



REVIEW OF THE RIIO FRAMEWORK AND RIIO-1 PERFORMANCE OFGEM

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FINAL REPORT

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EXECUTIVE SUMMARY

CEPA has been contracted to review the RIIO framework, and network companies' performance during the RIIO-1 price controls, in order to inform Ofgem's thinking on the approach to RIIO-2. Ofgem is developing its approach amid lessons from RIIO-1, including suggestions that network companies have been earning unjustified high returns, as well as broader changes to the energy sector that are challenging previous regulatory axioms.

Customers (and other stakeholders) reasonably expect that network companies would only earn additional returns if they deliver exceptional performance. Evidence to date suggests that RIIO-1 has succeeded at incentivising network companies to better deliver outputs for customers. Our analysis shows that high returns are, in part, a result of network companies improving their efficiency and their performance against output targets. Those are positives that reflect the ways in which the RIIO framework is working effectively.¹

The RIIO-1 price controls were, however, the first application of the RIIO framework. Given the breadth and complexity of the framework, it is perhaps not surprising that there will be room to improve how the framework is implemented in future price controls by learning from RIIO-1. We identified issues around the way the RIIO-1 price controls were implemented, and the risk-reward balance of those price controls, that have also made material contributions to the level of added returns for network companies.

Ofgem would need to address these issues in future price controls to provide customers with confidence that the charges they pay for network services reflects efficient costs. So we framed our recommendations in terms of:

- changes in the application of the RIIO framework for RIIO-2; and
- changes to the RIIO framework itself that would better meet the framework's intended impacts if applied in RIIO-2.

A. CEPA's review of network companies' performance during RIIO-1

Limitations of the analysis

Our assessment has been conducted on the basis of the available evidence to date – four years of data for RIIO-T1 and GD1, and two for RIIO-ED1. **Given the limited number of years available to inform our assessment, the views presented in this report represent a provisional view of the successes and failures of RIIO-1 price controls.**

It is also important to note that price control regulation is often considered a “repeated game”, so the impact of the RIIO framework would not play out in full during the first set of price controls. For example, if RIIO has resulted in larger efficiency savings, some of the benefit will feed through to lower charges for consumers in RIIO-1, but a further benefit to

¹ Assessing network companies' unit costs over time or benchmarking companies' relative efficiency is outside the scope of this review. Likewise, considerations of the cost of capital and financeability are also out of scope.

consumers would be when Ofgem uses those revealed costs to set lower allowances in RIIO-2. We expect both Ofgem and the network companies to be in a better position to apply the principles of the RIIO framework in future price controls.

In conducting our review, we have relied primarily on data collected by Ofgem from the network companies. We also surveyed the network companies for examples of how they responded to the introduction of the RIIO framework. **CEPA has not independently verified the data provided by Ofgem nor the statements made by the network companies.**

The sources of added returns during RIIO-1

In [Section 2](#) we summarise our assessment of network companies' performance so far in RIIO-1 and the reasons for the observed levels of returns. The majority of network companies are forecast to underspend their totex allowances for RIIO-1. These underspends do not appear to have come at the expense of delivering the required outputs, as network companies have generally improved their performance against output targets. This points to improved efficiency on the part of the network companies. But we have also identified the following issues that suggest the framework can be improved:

Application of the principles and objectives of the RIIO framework: The RIIO framework is ambitious and broad, creating execution risk for Ofgem. The framework was intended to be "high-powered", so if not executed correctly the consequences for network companies and/or customers would be more significant. We identified the following implementation issues that resulted in added returns for network companies in RIIO-1:

- Allowances, for example for non-load-related capex for National Grid Electricity Transmission (NGET), were not adequately linked to outputs. The conditions under which Ofgem might claw back any related underspend were not well defined.
- Following the Health and Safety Executive's decision to grant gas distribution networks (GDNs) more discretion on the iron mains replacement programme (repex), Ofgem's cost allowances were based on the previous, more expensive, approach. Ofgem might not have been able to credibly set different allowances at the time, but it also did not build in mechanisms that would allow it to revisit allowances in light of new information during RIIO-GD1. Additionally, GDNs may have been double-rewarded as activities funded under repex may have led to improved performance against the shrinkage and environmental emissions incentives.
- In RIIO-ED1, the interruptions incentive scheme (IIS) was based on outdated data. However, we note that Ofgem's decision was ultimately upheld by the Competition and Markets Authority (CMA). As a result, a number of electricity distribution network companies (DNOs) were outperforming their targets from the start of the new price control period, resulting in returns that are not proportionate to the performance improvement.

Risk allocation: The RIIO-1 price controls expose network companies to some risks that are likely to be outside their control. So far in RIIO-1 these risks have turned out favourable to network companies, resulting in added returns that are not due to improved performance. For example:

- We estimate that during the first four years of RIIO-T1 and GD1, real price effects (RPEs) have resulted in additional returns of regulatory equity (RoRE) of 80 basis points for NGET, 40 basis points for National Grid Gas Transmission (NGGT) and 70 basis points for GDNs.
- GDNs have been rewarded through the national transmission system exit capacity incentive partly because gas volumes have been lower than Ofgem's forecast.
- The fast-track settlements for the Scottish transmission operators (TOs) included baseline allowances for transmission projects that depended on new generation coming online. Delays or cancellation of the generation projects resulted in underspends and additional returns for the TOs.

Skew of expected returns: *Ex ante* mechanisms apply a powerful incentive on network companies to become more efficient and deliver service improvements, but they carry an inherent risk of Ofgem setting the wrong allowances and/or targets (for example, because the information available at the time turns out subsequently to have been incorrect). In practice, the upside potential for network companies is likely to exceed the downside risk because the companies have an information advantage over Ofgem. This means that the intended high-risk/high-reward framework might not be realistically achievable. However, Ofgem did not include a mechanism in RIIO-1 to protect customers against the residual risk of network companies earning added returns that are not due to performance improvements.

Review of other key elements of the RIIO framework

In addition to the above analysis of returns during RIIO-1, we have also assessed the key elements of the RIIO framework and how effective they have been at having their intended impacts. We highlight the following observations:

- **Stakeholder engagement** – Our assessment is that the 'enhanced engagement' model in RIIO-1 has been a positive step. There is evidence that network companies are learning by doing: stakeholder engagement in both developing the RIIO-ED1 business plans and on an ongoing basis has been notably more effective than in RIIO-T1 and GD1. So Ofgem could reasonably expect significant improvements from all network companies in RIIO-2.
- **Proportionate assessment of business plans and the fast-track incentive** – We estimate that the fast-track incentive is likely to have resulted in a net benefit to customers in RIIO-ED1. We were not able to establish whether the fast-track incentive (and the decision to fast-track the Scottish TOs) resulted in a net benefit to customers in RIIO-T1 and GD1. Our analysis suggests that the fast-track incentive is more likely to result in net benefits to customers in sectors where there is greater comparability between network companies,

as it is more likely to incentivise the companies to compete against each other to be fast-tracked.

- **The information quality incentive (IQI) and totex incentive rate** – Ofgem made two changes in how the IQI was applied in RIIO-1 that have had the effect of strengthening the incentive. Under the new application of the IQI network companies retain outperformance for the life of the asset (e.g. 45 years), compared to the previous approach in which outperformance was retained for five years. This effectively results in an added return if a network company's cost of capital is lower than the allowed rate of return (and *vice versa*). Additionally, the totex incentive rate is now calculated on a post-tax basis so that, for the same incentive rate, network companies' returns are exposed to wider variations as a result of under- or over-spends.
- **Longer price controls** – At the time of this report we only have a maximum of four years of information (for transmission and gas distribution) on how network companies have responded to the move to eight-year price controls at RIIO-1. We have received some anecdotal evidence from network companies on how they responded to the longer price control periods, but it is too early to make a definitive assessment of the costs and benefits of longer price controls.

To the extent that network companies have been able to achieve greater efficiencies as a result of the move to longer price control periods, customers would benefit from higher reductions in network costs through the totex incentive rate. Additionally, Ofgem would be able to use any such lower revealed costs when setting allowances for the next price controls. In this way, price control reviews can be thought of as a "repeated game", with the gains from longer control periods playing out over more than just the eight years of the current periods. However, the longer a price control period, the greater the scope that actual outcomes would diverge from network companies and Ofgem's forecasts.

B. CEPA's recommendations for RIIO-2

Implementing the RIIO framework better in RIIO-2

In [Section 3](#) we set out recommendations for better application of the RIIO framework and its underlying principles, which can go some way towards addressing the first two sources of added returns discussed above. To a degree, this is to help Ofgem consider the resources and processes required to implement the RIIO framework.

Our review identified the following elements of the RIIO framework as ones that Ofgem should prioritise implementing better for RIIO-2:

- **Stakeholder engagement** – In order to make more effective use of 'enhanced engagement', Ofgem should specify the areas of the price control where stakeholders are best placed to shape the settlement, and the forms of engagement that would be most

effective. More can also be done to define what ‘good’ looks like for engagement during price control reviews.

- **Output incentives** – In order to address issues such as demonstrated by the IIS, Ofgem should review the output incentive targets in light of network companies’ revealed performance in RIIO-1 and consider the latest data when setting future targets. Some outputs better lend themselves to relative, rather than absolute, targets. For others, Ofgem could consider setting localised targets if there is a material difference in local customers’ preferences.
- **Relationship between output targets and totex allowances** – In order to ensure that incentive targets are set such that network companies are not rewarded for performance improvements that are also funded through totex (‘double-rewarding’), Ofgem should conduct a sense-check of totex allowances against output targets. This is on top of general requirements for Ofgem to develop a clear understanding of what network companies would be expected to deliver with their totex allowances, and ensuring that allowances reflect efficient costs. This would also help mitigate against situations such as has been observed with NGET’s non-load-related capex.
- **Dealing with uncertain investment** – In order to address issues such as with the electricity TOs’ load-related capex, Ofgem can allocate a larger share of uncertain cost allowances to the cost uncertainty mechanisms (e.g. revenue drivers) rather than including them in baseline allowances. Another way of addressing cost uncertainty is through more competition for the market (e.g. Competitively Appointed Transmission Owners), which places the onus on bidders, rather than on Ofgem, to estimate the efficient costs of new investment. We note that such uncertainty mechanisms place an additional resourcing burden on Ofgem, network companies and stakeholders.
- **Long-term view on costs** – Network companies’ activities span a number of price control periods, and this should be reflected in Ofgem’s approach to setting allowances. This is a particularly pertinent issue for repex in RIIO-GD2: Ofgem should consider using a workload profile for RIIO-GD2 that accounts for the assumed, rather than actual, repex profile for RIIO-GD1. This would protect customers from cases where GDNs prioritised lower-cost work in RIIO-GD1 and left the higher-cost work for RIIO-GD2.

Amending the framework for RIIO-2 to achieve a lower target risk/reward balance

The RIIO framework was intended to be high-powered. It is rooted in the belief that the best long-term outcome for customers would be to create incentives for shareholders to apply pressure on network companies’ management to deliver better returns through strong performance. Our analysis shows that, to an extent, RIIO-1 has been successful at driving such behaviour. But we also found that some risks were not efficiently allocated in RIIO-1, and that the overall risk profile is likely to have been lower than would justify the available returns.

Moreover, we do not think that the truly high-risk/high-reward profile envisaged for RIIO can be realistically achieved under the current framework. This is because the complexity of the framework, coupled with information asymmetry between Ofgem and the network companies, naturally leads Ofgem to act with caution in setting its price control allowances and targets (for example, the safety risk of underinvestment in the network is likely to be of greater concern than the cost to consumers of “gold-plating” investment). This naturally de-risks the price control for network companies; or in other words, creates the potential for high returns to be made.

We draw an important distinction between risks *during* each price control period and risks *ahead* of the control period (i.e. at the price control review stage). This distinction is particularly important when considering the impact of the length of price control periods on risk. Longer price controls would increase certain risks during the period, but reduce others through less frequent price control reviews. For most options assessed, our analysis focuses on risk allocation during the price control period. When discussing options for the length of the control period we also cover risks ahead of the price control period.

We note that regulatory risk, which is brought about by price control reviews and any other regulatory interventions, is mitigated by Ofgem’s duty to follow due process (including consultation) and stakeholders’ ability to appeal Ofgem’s decisions to the CMA.

Based on our analysis of commercial risks that network companies may face under RIIO price controls, we recommend that Ofgem targets a lower risk-reward balance in future RIIO price controls.² In [Section 4](#) we set out and evaluate some of the options that Ofgem may consider using to change the risk profile of RIIO price controls. We present options for achieving a lower target risk-reward balance by changing the following elements:

- proportionate assessment and the fast-tracking incentive;
- the scope of outputs and how to encourage whole-of-system thinking;
- totex allowances and the information quality incentive (IQI);
- dealing with uncertainty, particularly with regard to RPEs;
- the length of the price control period; and
- options for protecting customers against unjustified returns by network companies.

We look at a range of options, including *ex ante* mechanisms that would achieve a risk/reward balance that is more aligned to the actual risk profile of RIIO-1 price controls, and *ex post* mechanisms. The latter would result in a lower risk/return profile more akin to rate of return regulation in the US.

² In a separate report published alongside this one, CEPA has advised Ofgem on how the RIIO framework may address certain financial risks in future price controls.

We note that some of the risks that would be affected by the options we discuss may be diversifiable, while others are more likely to be systematic (in practice risks are rarely one or the other, but rather have diversifiable and non-diversifiable elements to them). As such, the impact of any changes in risk allocation will need to be considered carefully and take account of the combined effect of any changes.

Whichever options Ofgem decides to adopt for RIIO-2, **it is essential that Ofgem models network companies' behaviour under the proposed framework** for the price control. Individual policies/mechanisms that may be well-intentioned and appropriate on their own could have a combined effect that results in perverse incentives, which Ofgem should seek to identify and mitigate against as early as possible in the price control process. Part of this exercise, particularly as regards risk mitigation, should involve Ofgem challenging its own assumption; for instance, tasking either an internal or external team to see how any proposals might be exploited by network companies in order to identify potential weaknesses. Whilst not being fool-proof, this would help identify risks and ways of mitigating them.

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LIST OF ACRONYMS

AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
BEIS	Department for Business, Energy & Industrial Strategy
CAA	Civil Aviation Authority
Capex	Capital expenditure
CBA	Cost-benefit analysis
CCG	Consumer challenge group
CEPA	Cambridge Economic Policy Associates
CEWG	Constructive Engagement Working Group for Heathrow
CI	Customer interruptions
CMA	Competition and Markets Authority
CML	Customer minutes lost
CMZ	Constraint Managed Zone
COAG (Energy Council)	Council of Australian Governments Energy Council
COPI	Construction Outputs Prices Index
CP5	ORR's price control review of Network Rail for 2014-19
CPB	Capital Portfolio Board for Heathrow
DECC	Department of Energy & Climate Change (now defunct)
DMIA	Demand management innovation allowance
DNO	Electricity distribution network operator
DPCR3/4/5	Electricity distribution price control reviews for 2000-05, 2005-10 and 2010-15
DSO	Distribution system operator
ENWL	Electricity North West Limited
EU KLEMS	European Union productivity study
GB	Great Britain
GDN	Gas distribution network
GDPCR1	Gas distribution price control review for 2008-13
HAL	Heathrow Airport Limited
HSE	Health and Safety Executive
IED	Industrial Emissions Directive
IFI	Innovation funding incentive
IFS	Independent Fund Surveyor
IIS	Interruptions incentive scheme

IMRP	Iron mains replacement programme
IQI	Information quality incentive
IRM	Innovation roll-out mechanism
LCNF	Low carbon networks fund
MEAV	Modern equivalent asset value
MPR	Mid-period review of RIIO price controls
NGET	National Grid Electricity Transmission
NGGT	National Grid Gas Transmission
NGN	Northern Gas Networks
NIA	Networks innovation allowance
NIC	Networks innovation competition
NLR (capex)	Non-load-related capital expenditure
NOM	Network output measure
NPg	Northern Powergrid
NTS	National (gas) transmission system
ODI	Outcome delivery incentive
Ofgem	Office for Gas and Electricity Markets
Ofwat	Water Services Regulation Authority
Opex	Operating expenditure
ORR	Office for Rail and Road
PCFM	Price control financial model for Ofgem's RIIO price controls
PR14/19	Ofwat's price control review for 2015-20 and 2020-25
Q6/H7	CAA's price control reviews of Heathrow for 2014-19 and 2020-25
RAV	Regulatory asset value
RBR	Risk-based review
Repex	Replacement expenditure (specifically, iron mains replacement expenditure in gas distribution)
RIIO	Revenue = Incentives + Innovation + Outputs
RIIO-ED1	Electricity distribution price control review for 2015-23
RIIO-GD1	Gas distribution price control review for 2013-21
RIIO-T1	Electricity and gas transmission price control review for 2013-21
RoRE	Return on regulatory equity
RPE	Real price effect
RPI	Retail Prices Index
RPI-X	Retail Prices Index less an efficiency savings estimate (price controls)
RRP	Regulatory reporting pack

SGN	Scotia Gas Networks
SHEPD	Scottish Hydro-Electric Power Distribution
SHET	Scottish Hydro-Electric Transmission
SPD	Scottish Power Distribution
SPEN	Scottish Power Energy Networks
SPMW	Scottish Power Manweb
SPTL	Scottish Power Transmission Limited
SRC	Strategic Review of Charges for Scottish Water
SSEN/SSEPD	Scottish and Southern Energy Networks (previously Scottish and Southern Energy Power Distribution)
SWW	Strategic wider works
TOs	Transmission operators
Totex	Total expenditure
TPCR4/RO	Electricity and gas transmission price control review for 2007-12 and its extension for 2012-13
UK	United Kingdom
UKPN	UK Power Networks
WICS	Water Industry Commission for Scotland
WPD	Western Power Distribution
WTP	Willingness to pay
WWU	Wales and West Utilities

1. INTRODUCTION

Economic regulation of energy networks was introduced in Great Britain (GB) in the 1980s following the privatisation of British Gas. The regulatory framework initially simply adjusted allowed revenues by the Retail Prices Index less a high-level efficiency savings estimate (RPI-X), and was focused on lowering the cost of energy network services. Over time the regulatory framework has taken on additional aims, and new mechanisms were introduced in order to address perceived issues with the previous framework; for example, incentives related to service quality were introduced to balance the imperative under RPI-X controls for network companies to minimise cost at the expense of longer-term service quality.

Ofgem reviewed the regulatory framework in its RPI-X@20 Review.³ The resulting Revenue = Incentives + Innovation + Outputs (RIIO) framework was introduced in 2010. RIIO established a conceptual framework to regulation that could be applied consistently across the four energy network sectors that Ofgem regulates (electricity distribution, electricity transmission, gas distribution and gas transmission) over time. But it was also recognised that the framework may need to be reviewed in light of lessons from previous price controls and from other sectors, and to respond to changes in government policy.⁴

The RIIO framework evolved from Ofgem's approach to prior price controls (particularly DPCR5) – for example, the use of total expenditure ('totex') and a focus on network companies' outputs.⁵ But it also introduced some new ideas – most notably a move to longer price control periods (eight years rather than five) and the option to agree a company's price control early if it submitted a strong business plan ('fast-tracking'). The RIIO framework also gave stakeholders a more prominent role in shaping companies' business plans and in influencing or challenging Ofgem's final price control decision.

Ofgem applied the RIIO framework for the first time to gas distribution (RIIO-GD1), and to electricity and gas transmission (RIIO-T1) from 1st April 2013. It then applied the framework to electricity distribution (RIIO-ED1) from 1st April 2015.⁶ Since the RIIO framework was introduced, a number of other regulators in the United Kingdom (UK) and internationally have adopted some of the RIIO concepts.⁷

³ See Ofgem's website: [Ofgem, RPI-X@20 Review](#).

⁴ [Ofgem, Handbook for implementing the RIIO model, 4 October 2010](#).

⁵ Note that in this report we use the term 'price control review' to describe the process Ofgem uses to set allowed revenues and output targets. We use the term 'price control period' to describe the time for which those allowances and targets apply (eight years in RIIO-1).

⁶ We refer to the first set of RIIO price controls collectively as 'RIIO-1'.

⁷ Ofwat's 2014 price control review (PR14) used totex, the potential for companies' proposals to be accepted early ('enhanced status' in Ofwat's terminology) and a greater focus on what water companies deliver ('outcomes' in Ofwat's terminology). See: [Ofwat, Setting price controls for 2015-20 – final methodology and expectations for companies' business plans, July 2013](#).

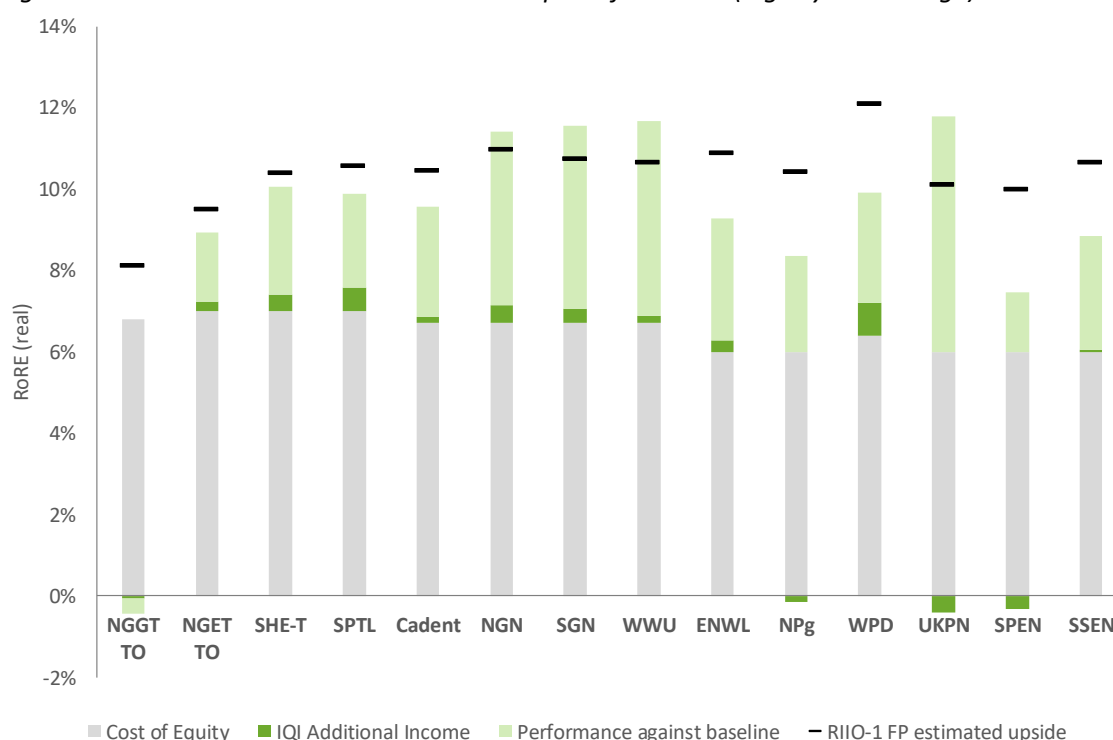
The Office for Rail and Road (ORR) is proposing to require Network Rail to engage more extensively with stakeholders as part of the 2018 periodic review. See: [ORR, Overall framework for regulating Network Rail, A PR18 consultation, July 2017](#).

In July 2017 Ofgem published an open letter detailing its ambitions for the next set of RIIO price controls reviews (collectively ‘RIIO-2’).⁸ The RIIO-2 price controls are currently scheduled to commence on 1st April 2021 (RIIO-GD2 and T2) and 1st April 2023 (RIIO-ED2).

As part of developing its approach to RIIO-2, Ofgem is reviewing the RIIO framework itself and is also looking to understand what is behind the level of network companies’ observed performance so far. For example, Ofgem is keen to understand why network companies across the board are earning returns that are materially above the baseline set at RIIO-1, with some earning higher returns than Ofgem’s estimated upper bound (from Ofgem’s RIIO-1 Final Decisions) – see Figure 1.1.

Persistent high returns across all energy network companies threaten the credibility of the regulatory framework. In order to ensure that the regulatory framework continues to work in customers’ long-term interests, Ofgem needs to respond to the lessons from RIIO-1. It needs to set a framework that provides customers with confidence that the network charges they pay reflect efficient costs, and that returns are justified and legitimate. This is also in network companies and their investors’ interest.

Figure 1.1: Estimated returns and estimated upside for RIIO-1 (eight-year average)⁹



Source: CEPA analysis of Ofgem data

Note: Performance against baseline represents actual outperformance (or underperformance) to date and forecasts for the remaining years of RIIO-1.

Italy’s Regulatory Authority for Electricity Gas and Water has proposed to use totex during the second half of the 5th electricity transmission and distribution networks price control, which covers 2016-2023, although the details of implementation have yet to be finalised. See: [A. Oglietti and M. Delpero, Electricity network regulation in Italy moves towards a new paradigm, Oxera, Agenda, February 2016.](#)

⁸ Ofgem, Open letter on the RIIO-2 Framework, 12 July 2017.

⁹ Returns are measured in terms of return on regulatory equity (RoRE).

1.1. Ofgem's requirements

Ofgem commissioned analysis from Cambridge Economic Policy Associates (CEPA) to inform its thinking on any potential changes that may be required for RIIO-2. The project consists of two related workstreams: (1) a review of the RIIO framework building blocks and lessons from its application for RIIO-1, and (2) a review of network companies' performances during RIIO-1. We have also drawn on lessons and best practice from regulation in other sectors in the UK and internationally. The terms of reference for this project are included in Annex A.

1.2. Summary of our approach

We undertook a structured and thorough approach to assessing the RIIO framework. Our starting point was to map each RIIO-1 price control against an Inputs – Outputs – Outcomes – Impacts evaluation framework. The evaluation framework is described in Annex B. Figure 1.2 illustrates the ultimate impacts (essentially the objectives) that RIIO sought to achieve.

Figure 1.2: Illustration of the RIIO framework's intended impacts



Source: CEPA

Once mapped, we reviewed information from Ofgem and the network companies to understand the extent to which the intended impacts had been achieved or are expected to be achieved in RIIO-1. As part of this we reviewed network companies' performance against their output targets, and their actual and forecast expenditure against allowed totex. We then analysed in detail the elements of each price control where there had been the greatest variation between network companies' performance and the allowances/targets set by Ofgem.

Note that assessing network companies' unit costs over time or benchmarking companies' relative efficiency is outside the scope of this review. Likewise, considerations of the cost of capital and financeability are also out of scope.

In light of our analysis we framed our recommendations in terms of:

- changes in the application of the RIIO framework for RIIO-2; and
- changes to the RIIO framework itself that would better meet the framework's intended impacts if applied in RIIO-2.

1.3. Structure of the report

The rest of this report is structured as follows:

- Section 2 reviews whether the RIIO framework has delivered its intended impacts. It analyses the performance of companies during RIIO-1 and the reasons for any significant outperformance.
- Section 3 identifies the existing elements of the RIIO framework that, if they were to be applied better in RIIO-2, would materially mitigate the risk of unintended outcomes.
- Section 4 discusses different options for better aligning the risks and rewards inherent in RIIO price controls.

