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RIIO-T1/GD1: Real price effects and ongoing efficiency appendix

Final decision - appendix

Publication date: 17 December 2012

Contact: Joanna Campbell

Team: RIIO-T1 and GD1

Tel: 020 7901 7094

Email: joanna.campbell@ofgem.gov.uk

Overview:

This appendix, to the main documents for RIIO-T1 and GD1 Final Proposals, sets out our decision in relation to real price effects (RPEs) and ongoing efficiency assumptions. It sets out in greater detail respondents' views on our Initial Proposals, our response, and the reasons for our decision. This document is aimed at those seeking a more detailed understanding of our decision in this area.

Associated documents

Main Documents

RIIO-GD1: Final Proposals – Overview

RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas – Overview

Relevant Supporting Documents

RIIO-GD1: Final Proposals Supporting Document – Cost efficiency

RIIO-T1: Final Proposals for NGET and NGGT – Cost assessment and uncertainty

Other Relevant Documents

RIIO-T1/GD1: Initial Proposals – real price effects and ongoing efficiency

Glossary for all the RIIO-T1 and RIIO-GD1 documents

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1. Introduction

Chapter Summary
This chapter sets out how this paper contributes to the RIIO-T1 and GD1 Final Proposals. It also summarises the background to the development of the real price effects and ongoing efficiency assumptions for the gas distribution networks (GDNs), National Grid Electricity Transmission (NGET) and National Grid Gas Transmission (NGGT).

Summary

1.1. In March 2011 we published our strategy (Strategy Document) where we set out our intended approach to assessing the network companies' proposals for real price effects (RPEs) and ongoing efficiency. We included a list of potential data sources and the type of analysis that we intended to use in deriving such assumptions.

1.2. In Initial Proposals (IP) we set out in detail the methodology we had applied to calculate our proposed RPE and ongoing efficiency assumptions. This built on the information in our Strategy Document and took into account relevant evidence submitted by the network companies in their business plans.

1.3. This appendix to Final Proposals focuses on responding to the comments raised on our assumptions in IP. It does not repeat the detail of the methodology that has been used to derive the assumptions and should therefore be read in conjunction with the methodology paper published as part of IP.

Structure of this document

1.4. The remainder of this document is structured as follows:

- Chapter 2 sets out our decision in relation to RPE assumptions.
- Chapter 3 sets out our decision in relation to ongoing efficiency assumptions.
- Chapter 4 summarises the net impact of RPE and ongoing efficiency assumptions.

2. Real price effects

Chapter Summary
This chapter sets out our decision in relation to the real price effect (RPE) assumptions for the GDNs, NGET and NGGT.

Introduction

2.1. Allowed revenues are indexed by the retail prices index (RPI) as part of the price control. 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 we provide an ex ante allowance based on forecasted differences between economy-wide inflation, as measured by the RPI, and input price inflation. The RPE assumptions take account of the inputs that each sector purchases, ie RPE assumptions vary between the network sectors.

2.2. Our approach to estimating RPEs over the price period is to draw on outturn data and short-term independent forecasts where available, and use the real average historical rate for relevant input price indices for all other years.[1] We note that respondents broadly supported the overall approach. Some respondents expressed concerns about our use of HM Treasury's consensus forecast as our short-term labour RPE assumption. We discuss these responses in detail below and provide our reasons for our decision to maintain the approach set out at IP.

2.3. For Final Proposal, we have updated our short-term wage growth forecasts with the latest forecasts published by HM Treasury. We have also incorporated outturn data for 2012/13 to date for material and equipment inputs. The latest outturn data on input price inflation is lower than at IP, and has resulted in lower allowances for RPEs in 2012/13 relative to IP. The overall effect is marginally lower RPE allowances for GDNs and NGET, but a more marked reduction in the RPE assumptions for NGGT reflecting the inclusion of the steep fall in steel prices experienced in the first half of 2012/13.

2.4. Our RPE assumptions are summarised in Table 1.1.[2]

[1] For details of the methodology see the RPEs and ongoing efficiency paper (July 2012): http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/RIIOT1_and_GD1_Initial_Proposals_Real_Effects.pdf
[2] Annual RPE assumptions can be found in Appendix 1.

Table 1.1: Average annual RPE assumptions (2011/12 to 2020/21)

	Opex	Capex	Repex	Totex	Totex RPE at IP
GDN RPEs	0.4%	0.5%	0.6%	0.5%	**0.5%**
NGET TO[1]	0.5%	0.8%	-	0.8%	**0.8%**
NGGT TO	0.6%	0.4%	-	0.4%	**0.7%**
NGET SO	0.4%	0%	-	0.3%	**0.2%**
NGGT SO	0.4%	0%	-	0.2%	**0.2%**

Note (1) TO refers to the Transmission Owner and SO refers to the System Operator.