Additional detail is provided in annexes to the report.

2. HOW SUCCESSFUL HAS RIIO BEEN AT MEETING ITS STATED GOALS?

This section summarises our assessment of network companies' performance so far during the RIIO-1 price controls, and the extent to which observed outcomes are in line with the RIIO framework's aims. In particular, we provide a detailed assessment of the key elements of RIIO-1 that have resulted in added returns for the network companies.

2.1. Our key findings

Customers (and other stakeholders) reasonably expect that network companies would only earn additional returns if they deliver exceptional performance. Evidence to date suggests that RIIO-1 has succeeded at incentivising network companies to deliver better outputs for customers.¹⁰ However, there is a question of whether the costs being borne by customers for the delivery of these outputs are too high.

Our analysis shows that the level of returns earned by network companies so far in RIIO-1 is, in part, a result of network companies improving their efficiency and their performance against output targets. Those are positives that reflect the ways in which the RIIO framework is working effectively. But we also identified three other sources of added returns for network companies, which Ofgem would need to address in future price controls to provide customers with confidence that the charges they pay for network services reflects efficient costs.

Applying the principles and objectives of the RIIO framework: The RIIO framework is ambitious and broad, creating execution risk for Ofgem. The framework was intended to be "high-powered",¹¹ so if not executed correctly the consequences for network companies and/or customers would be more significant. The way in which Ofgem implemented the framework in RIIO-1 has resulted in some of the added returns observed in RIIO-1 so far, without a corresponding benefit to customers.

We identified the following implementation issues that resulted in added returns for network companies:

- Allowances for non load-related (NLR) capex for National Grid Electricity Transmission (NGET) were not adequately linked to outputs. The conditions under which Ofgem might claw back any related underspend were not well defined.
- Following the Health and Safety Executive's (HSE) decision to grant gas distribution networks (GDNs) more discretion on the iron mains replacement programme (repex),

¹⁰ In this report we use 'customers' as a general term for any stakeholder that receives (or wishes to receive) a service from a network company. This includes end-users (domestic, commercial and industrial consumers), generators, retailers and, potentially, other network companies.

¹¹ For example: "those companies that deliver for consumers earn attractive rates of return, whilst those that demonstrably do not deliver, will earn low returns. Very poor performers could see rates of return on regulated equity below the cost of debt" ([Ofgem, RIIO: A new way to regulate energy networks – final decision, October 2010](#), p. 40).

Ofgem's cost allowances were based on the previous, more expensive, approach. Ofgem might not have been able to credibly set different allowances at the time, but it also did not draw on the uncertainty mechanisms use elsewhere in RIIO-1 to enable it to revisit allowances in light of new information during the price control period.

- In RIIO-ED1, the interruptions incentive scheme (IIS) was based on outdated data (albeit Ofgem's decision was upheld by the Competition and Markets Authority (CMA)). As a result, a number of electricity distribution network companies (DNOs) were outperforming their targets from the start of the new price control period, resulting in returns that are not proportionate to the performance improvement.

Risk allocation: Network companies are protected from many of the risks that face companies in competitive industries – particularly with regard to the impact of prices and demand on the revenue earned by the company. But RIIO-1 price controls do expose network companies to some risks that are likely to be outside their control. So far in RIIO-1 these risks have turned out favourable to network companies, resulting in added returns that are not due to improved performance. For example:

- We estimate that during the first four years of RIIO-T1 and GD1 real price effects (RPEs) have resulted in additional RoRE of 80 basis points for NGET, 40 basis points for National Grid Gas Transmission (NGGT) and 70 basis points for GDNs.
- GDNs have been rewarded through the national transmission system (NTS) exit capacity incentive partly because gas volumes (and exit capacity prices) have been lower than Ofgem's forecast.
- The fast-track settlements for the Scottish transmission operators (TOs) included baseline allowances for transmission projects that depended on new generation coming online. Delays or cancellation of the generation projects resulted in underspends and additional returns for the TOs.

Skew of expected outcomes: *Ex ante* mechanisms apply a powerful incentive on network companies to become more efficient and deliver service improvements, but they carry an inherent risk of Ofgem setting the wrong allowances and/or targets (for example, because the information available at the time turns out subsequently to have been incorrect). Asymmetric information and risk aversion on Ofgem's part mean that, in practice, the upside potential for network companies is likely to exceed the downside risk. This means that the intended high-risk/high-reward framework might not be realistically achievable. However, Ofgem did not include a mechanism in RIIO-1 to protect customers against the risk of network companies earning unjustified high returns.

A key lesson from our review is that an essential part of the price control review process should be for Ofgem to assess and model network companies' behaviour under the proposed the price control package. This is because individual policies/mechanisms that may be well-intentioned and appropriate on their own could have a combined effect that results in

perverse incentives for network companies. Part of this exercise, particularly as regards risk mitigation, should involve Ofgem challenging its own assumption; for instance, tasking either an internal or external team to see how any proposals might be exploited by network companies in order to identify potential weaknesses. Whilst not being fool-proof, this would help identify risks and ways of mitigating them.

2.2. Limitations of the analysis

Our assessment has been conducted on the basis of the available evidence to date – four years of data for RIIO-T1 and GD1, and two for RIIO-ED1. This means that we are only able to present a partial view of the success (or otherwise) of the RIIO framework. Network companies' performance and the effectiveness of different elements of the framework could change significantly over the course of the entire price control period, and the conclusions of this report should be considered with the above in mind.

It is also important to note that price control regulation is often considered a “repeated game”, so the impact of the RIIO framework would not play out in full during the first set of price controls. For example, if RIIO has resulted in larger efficiency savings, some of the benefit will feed through to lower charges for consumers in RIIO-1, but a further benefit to consumers would be when Ofgem uses those revealed costs to set lower allowances in RIIO-2. We expect both Ofgem and the network companies to be in a better position to apply the principles of the RIIO framework in future price controls.

We have attempted to identify whether material outperformance in RIIO-1 has been a result of:

- network companies' improved efficiency;
- forecasting errors built into the price control; and/or
- information asymmetry between Ofgem and the network companies.

However, it is difficult to definitely attribute outperformance to one of the above to the exclusion of all other reasons. Similarly, it is difficult to disentangle the impact of policies that aim to achieve related outcomes – for example, both the fast-track incentive and information quality incentive (IQI) aim to encourage network companies to reveal their efficient costs.

In conducting our review, we have relied primarily on data collected by Ofgem from the network companies. We also surveyed the network companies for examples of how they responded to the introduction of the RIIO framework. **CEPA has not independently verified the data provided by Ofgem or the statements made by the network companies.**

2.3. Have actual impacts met expectations?

We have drawn on Ofgem's annual performance reviews to assess performance against the evaluation framework that is described in Annex B. Where additional detail was required, we interrogated network companies' annual regulatory reporting packs (RRPs). We also sent

each network company a set of questions on how it has responded to the RIIO framework and considered the companies' responses in our assessment. We have used this information to qualitatively assess how successful the RIIO-1 price controls have been at meeting their desired impacts on customers.

We make the following key observations about network companies' performance against the intended outcomes and impacts of RIIO-1. **Given the limited number of years available to inform our assessment, the views presented below can only be considered to represent a provisional view of the successes and failures of RIIO-1 price controls:**

- All network companies except for three DNOs and NGGT are forecast to underspend their totex allowances for RIIO-1. These underspends do not appear to have come at the expense of delivering the required outputs (see below). This points to **improved efficiency** on the part of the network companies. Note that assessing network companies' unit costs over time or benchmarking companies' relative efficiency is outside the scope of this review. During the price control period customers benefit from companies' cost savings via the totex incentive rate. There is also an enduring benefit to customers as Ofgem would be able to use revealed information about network companies' costs to set lower allowances at the next price control review.
- Different network companies have sought to innovate to different degrees so far in RIIO-1. We have found **anecdotal evidence of technical, operational and contractual innovations**. Some of these have built on pre-RIIO innovation funding (in the case of DNOs), so it is possible that some innovation funding provided in the first half of RIIO-1 would lead to business-as-usual improvements in later years.¹²
- So far in RIIO-1, and based on the latest forecasts for the rest of the period, it appears that the framework has been successful at driving **improved output delivery for customers**. We make the following general observations with regard to the impacts that RIIO-1 set out to achieve:
 - **Customers** – customer satisfaction scores have generally been improving and there is evidence that network companies across the four sectors have improved their engagement with stakeholders, albeit certain sectors (e.g. transmission) have lagged others.
 - **Reliability and availability** – there is evidence of improved performance across the sectors.¹³ In electricity distribution, DNOs have been reducing the impact of planned and unplanned interruptions (and have earned additional returns via the IIS).
 - **Safety** – all network companies are on track to meet their safety targets or obligations. In particular, all GDNs are on track to meet or exceed their risk removed targets for the iron mains replacement programme.

¹² Annex G provides more detail on our assessment of Ofgem's innovation mechanisms for RIIO-1.

¹³ We note that Ofgem is reviewing the reliability targets for GDNs in light of apparent errors.

- **Environmental** – with the exception of NGGT, network companies have reduced their business carbon footprint, and reduced emissions and network losses. Companies have also taken steps to improve the process and timeliness of connections, including for low-carbon generation.
- **Social** – all but one GDN are on track to meet or exceed their fuel poor connections targets. It is too early to tell whether DNOs are on track to meet their social obligations. No social targets apply in transmission.

Overall, there is evidence that network companies across all four sectors have been responding to the intended incentives of RIIO. This includes adopting more flexible approaches to their activities and being responsive to new information. However, it is too early to say definitively whether RIIO-1 has improved long-term value for money for customers. In part, the long-term outcome for customers would depend on how Ofgem uses the information and evidence from RIIO-1 to inform its future regulatory decisions (in this sense price controls may be seen as a “repeated game”).

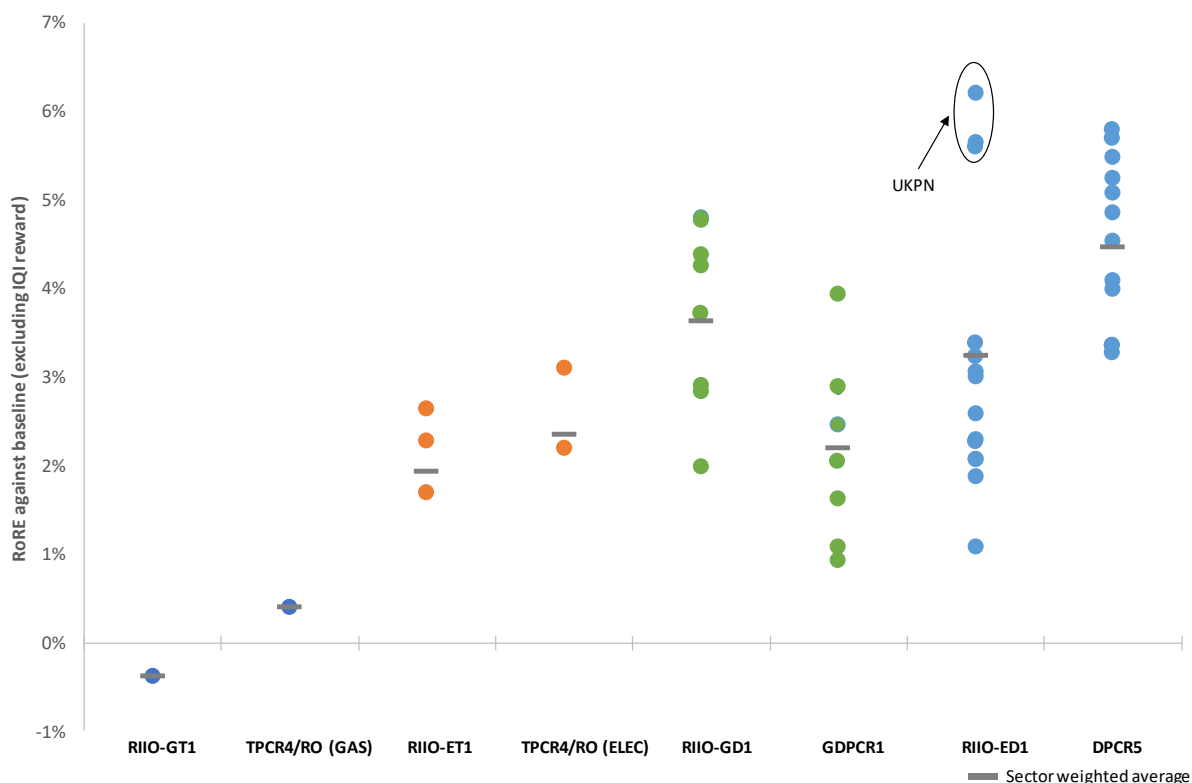
2.4. Contextualising performance

Ofgem’s key financial measure of network companies’ performance is return on regulatory equity (RoRE). It is based on Ofgem’s assumption of the share of companies’ assets that are financed by debt and equity. RoRE is averaged over the course of each price control period in order to minimise the impact of changes to the timing of expenditure. As such, RoRE may not perfectly match the returns that network companies report in their annual accounts.¹⁴

We use RoRE to compare the performance of different network companies, the performance at different price controls, and to compare energy networks to water companies. Figure 2.1 shows RoRE for the RIIO-1 price controls and for the previous control in each sector (DPCR5, TPCR4/RO and GDPCR1). For the RIIO-1 price controls, RoRE is estimated on the basis of actual performance to date (four years in RIIO-T1 and GD1, two years in RIIO-ED1) and network company forecasts for the remaining years. CEPA has not used any of its own forecasts in this analysis.

¹⁴ Other reasons for differences between RoRE and returns (or profits) reported in companies’ accounts may include differences between: regulatory and accounting depreciation, Ofgem’s notional gearing assumption and network companies’ actual gearing levels, the allowed cost of debt and network companies’ actual cost of debt, and Ofgem’s tax allowance and the amount of tax actually paid by network companies.

Figure 2.1: RoRE performance against the baseline (excluding the IQI reward) – RIIO and RPI-X price controls



Source: CEPA analysis of Ofgem data from 2016/17 RIIO annual performance reports and closeout reports for previous price controls.

Note that the above chart does not control for differences in notional gearing between companies/price controls, nor for different incentive rates on over/under-spend.

RoRE is presented in terms of additional returns against the baseline (the allowed return on equity) in each price control. This allows us to compare performance in different price controls on a like-for-like basis. We exclude any returns or penalties earned through the IQI ‘additional income’ (or equivalent reward for fast-tracked companies). This is because the IQI additional income reflects the efficiency of network companies’ totex proposals but not their actual performance during the price control period. We note that different price controls have different levels of notional gearing and different incentive rates for over-/under-spend.¹⁵

The one notable outlier on the chart is UK Power Networks (UKPN), which is forecast to achieve approximately double the RoRE outperformance of the other DNOs in RIIO-ED1. We also note that RoRE outperformance in RIIO-GD1 is estimated to be consistently higher than in GDPCR1. Other than those, the general trend appears to be lower expected RoRE in RIIO-1 compared to the previous set of RPI-X price controls. We discuss the potential reasons for the observed level of performance in section 2.5.

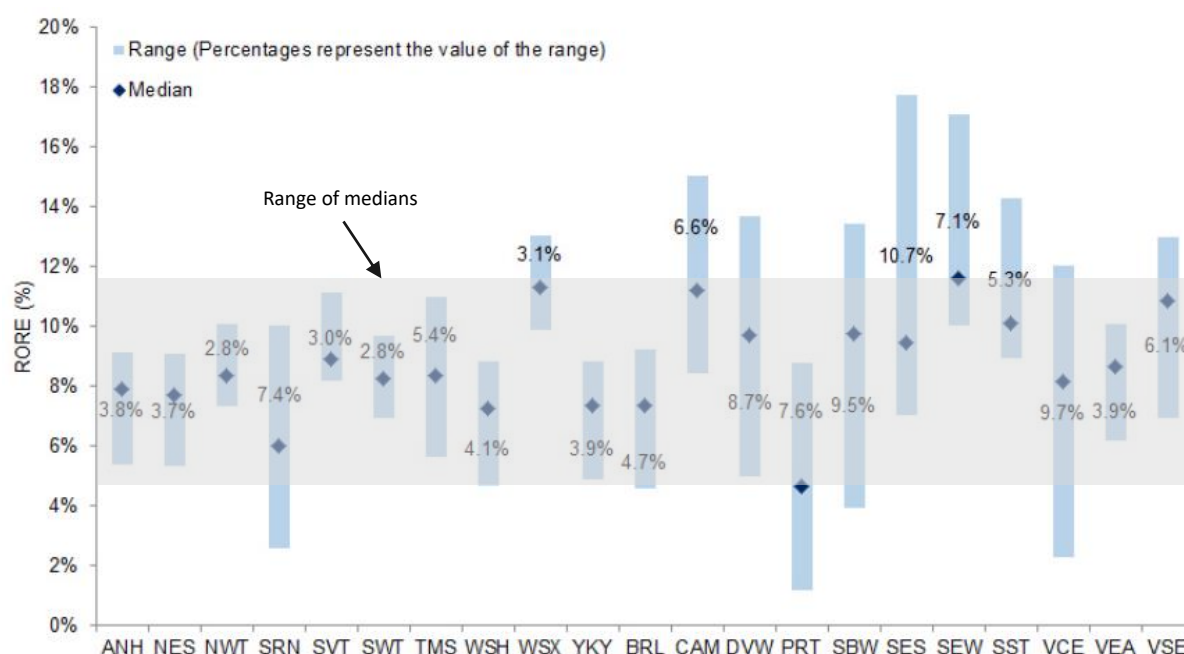
We have also sought to understand how returns in the energy sector compare to the water sector. The energy and water sectors have used similar regulatory approaches albeit with

¹⁵ Adjusting for these does not materially change our conclusions.

some differences in implementation. There are also important differences in the structure of the sectors – for example, water companies have been vertically integrated until recently.

Figure 2.2 presents estimated RoRE for water companies over an 11-year period. It is important to note that Ofwat’s figures are for annual RoRE, whereas we have used averages for the entire price control period in energy. The former is more volatile due to changes in the profiling of investment. It is also unclear whether Ofwat’s figures adjust for differences in notional gearing and different incentive rates on over-/under-spend. Nevertheless, the range of median returns reported by Ofwat (roughly between 5% and 11.5%) is consistent with the range of estimated returns in RIIO-1.¹⁶

Figure 2.2: Ofwat-estimated RoRE from 2001/02 to 2012/13



Source: [Ofwat, Setting price controls for 2015-20 – risk and reward guidance, January 2014, Figure 10.](#) Figures are based on water companies’ annual data returns.

2.5. What has led to the level of outperformance?

As noted in section 2.3, network companies have generally reduced their costs compared to allowances, and improved their performance against the defined outputs as incentives under the RIIO framework. These have resulted in additional returns for the network companies, as well as benefitting customers. We investigated further to understand which elements of RIIO-1 had the most material impact on network companies’ returns.

Based on the data available at the time of conducting the analysis (four years of actuals for RIIO-T1 and GD1, two years of actuals for RIIO-ED1, forecasts for the remainder of RIIO-1) we

¹⁶ Note that returns (or profits) reported in water companies’ accounts may be different from Ofwat’s RoRE estimates for similar reasons to those that apply to energy network companies.

have identified that *a few specific elements of the RIIO-1 price controls explain more than half of the observed outperformance*:

- **RIIO-ED1** – on a weighted average basis, DNOs are forecasting to earn around 160 basis points of additional RoRE from outperformance on the IIS. This represents 49% of forecast RoRE outperformance across RIIO-ED1. The next highest contributor to RoRE outperformance is totex, where the weighted average return is 100 basis points. However, the totex return masks great variability between individual DNOs – three DNOs are forecasting negative returns on totex, while UKPN’s three DNOs are forecasting between 290 and 340 basis points of additional returns. This suggests that totex outperformance is less likely to be a systematic issue.
- **RIIO-GD1** – GDNs are forecasting to underspend their totex allowance by around £2.1 billion. Two thirds (nearly £1.4 billion) of this are forecast to be underspend on repex.¹⁷ We estimate that this translates to around 190 basis points of additional RoRE on a weighted average basis across GDNs – 51% of forecast RoRE outperformance across RIIO-GD1. GDNs are forecasting an eight-year underspend of 19% on repex, compared to 12% forecast underspend on the rest of totex.
- **RIIO-T1 (electricity)** – TOs are forecasting to underspend their totex allowance by around £1.7 billion, with an estimated £1.1 billion forecast to be underspend by NGET on NLR capex.¹⁸ We estimate that this translates to around 130 basis points of additional RoRE on a weighted average basis across TOs – 68% of forecast RoRE outperformance across RIIO-ET1.
- **RIIO-T1 (gas)** – No part of the TO control has resulted in more than 50 basis points RoRE outperformance, with NGGT forecasting around 70 basis points RoRE loss as a result of totex overspend. The majority of outperformance (just over 100 basis points) is in the SO.

In transmission and gas distribution a key contributor to additional returns has been lower RPEs than Ofgem had allowed for in the price controls. RPEs are not estimated to have been a material source of positive or negative returns in RIIO-ED1 so far.

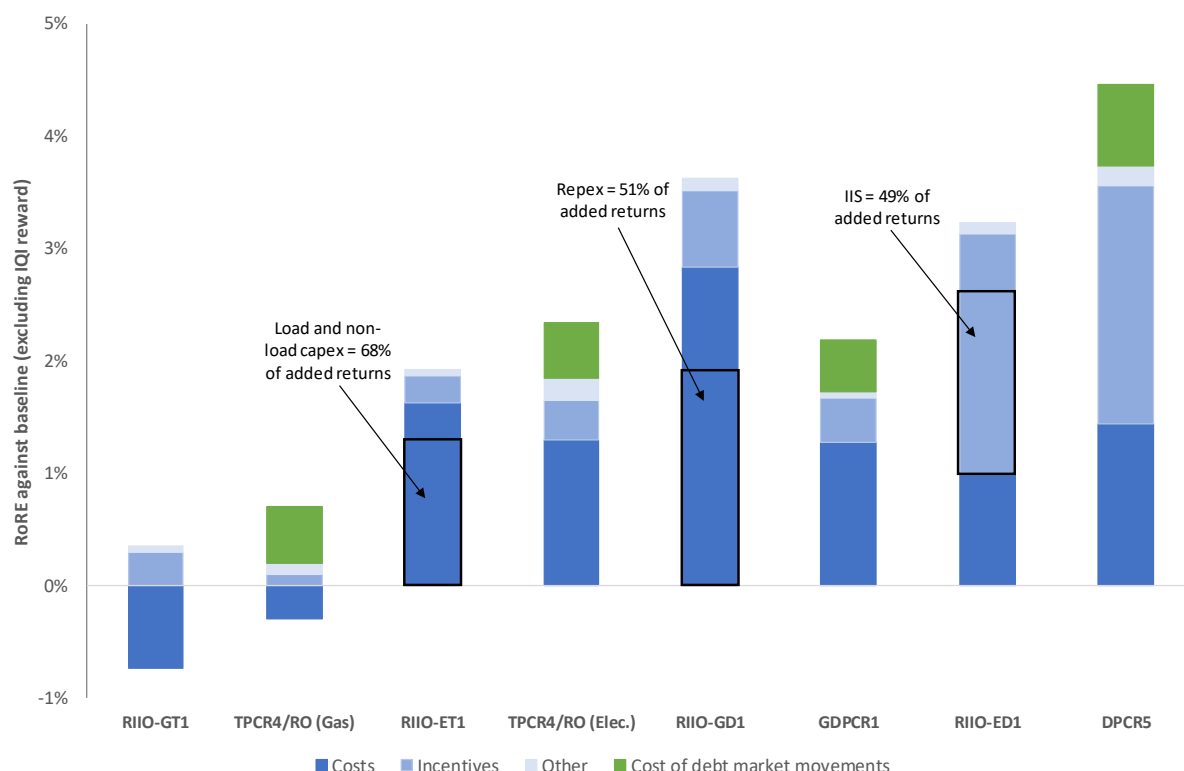
No other element of the RIIO-1 price controls has systematically led to more than 50 basis points additional RoRE across all network companies in a sector. Figure 2.3 illustrates the share of RoRE that is attributable to different sources of returns in RIIO-1 and in the most recent RPI-X price controls. We note that indexation of the allowed return on debt in RIIO1 has removed what was a source of around 50 basis points’ added return in previous price controls.

The remainder of this section discusses the key sources of outperformance in more detail.

¹⁷ Figures are in 2016/17 price basis.

¹⁸ Figures are in 2016/17 price basis.

Figure 2.3: Sources of RoRE performance against the baseline (excluding the IQI reward) – RIIO and RPI-X price controls



Source: CEPA analysis of Ofgem data from 2016/17 RIIO annual performance reports and closeout reports for previous price controls.

Note that the above chart does not control for differences in notional gearing between companies/price controls, nor for different incentive rates on over/under-spend.

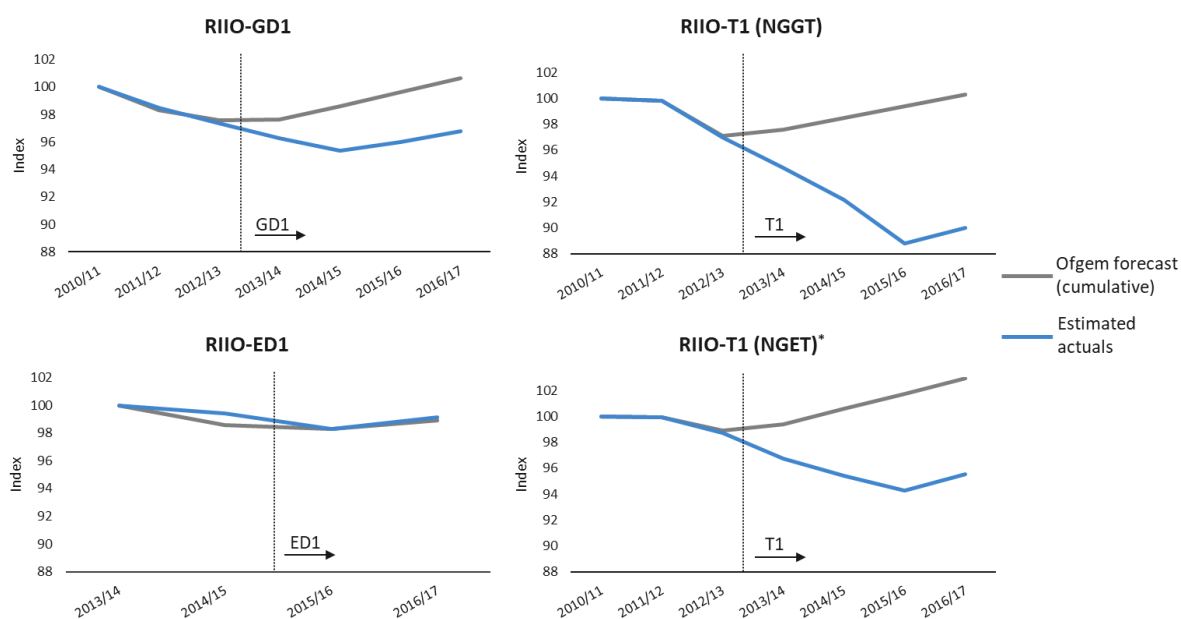
2.5.1. Real price effects

Allowed revenues and the Regulated Asset Value (RAV) in RIIO-1 price controls are indexed to the Retail Prices Index (RPI) – a measure of economy-wide inflation. However, some of the costs that network companies face may not move in line with RPI. To the extent that such cost pressures are considered to be outside of network companies' control, RPEs represent an allowance for forecast cost inflation (above RPI) during the price control period.

Ofgem used a mixture of independent short-term forecasts and historical averages of representative indices to set RPEs for the RIIO-1 price controls. We have repeated Ofgem's methodology with outturn values for the indices used by Ofgem.¹⁹ The results of our analysis are illustrated in Figure 2.4.

¹⁹ We were unable to source the latest data for the FOCOS Resource cost Index – Infrastructure, and for Price Adjustment Formulae Indices – Plastic Pipes.

Figure 2.4: Indices used in Ofgem's RPE methodology – assumptions in RIIO-1 and outturn values²⁰



Source: CEPA analysis of Ofgem decision documents and publicly available indices

Note that for electricity transmission Ofgem did not publish RPE assumptions for the fast-tracked TOs.

It is important to stress that RPEs are a regulatory construct. In practice, network companies may have faced higher or lower input cost pressures than implied by the index outturn values. The actual cost pressures faced by network companies depend on each company's circumstances, and its approach to contracting for labour, materials and equipment.

The share of RPEs in outperformance is highly dependent on the assumptions made about RPE levels in the remaining years of the price control periods. Instead of relying on forecast RPEs for the remaining four years of RIIO-T1 and GD1, and remaining six years of RIIO-ED1, our assessment only considered the years for which we can estimate outturn RPEs. Based on the data available at the time of the analysis we can say that:

- **RIIO-T1 (electricity)** – RPEs account for around 80 basis points of additional RoRE for NGET over the first four years of the price control period.²¹
- **RIIO-T1 (gas)** – RPEs account for around 40 basis points of additional RoRE for NGGT (TO only) over the first four years of the price control period.
- **RIIO-GD1** – RPEs account for around 70 basis points of additional RoRE across the GDNs (on a weighted average basis) over the first four years of the price control period.
- **RIIO-ED1** – RPEs broadly had a neutral impact on RoRE over the first two years of the price control period.

²⁰ 2010/11 = 100 for RIIO-T1 and GD1; 2013/14 = 100 for RIIO-ED1.

²¹ The figure is around 100 basis points across the TOs (on a weighted average basis) if it assumed that the same methodology was used for the Scottish TOs' RPEs as for NGET.

We note that the methodology employed by Ofgem to set RPEs in RIIO-ED1 was the same as for RIIO-T1 and GD1. This points to the different impact on price controls that started at different times, rather than necessarily pointing to a fault in Ofgem's methodology. Nevertheless, it may not be efficient to allocate the risk of RPEs to network companies. In section 4.5 we consider different approaches to RPEs, including indexation.

We also note that the variance between forecast and outturn RPEs occurred during the first four years of RIIO-T1 and GD1 (and the first two years of RIIO-ED1). As such, the difference between forecast and outturn RPEs *observed so far* is consequently not a function of the greater forecasting risk inherent in moving to eight-year price controls.²²

Lastly, when considering RPEs it is important to look at the ongoing efficiencies – a corresponding adjustment to allowances that Ofgem makes. Annex C.1 summarises our analysis of ongoing efficiencies.

2.5.2. Interruptions incentive scheme in RIIO-ED1²³

The IIS was introduced in 2001-02 and is designed to encourage DNOs to manage the number and duration of supply interruptions. The number and duration of supply interruptions are the primary outputs for network reliability in RIIO-ED1.

The interruption incentive scheme has symmetric annual rewards and penalties depending on each DNO's annual performance against their targets for:

- the number of customers interrupted (CI) per 100 customers; and
- the number of customer minutes lost (CML).

The DNO-specific targets are based on a combination of the DNO's own historic performance and benchmarked frontier performance. Separate targets are set for planned and unplanned customer interruptions and minutes lost.

The DNOs can make one-off exceptional event claims to adjust their performance in relation to supply interruptions. Large interruptions (to qualify interruptions must be above certain thresholds) due to exceptional events – e.g. severe weather or one-off events outside the control of a DNO – are excluded from annual performance figures. These exceptional event claims are reviewed by Ofgem's appointed examiner (currently Energypeople).

RIIO-ED1 approach

For *unplanned interruptions*, Ofgem decided to apply targets set upfront using the established benchmarking process from previous price controls, and using 'improvement factors'. Ofgem used data up to 2012/13 to set targets for unplanned interruptions.

²² Assuming that Ofgem would have applied the same methodology if it was setting RPEs for a shorter period.

²³ Annex C.3 offers similar assessments of the NTS exit capacity, shrinkage and environmental emissions incentives in RIIO-GD1.

The process for setting the targets was slightly modified compared to DPCR5, where targets for unplanned interruptions were based on each DNO's DPCR4 average performance. Targets at DPCR5 were largely flat over the price control, which allowed DNOs to earn additional returns as their reliability improved gradually over the price control.

For RIIO-ED1, Ofgem made the decision to apply improvement factors to both unplanned CI and CML targets. If companies are performing above (i.e. worse than) the benchmark, their CI target would decrease by 1.5% each year, until their performance matches the benchmark. The CI target then decreases by 0.5% per year. If companies are performing below (i.e. better than) the benchmark, their target would decrease by 0.5% each year.²⁴

Ofgem argued that its benchmarking approach captured improvements in historical performance, while the improvements factors mean that network companies face gradually more challenging targets in RIIO-ED1. Ofgem also considered that this approach reduced the risk of performance improvements realised late in DPCR5 not being reflected in the targets for RIIO-ED1.

For *planned interruptions*, annual targets are set on a rolling basis at the annual average level of planned interruptions and minutes lost over the previous three-year period (applied with a two-year lag). For example, the starting 2015/16 target was set using the average annual performance over 2011/12 to 2013/14.

As customers are less inconvenienced by planned outages with sufficient notice, these are weighted at 50% relative to unplanned outages. The incentive rate used is also half that of unplanned outages.

Apart from the introduction of improvement factors, two other notable changes were made to the IIS at RIIO-ED1:

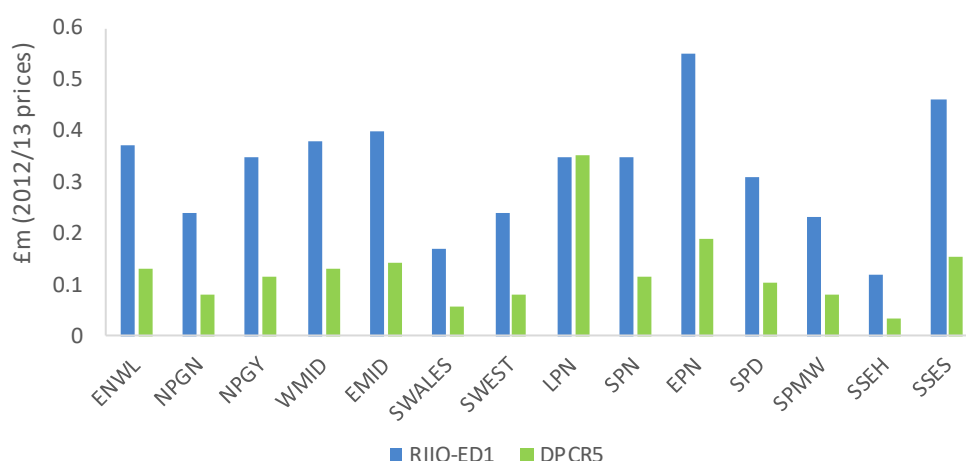
- change in incentive payment rates; and
- introduction of an incentive revenue cap.

As part of the RIIO-ED1 determination, Ofgem decided that the IIS incentive rates should be aligned with the value of lost load used to set the energy not supplied incentive in RIIO-T1.²⁵ However, this change seems to have resulted in significantly higher incentive payments in RIIO-ED1 than in DPCR5, which means companies earn higher returns for the same level of outperformance. This is shown in Figure 2.5, which compares incentive rates for customer interruptions in RIIO-ED1 with those in DPCR5; and in Figure 2.6, which compares the incentive rates for customer minutes lost.

²⁴ [Ofgem, Strategy decision for the RIIO-ED1 electricity distribution price control - Reliability and safety, 4 March 2013.](#)

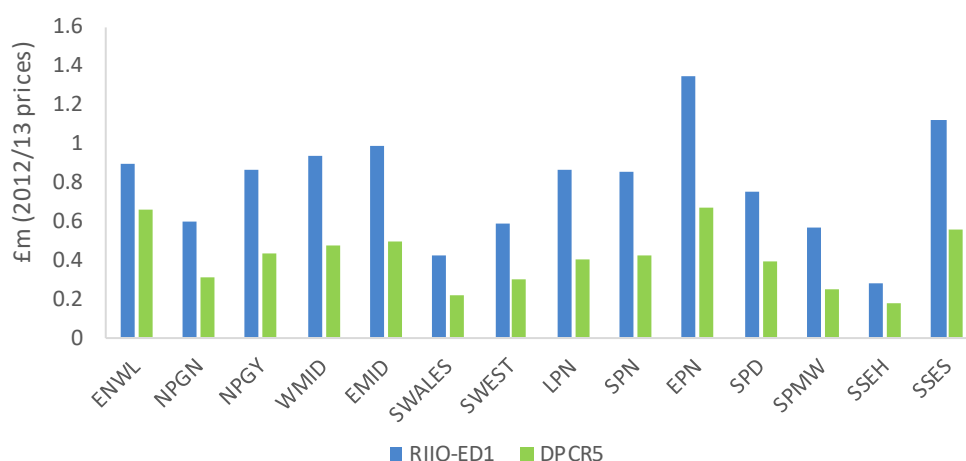
²⁵ [Ofgem, Strategy decision for the RIIO-ED1 electricity distribution price control - Outputs, incentives and innovation, 4 March 2013.](#)

Figure 2.5: Customer interruptions incentive rates RIIO-ED1 and DPCR5



Source: CEPA calculations, DPCR5 Final Proposals, RIIO-ED1 Final Determination.

Figure 2.6: Customer minutes lost incentive rates RIIO-ED1 and DPCR5



Source: CEPA calculations, DPCR5 Final Proposals, RIIO-ED1 Final Determination.

For RIIO-ED1 Ofgem set a cap on the amount each DNO can earn from the IIS in millions of pounds, based on 250 basis points of RoRE per year.²⁶ The cap on upside performance was seen as a measure to protect consumers from higher than expected returns.

RIIO-ED1 performance

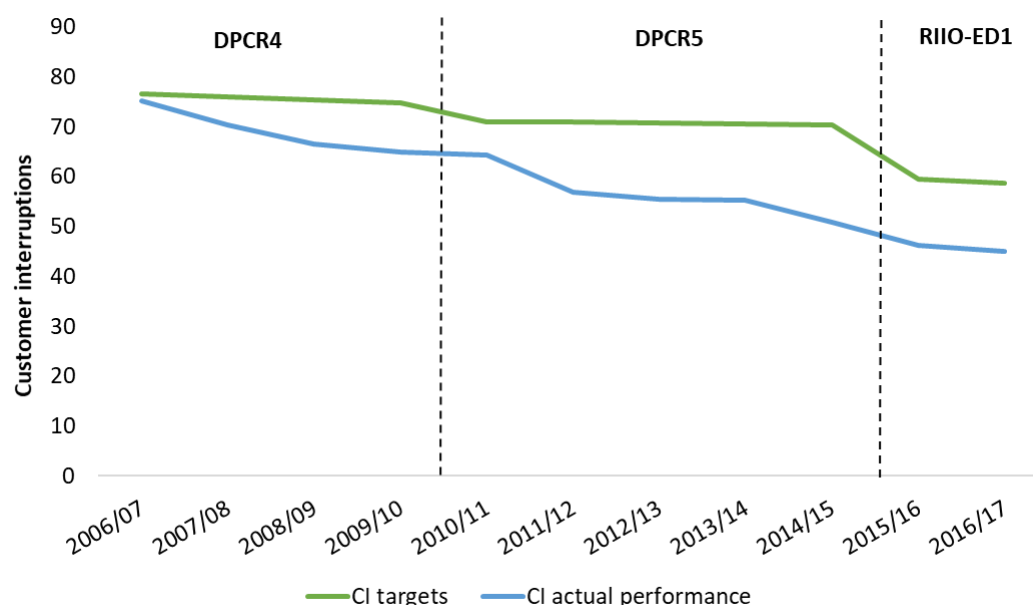
All DNOs have outperformed their targets in the first two years of RIIO-ED1, with the IIS accounting for the majority of RoRE outperformance in electricity distribution. Customers have benefited from fewer and shorter interruptions as a result of the incentive, but the large and systematic levels of returns from the IIS can be partly explained by the fact that the targets for RIIO-ED1 were set using data up to 2012/13.

Despite Ofgem's intentions of mitigating this risk, it appears that the IIS targets have not sufficiently accounted for the improvements in DNOs' performance that occurred in the last

²⁶ In RIIO-T1 and GD1, Ofgem set caps and/or collars for several incentives (for example in customer satisfaction) in terms of a percentage of allowed revenues.

two years of DPCR5. By the start of RIIO-ED1, several DNOs were already beating their targets. Figure 2.7 shows targets and performance for customer interruptions for DNOs as a whole since the start of DPCR4. It shows how the industry has consistently improved its performance over the last decade, but also that *targets set for the different price controls have not kept up with the improved performance.*

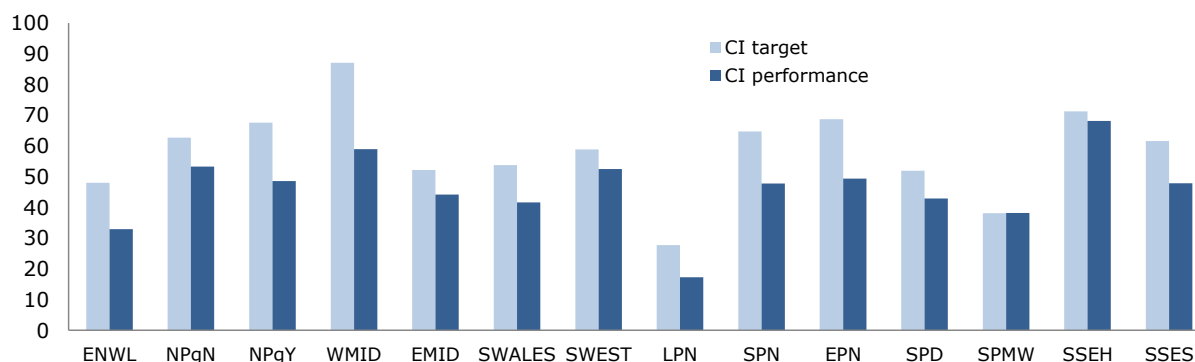
Figure 2.7: Customer interruptions targets and performance, industry average



Source: Ofgem data

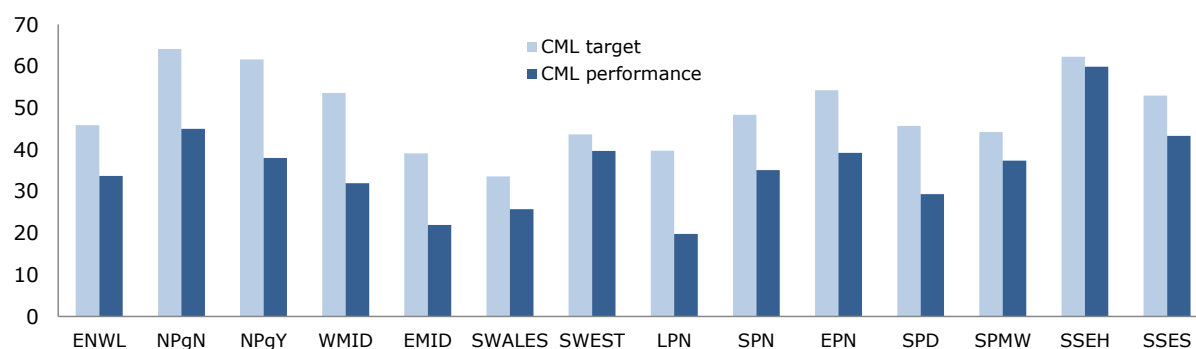
In the second year of RIIO-ED1, all DNOs beat their targets for the number and duration of customer interruptions, except Scottish Power Manweb (SPMW) which narrowly missed its target for the number of CIs, as shown in Figure 2.8 and Figure 2.9 (lower score means better performance). In 2015/16, all DNOs outperformed their targets for both number and duration of interruptions.

Figure 2.8: Number of Customer Interruptions (excluding exceptional events), 2016/17



Source: Ofgem RIIO-ED1 Annual report 2016/ data file

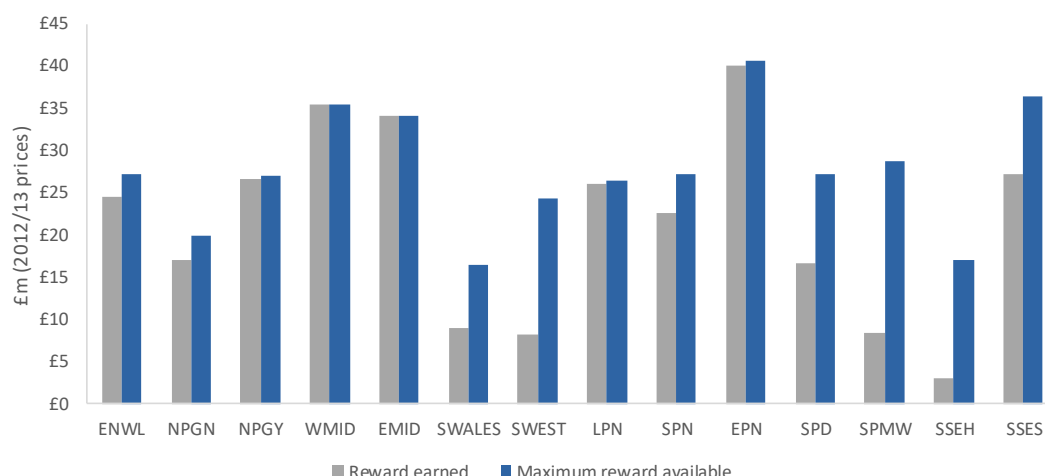
Figure 2.9: Duration of Customer Interruptions (excluding exceptional events), 2016/17



Source: Ofgem RIIO-ED1 Annual report 2016/17 data file

Figure 2.10 compares the reward earned by DNOs from the IIS during the first two years of RIIO-ED1 with the maximum reward available (i.e. the level of the cap). Two DNOs have earned the maximum additional revenue from the scheme. Overall DNOs have earned around 77% of the additional revenue available under the IIS in the first two years of RIIO-ED1.

Figure 2.10: Maximum reward available and reward earned during first two years of RIIO-ED1²⁷



Source: CEPA analysis based on Ofgem data

The design of the IIS was one of the grounds for appeal when British Gas referred the RIIO-ED1 decision to the CMA. British Gas argued that the design of the incentive scheme was flawed in a way that was likely to lead to significant rewards for DNOs without any substantive improvements in performance. It argued for using 2013/14 data rather than 2012/13 data to set the incentive targets. The CMA ruled that the decision was not wrong given the grounds allowed for upholding an appeal.²⁸

²⁷ The reward figures shown are calculated based on RIIO-ED1 incentive payments rates and company performance against targets. The numbers are pre-tax and include certain (small) adjustments made in Ofgem's annual iteration process.

²⁸ The CMA concluded that: "Our assessment does not support a view that the IIS targets set by [Ofgem] will systematically reward slow-track DNOs for maintaining current levels of performance. (see: [CMA, British Gas Trading Limited v The Gas and Electricity Markets Authority, Final determination, 29 September 2015](#), para. 5.58).

Conclusions

For RIIO-2, Ofgem should investigate options for ensuring that targets capture the most up-to-date information. A solution might be to adopt a rolling mechanism for setting targets, similar to that used to set planned interruptions targets or in the shrinkage and environmental emissions incentives in RIIO-GD1.

Another issue is the extent to which baseline expenditure set at the price control review should contribute to improved reliability performance. In areas such as the IIS, there is the possibility that, if DNOs are funded through their totex allowance to implement programmes or replace assets that are expected to result in better reliability (and thus less interruptions), DNOs will also earn additional revenue in the form of incentive payments for the improved IIS performance. In this case consumers could be left paying twice for the same output, once through the baseline expenditure and once through incentive mechanism payments. In future, improved reliability expected as a result of the DNOs' proposed investment programme should be captured in the IIS targets, with rewards only payable for improvements above and beyond that.

Estimated impact on customers

DNOs have earned around £185 million in additional revenue through the IIS for each year of RIIO-ED1 so far.²⁹ This is around 3.5% of annual allowed revenues for RIIO-ED1. We estimate that this is equivalent to a little more than a £3 increase in electricity distribution charges on average across DNOs.³⁰ The extent to which this increase in charges affects electricity consumers would depend on suppliers' pricing decisions. Given that the IIS targets become increasingly more challenging during the course of RIIO-ED1 through the application of improvement factors, consumers will continue to pay the same amount going forward only if DNOs continue to improve their reliability performance.

2.5.3. Repex in RIIO-GD1

Before the start of RIIO-GD1, the HSE announced significant changes to the iron mains replacement programme (IMRP), the GDNs' main repex programme. The HSE decided to move away from a prescriptive approach that required GDNs to remove a set length of iron mains. Instead, GDNs were given more freedom to prioritise the removal of the riskiest iron mains first (at least in terms of modelled risk), and to decide on the management of the remainder of their iron mains through a combination of maintenance and replacement techniques, in a similar way to how other assets are managed. The HSE describes the change

²⁹ In nominal prices, based on Ofgem's RoRE model. Figures include adjustments to reflect the fact that payout of the incentive occurs two years in arrears.

³⁰ Based on Ofgem's bill impact calculations in the RIIO-ED1 PCFM.

in approach as a “shift in emphasis from the wholesale decommissioning of ‘at risk’ iron pipes to targeted risk management”.³¹

The new HSE programme has introduced a three-tier approach covering all iron mains within 30 meters of a property:

- tier 1 are mains less than or equal to 8" in diameter (the majority of ‘at risk’ iron pipes fall within this category),
- tier 2 are mains above 8" and less than 18" in diameter; and
- tier 3 are mains equal to and greater than 18" in diameter.

RIIO-GD1 determination

At Initial Proposals, Ofgem used a regression analysis of the total metallic mains population for all diameters to benchmark tier 1 repex costs.³² Unit costs derived from GDNs’ historical costs and their forecasts for the first two years of RIIO-GD1 were rolled forward based on forecast volumes of tier 1 mains workload and associated services. For the Final Proposals, Ofgem recognised concerns expressed by GDNs that reporting of costs between tier 1 and other repex categories was not consistent. As a result, Ofgem decided to assess unit costs for all mains and services repex using regression analysis. Tier 1 annual workloads were assumed to be relatively constant over the remaining length of the repex programme (i.e. to 2032).

For tier 2 works, Ofgem set revenue drivers based on derived unit costs (£/m mains abandonment and £/service replaced) for mains with a modelled risk score already above or expected to exceed the risk threshold level (tier 2A). Allowances for tier 2A repex are adjusted based on the actual workload completed during the price control period, using Ofgem’s allowed unit costs.

For mains below the tier 2 risk threshold and for tier 3, GDNs had to submit a cost-benefit analysis (CBA) and meet Ofgem’s investment criteria. Ofgem initially disallowed most of the costs (87%) submitted by GDNs but increased the allowances at Final Proposals in light of GDNs resubmitting their investment appraisals for tier 2 and tier 3 mains.

Repex outperformance in RIIO-GD1

Our analysis of repex outperformance has focused on examining actual GDN costs and volume of work delivered against allowances and assumptions made at the time of the price control review. Our analysis suggests that GDNs’ performance is due to lower spending per km of mains abandoned:

- In the first four years of RIIO-GD1 GDNs have under-delivered workload volumes (in aggregate across all gas mains categories) by 2% against expected volumes at this stage

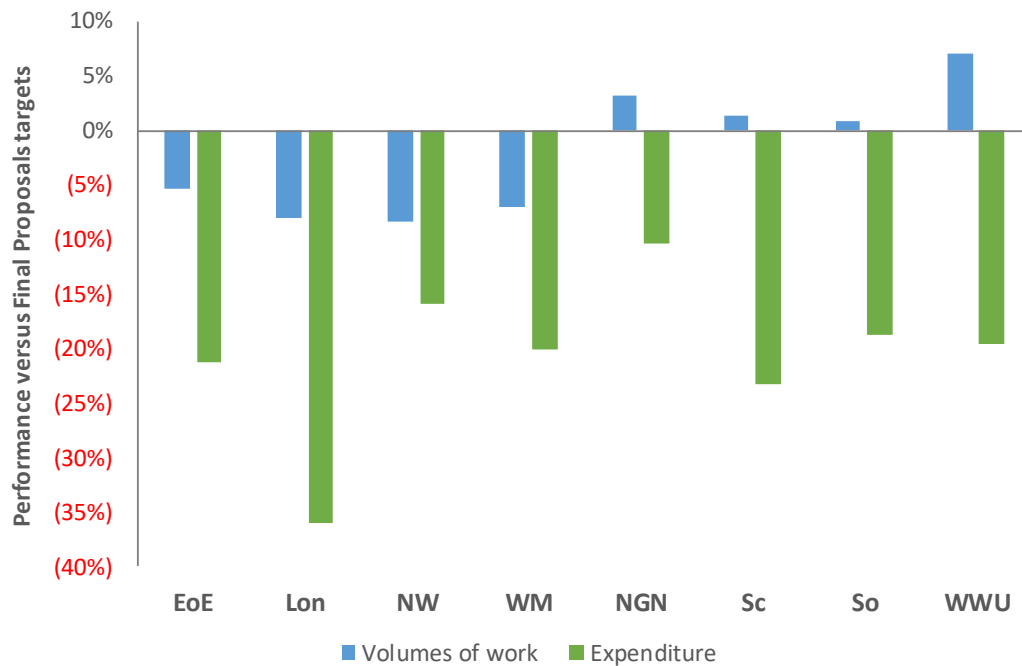
³¹ See HSE website: [Enforcement Policy for the iron mains risk reduction programme 2013 - 2021](#).

³² [Ofgem, RIIO-GD1: Initial Proposals - Supporting document - Cost efficiency, July 2012](#).

of the price control period. However, GDNs are underspending their repex allowances by around 20% as shown in Figure 2.11.