2.5. The changes in our assumptions are summarised below:

- The labour RPE in 2011/12 now incorporates the indices used to calculate the long-term average used in setting the RPE assumption from 2014/15.
- We have updated the shorter-term (2012/13 and 2013/14) labour RPE based on the latest HM Treasury's consensus forecast.[3]
- We have taken account of additional evidence provided by NGET to update its labour RPE.
- For 2012/13 we have incorporated outturn data into the RPE assumptions for materials and equipment and plant.
- Due to revisions of historical data there have been some minor changes in the long-term averages used in the assumptions.

2.6. We explain these changes in more detail below, we also respond to the principal issues raised by respondents on our RPE allowances set out in IP.

Labour RPE assumptions

2011/12 real wage assumption

2.7. At IP, we based our real wage assumption for 2011/12 on the private sector as a whole, although we noted that the unweighted average of real wages for the relevant sub-sectors (namely, the private sector, construction, transport and storage, and civil engineering) were only marginally lower (-0.1 per cent) than our private sector index. Respondents considered that the RPE for 2011/12 should capture wage growth of more specialist sectors and not just the private sector.

2.8. For FP, we have based our 2011/12 real wage assumption on an unweighted average of the relevant sub-sectors. We have used these sub-sectors to calculate the historical real average for consistency with our long-term labour RPE as at IP. However, we note that using the average of the comparator sectors for 2011/12 (equal to -2.9 per cent for the gas sector and -3.0 per cent for the electricity sector)

[3] HM Treasury, Forecasts for the UK Economy (October 2012), Tables 2 and 5: http://www.hm-treasury.gov.uk/d/201210forcomp.pdf

is only marginally different from using the private sector outturn value of -2.9 per cent (see Table 1.2). We have made this marginal correction to ensure consistency with our forecast over the long-term which is based on the historical average for the same comparators.

Table 1.2: Real labour indices (year on year change)

	2011/12 outturn	Long-term historical average (basis for forecast from 2014/15)
AWE private sector[1]	-2.8%	1.4%
AWE construction[1]	-3.6%	1.2%
AWE transport and storage[1]	-2.3%	1.0%
PAFI civil engineering[2]	-3.1%	1.8%
BEAMA electrical engineering[3]	-3.4%	2.2%
Unweighted average of relevant comparators	**Gas: -2.9% Electricity: -3.0%**	**Gas: 1.3% Electricity: 1.5%**

Note (1) Average weekly earnings (AWE), published by the Office for National Statistics (*ONS). (2) Price adjustment formula index (PAFI) for labour published by Building Cost Information Service (BCIS). (3) Labour index published by British Electrotechnical and Allied Manufacturers Association (BEAMA).*

2.9. National Grid (NG) (transmission and gas distribution) considered that our labour RPE assumption for 2011/12 did not adequately reflect the market in which it operates. It provided evidence on energy and process sector pay settlements, used in its negotiations with trade union, which suggested that real wage growth would be higher than for the private sector as a whole. NG transmission also considered that excluding a premium for specialist labour was inconsistent with our approach to setting ongoing efficiency assumptions and our decision on setting RPEs at previous price control reviews (which are based on comparator sectors).

2.10. As set out above, our labour real wage assumption already incorporates wage growth in comparable sub-sectors, namely construction, transport and storage, and civil engineering. We do not agree that we should use energy sector real wage data to set RPEs for 2011/12 for the following reasons:

- We use the same sub-sector wage series for 2011/12 as we use to calculate our long-term wage assumption based on historical averages, and therefore ensure the use of a consistent series over the price control period[4]
- If we were to use network companies' pay settlement data, there is a risk that we would reward companies for inefficient wage settlements. We prefer to use data which are comparable but independent of companies' labour costs.

[4] We acknowledge that we use forecast real wage data for the economy as a whole for 2012/13 and 2013/14 as opposed to forecasts for the comparable sub-sectors in the absence of forecasts for these sub-sectors.

2.11. We acknowledge that network companies employ specialist labour with high wage levels relative to the economy as a whole. However, it is not clear to us that the future growth rate in real wages for network companies' labour should differ from the historic real growth rates for our comparable sectors. In addition, we note our base year allowance takes into account any starting differences in the level of wages between network companies' employees and our comparator sectors. For these reasons, we do not consider that we need to allow any further adjustments (above the real wage growth implied by our comparator sectors) for specialised labour.

2.12. We agree with NGET's suggestion to use wage data for the electrical engineering sector as a comparator, represented by the labour index produced by BEAMA. We have therefore included this index in setting our long-term labour wage assumption (which is based on the long run historical real wage growth for BEAMA and other sectors), and incorporated this index into the 2011/12 labour RPE. The inclusion of the BEAMA index results in an increase of 0.2 per cent p.a. in the long-term average labour RPE assumption. for NGET. We have not used this index to set the labour RPE for either gas transmission or gas distribution as the index relates to electrical engineers.

Our use of HM Treasury's consensus forecast for 2012/13 and 2013/14

2.13. As at IP, we use HM Treasury's consensus forecast for whole economy wage growth as our labour RPE assumption for 2012/13 and 2013/14. We have updated our IP assumptions for the latest available forecasts (published October 2012) which results in marginally higher real wage growth assumption of -0.8 per cent in 2012/13 and -0.2 per cent in 2013/14.[5]

2.14. NG in its response supported the use of the Office of Budget Responsibility (OBR) private sector wage forecast instead of HM Treasury's consensus forecast which is for the economy as a whole. It considers that private sector wage growth is a more reasonable proxy for the expected wage growth for its labour force.

2.15. As we set out in IP, we did not use the OBR forecast to set the labour RPE for the following reasons:

- the impact of using the two approaches was only marginally different
- it was not clear to us that private sector wage growth was a better proxy than the economy as a whole
- we preferred to draw on a potentially more robust survey of forecasts as opposed to the forecast of a single organisation (OBR)
- HM Treasury's consensus forecast represented a more up to date forecast.

2.16. NG disputed our comment that the difference between using the OBR forecast and HM Treasury's consensus forecast was marginal. We note that NG appears to

[5] This is a change from -0.9 per cent in 2012/13 and -0.2 per cent in 2013/14 used in deriving the RPE assumptions at IP.

consider only the use of the OBR forecast to 2013/14 despite the forecast being available out to 2016/17. We present the labour assumption based on the two approaches in Table 1.3 below, using NGET's labour RPE as an example, but using the OBR forecast to 2016/17. We note that the average annual difference between using HM Treasury's consensus forecast and OBR forecast is 0.1 per cent p.a.

Table 1.3: NGET labour RPE using different forecasts (year on year change)

	2011 /12	2012 /13	2013 /14	2014 /15	2015 /16	2016 /17	2017 /18 on	Avg.
NGET Labour using HM Treasury forecast	-3.0%	-0.8%	-0.2%	1.5%	1.5%	1.5%	1.5%	0.65%
NGET Labour using OBR forecast[1]	-2.3%	-0.7%	1.4%	1.7%	0.8%	0.6%	1.5%	0.75%

Note (1): the OBR forecast is constructed from the OBR forecast of nominal private sector wage growth and the OBR forecast of inflation until the end of 2016/17. From then we revert to the long-term trend as per our labour RPE assumption.

2.17. Since IP, we have considered further whether we should use the OBR forecast (for the period to 2016/17) or the latest HM Treasury's consensus forecast. In particular, we have investigated NG's claim that public sector wage growth is lagging private sector wage growth, and thus HM Treasury's consensus forecast is likely to understate network companies' wage inflation. Specifically, NG proposed that we strip out the effects of low public sector wage growth, which it assumes to be zero per cent in nominal terms, from HM Treasury's consensus forecast.

2.18. We found no evidence to support NG's claim that HM Treasury's consensus forecasts are a poor proxy for the network companies because of low public sector pay deals relative to the private sector. The latest information from the ONS suggests that wage growth in the public sector is marginally higher than the private sector.[6] The Government has also announced a one per cent p.a. pay increase in the public sector. We would expect the recent comparable growth in public and private sector pay deals to be reflected in HM Treasury's consensus forecast for 2012/13 and 2013/14.

2.19. In addition, it is not clear to us that a private sector wage forecast is a better proxy for network companies than an all economy forecast. For example, comparably high levels of collective bargaining in the network companies and public sector may suggest that wage settlements follow with a similar lag relative to the economy as a whole. Furthermore, we prefer to use the more recent HM Treasury's consensus forecast (published October 2012) than the more dated OBR forecast (published in May 2012, but constructed for its March 2012 economic forecasts). For these reasons, we have decided to retain the use of HM Treasury's consensus forecast as our wage growth assumption for 2012/13 and 2013/14.

[6] Growth during the year to April 2012 versus the year to April 2011 was 1.5 per cent in the private sector and 1.6 per cent in the public sector. See ONS publication '2012 Annual Survey of Hours and Earnings' (November 2012) page 16: http://www.ons.gov.uk/ons/dcp171778_286243.pdf

Impact on recruitment and retention

2.20. Some respondents raised concerns that our proposed labour RPE would have a negative impact on recruitment and retention of staff for the network companies as it did not fully reflect the market in which they operate and compete for staff. We have already discussed the reasons for our choice of sectors in constructing the labour RPE assumption.

2.21. Additionally, in common with our overall approach, we set an overall revenue allowance which we consider allows an efficient network company to deliver the required outputs. Our RPE assumptions do not dictate to the network companies how much they should pay their employees; this is entirely a decision for them.

Comparison with previous decisions on RPEs

2.22. We also do not support NG transmission's view that our assumptions are inappropriate because they are different from those provided as part of the last electricity distribution price control review (DPCR5) or the settlement for the fast-tracked TOs. In relation to the latter, the Scottish TOs submitted different RPE assumptions. We accepted these RPE assumptions as part of an overall package when deciding to fast-track their plans as a whole. Part of the difference in RPE assumptions between the Scottish TOs and NG is also explained by our use of updated data in setting Final Proposals for NG.