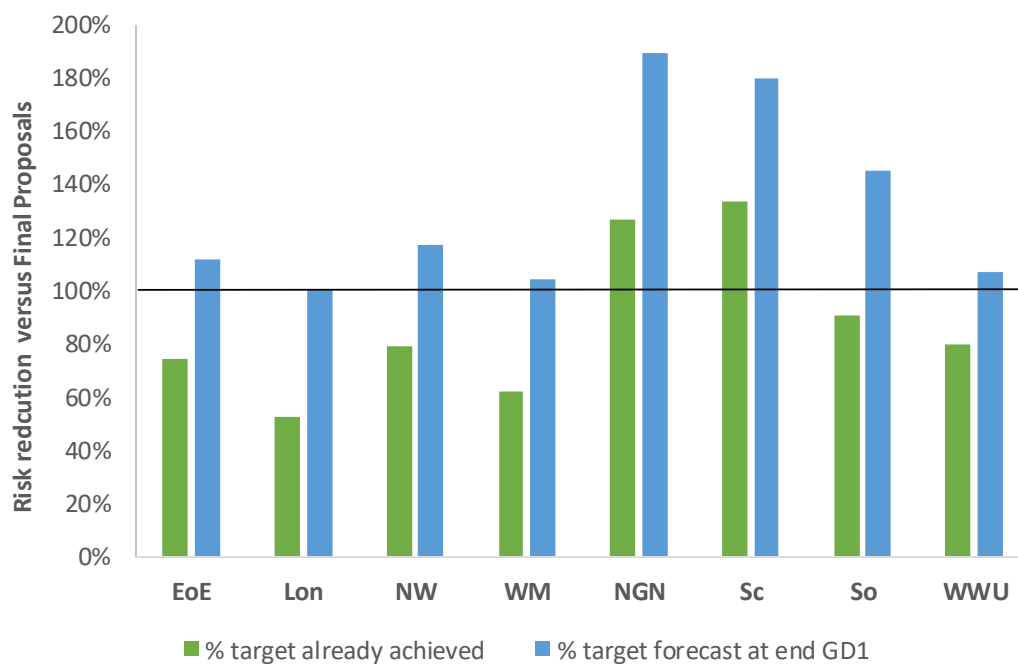
- At the same time, all GDNs are on track to meet their modelled risk reduction targets (with two GDNs having already exceeded their target for the entire price control period) as shown in Figure 2.12.

Figure 2.11: Workload and expenditure to date in RIIO-GD1



Source: CEPA analysis of 2016/17 RRP

Figure 2.12: Performance against modelled risk reduction target



Source: CEPA analysis of 2016/17 RRP

We understand from discussions with Ofgem that some GDNs' have profiled their repex workload to prioritise smaller diameter mains, which are cheaper and may result in more modelled risk being removed. We also understand that, where allowed, some GDNs have used different approaches to manage the risk of iron mains, rather than taking existing mains out of the ground and replacing them. These observations reflect the greater discretion given to GDNs' by the change in HSE policy, but they also arguably represent GDNs responding to new information and adapting their approach to delivering the outputs required under RIIO-1.

Conclusions

If, as is currently forecast, the GDNs meet their risk removed targets for RIIO-GD1 by reprofiling their repex workload to prioritise lower-cost work than Ofgem had assumed, they would be left with the costlier work in RIIO-GD2. In order to ensure that customers do not pay twice for those more expensive projects, Ofgem should consider using a workload profile for RIIO-GD2 that accounts for the assumed, rather than actual, profile for RIIO-GD1. Otherwise, higher unit cost allowances for RIIO-GD2 would protect GDNs from overspending, despite them being able to underspend in RIIO-GD1 by prioritising lower-cost work.

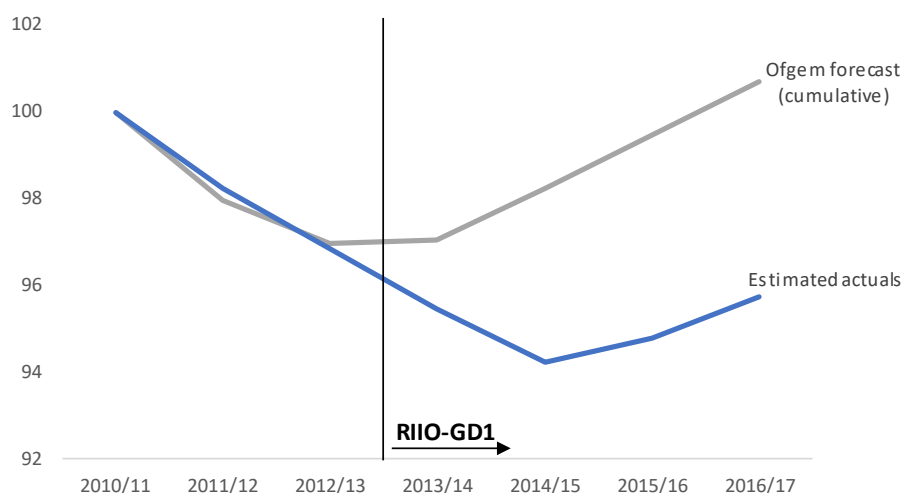
While the issue described above is particularly relevant for repex, it touches on a broader consideration of how Ofgem should approach network companies' activities that span a number of price control periods.

Annex C.2 describes additional assessment we conducted on the interaction between GDNs' repex expenditure and the transition of the repex capitalisation rate during RIIO-GD1.

Interaction with RPEs

Another source of the apparent unit cost outperformance in repex may be through RPEs. As discussed in section 2.5.1, actual RPEs have so far been significantly below the assumptions used by Ofgem in RIIO-GD1. Figure 2.13 shows the assumed and outturn changes in the indices used by Ofgem to set RPEs for repex. Since 2012/13, the annual average change in repex RPEs has been -0.5%, compared to an annual average increase of 0.6% allowed in Ofgem's Final Proposals.

Figure 2.13: Repex RPEs, assumptions and index outturn values (2010/11 = 100)



Source: CEPA analysis of Ofgem decision documents and publicly available indices.

Estimated impact on customers

GDNs are forecasting to underspend their repex allowance for RIIO-GD1 by nearly £1.4 billion over the course of the price control period.³³ GDNs would retain around 63-64% of any such underspend through the totex incentive mechanism. Around 30% of the underspend (c. £430 million) will result in lower network charges for customers in the current price control period.³⁴ On an annualised basis, this is around 1.5% of allowed revenues for RIIO-GD1. We estimate that this is equivalent to about a £2 reduction in gas distribution charges on average across GDNs.³⁵ The extent to which this reduction in charges would be passed through to gas consumers would depend on suppliers' pricing decisions.

2.5.4. Load-related capex in RIIO-ET1³⁶

Load-related capex is the investment required to connect new generators and customers to the network, to upgrade the existing network and to cater for growth in demand. It is driven by the capacity requirements and location of new customers (particularly new generation customers) and changes to existing customers' requirements (both demand and generation). Given the uncertainty about future generation and demand requirements, the level of load-related capex that is required over the length of the price control period is also uncertain. The RIIO framework uses uncertainty mechanisms such as volume drivers and within-period

³³ In 2016/17 price base.

³⁴ The remainder is paid out in tax.

³⁵ Based on Ofgem's bill impact calculations in the RIIO-GD1 PCFM.

³⁶ We note that there seems to be some inconsistency in the reporting of electricity transmission capex numbers even within the same RRP. Therefore, there is a degree of uncertainty around the precise cost estimates presented in this section and the next.

determinations for strategic wider works (SWW) to mitigate the risk of wide variance between allowed and actual costs for load-related capex.³⁷

RIIO-ET1 performance

Load-related capex is forecast to be one of the main areas of outperformance in RIIO-T1 across all three TOs. Table 2.1 compares each TO's actual expenditure on load-related capex against allowances. To calculate this, we have used figures reported by the TOs in their 2016/17 RRs.

We show figures for the first four years of RIIO-T1, as well as forecast performance across the entire price control period. The distinction is important because the substantial degree of outperformance observed over the first four years of the price control is forecast to reduce over the remaining four years. This seems to be mainly due to allowances having been set on the basis of higher expenditure in the early part of RIIO-T1, whereas the TOs are currently forecasting expenditure to pick up in the latter years.

Table 2.1: Company performance against allowances for electricity transmission load-related capex (£m 2016/17 prices)

Network company	Mid-period RIIO-T1 (actual)		Total RIIO-T1 (forecast)	
	Over-/under-spend (£m)	% of allowance	Over-/under-spend (£m)	% of allowance
NGET	-655	-24%	-288	-7%
SHET	-618	-31%	-306	-11.5%
SPTL	-146	-15%	-62	-5%
Total	-1,419	-25%	-656	-8%

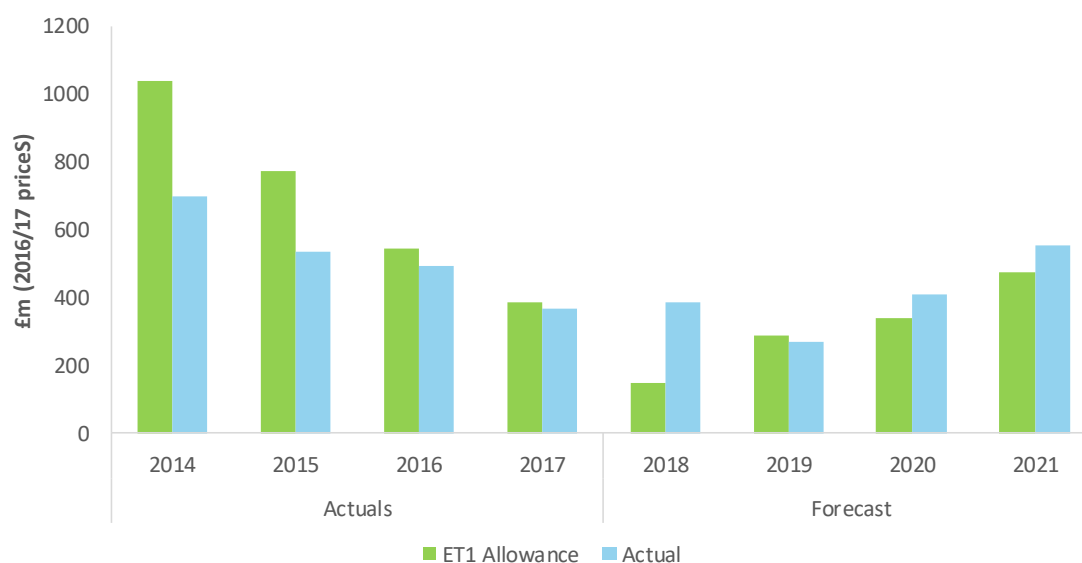
Source: CEPA analysis of 2016/17 RRs

Figure 2.14 shows annual load-related capex allowances and actual spending for NGET. The profiling of allowances assumed that more than two-thirds of load-related capex would be incurred in the first four years of RIIO-T1. While NGET has underspent its annual allowance in each year so far, it forecasts to overspend in three of the remaining four years.

Most of the load-related capex underspend is due to lower than predicted generation and demand connections, which reduced the need for boundary reinforcements. Despite the fact that a drop in required connections will result in an adjustment to allowances through the in-built uncertainty mechanisms, NGET still forecasts a significant underspend in this area.

³⁷ For example, volume drivers for NGET covered volume of new generation connections; new demand connections; wider reinforcement works; and planning requirements to mitigate impacts of new transmission infrastructure on visual amenity.

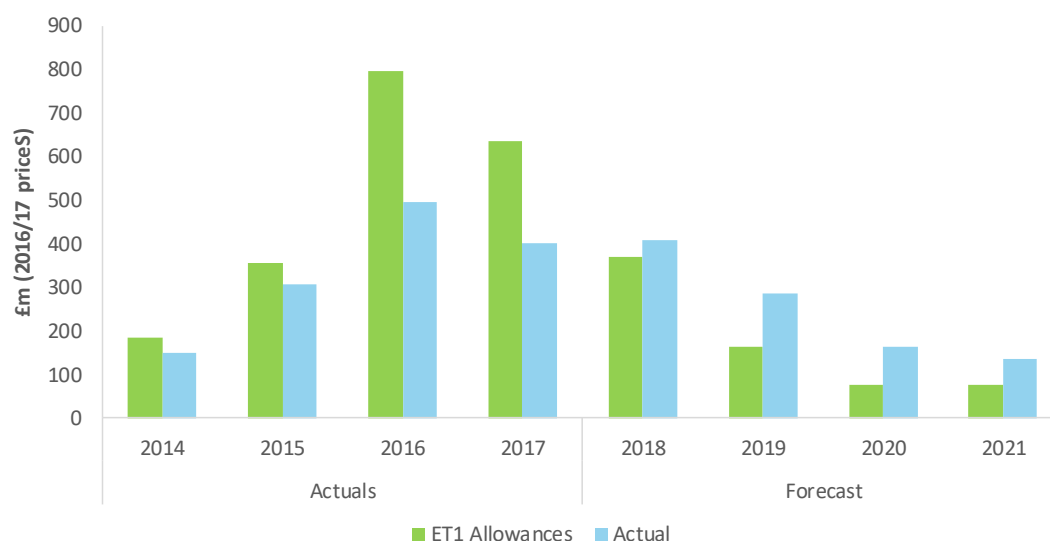
Figure 2.14: NGET annual load-related capex actual spending against allowances



Source: CEPA analysis of 2016/17 RRP

Figure 2.15 shows the annual load-related capex allowances and actual spending for Scottish Hydro-Electric Transmission (SHET). The allowance shown includes the impact (actual or forecast) of uncertainty mechanisms. As with NGET, SHET has underspent its allowance in each of the first four years of RIIO-T1 but is forecasting to overspend in the remaining years. The majority of this underspend over RIIO-T1 is related to forecast or realised savings on larger wider works projects (both included in the baseline and approved under the SWW mechanism) as well as underspend on connection assets covered by connection charges. The expected underspend in load-related capex will also outweigh predicted overspend by SHET in NLR and non-operational capex.

Figure 2.15: SHET annual load-related capex actual spending against allowances

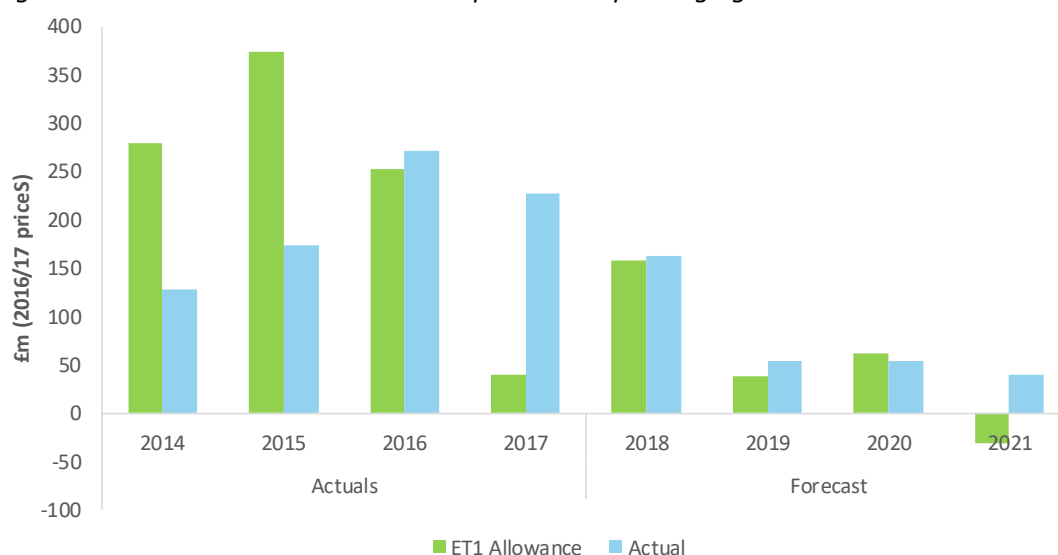


Source: CEPA analysis of 2016/17 RRP

Figure 2.16 shows the annual load-related capex allowances and actual spending for Scottish Power Transmission Limited (SPTL). The allowance shown includes the impact (actual and

forecast) of uncertainty mechanisms. Most of the load-related expenditure was expected to be incurred in the first three years of RIIO-T1. This is partly due to the expected timing of wider works projects included in the baseline as discussed below. As the delivery of some of these projects has been delayed, most of SPTL's load-related capex has been incurred or is expected to be incurred between 2016 and 2018.

Figure 2.16: SPTL annual load-related capex actual spending against allowances³⁸



Source: CEPA analysis of 2016/17 RRP

Conclusions

For the two Scottish TOs, some load-related projects were included in baseline allowances as part of the fast-track settlement when they would have otherwise been covered by an uncertainty mechanism. These projects were dependent on new generation connecting to the network (particularly onshore windfarms) so any delays or cancellation of the generation projects would appear as underspend (and additional returns for the TOs).

For example, five wider works outputs were included in SPTL's baseline load-related capex allowance for RIIO-T1. Based on SPTL's 2016/17 RRP, four of the five projects were or are expected to be completed during RIIO-T1. The delivery of the fifth output, related to provision of voltage support to address the possible closure of Hunterston B nuclear power station, is no longer required in the form specified in the RIIO-T1 decision due to the delayed closure of the power station. Ofgem considered the issue as part of the mid-period review (MPR) parallel work and decided to consider the output delivered if SPTL manages voltage across the network efficiently.³⁹ The agreed allowance for this output was £15m. Overall, SPTL is expected to underspend its baseline wider works allowance by around £87m.

³⁸ The negative allowance in 2020/21 is due to adjustments to allowed capex related to sole-use infrastructure.

³⁹ [Ofgem, MPR parallel work decision, 4 July 2017.](#)

2.5.5. Non load-related capex in RIIO-ET1

NLR capex covers expenditure that replaces or refurbishes assets that are either at the end of their useful life due to their age or condition, or need to be replaced on safety or environmental grounds. NLR expenditure is primarily driven by asset health conditions, the risk of asset failure and the impact on the transmission system (criticality). Network Output Measures (NOMs) are used to measure these various factors and help to determine the extent to which NLR expenditure is needed. NOMs are also used as secondary deliverables in RIIO-ET1 for network companies to assess the reliability of their networks.

As we discuss further in section 3.2.2, RIIO-1 price controls made only limited attempts to directly link allowed expenditure to outputs. Ofgem has been working with network companies to develop consistent NOMs methodologies, which could be key to enabling greater alignment between expenditure and outputs in RIIO-2, particularly for NLR capex.

However, in RIIO-ET1 TOs' NLR capex forecasts were not based on a consistent NOMs methodology but instead on each company's individual methodologies. For the fast-tracked TOs, Ofgem largely accepted the forecast of NLR capex. For NGET, Ofgem undertook a detailed assessment of NLR capex (with support from independent consultants). NLR capex allowances in RIIO-ET1 were typically not tied to the delivery of specific outputs, so there is an ongoing risk of network companies underspending in this area relative to others, as it is more difficult to directly attribute links between specific underspend and network performance at present.

RIIO-ET1 performance

NLR capex is expected to be a significant source of outperformance for TOs in RIIO-ET1. Table 2.2 shows that all three TOs have underspent in this category, with overall underspend being 31% below allowances to date and is forecast to be 16% below allowances for the whole of RIIO-ET1.⁴⁰ However, there are differences between the TOs' expected performance over the course of the price control period.

Most of the estimated outperformance is by NGET, which has underspent its allowance by £856 million (35%) over the first four years of RIIO-ET1. This is significantly larger both in absolute and percentage terms than the Scottish TOs. By the end of the price control period, NGET is expected to underspend its NLR capex allowance by £1.2 billion.

⁴⁰ As for load-related capex, these figures suggest that all three TOs are expecting to increase actual spending relative to allowances in the second half of RIIO-ET1.

Table 2.2: Company performance against allowances for electricity transmission NLR capex (£m 2016/17 prices)

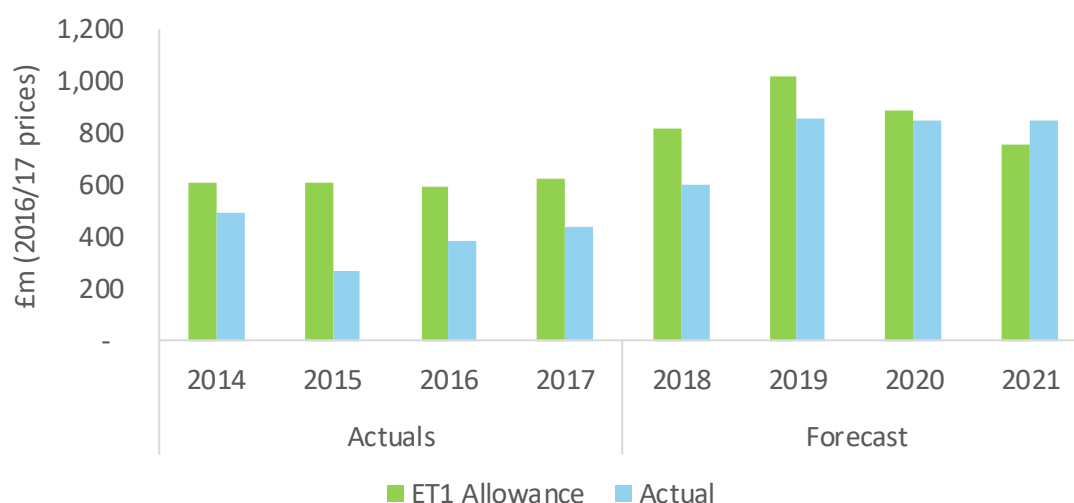
Network company	Mid-period RIIO-T1 (actual)		Total RIIO-T1 (forecast)	
	Over-/under-spend (£m)	% of allowance	Over-/under-spend (£m)	% of allowance
NGET	-856	-35%	-1,177	-20%
SHET	-20	-18%	106	33%
SPTL	-13	-4%	-62	-8%
Total	-889	-31%	-1,133	-16%

Source: CEPA analysis of 2016/17 RRP

Below we investigate NGET's underspend in more detail. Similar analysis for the Scottish TOs is presented in Annex C.4.

Figure 2.17 shows NGET's actual and forecast NLR capex against allowances over the price control period. Unlike load-related capex, the majority of NLR capex was expected to occur during the second half of the price control period, with current forecasts matching that expectation.

Figure 2.17: NGET annual NLR capex actual spending against allowances



Source: CEPA analysis of 2016/17 RRP

According to Ofgem's 2016/17 RIIO-ET1 annual report, the main factors for NGET's underspend on NLR capex are:

- greater understanding of asset conditions compared to the start of RIIO-ET1;
- changing of asset intervention plans; and
- revising the delivery of works that has allowed projects to be delivered in shorter timeframes and at a reduced cost.

To date NGET has underspent across most sub-categories of NLR capex. However, 72% of the underspend relates to circuit breakers (£213m underspend); protection, control, telecoms and metering (£192m underspend); and underground cables (£188m underspend).

Conclusions

One common theme for NLR capex is that all three TOs have adapted their asset replacement programme since the price control period began as a result of having better information on the conditions of their assets. We suggest that it would be worthwhile for Ofgem to understand why that has been the case.

Regardless of the reason, if new technologies and techniques have allowed for better assessment of asset health, it should be expected that for RIIO-2 the variation between allowances and expenditure on NLR capex would be lower. However, the incentive to underspend would remain strong unless Ofgem was able to closely link allowances for NLR capex to outputs. Further assessment of how Ofgem could consider approaches to do this are provided in section 3.2.2.

3. LESSONS FOR IMPLEMENTING THE RIIO FRAMEWORK BETTER

The RIIO-1 price controls were the first application of the RIIO framework. Given the breadth and complexity of the framework, it is perhaps not surprising that there will be room to improve how the framework is implemented in future price controls by learning from RIIO-1. This can go some way towards ensuring that returns earned by network companies are legitimate (although it would not eliminate the risk inherent in *ex ante* price controls).

A number of key improvements relate to the process of the price control review, and Ofgem's capacity to deliver it (e.g. developing cost assessment models that are informed by new information revealed in RIIO-1). We do not discuss those core activities further. Instead we focus on four areas for improvement:

- the role of 'enhanced' stakeholder engagement in the price control review;
- setting the targets and rewards/penalties for output incentives;
- ensuring that totex allowances and output targets are consistent with each other; and
- using uncertainty mechanisms to address unpredictable investment needs.

A related issue is Ofgem needing to take a longer-term view of network companies' activities, rather than treating their investment in each price control period as discrete activities. In section 2.5.3 we stress the importance of this issue with regard to repex in RIIO-GD2.

3.1. Stakeholder engagement

The RIIO framework formalised an expectation that network companies would engage extensively with their stakeholders both to inform their business plans and on an ongoing basis during the price control period itself. This expectation was part of a broader intention within the RIIO framework for network companies to shift their focus from negotiating with Ofgem to understanding consumers' changing needs and meeting them.⁴¹

Ofgem identified the following nine principles of enhanced stakeholder engagement in RIIO:

- | | |
|------------------|--------------------------|
| • Inclusiveness | • Accountability |
| • Transparency | • Taking views seriously |
| • Accessibility | • Demonstrating impact |
| • Control | • Evaluation |
| • Responsiveness | |

Annex E provides more detail on Ofgem's objectives for stakeholder engagement in RIIO, how

⁴¹ Ofgem identified the following stakeholder groups: domestic, industrial, commercial, and small and medium enterprise consumers; environment groups; suppliers; generators (including distributed generators); shippers; providers of energy services; government; other regulators; investors; electric vehicle developers; storage operators; carbon capture and storage developers; interconnector operators; independent DNOs; biogas developers; and independent gas transporters.

the enhanced engagement model was used during the RIIO-1 reviews, and provides observations on ongoing stakeholder engagement so far during the price control period.

3.1.1. What has been the benefit to customers of enhanced engagement in RIIO-1?

To date, our assessment is that enhanced engagement has been a positive step. The evidence presented in Annex E.1 shows that network companies have improved their stakeholder engagement year on year, albeit with some differences across and within sectors.

Through CEPA's primary research for this project we asked network companies:

- what elements of their business plans for RIIO-1 benefited the most from stakeholder engagement;
- how engagement activities that they have introduced under RIIO-1 have added value for customers; and
- which of the stakeholder engagement initiatives that they used to inform their RIIO-1 business plans have been retained.

Responses varied, but most commented that stakeholder engagement provided a strong basis for the development of the outputs framework for RIIO-1 and allowed for the identification of topics that stakeholders rated as the most important. All network companies provided example of how engagement activities have added value for customers. Although not all of the examples resulted in cost savings for customers.

With regard to ongoing engagement, some network companies have evolved their approach since the RIIO-1 business planning stage in order to better meet stakeholder needs and improve stakeholder communication. Network companies have received substantial feedback on their stakeholder engagement through the RIIO-1 price control review process and from the panel for the annual incentive scheme. As a result, companies say that they have been able to tailor their stakeholder engagement approaches accordingly.

3.1.2. Recommended changes for RIIO-2

There is evidence that network companies are learning by doing. Stakeholder engagement in both developing the RIIO-ED1 business plans and on an ongoing basis has been notably more effective than in RIIO-T1 and GD1. So even if Ofgem did not change the requirements for stakeholder engagement, it could reasonably expect significant improvements from all network companies in RIIO-2. Furthermore, now that stakeholder engagement has been trialled in RIIO-1, it is reasonable for Ofgem to apply (stronger) penalties for insufficient/inadequate stakeholder engagement in RIIO-2.