Incorporating pension contributions in the labour RPE

2.23. SGN has requested an additional £50m of revenue to cover additional pension costs. This mainly comprises funding of its assumed incremental pension deficit over the 15-year deficit funding period, that is the deficit attributable to new service from the start of RIIO-GD1.

2.24. In setting Final Proposals, consistent with our stated policy on pensions, we only provide specific pensions deficit funding for the established deficit. This relates to service up to the start of the price control period and a totex allowance based on our assumed efficient level of total labour costs, ie covering both wages and ongoing pension costs including incremental deficits.

2.25. SGN has proposed that we increase our real wage assumption and thus our allowed totex to reflect its expected incremental pension deficit. Specifically, it proposed an increase in our composite RPE of 0.15 per cent p.a. to cover the deficit. We acknowledge that our wage series for private sector and comparable sectors, which we draw on to set labour RPEs, excludes pension costs. However, it is not clear to us that the growth in the indices (as opposed to the level) would be higher if it were gross of pension costs. Indeed, given the perceived tightening of pension benefits, for example closure of final salary pension schemes, we may expect the historical growth in total labour indices to be lower if they were measured gross of pension costs. We therefore consider that our labour RPEs reasonably reflect expected increases in total labour costs (including pensions).

Summary of our labour RPE assumptions

2.26. Table 1.4 summarises the labour RPEs for the GDNs, NGET and NGGT.

Table 1.4: Labour RPEs (year on year change)

	Proportion of totex	2011/12	2012/13	2013/14	2014/15 to 2020/21	Avg. over period
GDN labour	64%	-2.9%	-0.8%	-0.2%	1.3%	0.5%
NGET labour	39%	-3.0%	-0.8%	-0.2%	1.5%	0.6%
NGGT labour	27%	-2.9%	-0.8%	-0.2%	1.3%	0.5%

Non-labour RPE assumptions

Incorporating outturn data for 2012/13

2.27. We have incorporated outturn data for the first six months of 2012/13 into the RPE assumptions for the non-labour inputs. The latest outturn data on input price inflation indicates that in a number of areas it remains lower than long-term averages. Therefore to assume the long-term average real growth would overstate input price inflation for this year.

2.28. To incorporate outturn data we have assumed that the growth rate in the outturn data in 2012/13 is maintained for the rest of the year.[7] For example, if the real growth rate calculated from outturn data is -2.3 per cent we have assumed the real growth rate for 2012/13 will be -2.3 per cent. One supplier considered that our proposed allowances are overgenerous. We consider that factoring in outturn data for 2012/13 results in a more accurate near-term forecast.

2.29. Table 1.5 represents the outturn and forecast data used to construct our materials, and equipment and plant RPE assumptions, including the outturn data for 2012/13.

[7] For the majority of indices we have been able to incorporate six months of outturn data.

Table 1.5: Real materials, and equipment and plant indices (year on year change)

	2011/12 outturn	2012/13 outturn	Long-term historical average (basis for forecast from 2013/14)
FOCUS RCI infrastructure materials[1]	2.9%	1.5%	1.5%
PAFI steel works[2]	1.8%	-7.7%	1.7%
PAFI plastic pipes[2]	-1.3%	0.7%	1.2%
PAFI copper piping[2]	4.4%	-2.3%	2.2%
PAFI plant & road vehicles[2]	-2.9%	-1.6%	0.5%
Machinery & equipment output PPI[3]	-1.6%	-1.2%	-0.9%
Machinery & equipment input PPI[3]	-0.4%	-3.2%	-1.6%

Note (1) FOCUS RCI stands for the infrastructure resource cost index. (2) PAFI stands for the price adjustment formula index. (3) PPI stands for the producer price index.

Incorporating growth in the cost of civils

2.30. NG transmission raised concerns that our RPE assumptions do not take into account forecast changes in the cost of civils, eg concrete and scaffolding. It states that it has included the proportion of total costs in this area in the equipment and plant category. It proposes that a forecast of the infrastructure resource cost index be included in the RPE assumption for equipment and plant.

2.31. We have not changed the indices we have referenced in calculating the RPE assumption for equipment and plant. The infrastructure resource cost index is incorporated into our RPE assumptions as it is used to construct the RPE for opex materials. NGET's business plan states that equipment and plant costs make up 11 per cent of capex and NGGT's business plan states that it makes up 4 per cent of capex.[8] It is not possible, based on the granularity of the data, to verify exactly what costs have been included in each category, ie what inputs fall in the materials category and what in the equipment and plant category. We consider that our RPE assumptions adequately represent the range of inputs that NGET and NGGT purchase, and the potential for real input price inflation in these inputs.

[8] This compares to the other TOs' business plans' which stated that between 5 and 43 per cent of capex related to the cost of equipment and plant.

NGGT capex materials RPE does not reflect the type of steel used

2.32. NGGT considers that our choice of steel index used to represent the RPE assumption for capex materials does not represent the specialist steel that is required on its transmission network. It proposes that ONS data on the cost of iron and steel be incorporated into the RPE assumption.