Setting out the specific purpose of stakeholder engagement

Compared to other sectors and regulatory frameworks, the RIIO framework is largely unspecific about the areas of the price control that would benefit the most from stakeholder

engagement. As a result, it has been difficult to pinpoint specific benefits from enhanced engagement, but that is not to say that engagement cannot deliver tangible benefits.

Other sectors show that engagement has the greatest benefit where it is focused on areas of greatest stakeholder knowledge (see Annex E.2 for case studies of approaches used in other UK sectors). For more technical issues such as cost assessment and the cost of capital there is likely to be a need for more direct involvement by the regulator. This means that the most effective form of stakeholder engagement depends on the context of the sector and the nature of the issues being assessed. This also points to a need for more specific direction by Ofgem on what areas of the price controls companies should focus their engagement on. An area where we see particular benefit for further guidance from Ofgem is in how engagement can capture the needs of future customers.

Ofgem could revise the framework to specify the areas of the price control where stakeholders are best placed to shape the settlement (e.g. the value placed on companies delivering a certain level of outputs), and to influence business strategy and decisions. Ofgem could likewise specify the forms of engagement that would be most effective for those areas (e.g. willingness to pay (WTP) studies to calibrate incentive pay-out rates). Ofgem's own engagement activities should also be targeted to the areas that stakeholders are most knowledgeable about.

Minimum standards for engagement

More can be done to define what represents effective engagement. The lessons from RIIO-1 (and other sectors) can be used to set the expectations for how stakeholder engagement is used to inform companies' business plans.⁴² This would help Ofgem in applying proportionate assessment to the plans (be it for fast-tracking or otherwise), as well as in determining any incentive payments/penalties for ongoing engagement. The panel's views on the stakeholder engagement incentives represent a baseline of the expectations for network companies, which Ofgem should consider in setting a baseline requirement for engagement on RIIO-2 business plans.

Specifying the form of engagement

In our work on the RPI-X@20 Review, CEPA highlighted the potential benefits of a more structured involvement for customers in the price control process. One model that we highlighted at the time is the 'constructive engagement' that has been used by the Civil Aviation Authority (CAA) as part of the price control reviews for Heathrow.⁴³

Constructive engagement required the regulated airport to consult with airlines and the air traffic control service provider in developing its plans for the next price control period. The

⁴² Ofwat has further defined its expectations for stakeholder engagement in its PR19 final methodology. See Annex E.2 for more information.

⁴³ Attempts were also made to use constructive engagement for Gatwick and Stansted airports when they were regulated and, to an extent, for the National Air Traffic Services (NATS) price control review.

airlines and airport were expected to engage directly on all areas relating to the regulatory building blocks to identify areas of joint agreement, or indeed where they do not agree. Passengers were not directly represented, as the approach assumes that airlines adequately represent passengers' views.⁴⁴

In Annex E.2 we provide our observations on constructive engagement in the most recent Heathrow price control reviews. We also discuss arrangements introduced to enable more stakeholder involvement in ongoing decisions regarding Heathrow's capex programme.

For constructive engagement to be effective, stakeholders must be sufficiently resourced and knowledgeable, and have access to the necessary information to be able to challenge the regulated company's business plan. If those stakeholders are not the final consumers themselves, it is also essential that their interests are aligned with those of final consumers. The ongoing capex governance arrangements introduced for Heathrow are likely to be most effective for large, discreet projects.

The above characteristics suggest that constructive engagement may be more suited to gas and electricity transmission, but is likely to be less effective in distribution. However, there are important differences between the aviation and energy sectors that need to be accounted for:

- energy is a homogenous good, whereas airlines can distinguish themselves in passengers' eyes through the choice of the airport they operate from; and
- in energy networks connections are specific to the user, whereas additional airport capacity could be competed for by any airline.

As a result, the interests of current and future generators (or those of other users of the transmission network) may not be aligned with one another, nor with those of final consumers.

In Annex E we also summarise the lessons for Ofgem from the approaches to stakeholder engagement taken in the water sectors in Scotland and in England and Wales.

3.2. Output incentives

Our assessment of network companies' performance so far in RIIO-1 (see Section 2) highlighted the IIS in RIIO-ED1 as the output incentive where DNOs have consistently earned high returns. We also note that GDNs have been able to consistently outperform the NTS exit capacity incentive, and the shrinkage and environmental emissions incentives (see Annex C.3).

The above are all outputs where the use of incentives is warranted, and where network companies' performance has generally been strong and improving over the course of RIIO-1.

⁴⁴ We note that for Heathrow's next price control review (H7) the CAA is introducing a consumer challenge forum.

The question facing Ofgem is whether the levels of outperformance observed justify the rewards earned.

Our analysis of the information available to date suggests that some of the added returns observed cannot be attributed purely to actions taken by the network companies. As such, Ofgem should look to address the following issues for RIIO-2:

1. **Mis-calibration of targets** – For example, historical data used to set output targets did not capture more recent performance improvements. We discuss this issue with regard to the IIS in detail in section 2.5.2, and suggest changes for RIIO-2 in section 3.2.1.
2. **External factors outside the control of network companies** – Some incentives in RIIO-1 expose network companies to potential windfall gains or losses as a result of factors that they do not control (e.g. energy demand, macroeconomic trends). In Section 4 we discuss options for changing what risks network companies are exposed to in future price controls.
3. **Potential double-rewarding through totex allowances and incentive payments** – Some of the costs funded through baseline allowances may lead to improved performance on incentives, resulting in network companies also earning a reward through the incentive mechanisms. We discuss this issue further in section 3.2.2.

3.2.1. Setting output incentive targets for RIIO-2

Customers (and other stakeholders) reasonably expect that network companies would only earn additional returns if they deliver exceptional performance. So in order to address the first issue listed above – mis-calibration of targets – it is important that Ofgem clearly defines what level of output delivery represents exceptional performance. This is not a trivial task, particularly as:

- the data available to Ofgem may not be sufficiently accurate to allow it to identify with confidence what constitutes exceptional performance on certain outputs; and
- the cost of meeting certain levels of performance may exceed the benefit to customers from that improved performance (e.g. the cost of reducing a network safety risk may be disproportionate to the likelihood of the risk occurring and the harm caused if it were to occur).

However, going into RIIO-2 Ofgem should have better information on network companies' performance against output measures than it did at the RIIO-1 reviews. It would have also had more time to work with stakeholders to define what the key outputs are, how to best measure them, and what standard of performance is expected.

Recommended changes for RIIO-2

We recommend that Ofgem use the information from network companies' revealed performance against outputs, and customer WTP studies (including studies of whether

customers value further improvements in outputs),⁴⁵ to set more stretching output targets. Ofgem should also consider whether it is appropriate to set localised targets, if studies reveal material differences in customers' preferences in different regions.

For some output measures it may be more difficult to set absolute targets as it may be difficult (or impossible) to define exceptional performance in absolute terms. Those outputs (e.g. stakeholder engagement, connections) may be more suited to incentives that are set on a relative basis (subject to a minimum threshold of performance).

3.2.2. Relationship between outputs and totex allowances

For RIIO-1 price controls only a few outputs were linked directly to expenditure allowances. For example:

- In RIIO-GT1 NGGT (as the System Operator) was given a permits allowance to enable it to deliver outputs related to meeting incremental capacity targets.
- In RIIO-GD1 GDNs have *ex ante* allowances to enable all sub-deduct networks to be evidenced as being 'off-risk' by the end of RIIO-GD1.
- In RIIO-ED1 DNOs were given a 'use it or lose it' allowance to improve the reliability of services to customers who currently receive the worst services.

We note that the above examples relate to specific costs that are directly attributable to a project or programme of work. However, our review of RIIO-1 suggests that Ofgem could have adopted a more systematic approach to considering whether output targets are aligned with the performance level that can be expected from totex allowances.⁴⁶ For example, we have not been able to identify a clear link between the targets for the shrinkage and environmental emissions incentives in RIIO-GD1, and the allowances GDNs received for repex. This is despite the one of the key benefits of the iron mains replacement programme being lower leakage from the networks.⁴⁷

One way in which Ofgem has looked into more closely linking totex to outputs is through NOMs. NOMs were not used to set allowances for RIIO-1 price controls, but Ofgem did express an intention to review network companies' performance against NOMs at the end of the price control periods, with potential subsequent adjustments to allowances. Ofgem has stated that network companies that are able to justify over-delivery against NOMs would be funded for the incremental cost of over-delivery, and could be rewarded by up to an extra 2.5% of the incremental cost. By the same token, network companies that are not able to justify under-delivery against NOMs would not be funded at RIIO-2 for catching up to the RIIO-

⁴⁵ Such studies could either be conducted by Ofgem itself (as was the case in DPCR3) or else network companies could be required to provide WTP evidence to support their business plans (as was the intention for RIIO-1).

⁴⁶ We note that such a process is not necessarily simple, as the relationships between costs and outputs can be complex.

⁴⁷ [CEPA, HSE/Ofgem: 10 year review of the Iron Mains Replacement Programme, 2011](#)

1 targets, and may be penalised by up to an extra 2.5% of the avoided cost.⁴⁸

In order to ensure that an assessment of NOMs-related expenditure and performance against NOMs can be achieved, Ofgem included a special licence condition for network companies to have a common NOMs methodology in place by the end of RIIO-1. At the time of preparing this report, Ofgem has signed off methodologies for electricity and gas distribution,⁴⁹ while the methodology for electricity transmission is expected to be signed off by mid-2018. The common NOMs methodologies are also expected to allow network companies to monetise criticality and asset health so that they can be used in CBAs that inform totex proposals and allowances for RIIO-2.

A similar approach for linking outputs to allowances was attempted by Ofwat during PR14. This experience, described in the box below, represents a concerted effort by a regulator to mitigate the risks of double-rewarding companies through both totex allowances and output incentives, but it also demonstrates the challenges involved. As such, the Ofwat case study could have important lessons for Ofgem when considering its approach for linking expenditure and outputs.

Case study – Outcome Delivery Incentives (ODIs) in the water sector

As part of the 2015-20 price control review (PR14) Ofwat introduced ODIs in order to incentivise water companies to deliver outcomes that were in the interest of consumers and society. Some ODIs included financial penalties/rewards. We understand that Ofwat considered ways of capturing ODIs in its cost assessment in order to more closely link outcomes to totex. However, this was not pursued because:

- The final ODIs were not known at the time of Ofwat developing the cost assessment models (econometric and unit cost models). The final list of ODIs was published as part of Ofwat's Final Determination.
- The water companies were able to propose their own ODIs, resulting in over 500 ODIs in PR14, many of which are company-specific. This made it difficult to capture company specific ODIs in a sector-wide totex model.
- There is a high degree of interaction between ODIs, making it difficult to allocate costs to specific outcomes.
- Including the actual level of ODIs in cost models could lead to counter-intuitive results, such as suggesting that worse performing companies should be given higher cost allowances (e.g. for companies who had higher levels of leakage). To address this issue, Ofwat calibrated ODIs using the incremental cost for the company of providing that service, i.e. Ofwat used a methodology that allowed to consider the current level of the ODI of the company and the expected stretch the company would be facing.

⁴⁸ This assessment will be based on reviewing the various asset health indices, and from these determine the level of investment that took place, as opposed to having specific expenditure allowances linked directly to NOMs.

⁴⁹ NOMs were first introduced in electricity distribution as part of DPCR5.

Instead of including ODIs in totex models, Ofwat introduced a calibration mechanism whereby companies would be rewarded/penalised for over or under-delivering ODIs based on consumer willingness to pay, the cost of not meeting an outcome, and the totex incentive rate. In CEPA's opinion, this approach, together with the way targets for 'core' ODIs were benchmarked across water companies, reduces but does not eliminate the risk of companies being remunerated twice for the same outcome – once through totex and once through ODI rewards. We note that Ofwat has sought to develop its approach to ODIs in PR19, in light of lessons from PR14.

The key lessons for Ofgem to consider from this include:

- The need to ensure that **specific, manageable set of output measures are agreed upon** in each sector so that comparisons could be made and outputs potentially be used in totex models.
- The importance of considering **interaction between different outputs**.
- The need to ensure that using outputs in totex modelling (or other cost assessments) **does not encourage perverse company behaviour**.

Source: [*Ofwat, Setting price controls for 2015-20 - final methodology and expectations for companies' business plans. Appendix 1: Integrating the calibration of outcome delivery and cost performance incentives, July 2013.*](#)

Recommended changes for RIIO-2

Directly linking outputs to expenditure is currently in its infancy (although we note Ofgem has made some progress with regard to NOMs) and it may not be possible to directly link all costs to outputs. But, as a minimum, Ofgem should build a sense-check of totex allowances and output targets into the price control review process to mitigate the risk of network companies being double-rewarded.

Ofgem should be clear in RIIO-2 about the performance improvements (e.g. reliability) that are funded through base allowances. It should also develop an understanding of how activities funded through baseline allowances are likely to impact performance as a bi-product (e.g. the impact of repex on leakage from the gas distribution network). Output targets should be set such that network companies are only rewarded for performance above and beyond what is funded through baseline allowances, so that customers do not pay twice for the same output.

3.3. Dealing with uncertain investment

This section focuses on how the regulatory framework may deal with uncertain future investment in the networks.

3.3.1. How effective are current uncertainty mechanisms related to network investment?

Ofgem used a range of mechanisms in the RIIO-1 price controls to deal with uncertain network investment, as highlighted in Table 3.1.⁵⁰ Further details regarding the use of these mechanisms during RIIO-1 can be found in Annex F.

Table 3.1: Uncertainty mechanisms linked to network use in RIIO-1

Uncertainty mechanism	Description	Sector
SWW	Arrangement for in-period assessment on some projects that were uncertain (both in terms of cost and timing) at the time of the price control review. Given the varying size of the TOs, each have specific cost thresholds: £50m for SHET, £100m for SPTL and £500m for NGET.	Electricity transmission
Within period determinations for specific projects	In-period revenue adjustments to account for specific projects taking place due to other projects also going ahead (for example, projects under SWW). These are often non-load related, and of a smaller scale than SWW.	Electricity transmission
Volume/revenue drivers	Mechanism whereby allowances vary depending on specific measurable events that can influence costs. Examples include increased generation, demand or capacity connections in transmission, and revenue drivers for tier 2 repex in gas distribution.	All
Re-openers	Specific windows whereby allowances can be adjusted (beyond a certain threshold) to allow or disallow specific costs in light of new information about network companies' activities. Examples include re-openers for high-value projects and load-related expenditure in electricity distribution. There also company-specific re-openers, including connecting remote households to the gas network (Scotia Gas Networks (SGN)) and for meeting peak demand obligations (NGGT).	All

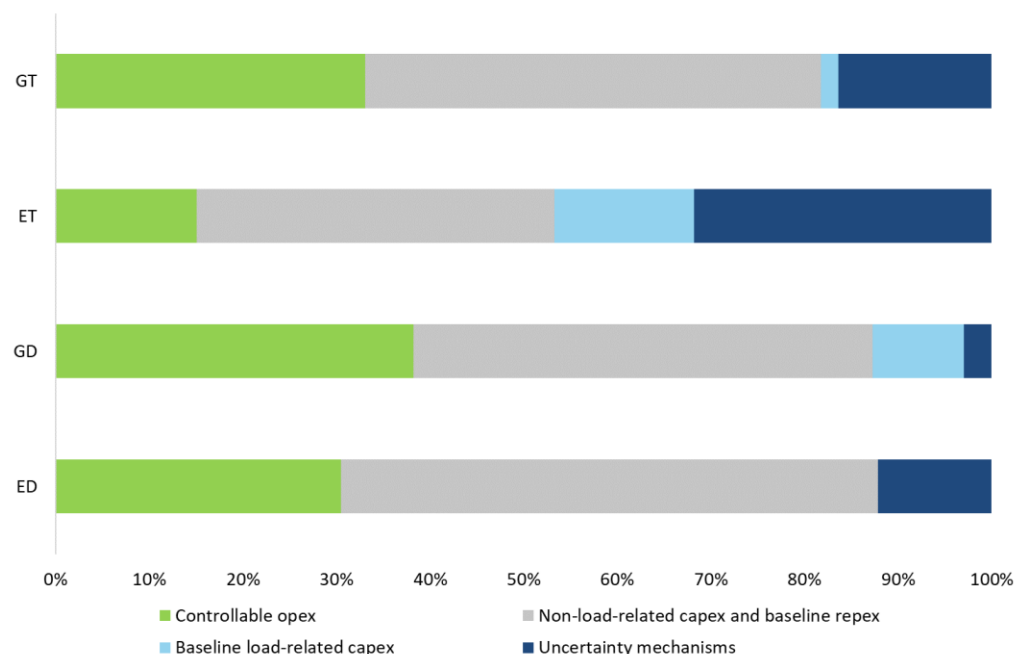
Source: CEPA analysis of Ofgem publications

The degree of uncertainty in expenditure varies between the energy network sectors. For example, a considerable amount of expenditure in electricity transmission is subject to within period determinations via the SWW mechanism and re-openers for other wider works. As part of this review we have assessed the extent to which different sector expenditure is subject to differing degrees of uncertainty.

⁵⁰ Please note that in this section we do not discuss the uncertainty mechanisms not linked to network work use (for example, pass-through costs and RPI indexation). We have also omitted the MPR from this list, given that this is in place to review whether changes are needed to primary outputs, as opposed to being an uncertainty mechanism linked to specific investments.

In Figure 3.1 we have separated expenditure into different categories based on their expected levels of uncertainty.⁵¹ NLR capex and repex, and controllable opex are generally considered to be fairly predictable. Baseline load-related capex carries some uncertainty, while expenditure linked to within period determinations (such as SWW for electricity transmission and re-openers for other sectors) and revenue drivers is the most uncertain.

Figure 3.1: Share of totex allowances and forecast allowances by uncertainty grouping



Source: CEPA analysis of 2016/17 RRP's and Ofgem Final Decision documents

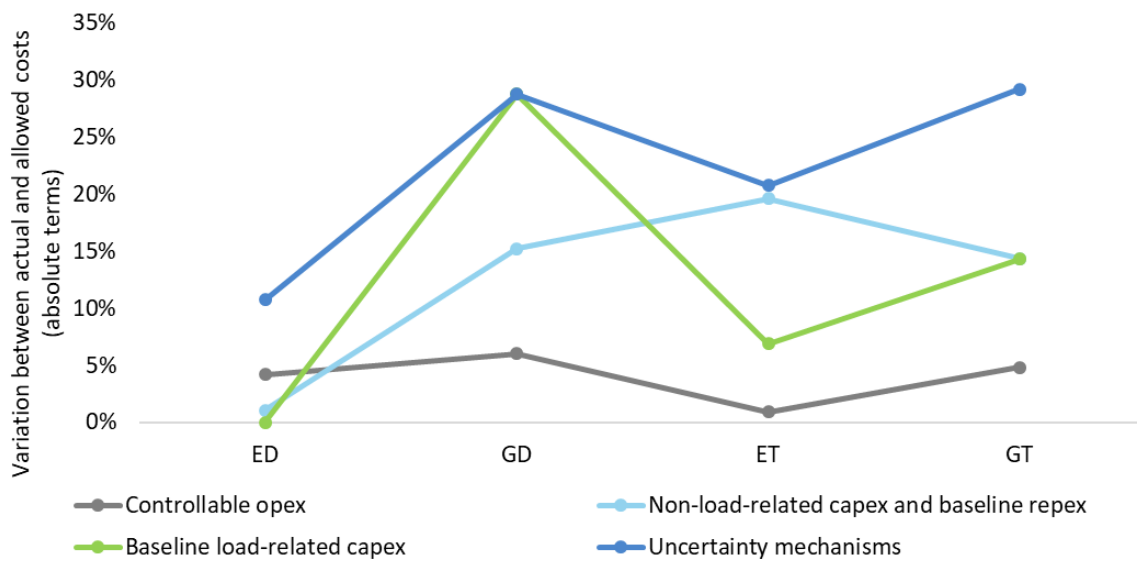
As Figure 3.1 shows, 32% of totex in RIIO-ET1 is subject to some form of uncertainty mechanism, which is notably higher than the proportions found in other sectors.

We have also assessed the variance between allowed and actual costs for each of the categories from Figure 3.1.⁵² This is summarised in Figure 3.2.

⁵¹ The figure is based on baseline totex allowances, plus network companies' forecasts of allowances under uncertainty mechanisms.

⁵² Including forecast allowances under the uncertainty mechanism.

Figure 3.2: Variance between allowed and actual totex (absolute terms)



Source: CEPA analysis of 2016/17 RRP's and Ofgem Final Decision documents

As the figure shows, there has been considerable variability between expected allowances and actual costs for expenditure linked to uncertainty mechanisms. The high variability between allowed (including companies' forecasts) and actual expenditure suggests that uncertainty mechanisms have helped protect customers from bearing the costs that are difficult to forecast, particularly for electricity transmission. The high variance between actual and allowed expenditure for NLR capex in electricity transmission was discussed in detail in section 2.5.5.

3.3.2. Recommended changes for RIIO-2

As noted in section 2.5.4, a large amount of underspend by the Scottish TOs was due to uncertain load-related capex being included in baseline allowances. Such issues could be addressed going forward by effectively utilising the range of uncertainty mechanisms currently at Ofgem's disposal, as listed in Table 3.1. It is important that the conditions under which these uncertainty mechanisms would be used, and the process that would be followed, are clearly set out in licences so as to enable all parties to make informed decisions regarding future investment.

We recognise that implementing uncertainty mechanisms places a greater resourcing burden on Ofgem and the network companies during the price control period. But this cost is relatively small compared to the potential for network companies to make windfall gains or losses as a result of erroneous forecasts of future investment needs.

4. RESETTING THE RISK-REWARD BALANCE IN RIIO

The RIIO framework was intended to be high-powered.⁵³ It is rooted in the belief that the best long-term outcome for customers would be to create incentives for shareholders to apply pressure on network companies' management to deliver better returns through strong performance.⁵⁴ Our analysis shows that, to an extent, RIIO-1 has been successful at driving such behaviour.

However, we have also found other important reasons for the level of added returns earned by network companies so far in RIIO-1:

- Ofgem's application of the principles and objectives of the RIIO framework (this is addressed in Section 3).
- Network companies were exposed to a number of risks that may be outside their control, and have earned added returns when these risks have so far turned out in their favour.
- The absence of a "failsafe" mechanism in RIIO-1, despite the information asymmetry that Ofgem faces and the risk aversion in its decision-making, which mean that network companies are more likely to enjoy upside risks than be exposed to downside risks.

In this section we review how risks were allocated in RIIO-1 and discuss the options that Ofgem could introduce in RIIO-2 to adjust that risk balance. We cover the following elements of RIIO price controls: proportionate assessment and the fast-tracking incentive; the scope of outputs and how the regulatory framework might encourage whole-of-system thinking; totex allowances and the IQI; dealing with uncertainty, particularly with regard to RPEs; the length of the price control period; and options for calibrating returns.⁵⁵

We note that the options we discuss do not address network companies' ability to earn additional returns through higher gearing, minimising their tax payments, decisions they make regarding accounting depreciation, or financial arrangements at group level.

Whichever options Ofgem decides to adopt for RIIO-2, it is essential that the impact on network companies' behaviour is carefully assessed and modelled in order to mitigate the risk of unintended outcomes. Individual policies/mechanisms that may be well-intentioned and appropriate on their own could have a combined effect that results in perverse incentives, which Ofgem should seek to identify and mitigate against as early as possible in the price control process (see section 2.1 for a suggestion of how Ofgem might do this).

⁵³ [Ofgem, RIIO: A new way to regulate energy networks – final decision, October 2010.](#)

⁵⁴ See, for example: [Ofgem, RIIO-ED1 Strategy Decision – presentation by Hannah Nixon, Senior Partner, Distribution, 8 March 2013](#)

⁵⁵ In Annex G we review the mechanisms Ofgem uses to encourage network companies to innovate, and how innovation is addressed in other regulatory contexts.

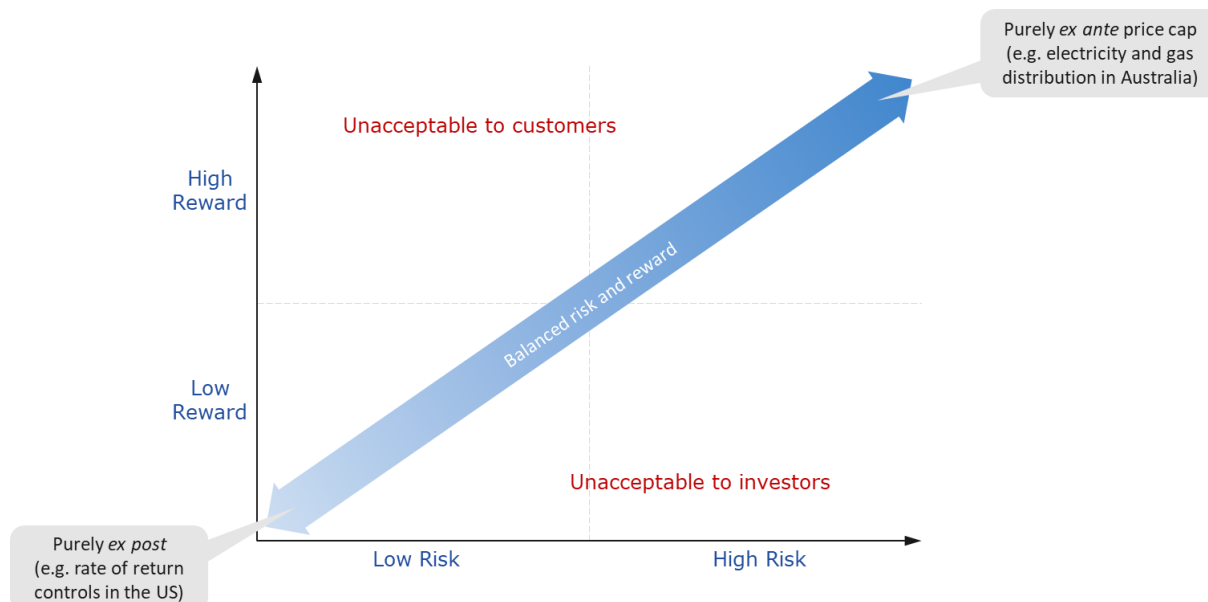
4.1. Risk allocation in RIIO-1

It is useful to apply a risk/reward matrix to regulatory regimes in order to understand the allocation of risks between network companies and customers and to assess, at least in the round, whether the observed returns appear to be in line with the risks carried by companies. Two key principles inform how the regulatory framework should treat risk:

- risks should be allocated to the parties best placed to manage them in order to maximise the efficiency of risk allocation; and
- the price control package should be calibrated so that baseline returns are consistent with the level of risk network companies are exposed to.

Figure 4.1 illustrates the second principle. It is important to stress that the range of risk-reward options illustrated even at the top right hand side of Figure 4.1 is still lower than that faced by companies in competitive sectors.