2.33. As stated in IP, our policy is not to use commodity price indices in setting RPE assumptions. Our reason for this is that commodity prices will not reflect other factors which affect the price of the goods that the network companies purchase as they purchase manufactured goods not raw materials. For this reason we have not changed the index used to set the RPE assumption for capex materials.

2.34. We have updated the capex materials RPE for NGGT based on outturn data in 2012/13 as we explained above. The impact of this is to reduce the capex materials RPE from that assumed at IP by 9.4 per cent. Given this significant change we have also examined the index that NGGT proposed. We note this index too shows negative growth in 2012/13 outturn data of -12 per cent.

Summary of non-labour RPE assumptions

2.35. Table 1.6 summarises the non-labour RPEs for the GDNs, NGET and NGGT.

Table 1.6: Non-labour RPEs (year on year change)

	Proportion of totex	2011/12	2012/13	2013/14	2014/15 to 2020/21	Avg. over period
Materials opex[1]	**1-2%[6]**	2.9%	1.5%	1.5%	1.5%	1.6%
GDN materials capex/repex[2]	**9%**	1.6%	-3.1%	1.7%	1.7%	1.2%
NGET Materials capex[3]	**26%**	4.4%	-2.3%	2.2%	2.2%	2.0%
NGGT Materials capex[4]	**29%**	1.8%	-7.7%	1.7%	1.7%	0.7%
Equipment/plant[5]	**1-9%[7]**	-1.6%	-2.0%	-0.7%	-0.7%	-0.9%

Note (1): Based on FOCOS resource cost index for the infrastructure industry. (2) Based on unweighted average of PAFI indices for steel works, plastic pipes and copper piping. (3) Based on PAFI index for copper piping. (4) Based on PAFI index for steel works. (5) Based on unweighted average of PAFI index for plant and road vehicles, machinery and equipment output PPI and machinery and equipment input PPI. (6) For GDNs and NGET it is 2% and for NGET it is 1%. (7) For GDNs it is 1%, NGGT it is 3% and NGET it is 9%.

2.36. Our RPE assumptions for transport and other costs remain as zero, ie we consider that costs will grow in line with the RPI.

The ONS review of the methodology used to derive RPI

2.37. We have acknowledged the potential impact of the ONS review into the methodology used to derive the RPI.[9] We discuss our approach to dealing with uncertainty in this area in our Final Proposals for uncertainty mechanisms.[10] Our RPE assumptions are based on the relationship between historical nominal indices and the RPI. Therefore if there is a change in the RPI we have signalled that we will review these Final Proposals to ensure they remain appropriate.

[9] National Statistician consults on changes to the Retail Prices Index (October 2012): http://www.ons.gov.uk/ons/rel/mro/news-release/national-statistician-consults-on-changes-to-retail-prices-index/nsconsultrpinr1012.html

[10] For RIIO-T1 see Chapter 3 of the Cost Assessment and Uncertainty Supporting Document. For RIIO-GD1 see Chapter 8 of the Finance and Uncertainty Supporting Document.

3. Ongoing efficiency

Chapter Summary
This chapter sets out our decision in relation to the ongoing efficiency assumptions for the GDNs, NGET and NGGT.

Introduction

3.1. We expect even the most efficient network company to make productivity improvements, for example by employing new technologies. These improvements are captured by our ongoing efficiency assumption. This assumption represents the potential reduction in input volumes that can be achieved whilst delivering the same outputs.

3.2. Overall, we do not consider that the responses to IP raised any material issues to support a change to our conclusions. As with IP, we therefore set our assumptions for ongoing efficiency equal to the average historical improvement in efficiency for comparator sectors. Our assumptions draw on data from the EU KLEMS dataset.[11]

3.3. Specifically, as at IP, we draw the following conclusions from the comparator sector data set out in Table 2.1 below:

- A one per cent improvement in opex efficiency based on partial factor productivity measures (ie labour, and labour and intermediate inputs) for the industry averages (which range from 2.8 to 0.5 per cent p.a.). Our assumption of one per cent is also in line with network company assumptions.
- A 0.7 per cent improvement in capex and repex efficiency which is at the top-end of the estimates for total factor productivity (TFP) for construction, our principal comparator, but below the average TFP for other industries.

Table 2.1: Average annual growth rates for productivity measures from EU KLEMS (1970 to 2007): selected industry sectors

Sector (EU KLEMS sector code)	TFP (VA)[2]	Labour & Productivity (VA) at constant capital	TFP (GO)[3]	Labour & Intermediate Input Productivity (GO) at constant capital	Labour & Intermediate Input Productivity (GO)
Construction	0.7%	0.7%	0.3%	0.3%	0.4%
Unweighted average selected industries	2.3%	2.8%	0.9%	0.9%	1.1%

[11] EU KLEMS website: http://www.euklems.net/

Sector (EU KLEMS sector code)	TFP (VA)[2]	Labour & Productivity (VA) at constant capital	TFP (GO)[3]	Labour & Intermediate Input Productivity (GO) at constant capital	Labour & Intermediate Input Productivity (GO)
Unweighted average selected industries (exc. manufacturing)	1.1%	1.2%	0.5%	0.6%	0.8%
Unweighted average all industries[1]	1.3%	1.5%	0.5%	0.5%	0.8%
Weighted average all industries[1]	1.1%	1.1%	0.5%	0.5%	0.8%

Note (1) We have excluded the following industries from this average: real estate (K), public admin (L), education (M), health (N) and social services (O). (2) Value added (VA) is a measure of the value of gross output minus the value of intermediate inputs (energy, materials and services) required to produce the final output. (3) Gross output (GO) is a measure of the value of the output of an industry, ie the combined turnover of the companies within that industry.

Respondents' comments and our decision

3.4. We provided more detailed support for our conclusions in IP. Below we set out our views on the comments raised by respondents.

Macroeconomic performance and productivity growth

3.5. NG considers that there has been a general slowdown in economic activity over the last 40 years which is not reflected in our productivity assumptions. It considers that the most recent ten-year period is more applicable and would result in a lower productivity assumption than our approach which drew on data from the last 40 years.

3.6. However, NG has not provided any evidence to support its assertion that there has been a "*general slowdown in economic activity over the past forty years*", or if this were correct, why this should necessarily imply lower productivity levels for network companies. Thus, we do not propose to change our view of ongoing productivity for this factor.

The declining gas distribution industry

3.7. NGGD states that productivity assumptions should be reduced given that peak-day flows on its network will be stable or declining, and that repairs will decline. We do not consider that these factors are relevant to our productivity assumptions. For example, a decline in peak-day flows should not inhibit NGGD's ability to improve the efficiency of pipe laying or its operational activities.

3.8. We accept that there may be an inverse relationship between productivity improvements and overall levels of investment, ie high levels of investment may help deliver improvements through capital substitution or drive R&D expenditure. However, as we explain below, our productivity assumption for opex is based on the assumption of constant capital, ie no change in the level of capital inputs. Instead we take account of capital substitution when setting total cost allowances, eg in gas distribution, we model repair costs as a function of total number of reports, which are in turn dependent on expected levels of investment.

3.9. Thus, we consider that we have adequately addressed investment levels in setting cost allowances, and so we do not propose to modify our productivity assumptions in this area.

The impact of investment efficiency

3.10. NGGD considered that we double-count the impact of investment levels on opex productivity improvements. Specifically, it claimed that:

- its planned investment has the effect of reducing controllable opex by a further 0.33 per cent p.a.
- our UK comparator set is at constant capital but that "*this will still include the effects of investment in replacing existing equipment – analogous to mains replacement in gas distribution.*"
- as a consequence, it is "*illogical to apply a 1 per cent p.a. opex productivity growth assumption on top of an existing 0.33 per cent p.a. from investment, largely replacement activity. It would be more logical for the productivity growth from the UK comparators to be reduced by the 0.33 per cent gain from the investment effect on opex workload [...]*".

3.11. We disagree with NGGD's assertion that we need to reduce our assumed opex productivity assumption of 1 per cent p.a. by 0.33 per cent p.a. for investment workload effects. In making our assumption for opex productivity, we draw on LEMS productivity at constant capital. This is defined as follows (emphasis added by us):

"*a measure of the rate of reduction in a volume index for labour and intermediate outputs that would arise if all gross output total factor productivity growth took place through reductions to the volume of labour and intermediate inputs, with no change to the volume of output produced or to capital inputs.*"[12]

3.12. Thus, the effect of capital-labour substitution is specifically excluded from the data that we use as the basis for ongoing efficiency improvements. Therefore, we do not propose to adjust our approach for this factor.

[12] See: Reckon (20 May 2011) Productivity and unit cost change in UK regulated network industries and other UK sectors: initial analysis for Networks Rail's periodic review, p. 140, para 9.21: http://www.rail-reg.gov.uk/upload/pdf/reckon_200511.pdf

The Upper Quartile double count

3.13. NG (transmission and gas distribution) considers that our ongoing productivity assumption includes an element of "catch-up efficiency", and this represents a double-count given our reductions to unit costs based on our assessment of network companies' comparative efficiency. For example, for gas distribution, we require GDNs to close 75 per cent of the efficiency gap to the frontier arising from our comparative efficiency modelling.

3.14. NG's assumption that there is a double-count rests on an academic article published by Fare et al in 1994,[13] and regulatory precedent from other regulators, as well as the Competition Commission (CC). It states that based on this evidence, we should assume that 25 per cent of the efficiency improvements derived from the EU KLEMS dataset represents catch-up efficiency and thus a double-count when taken together with our reductions in relation to our benchmarking analysis.

3.15. We have reviewed the academic article and the regulatory precedent. As we set out in IP, we do not consider that our use of productivity data, from the EU KLEMS dataset, results in a double-count.