Figure 4.1: An illustration of risk and reward in a price control



Source: CEPA

We mapped the RIIO-1 price controls against a list of the risks that directly impact network companies' costs and/or revenues (i.e. those that affect the risk borne by shareholders). We have only covered risks that can be directly influenced by decisions Ofgem makes in setting price controls. We did not include environmental, health and safety, and political risks.

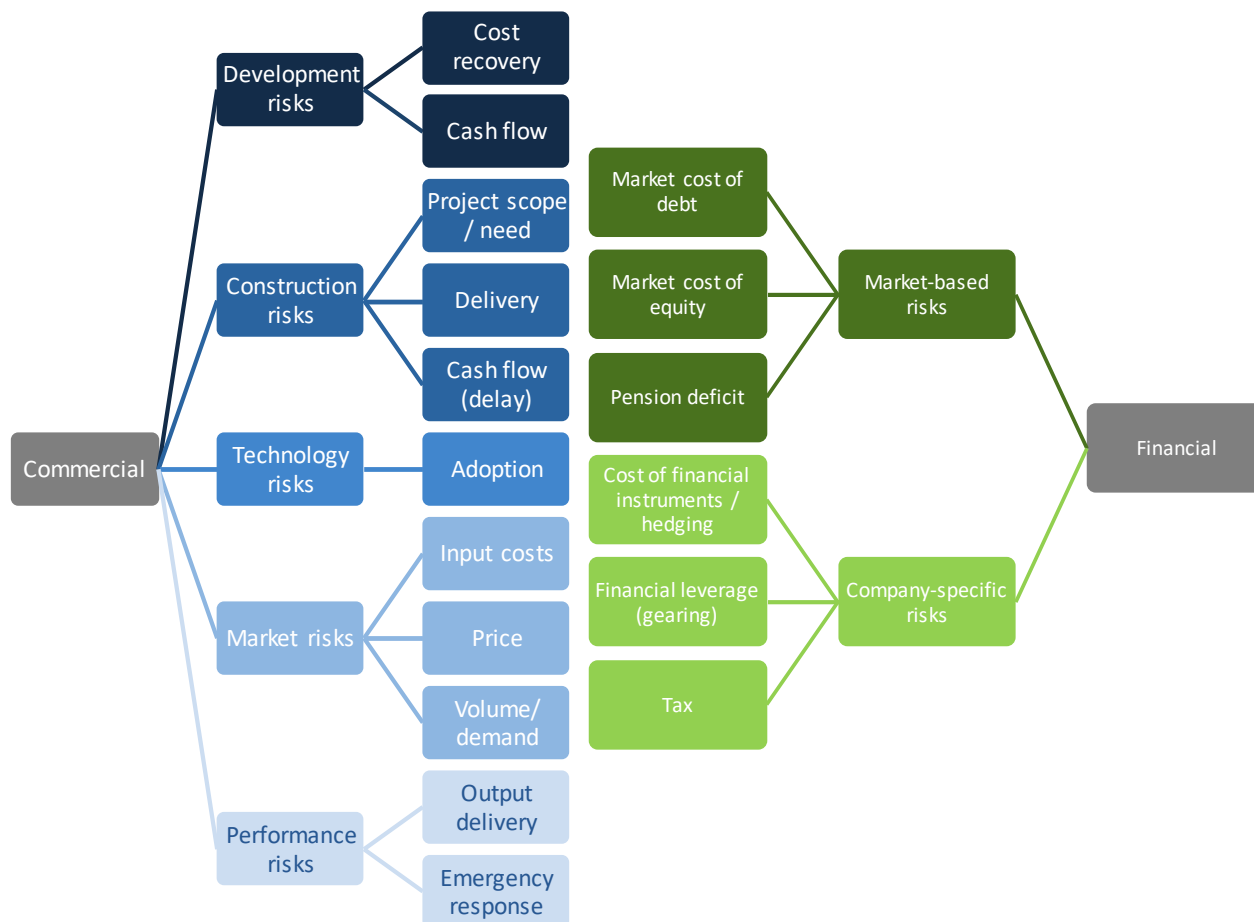
We also draw an important distinction between risks *during* each price control period, and risks *ahead* of the control period (i.e. at the price control review stage). This distinction is particularly important when considering the impact of the length of price control periods on risk. Longer price controls would increase certain risks during the period, but reduce others through less frequent price control reviews. For most options assessed, our analysis focuses

on risk allocation *during* the price control period. When discussing options for the length of the control period we also cover risks *ahead* of the price control period.

We note that regulatory risk, which is brought about by price control reviews and any other regulatory interventions, is mitigated by Ofgem’s duty to follow due process (including consultation) and stakeholders’ ability to appeal Ofgem’s decisions to the CMA.

Figure 4.2 illustrates the risks that are directly affected by RIIO price controls, which we have grouped under ‘commercial’ and ‘financial’ risks.

Figure 4.2 Overview of commercial and financial risks in RIIO price controls



Source: CEPA

In Table 4.1 we provide a brief description of each risk and indicate how it was allocated in RIIO-1. In the rest of this section we focus on options that only affect commercial risks. In a separate report published alongside this one, CEPA has advised Ofgem on how the RIIO framework may address certain financial risks in future price controls.

We note that some of the risks we list may be diversifiable, while others are more likely to be systematic (in practice risks are rarely one or the other but rather have diversifiable and non-diversifiable elements to them). As such, *for some of the risks listed allocating more of the risk to network companies would not necessarily increase their cost of capital, and vice versa*. It is also important to consider the interaction between different risks. For example, development risks are likely to be correlated with project scope/need risk.

Table 4.1: Summary of risk allocation in RIIO-1

Type of risk	Description	Risk allocation during RIIO-1
Commercial risks	Development – Cost recovery	Allocated to network companies, as the recovery of costs related to projects that are no longer needed is at Ofgem’s discretion. Examples such as Avonmouth (gas transmission) suggest that Ofgem would allow companies to recover reasonable development costs.
	Development – Cash flow	Shared, as network companies’ portfolios mean they earn revenue from existing assets at the same time as they incur costs developing others.
	Construction – Project scope/need	Allocated to customers for costs that are deemed uncertain, via the use of SWW (in electricity transmission), volume drivers, re-openers and pass-throughs. Otherwise shared through the totex incentive.
	Construction - Delivery	Shared through the totex incentive, which allocates a larger proportion of the risk to network companies (% differs by company).
	Construction – cash flow (delay)	Shared, as network companies’ portfolios mean they earn revenue from existing assets at the same time as they incur costs developing others. Additionally, assets under construction may be added to the regulated asset value (RAV).
	Technology – Adoption	In principle allocated to network companies. In practice, during (early years of) price control periods network companies would likely only adopt technologies that reduce their costs. Technologies that increase companies’ costs would only be adopted if Ofgem had set correspondingly higher allowances at the price control review. Some of the risk is also borne by customers through innovation allowances.
	Market – Input costs	General inflation risk is allocated to customers through the indexation of revenues and the of RAV to RPI. The residual risk relating to input cost inflation is primarily allocated to network companies during the price control period, although a fixed (<i>ex ante</i>) allowance is provided for RPEs.
	Market – Price	Allocated to customers during price control periods through the application of a revenue cap (which may potentially be adjusted at the mid-period review).

Type of risk		Description	Risk allocation during RIIO-1
	Market – Volume/ demand	The risk to a network company's revenue as a result of the demand for its services changing, for example through competition or as a result of technological changes; includes asset utilisation/stranding risk.	Allocated to customers during price control periods through the application of a revenue cap. For costs included in the RAV, volume risk is allocated to customers over the assumed life of the assets.
	Performance – Output delivery	The risk that a network company's revenue would change as a result of its performance against output targets (e.g. availability, safety, etc.); this includes the risk of asset failure that affects a network company's performance.	Allocated to network companies for those outputs for which a financial incentive is defined. Allocated to customers where allowances are not linked to an output.
	Performance – Emergency response	The risk that a network company would incur additional costs as a result of events such as severe weather and/or that its performance against output targets would be affected.	The risk relating to added costs is allocated to network companies up to a point, although a fixed allowance is provided for contingency costs. At the extreme, a disapplication clause protects companies in the case of significant impact outside of their control. The risk relating to output incentive revenue is allocated to customers, as network companies' performance is generally measured after excluding exceptional events.
Financial risks	Market cost of debt	The risk that the market cost of debt, against which a network company may have to raise money, would change.	Allocated to customers through the use of the cost of debt index.
	Market cost of equity	The risk that the market cost of equity, against which a network company may have to raise money, would change.	Allocated to network companies through the use of a fixed allowance.
	Pension deficit	The risk that, as a result of changes in the value of the underlying assets and liabilities, a network company could recover its defined benefit pension deficit via its allowance.	Allocated to customers through the pass-through of established pension deficits (subject to triennial efficiency review).
	Cost of financial instruments / hedging	The risk that the financing costs a network company incurs as a result of its financing choices (e.g. currency of issuance, use of swaps) would be different from its allowances.	Allocated to network companies as allowed rate of return is based on notional assumptions.
	Financial leverage (gearing)	The risk that the financing costs a network company incurs as a result of its chosen level of gearing would be different from its allowance.	Allocated to network companies as allowed rate of return is based on notional assumptions.
	Tax	The risk that a network company's tax liability would be different from its tax allowance.	At the licensee level allocated to customers, other than within the tax trigger deadband where risk of changes in tax are allocated to network companies. The risk of differences between regulatory and accounting depreciation is allocated to network companies.

Source: CEPA analysis

As noted earlier, information asymmetry means that the distribution of risks is more likely to be in network companies' favour than against them. Combined with the protections provided within the regulatory framework, our analysis suggests that some risks were not efficiently allocated in RIIO-1, and that the overall risk profile is likely to have been lower than would justify the available range of returns. Figure 4.3 illustrates this concept.

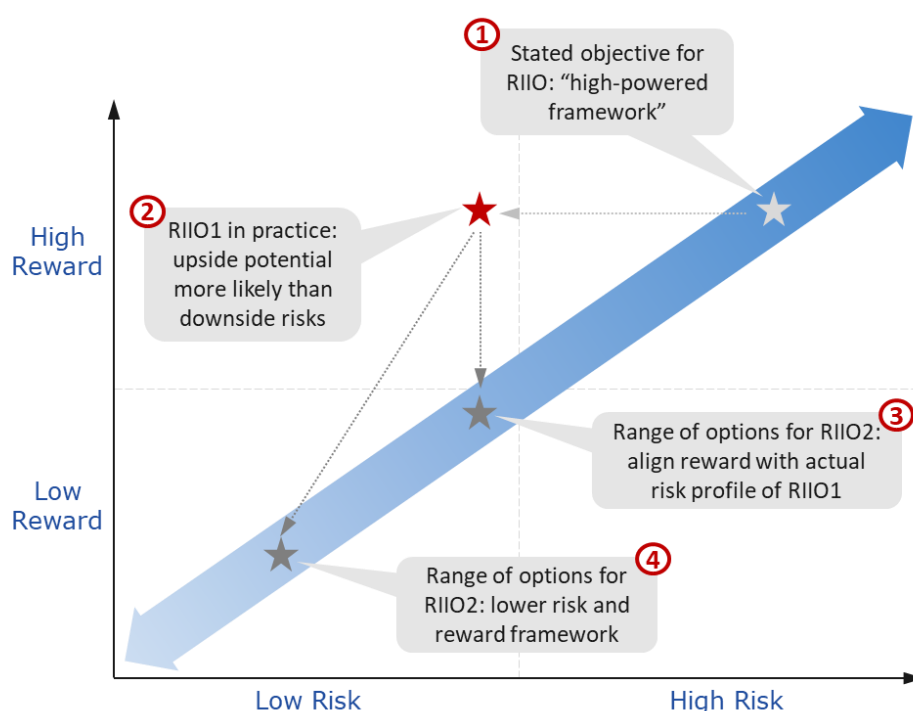
We do not think that the truly high-risk/high-reward profile envisaged for RIIO can be realistically achieved under the current framework. This is because the complexity of the framework, coupled with information asymmetry between Ofgem and the network companies, naturally leads Ofgem to act with caution in setting its price control allowances and targets. This naturally de-risks the price control for network companies, essentially resulting in a misalignment between risk and return.

Figure 4.3 also illustrates a range of potential options for Ofgem to recalibrate the risk/reward balance to in RIIO-2:

- More can be done to reduce network companies' exposure to risks that are outside of their control, including making greater use of existing uncertainty mechanisms (as discussed in section 3.3). This could also include making greater use of competitive mechanisms such as Competitively Appointed Transmission Owners (CATOs), which would allocate the risks relating to tendered projects with the bidders, instead of the current price control mechanisms that rely on Ofgem accurately forecasting efficient costs.⁵⁶ Combined with targeted "failsafe" mechanisms, these changes would result in a framework where the risk/reward balance is more aligned to the actual risk profile of RIIO-1 price controls.
- If Ofgem was more concerned about the variability of returns, it could potentially draw on more *ex post* mechanisms that apply to the entire price control package. These would result in a lower risk/return profile more akin to rate of return regulation in the US.

⁵⁶ We note that the CATO regime depends on primary legislation changes.

Figure 4.3: Illustration of the risk/reward balance in RIIO price controls



Source: CEPA

Note: the location of stars in the above diagram is illustrative of the risk/reward profile and is not a quantified estimate of risk.

4.2. Proportionate assessment and fast-track⁵⁷

A key change introduced by the RIIO framework has been the notion of ‘proportionate treatment’ of network companies’ price control proposals (business plans). Ofgem’s stated rationale behind proportionate treatment was to focus effort where it is most needed. At the same time, it would allow those network companies that provide well-justified business plans to spend less time on the price control review and more time on running their business.⁵⁸ Where Ofgem judges a network company’s proposal to be particularly strong, it may decide to settle that company’s price control review up to a year in advance of the standard timetable (‘fast-track’).

The fast-tracking incentive aims to address the information asymmetry between network companies and Ofgem. It does so by making it in companies’ interest to propose efficient costs in their business plans, set stretching output targets, and demonstrate that their business plans deliver what stakeholders want.

From a network company’s perspective, fast-tracking locks in the regulatory settlement a year earlier, allowing management to focus on delivery. It also represents a “vote of confidence” by the regulator, which might give it an advantage in accessing finance from debt and equity providers. Network companies may also expect a fast-track settlement to be more favourable

⁵⁷ Annex D provides more detail on proportionate assessment and fast-tracking in RIIO-1.

⁵⁸ [Ofgem, Handbook for implementing the RIIO model, October 2010.](#)

than slow track, because the regulator is accepting the company's own proposals. Additionally, Ofgem provided specific financial incentives for being fast-tracked in RIIO-1: an *ex ante* reward in lieu of the IQI (higher than the likely IQI additional allowance under slow-track), and a higher totex incentive rate than would have likely been set under slow-track.

4.2.1. What has been the benefit to customers of the fast-track incentive?⁵⁹

In this section we use the RIIO-ED1 price control to assess the likely benefits and costs to customers of the fast-track incentive and the decision to fast-track Western power distribution (WPD). We use RIIO-ED1 for two reasons:

- as the most recent application of the RIIO framework, it captures learnings from previous RIIO decisions and can be considered to be more representative of future applications of the fast-track incentive;⁶⁰
- the DPCR5 price control used many of the elements of the RIIO framework but did not include the fast-tracking incentive, so it offers a reasonable counterfactual against which to measure the impact of the fast-track incentive.⁶¹

The latest RPI-X price controls for transmission and gas distribution were substantially different from the RIIO framework. As such, they do not allow us to assess the benefits and costs of fast-track due to the lack of counterfactual and like-for-like comparison. We explain this in more detail in section 4.2.2.

We acknowledge that quantifying the effect of fast-track is a challenging exercise as many other aspects of the price control regime have the potential to impact the costs submitted by network companies in their business plans. Our approach seeks to arrive at a reasonable order-of-magnitude estimate, rather than a specific figure.

Our approach to estimating the customer benefits of fast-track in RIIO-ED1 is as follows:

1. We begin by estimating the *additional totex allowance and allowed revenues that were included in WPD's fast-track settlement* compared to what it might have been set under slow-track. This gives us an indication of "breakeven" levels in relation to fast-track – estimated savings would need to be at least this high to suggest that there might have been a net benefit to customers in RIIO-ED1.
2. We then estimate the reduction in totex allowances between DPCR5 and RIIO-ED1 (on a like-for-like basis). We compare these to the totex breakeven point calculated in step 1 and *identify the share of totex reduction that needs to be attributed to fast-track in order*

⁵⁹ Unless stated otherwise, all figures in this section are presented in the 2016/17 price base.

⁶⁰ It is worth noting that the same incentive properties for being fast-tracked would not necessarily result in the same costs/benefits in the future as this would depend on how the network companies respond to the fast-track incentive in the next RIIO controls.

⁶¹ Other key differences between DPCR5 and RIIO-ED1 are: the move to eight-year price controls, indexation of the allowed return on debt, and the application of totex to all of DNOs' expenditure. We do not think that these differences are likely to have a systematic impact on our estimated costs and benefits of the fast-track incentive.

for the incentive to have led to a net benefit for customers. We consider whether attributing that share is reasonable.

3. We then run the estimated totex savings through Ofgem’s price control financial model (PCFM) for RIIO-ED1 to estimate the reduction in allowed revenues. We compare that figure to the allowed revenue breakeven point, identify the share of revenue reduction that needs to be attributed to fast-track in order for the incentive to have led to a net benefit for customers during RIIO-ED1, and consider whether attributing that share is reasonable.

Table 4.2 summarises the sources of additional allowances for WPD and the sources of totex savings that are covered by our assessment. We note that the first source of savings is the benefit of having the fast-track incentive in place, and is not dependent on any company actually being fast-tracked. The second and third sources of savings do depend on one or more companies being fast-tracked.

Table 4.2: Sources of totex savings and additional revenues that may be attributed to fast-track

Cost of RIIO-ED1 fast-track: sources of additional revenues ⁶²	Savings of RIIO-ED1 fast-track: sources of totex savings
<ul style="list-style-type: none"> Higher allowed return on equity, leading to a higher weighted average cost of capital. Additional income reward of 2.5% of totex (in lieu of the IQI reward). Higher cost allowances (RPEs and smart grid adjustments). 	<ul style="list-style-type: none"> Lower cost company initial proposals (less “gaming”). Lower cost company revised proposals (slow-tracked companies respond to benchmark set by the fast-tracked company). More efficient Ofgem baseline costs (fast-tracked company used to benchmark allowances for slow track).

Source: CEPA analysis

Note: Only a proportion of these totex savings could be attributed to fast-track.

Our assessment of the possible benefits of fast-track is necessarily limited to certain areas that can be reasonably quantified and assessed on a comparable basis. It excludes other sources of costs and benefits relating to fast-track, such as:

- higher output targets and lower cost of capital in network companies’ proposals;
- resource costs incurred by Ofgem, network companies and stakeholders of participating in the fast-track process;
- administrative savings such as the fast-tracked company’s management’s time; and

⁶² We also note that, as a result of being fast-tracked, WPD’s allowed return on debt is not based on the ‘trombone’ approach that applies to slow-track DNOs. WPD is also subject to slightly different re-openers compared to the slow-tracked companies. These two items have not been included in the table above as they refer to different risk profiles instead of cost savings, i.e. not inherent added costs).

- the impact of having a higher totex incentive rate for the fast-tracked company.⁶³

Estimated costs of the decision to fast-track WPD in RIIO-ED1

Ofgem's RIIO-ED1 publications indicate that WPD was provided with a higher allowed revenue as a result of being fast-tracked compared to its likely slow track settlement. This consists of three elements:⁶⁴

- The **allowed return on equity** was higher for WPD at 6.4% than for slow-tracked DNOs (6.0%). The resulting difference in allowed revenue for WPD's four DNOs is approximately **£100m** over the course of RIIO-ED1.
- **Ex ante reward** of 2.5% of totex in lieu of the IQI additional income. In comparison, the highest reward in slow track was 0.66% of totex (achieved by Electricity North West Limited (ENWL)). Had WPD been set an IQI reward of 0.66% instead of 2.5%, the resulting difference in allowed revenue for WPD's four DNOs would have been approximately **£140m** over RIIO-ED1.
- **Higher cost allowances** for RPEs and smart grid benefits. Ofgem's slow track draft determinations implies that WPD would have been subject to:
 - a reduction in allowed totex of £525m for lower RPEs than the company had proposed; and
 - a reduction in allowed totex of £153m to reflect smart grid benefits.

The resulting £678m reduction in totex would have translated to approximately **£270m** lower allowed revenues for WPD's four DNOs' over the course of RIIO-ED1.

We summarise the estimated additional allowances for WPD in Table 4.3.

Table 4.3: Estimated 'breakeven points' for the fast-tracking decision in RIIO-ED1

Estimated totex breakeven point for WPD in RIIO-ED1	Estimated allowed revenue breakeven point for WPD in RIIO-ED1
• £678m	• £510m ⁶⁵

Source: CEPA analysis

Totex savings that may relate to RIIO-ED1 fast-track

The three sources of savings identified in Table 4.2 (second column in green) are presented in turn below.

⁶³ In RIIO-ED1 WPD was set an incentive rate of 70%, whereas incentive rates for slow-tracked DNOs ranged between 53% and 58%. The higher incentive rate means that customers share a smaller proportion of efficiency savings by the fast-tracked network company (albeit starting from what is likely to be a lower cost baseline than would have been the case without fast-tracking). But it also means that, if a company had been fast-tracked on the basis of submitting unrealistically low totex proposals, customers would be protected against overspends.

⁶⁴ The revenue figures were calculated using Ofgem's November 2017 RIIO-ED1 PCFM.

⁶⁵ Calculated as £100m + £140m + £270m = £510m

1. **Lower cost company initial proposals.** Ofgem used a range of models to set totex allowances for RIIO-ED1. This included both totex benchmarking and ‘bottom-up’ assessments of specific cost categories. All models relied on costs (both historical and forecasts) provided by the DNOs. As such, Ofgem’s estimates of efficient costs were influenced by the level of costs in DNOs’ business plans. The lower the forecasts submitted by DNOs, the lower the allowances Ofgem could set (and, therefore, the greater the savings for customers).⁶⁶

We use the IQI efficiency score to compare the costs of DNOs’ initial business plans in DPCR5 and RIIO-ED1 on a like-for-like basis.⁶⁷ Table 4.4 shows that all DNOs except Scottish Power Energy Networks (SPEN) achieved lower IQI scores for their initial business plans in RIIO-ED1 compared to the same stage in DPCR5.

Table 4.4: DPCR5 v RIIO-ED1 comparison of initial business plans using IQI scores

DPCR5		RIIO-ED1		Initial business plans IQI score
DNO (by group)	Initial business plan IQI score	DNO (by group)	Initial business plan IQI score	RIIO- ED1 improvement against DPCR5?
ENWL	123.4	ENWL	102.4	
NEDL/YEDL	111.1	NPg	106.9	
EDF	118.6	UKPN	113.7	
SPEN	117.6	SPEN	123.5	
SSEPD	110.0	SSEN	102.4	
CNE/CNW	112.4	WPD	99.3	
WPD	110.0			
Median	112.4		104.7	
Upper quartile	110.6		102.4	

Source: CEPA analysis based on Ofgem DPCR5 initial assessment of business plans and RIIO-ED1 initial assessment of business plans

Note: Cells highlighted in light blue identify the companies that have an IQI above the median.

By multiplying the change in the difference in median IQI scores (7.8%)⁶⁸ by all DNOs’ proposed totex for RIIO-ED1 (£28 billion) we can estimate the saving from lower totex in

⁶⁶ Additionally, Ofgem’s totex allowances were based on an interpolation of its baseline estimate and companies’ proposals on a 75:25 basis. This means that lower cost proposals would have resulted in lower allowances after applying the IQI interpolation.

⁶⁷ The IQI efficiency score is the ratio of companies’ proposed costs to Ofgem’s view of efficient costs. It does not vary with different calibrations of the IQI mechanism. However, IQI scores might change as a result of Ofgem using different approaches to identify efficient costs. For example, Ofgem used both DNOs’ historical and forecast costs to identify efficient costs in RIIO-ED1, whereas it only used historical costs in DPCR5. All other things being equal, that is likely to have led to lower IQI scores in RIIO-ED1. Even with the above consideration in mind, we consider that IQI scores are the best available basis for comparing the efficiency of DNOs’ initial business plans in RIIO-ED1 and DPCR5.

⁶⁸ DPCR5 median IQI minus RIIO-ED1 median IQI: 112.4 – 104.7 = 7.8.

initial company proposals for RIIO-ED1 compared to DPCR5.⁶⁹ We note that these savings cannot be entirely attributed to fast-tracking. DNOs could have been responding to new information or stakeholder views; Ofgem's use of forecasts in its cost assessment models likely lowered IQI scores; and some of the least efficient DNOs at the start of DPCR5 had been taken over by new management before RIIO-ED1.

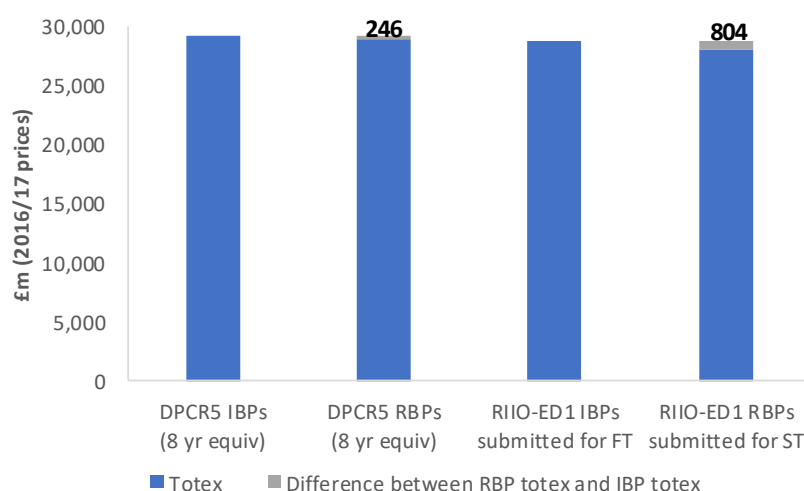
Approximate saving from lower totex in initial company proposals for RIIO-ED1

£2,230 million over eight years⁷⁰

2. **Lower cost company revised proposals.** For the DNOs that were not fast-tracked, there was an opportunity to propose more efficient costs in their revised business plans. A proportion of the lower costs proposed by network companies in their revised proposals may be due to DNOs responding to the benchmark set by WPD. But it can also be because DNOs may have responded to new information or stakeholder views, or corrected errors from their initial business plans. They may have also responded to more information revealed by Ofgem about the likely final price control settlement (e.g. the level of the allowed rate of return).

Figure 4.4 demonstrates that in DPCR5 DNOs reduced their totex proposals by 0.8% (£246m on an eight-year equivalent basis) between initial and final business plans. In RIIO-ED1 the DNOs reduced their totex proposals by 2.8% (£804m).⁷¹

Figure 4.4: DPCR5 and RIIO-ED1 totex proposals



Source: CEPA analysis based on Ofgem DPCR5 and RIIO-ED1 initial assessments of business plans

Approximate saving from lower totex in revised company proposals in RIIO-ED1

£560 million over eight years

⁶⁹ The savings based on the change in the upper quartile IQI score are 8.1%.