3.16. The Fare et al (1994) article cited by NG decomposes productivity growth into frontier or technical efficiency and catch-up efficiency. The authors undertake this decomposition for 17 OECD countries by:

"*[constructing a] world frontier based on the data from all of the countries in the sample. Each country is compared to that frontier. How much closer a country gets to the world frontier is what we call "catching-up"; how much the world frontier shifts [..] is what we call 'technical change'.*"[14]

3.17. The authors found that, for the period 1979-1998, 25 per cent of the productivity growth rate observed in the UK was related to closure of the efficiency gap to the world frontier (in this case, the US).[15]

3.18. It is not clear to us that the report's findings are relevant to our proposed use of KLEMS data. For example, our comparative benchmarking analysis for gas distribution identifies the least cost GDN of the four companies in the GB sector (based on the upper quartile company). We then assume that the least cost GDN can reduce costs in line with the historical improvement in comparator sectors in the UK, ie based on KLEMS data. We do not consider that we need to modify our on-going efficiency for the (uncertain) element that represents closure to the global frontier.

[13] Fare, et al (March 1994) *Productivity growth, technical progress, and efficiency change in industrialised countries*, The American Economic Review, Vol 84.
[14] Fare, et al (March 1994), pp. 66-83.
[15] This assumption appears to be based on Table 4 in Fare et al (1994).

3.19. The regulatory precedent cited by NG (notably, an Oxera report in 2005 for the Office of Rail Regulation (ORR)) relies on the same Fare et al (1994) article. For this reason, we do not propose to modify our assumptions for the cited regulatory precedent. We also note a much more recent report by Reckon for the ORR did not consider that Oxera's reliance on Fare et al (1994) in decomposing KLEMS data into catch-up and frontier shift was a relevant factor in interpreting EU KLEMS data for ORR.[16]

3.20. NGET, NGGT and NGGD also cite the OECD in support of its assertion of a double-count. The OECD states: "*Conceptually, the KLEMS productivity measure captures disembodied technical change. In practice, it reflects also efficiency change, economies of scale, variations in capacity, utilisation and measurement errors.*"[17]

3.21. We accept the point that EU KLEMS data reflects a number of effects, as set out in the OECD handbook. However, our assumption in IP was that a long-term time-series incorporating a range of comparator sectors is a useful proxy to productivity improvement as we would not expect there to be systematic catch-up, error, change in utilisation etc over such a long-term period and covering a number of sectors.

Regulatory precedent

3.22. In relation to gas distribution, NGGD considers that our assumptions are inconsistent with the CC's conclusions in the Bristol Water determination.[18] Table 2.2 compares our assumptions with those of the CC in the Bristol Water determination.

3.23. We considered the CC Bristol Water determination at IP, and we have reviewed the decision in further detail. In relation to opex productivity, we note that the CC assumed 0.9 per cent p.a., only marginally lower than our assumption of 1 per cent p.a. for opex.[19,20]

3.24. In relation to capex assumptions, the CC has not explicitly stated its productivity assumption although we assume this is 0.4 per cent p.a., which is lower

[16] It states: "*The notion of catch-up of the average level of productivity of one country compared to another does not seem the same as the notion of catch-up that is relevant to the estimates from the EU KLEMS report*". Source: Reckon (20 May 2011) Productivity and unit cost change in UK regulated network industries and other UK sectors: Initial analysis for Network Rail's periodic review, p. 46.
[17] NGGD (September 2012) Response to Initial Proposals, p. 46. OECD (2001) The Measuring Productivity Manual, p. 18, http://www.oecd.org/std/productivitystatistics/2352458.pdf
[18] NGGD states: "*For investment, our IP assumption of 0.7 per cent p.a. [for capex productivity improvement] appears high, being well above the regulatory precedent provided by the Competition Commission's 0.4 per cent p.a.*" It also states that it used the CC assumption of 0.5 per cent p.a. for opex "*as the basis of its business plan submission*". See NGGD (September 2012) Response to Initial Proposals, p48.
[19] Competition Commission (18 June 2010) Bristol Water Plc, Provisional findings report, Annex H27, para. 99, and Competition Commission (4 August 2010) Bristol Water Plc, Report, Appendix K28, Table 11.
[20] We also acknowledge that the CC incorporated a further adjustment of 0.25 per cent p.a. to unit cost (not productivity per se) to leave potential for companies to outperform, and to reflect uncertainty associated with some of the components in its calculation. See: Competition Commission (4 August 2010) Bristol Water Plc, Report, Appendix K28, para. 133.

than our assumption of 0.7 per cent p.a.[21] Notwithstanding the lower CC assumption, we do not consider that the Bristol Water determination contains any evidence that contradicts the basis for our assumptions for GDNs or TOs. We also note that we should not expect to draw identical conclusions as the CC Bristol Water determination given the CC decision relates to a different sector.