⁷⁰ An alternative way of calculating the savings is by using a weighted average change in IQI scores, with the weights being the totex amounts submitted by each DNO in their initial business plans. This approach accounts for the relative size of the DNOs. With a weighted average, the approximate savings from lower cost initial business plans in RIIO-ED1 would be £1,900 million in 2016/17 prices.

⁷¹ The reduction is 3.8% if WPD is excluded.

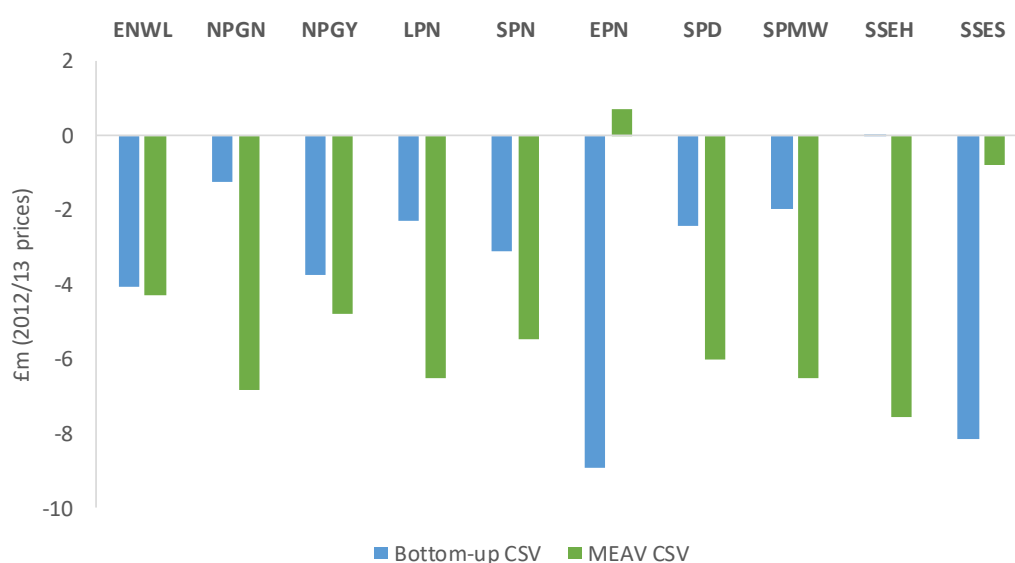
3. **More efficient Ofgem baseline costs.** In RIIO-ED1, Ofgem set totex allowances for the slow-tracked companies using:

- Two totex top-down models each given 25% in setting the cost baseline. One model used a cost driver that reflected a weighted average of the drivers used in each of the disaggregated models ('Bottom-up CSV', see below). The other model used a cost driver of modern equivalent asset value ('MEAV CSV') and customer numbers.
- One bottom-up (disaggregated) totex model, which was given a 50% weight placed on it in setting the cost baseline. The 'disaggregated' model's estimates were based on an aggregate value from over 40 activity level models.

We re-ran the top-down models without WPD's forecasts for RIIO-ED1 in order to estimate what effect those forecasts had on Ofgem's cost baseline. We were not able to replicate this test for the bottom-up models, as they relied on a range of benchmarks that could not be directly linked to WPD's forecasts (e.g. engineers' view of efficient unit costs).

Figure 4.5 shows that excluding WPD's forecasts from the top-down models had only a minor impact on the cost baselines. *This suggests that slow-tracked DNOS' revised business plans caught up to the benchmark set in WPD's business plan.* This is consistent with our analysis in the preceding section.

Figure 4.5: Results of the RIIO-ED1 top-down models excluding WPD forecasts



Source: CEPA analysis based on Ofgem's RIIO-ED1 top-down models

Note: The estimates are before modelling adjustments are reversed, RPEs added and the upper quartile is applied. Figures are presented in 2012/13 prices, as used in Ofgem's RIIO-ED1 models.

Approximate saving from using WPD in totex models in RIIO-ED1

£40 million over eight years

How do the totex savings and costs compare?

As mentioned previously, the savings estimated in the above three sources cannot be attributed entirely to fast-tracking – companies could have been responding to new information, stakeholder views, management preferences, and other factors. Table 4.5 compares the estimated totex costs and savings from the previous sections. It shows that at least 24% of the estimated savings need to be attributable to the fast-track incentive in order for it to have had a net benefit on customers through lower totex allowances.⁷² *In light of the statements Ofgem made regarding DNOs' initial business plans for RIIO-ED1,⁷³ we consider that attributing at least 24% of the estimated savings to fast-track is reasonable.*

Table 4.5: Estimated costs and savings (totex) as a result of fast-track in RIIO-ED1

Savings/costs	Totex
1. Lower cost company initial proposals	£2,230m
2. Lower cost company revised proposals	£560m
3. More efficient Ofgem baseline costs	£40m
Total estimated totex savings	£2,830m
Total estimated totex cost	£680m
Share of savings that need to be attributable to fast-track for breakeven	24%

Source: CEPA analysis of Ofgem data

Note: All figures are in 2016/17 price base.

How do the savings and costs on allowed revenues compare?

For the eight years of RIIO-ED1 we estimate that:

- WPD was set allowed revenues that were approximately **£510m** higher than had it been slow-tracked.
- The estimated £2,830m reduction in totex (from the previous section) results in approximately a **£1,120m** reduction in allowed revenues for all DNOs over the course of RIIO-ED1.
- As such, **45%** of the estimated reduction in allowed revenue needs to be attributable to the fast-track incentive in order for fast-track to have led to a net reduction in electricity distribution charges recovered from customers in RIIO-ED1.⁷⁴

We consider that 45% is towards the upper end of savings that can be reasonably attributable to fast-track. As such, it is less clear that fast-tracking resulted in a net saving for customers

⁷² Calculated as $680/2,830 = 24\%$

⁷³ For example: “the potential to be fast-tracked inspired all DNOs to raise their game” and that proposed expenditure was £2 billion lower than DNOs’ previous forecasts. Source: [Ofgem, Decision to fast-track Western Power Distribution, 28 February 2014](#).

⁷⁴ Calculated as $510/1,120 = 46\%$

during the eight years of RIIO-ED1. It is not surprising that the fast-track incentive is more likely to have led to a net benefit in the longer-term, as the incentive involves upfront payment in exchange for network companies revealing information that Ofgem could use to set lower allowances in the future.

Key observations

We note that the largest saving appears to be derived from the first component (lower cost initial proposals), suggesting that the main benefit is derived from a credible possibility that one or more network companies would be fast-tracked. Our analysis also shows that the savings from the second and third components are notably smaller. In particular, the impact of including WPD's forecasts in Ofgem's slow-track cost assessment models in RIIO-ED1 appears to have been very small. This suggests that the DNOs' revised proposals were close to the benchmark set by WPD, meaning there was less scope to cut allowances further.

In theory, all network companies could be fast-tracked if their business plans are judged by Ofgem to be of sufficiently high quality. This would be in line with adopting business plans that are in the best interest of consumers. However, in practice some important aspects need to be considered before fast-tracking any company, for example, company historical performance, complexity of operations, size or significance to national security. Additionally, if all business plans are of very high quality, the hurdle for a company standing out and being fast-tracked may be raised (deliberately or inadvertently). The costs and benefits of fast-tracking would likely change compared to our estimates for RIIO-ED1 if fewer or more network companies are fact-tracked.

Overall, we estimate that the fast-track incentive is likely to have resulted in a net benefit to customers in terms of the costs (totex) incurred during this period that would be recovered from customers at subsequent price control periods, and may have also done so (although this is less certain) in terms of the charges recoverable during RIIO-ED1.

4.2.2. Estimating the impact of fast-track on RIIO-T1 and GD1

Due to the significant differences between the RIIO framework and the preceding TPCR4 and GDPCR1 price controls, it is not possible to estimate the impact of fast-track on RIIO-T1 and GD1.⁷⁵ The differences mean it has not been possible for us to set a counterfactual against which to estimate the costs and benefits of the fast-track incentive. We were also unable to estimate costs or savings owing to specific reasons for each price control.

We also note that the way the fast-track incentive was applied in RIIO-T1 and GD1 is unlikely to reflect its future application. For example, Ofgem fast-tracked the Scottish TOs' proposals in RIIO-T1 despite noting material concerns with their initial business plans (albeit Ofgem

⁷⁵ We note that the purpose of the analysis is to attribute costs/savings to fast-track – as noted elsewhere in the report, assessing changes in network companies' costs between price control periods is out of scope for this study.

deemed those to be resolvable before its final decision). It would be reasonable to expect that this is unlikely to happen again in RIIO-2 as all network companies will have learned from the fast-track process in RIIO-1.

For **RIIO-GD1**, the only applicable component from the assessment we used for RIIO-ED1 is lower cost initial business plans because no GDNs were fast-tracked. However, we were not able to quantify this component because Ofgem did not publish (nor, to the best of our knowledge, calculate) IQI scores for RIIO-GD1 initial business plans. In any case, IQI scores would have only offered limited comparability between RIIO-GD1 and GDPCR1 because in the latter price control the IQI only applied to capex and repex.

For **RIIO-T1**, we were not able to estimate the lower cost initial business plans and the lower cost revised business plans as done for the RIIO-ED1 analysis. This is because TPCR4 did not use the IQI, so we could not establish a counterfactual for the efficiency of business plans in RIIO-T1. We were also unable to estimate the savings from more efficient Ofgem using the fast-tracked TOs' costs to set baselines because RIIO-T1 relied on bottom-up cost assessment. Even if Ofgem had used totex benchmarking in RIIO-T1, excluding the Scottish TOs would have left only NGET in the totex model, which would have nullified the analysis.

Furthermore, we were not able to ascertain the costs (or benefits) associated with RPEs as we did in the RIIO-ED1 analysis. Unlike in RIIO-ED1, Ofgem did not state how the RPEs for RIIO-T1 slow-track compared to those allowed for the fast-tracked companies.

Finally, in relation to the cost of capital, we do not think that the allowed rate of return for fast-track could be meaningfully compared to the allowed rate of return for slow-track in RIIO-T1. The RIIO framework specifies that notional gearing would be different where risk profiles are materially different. This is the case in RIIO-T1, where the Scottish TOs were deemed by Ofgem to face a higher risk profile than NGET. This is distinct from RIIO-ED1, where the fast-tracked and slow-tracked companies face similar risk profiles.

Below we consider how the sources of saving discussed above may apply to the other sectors:

- **Lower cost company initial proposals** – GDNs should have a similar incentive to compete for fast-track as the DNOs had in RIIO-ED1. In transmission, the Scottish TOs may decide to compete for fast-tracking whilst NGET may consider itself too big to be comparable to the other TOs so may not entirely reveal its efficient costs in its initial business plan. NGGT does not directly compete for fast-tracking, so may not respond strongly to the incentive.
- **Lower cost company revised proposals** – If one or more GDNs are fast-tracked, it is reasonable to expect that this would encourage the remaining GDNs to submit lower revised proposals, as was the case in RIIO-ED1. The impact is likely to be more muted in electricity transmission, where the TOs are somewhat different from one another and face different circumstances. This component does not apply to gas transmission.
- **More efficient Ofgem baseline costs** – Ofgem used a similar set of top-down and bottom-up models in RIIO-GD1 as it did in RIIO-ED1, so the impact of using a fast-tracked GDN's

forecasts to set cost baselines is likely to be comparable to RIIO-ED1. The impact is likely to be more muted in electricity transmission, where Ofgem assesses costs using bottom-up techniques, including assessing the costs of individual projects. This component does not apply to gas transmission.

The above suggests that the fast-track incentive is more likely to result in net benefits to customers in distribution than in transmission. This is because the greater degree of comparability between companies in electricity distribution and gas distribution is more likely to incentivise companies to compete against each other, thus offering better value for customers. Overall, we were not able to establish that the fast-track incentive led to a net benefit to customers in RIIO-T1, unlike RIIO-ED1 where our analysis suggests that a net benefit was likely.

4.2.3. Options for RIIO-2

The fast-track incentive is not risk-free for Ofgem. The process is resource-intensive – Ofgem effectively needs to undertake a detailed assessment of network companies' proposals in order to be able to identify whether any of them should be subject to 'light touch' assessment. The work assessing initial business plans may come at the expense of longer-term development of policies and models that would be valuable at the slow track stage. Ofgem may also find that allowances given in the fast-track settlement set out an overly generous baseline for the slow track decision.⁷⁶

The costs and benefits of fast-tracking would likely change if more/fewer companies were fast-tracked, so Ofgem may want to consider whether the reward for fast-tracking should be dependent on the number of companies fast-tracked.

Table 4.6 sets out a number of options Ofgem may consider for RIIO-2. Proportionate assessment was a new core feature of the RIIO framework and we think it represents good regulatory practice in terms of prioritisation. All options discussed in Table 4.6 retain proportionate assessment of business plans, but take different approaches to the fast-track incentive. All options reduce the potential gains from fast-track for companies but to varying degrees. This results in more of the price risk being borne by customers, as the incentive for network companies to reveal their efficient costs and commit to stretching output targets may be somewhat weaker.

Annex D offers a comparison of Ofgem's approach to fast-tracking with Ofwat's approach.

⁷⁶ For example, network companies in a sector are likely to face a similar risk profile. As such, the allowed rate of return for fast-tracked companies may be seen to also be applicable to slow-tracked companies. We note, however, that Ofgem did set higher notional gearing for NGET than for the Scottish TOs in RIIO-T1, and a lower return on equity for slow-tracked DNOs than for WPD in RIIO-ED1.

Table 4.6: Proportionate assessment and fast-track – evaluation of options

Option	Set a higher bar for being fast-tracked, with a lower financial reward through the <i>ex ante</i> allowance.	Remove the possibility of being fast-tracked for transmission but keep it for distribution.	Remove the fast-tracking incentive for all sectors.
Impact on risk allocation	<ul style="list-style-type: none"> More price risk allocated to customers than in RIIO-1 	<ul style="list-style-type: none"> More price risk allocated to customers than in RIIO-1 	<ul style="list-style-type: none"> More price risk allocated to customers than in RIIO-1
Pros	<ul style="list-style-type: none"> Reduces the cost of fast-tracking but likely retains much of the benefit (see savings under components 1 and 2 above) A logical evolution now that network companies have been through one set of RIIO controls Tougher criteria would raise the bar in such a way that only a limited number of companies would be able to be fast-tracked 	<ul style="list-style-type: none"> Targets the incentive at the sectors where there is more likely to be a material net benefit for customers Proportionate assessment still possible in transmission Reduced resourcing burden for the parallel RIIO-T2 and GD2 reviews 	<ul style="list-style-type: none"> Proportionate assessment still possible Reduced resourcing burden
Cons	<ul style="list-style-type: none"> The fast-track process remains resource-intensive for all involved 	<ul style="list-style-type: none"> Could result in more gaming / higher bids from the transmission companies, particularly if IQI is also removed (see section 4.4) 	<ul style="list-style-type: none"> Significant risk of increased gaming, particularly if IQI is also removed (see section 4.4)
Practical implications	<ul style="list-style-type: none"> It may be appropriate for Ofgem to set out upfront the maximum level of baseline and expected RoRE for fast-tracked companies that would be accepted Ofgem would need to build up its capabilities over the next 12-24 months; particularly on cost assessment 	<ul style="list-style-type: none"> Ofgem would need to build up its assessment capabilities in electricity and gas distribution Ofgem would have to develop an approach for assessing transmission proposals or risk this being seen as reverting back to a RPI-X type of approach Need to ensure that transmission companies continue to engage stakeholders in developing their business plans 	<ul style="list-style-type: none"> Ofgem may have to develop new approaches reducing the information asymmetry Need to ensure that companies continue to engage stakeholders in developing their business plans

Source: CEPA

4.3. Scope of outputs

One of the primary objectives of RIIO was to shift the regulatory framework from being focused on what network companies do ('inputs' in Ofgem's terminology) to one that is focused on what network companies deliver ('outputs' in Ofgem's terminology).⁷⁷ Output incentives for the RIIO-1 price controls were defined in relation seven broad categories: safety, customer satisfaction, reliability, availability (transmission only), environmental, social (distribution only), and connections.

As part of this project CEPA was asked to assess whether there are any missing outputs in the RIIO framework, specifically with regard to incentivising whole-of-system efficient solutions. We discuss whole-of-system considerations in detail below. Otherwise, our review of the RIIO-1 outputs did not identify material missing outputs.⁷⁸ Rather, we consider that the key improvements for RIIO-2 are likely to be regarding how output targets are set and how cost allowances are linked to outputs (see section).

4.3.1. Whole of system outputs

In July 2017 Ofgem and the Department for Business, Energy & Industrial Strategy (BEIS) published a joint strategy document for a flexible future energy system.⁷⁹ One of the key issues raised in this document is the need to ensure that energy network companies (and the System Operators) work together to deliver the best outcomes across the energy system as a whole. This includes, for example, joined-up planning so that investment decisions take place at either the transmission or distribution levels, depending on which would best serve customers' interests.⁸⁰

In the context of price controls, a whole-of-system approach would aim to deliver the objectives of the RIIO framework using all sectors in an integrated manner, as opposed to considering each individual network in isolation. Adopting such an approach helps identify solutions that offer the best value for money (e.g. a constraint may be resolved through a solution applied at the distribution or transmission level), as well as enabling the sector to meet objectives in a comprehensive and coherent manner.

For the RIIO framework to appropriately encourage whole-of-system thinking, it is essential that Ofgem defines what this means. We note that 'whole-of-system' is sometimes used to describe interactions between the transmission and distribution levels (particularly in electricity). But it can also apply to other energy sector interactions, including: electricity-gas

⁷⁷ Note that the terms 'inputs' and 'outputs' are defined differently in Ofgem's RIIO publications than in our evaluation framework (see Annex B).

⁷⁸ Existing outputs may need to be modified to account for recent technological developments. For example, the reliability output could be changed to also cover frequency control issues. The scope and scale of electric vehicle uptake can be covered under the current connections incentives for electricity distribution, but that the incentive used in RIIO-ED1 may need some calibration.

⁷⁹ [Ofgem and BEIS, Upgrading our Energy System – smart systems and flexibility plan, July 2017](#)

⁸⁰ Ibid, p. 19

interactions; interactions between networks in the same sector (e.g. two or more DNOs); or interactions with non-energy sectors (such as rail electrification). Given the range of possible definitions, and in the absence of guidance from Ofgem at this stage, the remainder of this section focuses on the concept of whole-of-system solutions in broad terms.

If whole-of-system outputs are defined as the interaction between electricity transmission and distribution, many of the key issues relate to system operation and co-ordination. These questions are linked to the potential introduction of Distribution System Operators (DSOs). Ofgem is yet to state its position on the regulatory arrangements for DSOs. Depending on the relationship between DSOs and DNOs, the former may be asset-light businesses in which case the regulatory framework that would apply to DSOs can be expected to be markedly different from current RIIO price controls. This is because current price controls are fundamentally concerned with efficient investment and use of assets that have natural monopoly characteristics. The development of the appropriate regulatory framework for DSOs is outside the scope of this project.

4.3.2. Options for RIIO-2

Table 4.7 summarises options that Ofgem may consider for incentivising whole-of-system thinking. These range from encouraging greater engagement between network companies in different sectors by, for example, emphasising whole-of-system options in Ofgem's cost assessment of business plans, to introducing incentives for delivering pre-defined whole-of-system outputs.

The options set out in Table 4.7 are not mutually exclusive. For example, encouraging greater collaboration could be achieved by requiring companies to submit data and/or develop a methodology for valuing whole-of-system outputs, while also introducing an incentive later on in the price control once such data has been collected (for example, as part of the mid-period review).

Table 4.7: Incentivising whole-of-system thinking – evaluation of options

Option	Update network companies' CBA methodologies to take account of whole-of-system costs and benefits, potentially with penalties for companies whose CBAs are not sufficiently evidenced or are missing.	Define whole-of-system primary output and introduce a reputational incentive	Introduce a financial incentive that applies across sectors (depending on how whole-of-system is defined)
Impact on risk allocation	<ul style="list-style-type: none"> No impact on risk allocation during price control periods, but potentially increases network companies' exposure to the risk of disallowed costs at the price control review 	<ul style="list-style-type: none"> No impact on commercial risk for network companies 	<ul style="list-style-type: none"> Increases output delivery risk for network companies compared to RIIIO-1
Pros	<ul style="list-style-type: none"> May be simpler to implement than the other options presented here Network companies retain ownership of their plans and actions 	<ul style="list-style-type: none"> A more proportionate approach than a financial incentive, given current uncertainty about future needs 	<ul style="list-style-type: none"> If designed appropriately, can fundamentally change network companies' behaviour
Cons	<ul style="list-style-type: none"> Quality of CBAs likely to vary between companies 	<ul style="list-style-type: none"> Likely to be difficult to isolate the impact of a network company across the value chain Unclear how strongly network companies respond to reputational incentives 	<ul style="list-style-type: none"> Likely to be difficult to isolate the impact of a network company across the value chain Potential for overlap with SO incentives
Practical implications	<ul style="list-style-type: none"> Resource burden on network companies creating new measures for 'whole-of-system' and conducting CBAs Resource burden on Ofgem of reviewing CBAs can be significant 	<ul style="list-style-type: none"> Ofgem would need to collect the relevant data and develop (or task network companies with developing) an evaluation methodology 	<ul style="list-style-type: none"> Ofgem would need to collect the relevant data and develop (or task network companies with developing) an evaluation methodology

Source: CEPA

4.4. Totex allowances and the IQI

Since DPCR4 Ofgem has been using menu regulation to set cost allowances. Ofgem's menu – the IQI was initially just used for capex, but over time its use has expanded and under the RIIO framework it has been applied for all expenditure categories under totex.

The IQI aims to address the information asymmetry between Ofgem and the network companies by making it in companies' best interest to propose their true expected costs (i.e. not to over- or under-bid). The two main critiques of the IQI is that it is overly complex, and that the theoretical assumptions on which it is based do not hold in practice. For the IQI to work optimally, the following conditions need to hold:⁸¹

- Network companies are risk-neutral (i.e. they view the possibility of an £1m reward equally to the risk of a £1m penalty).
- Ofgem is able to set its baseline view of efficient costs independently of companies' own forecasts (or more accurately, companies must not think that their proposals could influence the baseline).
- The allowed rate of return is equal to network companies' actual cost of capital.

These may not hold true for some, or even all, regulated companies. For example, insight from behavioural economics suggests that *loss aversion* means companies may favour minimising the downside risk over maximising returns. Similarly, *present bias* can exacerbate preferences for short-term wins over optimising longer-term returns. Ofgem's approach to cost assessment means that the baseline is unlikely to be completely independent of companies' forecasts, particularly for transmission where Ofgem uses bottom-up assessment of companies' proposed projects and the ability to benchmark costs is more limited.

In the rest of this section we review the approach to the IQI in RIIO-1, and consider some alternatives.

4.4.1. Application of the IQI in RIIO-1

As part of the RIIO framework, Ofgem changed the way efficiency adjustments are implemented compared to previous price controls:⁸²

- In RIIO, revenue adjustments are implemented annually during the price control period through adjustments to the RAV and fast-money allowances. This is done via the annual iteration process.

⁸¹ Since the IQI affects network companies' ability to earn additional returns (and exposure to lower returns) during price controls, it is also based on an assumption that incentives on network companies' management and investors are aligned.

⁸² [Ofgem, Consultation on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1 Business plans, innovation and efficiency incentives, 17 December 2010](#), p. 44-45

- In previous price controls the RAV would track actual expenditure, but allowed revenues during the price control period would follow allowances set at the price control review, with adjustment for over-/under-spend applied in the subsequent price control review on a net present value (NPV) neutral basis.⁸³

The new approach means that network companies retain outperformance for the life of the asset (e.g. 45 years), whereas the previous approach meant that outperformance was only retained for five years. If the allowed rate of return is equal to network companies' actual cost of capital, the two approaches are equal in NPV terms.

However, if network companies have a lower cost of capital than the rate of return allowed in Ofgem's price controls (meaning that network companies earn a premium on their RAV above the amount required by their investors), then there are some potential gains for the company under the new approach. To illustrate the impact of the new approach we use the following simplified example:

- We assume a 50% incentive rate and 80% totex capitalisation rate.
- We also assume that the allowed rate of return is 4% while the company's actual cost of capital is 3%.
- In this case, a 10% underspend by the company would result in 0.4% higher allowed revenue over 45 years (in NPV terms) under the RIIO application of the IQI than it would have done under the previous approach.⁸⁴

An additional change was that the incentive rate is calculated on a post-tax basis whereas in previous price controls it was calculated on a pre-tax basis. This means that allowed revenues are adjusted by both the share of any under-/over-spend allocated to customers and by the tax impact of that under-/over-spend. Another way to think about this is that for the same incentive rate (e.g. 50%), network companies' returns are exposed to wider variations as a result of under- or over-spends.

4.4.2. Alternatives to the IQI

In this section we provide a flavour of the strengths and weaknesses of two potential alternatives to the IQI. We note that there may be other options that Ofgem considers for RIIO-2, or different calibrations of the mechanisms described in this section – these may have different incentive properties to the examples we discuss and may lead to different outcomes. We have not modelled the various alternatives to the IQI but would recommend that Ofgem does so if it intends to introduce one such alternative.

⁸³ In DPCR5 this included using a 'rolling incentive mechanism' so that DNOs faced the same efficiency incentive for over-/under-spend in each year of the price control period.

⁸⁴ In order to give a sense of magnitude, 0.4% of allowed revenues for the RIIO-1 price controls is approximately £400m in 2016/17 prices.

Ofwat – cost sharing mechanism for PR19

Ofwat had previously used a ‘menu’ similar to the IQI to set cost allowances. However, Ofwat has decided to abandon the menu for the 2020-25 price control (PR19). This follows the CMA’s decision on the Bristol Water appeal of PR14, where the CMA rejected the application of the menu for Bristol Water. The CMA considered that Ofwat’s menu for PR14 would not have made an effective contribution to the financial incentives for water companies to submit more accurate expenditure forecasts.⁸⁵

The perception that menus are complex likely also contributed to Ofwat’s decision to abandon them. In the box below we describe Ofwat’s alternative approach for PR19.

Case study – Cost sharing mechanism for PR19

Ofwat’s cost sharing mechanism for PR19 is illustrated in the table on the next page. The mechanism has a number of key features:

- regardless of what companies propose, totex allowances would be based on Ofwat’s view of efficient expenditure;
- different incentive rates apply to over- and under-spend;
- the incentive rate for underspend declines the more inefficient a company’s proposal is judged to be; and
- the incentive rate for overspend is fixed for companies that are judged to be at least as efficient as Ofwat’s baseline, and increases for companies that are judged to be less efficient than the baseline.

For companies that are categorised by Ofwat as requiring ‘significant scrutiny’, the incentive rates are fixed at 75% for overspend and 25% for underspend (these are not shown in the table on the next page).