Table 2.2: CC Bristol Water assumptions, and our IP (year on year change)

	Opex		**Capex**	
	CC[1]	**Ofgem IP**	**CC[2]**	**Ofgem IP**
Ongoing efficiency	- 0.9	-1	-0.4 (assumption)	-0.7

Notes: (1). Competition Commission (18 June 2010) Bristol Water Plc, Provisional findings report, Annex H27, para. 99, and Competition Commission (4 August 2010) Table 11 Bristol Water Plc, Report, Appendix K28, Table 11. (2) Competition Commission (4 August 2010) Table 11 Bristol Water Plc, Report, para 4.11, p 41. It is not clear to us from the report, the component elements of the CC's conclusion on capital unit cost reductions.

Application to different sectors, and years relating to GDPCR1

3.25. SGN stated that we should not apply the ongoing productivity assumption to all cost areas, eg emergency services, where it considers that there are material cost pressures.

3.26. We do not agree with this argument. We acknowledge that GDNs may be able to realise greater cost reductions in some expenditure areas than others; however, this does not mean that in aggregate GDNs cannot achieve the productivity gains achieved by the comparator sectors.

3.27. In relation to the application of years relating to GDPCR1, we consider that we need to apply our productivity assumptions from the base year onwards. That is, for GDNs we roll-forward the upper quartile benchmark costs identified using historical cost models based on 2008/9 to 2011/12 data using productivity assumptions from 2012/13. For econometric models using two-year forecast data, we roll-forward the identified benchmark from 2014/15. We note that we have not applied productivity assumptions in our assessment of non-regressed costs.

[21] The CC states that its assumption of 0.4 per cent p.a. relates to changes in unit costs. NGGD told us that it understood this assumption should be combined with the CC's assumption for the construction output price index (COPI) of 0.75 per cent p.a. providing an overall net allowance of 0.35 per cent p.a. (ie = -0.4+0.75), and thus the 0.4 per cent unit cost reduction is in effect a productivity assumption. See: Competition Commission (4 August 2010) Bristol Water Plc, Report,p.41, para 4.11.

4. Net impact of RPEs and ongoing efficiency

Chapter Summary
This chapter summarises our decision on the assumptions for RPEs and ongoing efficiency.

4.1. In general, most respondents supported our approach to setting RPEs and ongoing efficiency as we set out in IP. As set out above, we do not consider that we need to change our overall framework from that used at IP, although we have updated our RPE forecasts for latest outturn and forecast data.

4.2. Table 3.1 sets out the net impact of our decision on RPE assumptions and ongoing productivity. Overall, this shows that we expect network companies to absorb real input price inflation through ongoing productivity improvements.

Table 3.1: Average annual net impact (2011/12 to 2020/21, year on year change)

	GDNs	NGET TO	NGGT TO	NGET SO	NGGT SO
Opex	-0.6%	-0.5%	-0.4%	-0.6%	-0.6%
Capex	-0.2%	0.1%	-0.3%	-0.7%	-0.7%
Repex	-0.1%	-	-	-	-
Totex	**-0.3%**	**0.0%**	**-0.3%**	**-0.6%**	**-0.7%**
Totex impact set out in IP	**-0.3%**	**0.1%**	**0.0%**	**-0.7%**	**-0.7%**

4.3. As Table 3.1 shows for the majority of network companies the changes we have made since IP have made minimal difference to the overall impact on totex cost allowances. The largest change is in the assumptions for NGGT TO where there has been a fall in the net impact of 0.3 per cent p.a. on average. This is as a result of the materials RPE assumption capturing the fall in steel prices in 2012/13.

Appendices

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Appendix 1 – Annual RPE assumptions

1.1. This appendix sets out the annual growth rate in RPEs for the GDNs, NGET and NGGT.

Table A1.1: GDNs' annual RPE assumption (year on year change (%))

	2011/12	2012/13	2013/14	2014/15 to 2020/21
Opex	-1.4	-0.4	0.0	0.8
Capex	-1.4	-1.1	0.2	1.0
Repex	-2.0	-1.0	0.1	1.2
Totex	-1.7	-0.8	0.0	1.0

Table A1.2: NGET's annual RPE assumption (year on year change (%))

	2011/12	2012/13	2013/14	2014/15 to 2020/21
TO Opex	-1.5	-0.3	0.0	1.0
TO Capex	0.2	-1.1	0.6	1.2
TO Totex	-0.1	-1.0	0.5	1.2
SO Opex	-1.8	-0.5	-0.1	1.0
SO Capex	0.0	0.0	0.0	0.0
SO Totex	-1.2	-0.3	-0.1	0.6

Table A1.3: NGGT's annual RPE assumption (year on year change (%))

	2011/12	2012/13	2013/14	2014/15 to 2020/21
TO Opex	-1.2	-0.2	0.1	1.0
TO Capex	0.0	-3.1	0.6	0.9
TO Totex	-0.2	-2.7	0.5	0.9
SO Opex	-1.7	-0.5	-0.1	0.8
SO Capex	0.0	0.0	0.0	0.0
SO Totex	-1.0	-0.3	-0.1	0.5