⁸⁵ We note that some of the CMA’s critiques relate to a different way in which Ofwat used menus compare to how Ofgem used the IQI. In PR14 water companies only submitted a single business plan and were able to select their totex incentive rate within a range specified by Ofwat after cost allowances are set. In contrast, the incentive rate in RIIIO price controls is determined by the IQI ratio for each company’s cost proposals, which are based on revised business plans.

Business plan totex %	80%	85%	90%	95%	100%	105%	110%	115%	120%
Ofwat totex baseline %	100%	100%	100%	100%	100%	100%	100%	100%	100%
Incentive rate (underspend)	65.0%	62.5%	60.0%	55.0%	50.0%	45.0%	40.0%	37.5%	35.0%
Incentive rate (overspend)	50.0%	50.0%	50.0%	50.0%	50.0%	55.0%	60.0%	62.5%	65.0%
Actual expenditure: baseline	Total incentive payment or penalty to company (payment as a % of Ofwat totex baseline)								
80%	13.0%	12.5%	12.0%	11.0%	10.0%	9.0%	8.0%	7.5%	7.0%
85%	9.8%	9.4%	9.0%	8.3%	7.5%	6.8%	6.0%	5.6%	5.3%
90%	6.5%	6.3%	6.0%	5.5%	5.0%	4.5%	4.0%	3.8%	3.5%
95%	3.3%	3.1%	3.0%	2.8%	2.5%	2.3%	2.0%	1.9%	1.8%
100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
105%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.8%	-3.0%	-3.1%	-3.3%
110%	-5.0%	-5.0%	-5.0%	-5.0%	-5.0%	-5.5%	-6.0%	-6.3%	-6.5%
115%	-7.5%	-7.5%	-7.5%	-7.5%	-7.5%	-8.3%	-9.0%	-9.4%	-9.7%
120%	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%	-11.0%	-12.0%	-12.5%	-13.0%

Source: [Ofwat, 2019 price review: Final methodology, Cost sharing rates spreadsheet, December 2017](#).

As Ofwat's proposed mechanism has yet to be applied in practice, it remains to be seen how water companies would respond to the incentives contained therein. Therefore, it is too early to conclude whether the mechanism can have its desired effect. Based on the information available to date, however, CEPA makes the following observations regarding Ofwat's proposed alternative to the IQI:

Whereas the IQI is designed to incentivise network companies to reveal their *true* costs (whether they are lower or higher than the regulator's efficient baseline), Ofwat's new mechanism incentivises companies to propose the *lowest* costs. The best outcome for a company (other than those who expect to be categorised for 'significant scrutiny') is to ensure that its proposed costs are more efficient than Ofwat's baseline.

This concern was noted in stakeholder responses to a slightly different version of the cost sharing mechanism, which was proposed in Ofwat's draft methodology.⁸⁶ Ofwat has amended the cost sharing mechanism for its final methodology. However, in CEPA's opinion the issue remains.

Ofwat considers that other elements of the price control review – specifically the requirement for companies' boards to sign off on their proposals – and companies' assumed aversion to being seen to overspend their allowance would mitigate the risk of unreasonably low cost proposals.⁸⁷ Nevertheless, if the incentive results in companies proposing unrealistically low costs, Ofwat's ability to set appropriate baselines could be compromised.

⁸⁶ "Respondents considered that the proposed cost sharing mechanism provided a perverse incentive to bid "too" low, irrespective of true expectation of costs, which can lead to undesired outcomes for customers and companies." ([Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, Appendix 15: Responses to our draft methodology, December 2017](#), p. 165-166, Table 8.2)

⁸⁷ Ibid.

- The cost sharing mechanism is one of a number of factors that contribute towards a water company's approach to its business plan. In CEPA's opinion, the incentives on a water company to propose efficient costs in its business plan would depend on how it expects to be categorised in Ofwat's business plan assessment. If a company expects to be categorised for 'significant scrutiny', its expected outcome would be completely independent of its proposal.

Varying incentive rates

One option that regulators have often considered is to set different incentive rates for different levels of over-/under-spend. The thinking behind this approach is that companies should be exposed to small variations between actual and allowed costs, but that customers should be protected from large variations because those are more likely to represent a mistake in the level of allowances.

Aside from the added complexity that setting different incentive rates for different levels of over-/under-spend would entail, this idea has typically been rejected because of the risk of unintended consequences. In the box below we provide a high-level illustration of how 'tapered' incentive rates could discourage network companies from maximising efficiencies that would later be used by Ofgem to set lower allowances.

Illustration – 'Tapered' incentive rates

To illustrate the impact of tapered incentive rates on the incentive for network companies to achieve efficiency gains, we have used a simplified example in which expenditure within 10% of the allowance faces a 60% incentive rate, and expenditure of more than 10% from the allowance faces a 20% incentive rate. We compare the outcomes for customers and the regulated company under three scenarios (see table on the next page):

- scenario 1 is a counterfactual in which a single incentive rate of 60% applies to all underspend;
- in scenario 2 the company minimises its expenditure in every year; and
- in scenario 3 the company maximises its profit in each price control period.

Our modelling uses the following assumptions: 8-year price controls and 45-year assessment horizon; the regulator sets an allowance of £10m per year in the first price control period; the company identifies efficiencies in Year 2 that mean its efficient costs are £8m per year; for future price controls, the regulator sets the allowance equal to the company's actual costs in the final year of the preceding price control; a discount rate of 3% is used for NPV calculations. We ignore the impact of tax and inflation.

	Scenario 1	Scenario 2	Scenario 3
Starting annual allowance	£10m	£10m	£10m
Company annual expenditure Year 1	£10m	£10m	£10m
Company annual expenditure Years 2-8	£8m	£8m	£9m
Company annual expenditure Years 9-16	£8m	£8m	£8.1m
Company annual expenditure from Year 17 onwards	£8m	£8m	£8m
Incentive rate for underspend ≤10%	60%	60%	60%
Incentive rate for underspend >10%	60%	20%	20%
NPV of total profit to the company	£7.3m	£4.8m	£6.9m
NPV of total cost to customers	£205.3m	£202.9m	£211.6m

Source: CEPA

The table above shows that, with tapered incentive rates the best outcome for the company would be to underspend allowances by 10% in the first and second price control periods (scenario 3). This approach results in a 40% increase in profits compared to scenario 2, in which the company maximises its efficiency as soon as Year 2. Because the company does not immediately reveal its efficient costs in scenario 3, the cost to customers is 3% higher than would have been the case with a single incentive rate (scenario 1).

4.4.3. Options for RIIO-2

Table 4.8 sets out a number of options Ofgem may consider for RIIO-2. For each of the options discussed it is essential that Ofgem consider the implications of setting materially different incentive rates in RIIO-2 on network companies' expenditure decision in the remainder of RIIO-1 and in RIIO-2.

Table 4.8: Totex and the IQI – evaluation of options

Option	Set a consistent IQI across all four energy network sectors, with a stronger truth-telling incentive (steeper profile of expected outcomes).	Reduce the incentive rate(s) or introduce ‘tapered’ incentive rates	Replace the IQI with a new approach for setting incentive rates for all sectors
Impact on risk allocation	<ul style="list-style-type: none"> Allocates more delivery and project scope risk to network companies compared to RIIO-1 	<ul style="list-style-type: none"> Allocates less delivery and project scope risk to network companies compared to RIIO-1 	<ul style="list-style-type: none"> Risk allocation depends on the specific design and parameters of the new approach
Pros	<ul style="list-style-type: none"> If network companies behave in line with the assumptions underlying the IQI the stronger incentive would be more effective in revealing true costs The mechanism is familiar to stakeholders 	<ul style="list-style-type: none"> Customers would retain a larger share of any underspend 	<ul style="list-style-type: none"> Potential to introduce a more effective mechanism than the IQI
Cons	<ul style="list-style-type: none"> If network companies do not behave in line with the assumptions underlying the IQI there could be unintended results Perception that the IQI is complex, and that its theoretical assumptions do not hold in practice 	<ul style="list-style-type: none"> Weaker incentive for network companies to seek efficiencies, in the longer term potentially reducing Ofgem’s ability to set lower cost allowances Customers would liable for a larger share of any overspend 	<ul style="list-style-type: none"> Risk of ending up with a less effective mechanism and/or one that is more complex than the IQI
Practical implications	<ul style="list-style-type: none"> Standardising the IQI across all sectors means that some network companies will likely face materially different incentive rates in RIIO-2 than they do in RIIO-1 	<ul style="list-style-type: none"> Ofgem would need to consider the strategic implications of protecting network companies from overspends in RIIO-2 having allowed them to retain a larger share of underspends in RIIO-1 	<ul style="list-style-type: none"> Any proposed alternative mechanism would require extensive modelling and testing to understand its likely impact of the mechanism on network companies’ behaviour

Source: CEPA

4.5. Dealing with uncertainty – real price effects⁸⁸

Our analysis in section 2.5.1 shows that RPEs are likely to have been a source of material added returns so far in RIIO-T1 and GD1. This is a result of the decision to allocate the risk around RPEs (input cost risk in our terminology) to network companies.

Ofgem set fixed *ex ante* RPE allowances for RIIO-1 that were largely based on the historical relationship between different input cost indices and RPI.⁸⁹ Ofgem's approach requires a stable and predictable long-term relationship between RPI and input prices. If this is not the case, forecasts may be biased. For example, labour costs are the largest component of RPEs and there is some evidence that real labour costs have grown at different rates over several decades, suggesting that they reflect structural changes in the economy and in labour productivity.⁹⁰

Many of the components of Ofgem's overall RPE forecasts are volatile and their changes can be difficult to explain. For example, falling working hours, changes in workforce composition and increases in non-working costs during the 2008-09 economic downturn may have all acted to reduce real wage growth. However, these factors do not appear to explain the continued decline in real earnings after 2010. Other components of RPEs are generally more volatile than labour costs, and so even more difficult to forecast. The difficulty of forecasting most components highlights the risk of setting fixed RPEs for eight-year price control periods.

The main advantage of the current approach is that customers are protected from unexpected increases in real input prices. This leaves the risk of unexpected real cost increases with network companies, generating strong incentives for them to manage these costs efficiently.⁹¹ Network companies are likely to have some scope to manage the risk around their input costs through contracting and hedging. However, network companies would remain exposed to the impact of factors outside of their control on the costs of labour, materials and equipment.

The result, as seen in RIIO-T1 and GD1, is that RPEs could result in windfall gains or losses for network companies that are not the result of company actions. As the risk relating to RPEs is systematic, reducing network companies' exposure to it should lower network companies' cost of capital.

⁸⁸ This section draws on [CEPA, Response to the Ofgem consultation on Real Price Effects for RIIO ED1, Report prepared for British Gas, September 2014](#).

⁸⁹ As part of this project we did not review the use of RPI for indexing allowed revenues and the value of the RAV. We note that a recent review by the UK Statistics Authority concluded that "Government and regulators should work towards ending the use of the RPI as soon as practicable." [Paul Johnson, UK Consumer Price Statistics: A Review, January 2015](#), p. 15.

⁹⁰ [Ciaren Taylor, Andrew Jowett and Michael Hardie, An Examination of Falling Real Wages, 2010 - 2013, Office for National Statistics, 31 January 2014](#).

⁹¹ That incentive is strengthened by the move to setting allowances for eight years in RIIO-1, providing an added imperative for network companies to enter longer-term contracts.

4.5.1. Options for RIIO-2

Table 4.9 evaluates two options Ofgem may consider for reducing network companies' risk exposure from RPEs. Annex F.3 summarises the approaches taken by other UK regulators in their most recent price control reviews.

Table 4.9: RPEs – evaluation of options

Option	Set fixed allowances for RPEs, with dead-band beyond which RPEs are re-set ⁹²	Set indexed allowances for RPEs using notional cost structures and a set of pre-determined indices.
Impact on risk allocation	<ul style="list-style-type: none"> Allocates less input cost risk to network companies than in RIIO-1 	<ul style="list-style-type: none"> Allocates input cost risk primarily to customers
Pros	<ul style="list-style-type: none"> Retains much of the incentive for network companies to minimise input cost inflation Simpler to set and administer than indexation Depending on how allowances are re-set, potentially less reliant on ongoing availability of indices 	<ul style="list-style-type: none"> Reduces the potential for out-/under-performance due to forecasting errors Retains some incentive for network companies to minimise input cost inflation The concept is familiar to stakeholders following the use of the cost of debt index Can be incorporated into the annual iteration process
Cons	<ul style="list-style-type: none"> Still potential for windfall gains or losses due to factors that are outside companies' control 	<ul style="list-style-type: none"> If RIIO-1 turns out to be a period of below-average RPEs, introducing indexation for RIIO-2 risks allowing network companies to retain RPE outperformance in RIIO-1 while protecting them from RPE underperformance in RIIO-2 More complex to set and administer Potentially inconsistent with a fixed ongoing efficiency adjustment
Practical implications	<ul style="list-style-type: none"> Ofgem would need to confirm with stakeholders that its methodology for calculating the initial RPE values remains appropriate The rules for re-setting allowances beyond the dead-bands would have to be consulted and tested carefully 	<ul style="list-style-type: none"> Ofgem would still have to set a methodology for calculating RPEs based on the appropriate indices Different cost structures mean that each sector will have different indexed allowances Risk that indices are discontinued or that their methodology changes

Source: CEPA

⁹² CEPA has previously advised Ofgem on options for adjusting RPEs subject to a deadband. See: [CEPA, Research into volume and input price uncertainty for electricity distribution price control review 5, April 2009.](#)

4.6. Length of the price control period

Setting the duration of price controls involves determining an appropriate balance between the stability of regulatory decisions and the risk that forecasts made at the price control review stage (by either network companies or Ofgem) will turn out to be wrong. For Ofgem, the decision to move to eight-year price controls for RIIO (instead of five previously) was one of a set of changes aimed at encouraging longer-term thinking by network companies.⁹³

Longer price controls can be expected to enable network companies to achieve higher efficiencies by being able to plan for the longer-term and, consequently, being able to be more innovative and extract more value from contracting. Additionally, longer controls mean that companies' management is able to spend a larger share of each price control period focusing on operational issues, rather than on negotiating with Ofgem.

For Ofgem, longer price controls also mean that it is able to draw on a longer time series of network companies' performance when setting the next set of controls. With five-year price control periods, Ofgem typically only had data from the first two years of the current price control as it was conducting its next review. At times network companies have taken as long as two years to adjust to a new regulatory period, meaning that with five-year controls Ofgem risks drawing on information that may not accurately represent network companies' ongoing activities. As noted in section 2.5.2, using outdated information to set the RIIO-1 price controls is likely to have contributed to some of the outperformance observed to date.

On the other hand, shorter price controls help to reduce the risk that forecasts would be materially wrong (i.e. they carry lower risk *during* the price control period). However, this comes at the expense of higher uncertainty for companies and investors through more frequent resetting of prices (i.e. higher risk *ahead* of the price control period). More frequent reviews also carry a higher administrative burden for Ofgem, network companies and stakeholders.







4.6.1. What has been the customer benefit of moving to eight-year price controls?

At the time of CEPA conducting this review, data is only available on network companies' activities and performance during the first four years of RIIO-T1 and GD1, and the first two years of RIIO-ED1. This means that any assessment of the benefits of longer price controls is based on only a fraction of the relevant information. As such, **the observations presented below should be considered as preliminary views only.**

Table 4.10 summarises the potential impacts of longer price controls, and identifies when and how they may be assessed. In the remainder of this section we discuss the potential impacts of longer price controls in more detail.

⁹³ [Ofgem, RIIO: A new way to regulate energy networks: Final decision, October 2010.](#)

Table 4.10: Assessment of the elements of the RII frameworks in relation to the length of the price control

Effect of longer price control periods	Can the impact be assessed now?	When can it be assessed?	How would the impact be assessed?
Improved efficiency from longer-term planning and innovative contracting		<ul style="list-style-type: none"> Now and throughout the price control period. 	<ul style="list-style-type: none"> Anecdotal evidence from the network companies.
Lower allowances for the next price control based on more efficient costs revealed in the current period		<ul style="list-style-type: none"> At the next price control review stage. 	<ul style="list-style-type: none"> Allowed unit costs for the next price control period compared to those allowed for the current period (in real prices).
Ofgem's ability to use longer-term forecasts in cost assessment models		<ul style="list-style-type: none"> At the price control review stage (and now). 	<ul style="list-style-type: none"> Based on Ofgem's decisions of the length of historical data used in the cost assessment models.
Ofgem's ability to use a longer time-series of historical costs incurred under the same price control in cost assessment models		<ul style="list-style-type: none"> At the next price control review stage. 	<ul style="list-style-type: none"> Based on Ofgem's decisions of the length of historical data used in the cost assessment models.
Network companies' efficiency (unit costs or productivity indices)		<ul style="list-style-type: none"> Now and throughout the price control period. 	<ul style="list-style-type: none"> Benchmarking unit costs (or developing productivity indices) using companies' RRP submissions. Note that assessment of unit costs is outside the scope of CEPA's review.
Forecasting errors for cost allowances/ RPEs/ outputs for the latter years of the control period		<ul style="list-style-type: none"> Once data is available for years 6-8 of the price control period. 	<ul style="list-style-type: none"> Compare variance from allowances/ targets in years 6-8 to variance in years 1-5.

Source: CEPA

To the extent that network companies have been able to achieve greater efficiencies as a result of the move to eight-year price control periods, customers would benefit from higher reductions in network costs through the incentive rate on totex. However, arguably a greater benefit to customers is Ofgem's ability to use those lower revealed costs when setting the next price controls. In this way, price control reviews can be thought of as a "repeated game", with the gains from longer control periods playing out over more than just the eight years of the current periods.

We asked network companies to provide details of any strategic change programmes they introduced for RIIO-1 in light of the longer price control period. **Note that claims made by network companies were not independently verified by CEPA.**

The companies' responses varied but most pointed to longer price controls allowing:

- network companies to negotiate longer contracts with third parties/suppliers, thus reducing overall costs;
- more scope for network companies to innovate and drive efficiencies, which may result in more ambitious options taken forward, in turn supporting investor confidence; and
- company management to spend more time managing the performance of the business instead of making submissions to Ofgem.

Some network companies said they adopted a more strategic view in preparing their business plans for RIIO-1. For others, their approach did not change as they already had longer strategic plans in place before RIIO, e.g. ten-year plans.

Some network companies pursued organisational changes as a response to longer price controls, although some note that these were not solely driven by the longer price control. For example, UKPN and Cadent commented that they pursued major reorganisation to better align their processes to deliver their business plans. But these were also aimed at improving employee engagement, issue resolution, visibility of team deliverables and customer service.

A few specific examples of savings attributed to the longer price control included:

- One GDN trialled a different contracting model for delivering repex work. It has since awarded contracts up to the end of RIIO-GD1, and estimates that these have resulted in savings of £6-8m per annum (around £50m over the course of RIIO-GD1). The GDN attributed the saving to having a longer period to trial and embed the new approach.
- A TO said that the longer price control meant it was commissioning a wider portfolio of transformer replacement/maintenance. Combined with focusing on the primary output, the TO claimed it has been able to save £28m.
- A TO said that the longer price control allowed it to review the portfolio of wider works projects over the 8-year period and identify common solutions to multiple projects – deferring some and changing the scope of others. By finding a common solution for three

separate projects, the TO claimed it was able to create a single tender that delivered a saving of £31m on these schemes.

Through the totex incentive mechanism, such savings would feed into lower network charges.

Stakeholder engagement has also been highlighted as an area where longer price controls are beneficial; a few network companies have been able to invest in local engagement and build stronger ties with local communities, including vulnerable customers.

It is also important to stress two elements that have not been influenced by the move to eight-year controls:

- Added returns from on RPEs to date in RIIO-1 (see section 2.5.1 for details) has not been the result of the move to longer price control periods. Lower RPEs so far in RIIO-T1 and GD1 occurred during the first four years of the price control periods. Assuming that Ofgem would have applied the same estimation methodology to RPEs for a 5-year price control period, the same level of returns from on RPEs would have been observed.
- As described in section 4.4, the RIIO framework de-coupled the totex efficiency incentive from the length of the price control period. The new application of the totex incentive rate means that network companies retain outperformance for the life of the asset, not just for the duration of the price control period.⁹⁴

4.6.2. Interactions with uncertainty

The longer a price control period, the greater the scope that actual outcomes would diverge from network companies and Ofgem's forecasts. For example, the cost and need for a project in seven or eight years' time is likely to be more uncertain than the cost and need for a project in three or four years' time. That is not to say that longer price controls would necessarily result in larger forecasting errors. For example, if an element of the price control tends to revert to the mean (as might be the case with RPEs), forecasting errors may average out over a longer price control period.

The length of a price control period interacts with uncertainty in the following ways:

- **Uncertainty mechanisms** – all other things being equal, the greater scope for forecasting error in a longer price control period would justify the introduction of more uncertainty mechanisms, or the application of existing mechanisms to a larger share of allowances (e.g. applying a revenue driver to a larger share of totex). This needs to be balanced against the added complexity of uncertainty mechanisms.

⁹⁴ Note that longer price controls may still increase the incentive to innovate/make efficiency gains because the regulator would adjust allowances less frequently. We note that there are two separate aspects in relation to totex efficiency and the length of the price control: 1) in theory, additional efficiency gains can be achieved through the stability of a longer price control; but 2) the strength of the incentive rate is not linked to the length of the price control.

- **Totex** – longer price controls have a greater potential scope for required costs to diverge from forecasts/allowances made at the price control review. But they also offer a potentially richer data set for Ofgem to use in its cost assessment. Network companies' eight-year forecasts can be used to better identify cost drivers and set totex allowances, this will be useful in Ofgem's cost assessment in RIIO-2. This relies on network companies providing reliable forecasts for later years of the price control period. This was the case in RIIO-ED1 where Ofgem used eight-year forecast in its models, but not in RIIO-GD1 where Ofgem decided that it could only rely on GDNs' forecasts for the first two years.
- **Outputs** – as with totex, there is a greater scope for network companies' performance on outputs to diverge from targets set at the start of the control period. There is also a greater risk of the required outputs themselves diverging from those envisaged when the price control was set. Ofgem has looked to address the latter risk through the introduction of the MPR in RIIO.

Our review suggests that most network companies are in favour of the eight-year price controls but are wary of aspects that appear to not have worked as well as expected in RIIO-1. In response to Ofgem's RIIO-2 open letter, a number of network companies (particularly DNOs) commented that it was early to assess the benefits of longer price controls. For example, ENWL said that load-related expenditure should be reviewed more frequently than eight years due to significant uncertainty in electricity demand, but noted that a period of eight-years is appropriate for other cost categories, such as asset replacement expenditure.⁹⁵

4.6.3. Options for RIIO-2

Table 4.11 evaluates some of the options that Ofgem could consider regarding the length of future price control periods. The RIIO Handbook notes that different length of price controls may be appropriate as circumstances change,⁹⁶ so all of the options presented in Table 4.11 are consistent with the RIIO framework.

The length of the price control affects the allocation of several risks between customers and network companies. Shorter price controls would normally carry a narrower distribution of potential outcomes *during* the price control period – i.e. a lower risk of forecasting error by either Ofgem or the network companies. All other things being equal, this means that shorter price controls reduce network companies' exposure to project scope / need risk, and to input cost risk. All else equal, shorter price controls also reduce network companies' exposure to delivery, technology (adoption) and output delivery risk. This is because allowances and targets would be updated more frequently in light of network companies' actual performance.

However, shorter price controls increase network companies' exposure to price and volume risks *ahead* of the price control period. This is because more frequent price control reviews

⁹⁵ ENWL, Response to Ofgem's open letter on the RIIO-2 Framework, September 2017.

⁹⁶ [Ofgem, Handbook for implementing the RIIO model, 4 October 2010](#), p. 27.

provide Ofgem with more opportunity to determine revenue allowances and determine the costs added to the RAV.

Lastly, an important consideration for the length of price control periods – particularly in electricity distribution – is the emergence of DSO roles. A DNO and a DSO are likely to have inherently different characteristics (the latter is asset-light), and Ofgem may even decide that these roles should ultimately be played by separate entities. The regulatory framework that applies to DSO, therefore, may be considerably different from the current RIIO framework. Since the timing, nature and extent of the move to DSOs is highly uncertain, Ofgem may wish to account for it by setting shorter price controls in electricity distribution, or by defining conditions under which a price control would be re-opened.

Table 4.11: Length of price control periods – evaluation of options

Option	Continue with eight-year controls, with a larger share of allowances linked to uncertainty mechanisms	Eight-year price controls for some sectors and shorter price controls for other sectors	Shorter price controls across all sectors; potentially with interim determinations of uncertain elements ('parallel controls')
Impact on risk allocation	<ul style="list-style-type: none"> Allocates less project scope / need risk to network companies than in RIIO-1 	<ul style="list-style-type: none"> Shorter price controls allocate less project scope/need, delivery, technology adoption, input cost and output delivery risks to network companies <i>during</i> price control periods. However, the more frequent price control reviews increase price and volume risks for network companies. 	<ul style="list-style-type: none"> Shorter price controls and more frequent interim reviews allocate less project scope/need, delivery, technology adoption, input cost and output delivery risks to network companies once a determination is made. But they increase price and volume risks for network companies as a result of more frequent determinations.
Pros	<ul style="list-style-type: none"> Allows the benefits envisaged from longer price controls to play out, with a more informed assessment taking place at a future date Allows for regulatory continuity and investor confidence which may be positive considering the current macroeconomic forecast Ofgem could still to re-open the price control in case of a material change that renders the existing controls unsuitable 	<ul style="list-style-type: none"> Allows Ofgem to “wait and judge” its approach when it comes to sectors that are deemed more uncertain Network companies may decide to enter into shorter contracts, reserving flexibility in case of material changes in circumstance 	<ul style="list-style-type: none"> As per column to the left plus: more frequent determinations may reduce the scope for windfall gains or losses for network companies as a result of forecasting errors
Cons	<ul style="list-style-type: none"> Greater risk of forecasting errors than under shorter price controls 	<ul style="list-style-type: none"> Shorter price controls could increase perceptions of risk in the sector Could reduce the scope for efficient planning and contracting Resource cost of RIIO reviews may be disproportionate to shorter control periods 	<ul style="list-style-type: none"> As per column to the left plus: parallel controls may entail significant administrative costs on Ofgem, network companies and stakeholders. They may also increase the risk of “gaming” what projects are proposed at the price control review stage and at interim determinations
Practical implications	<ul style="list-style-type: none"> Mechanisms would need to be calibrated/ developed based on lessons from RIIO-1 	<ul style="list-style-type: none"> Ofgem would need to consider the strategic implications of setting more challenging price control for a shorter period in RIIO-2 following sustained outperformance in RIIO-1 	

Source: CEPA

4.7. Calibrating returns

As noted earlier in this section, given the asymmetric information between regulators and network companies, and the asymmetric risk of decisions (e.g. the safety risk of underinvestment in the network is likely to be of greater concern than the cost to consumers of “gold-plating” investment). It is appropriate to consider what “failsafe” measures might be required to ensure that companies do not make higher than expected returns (or losses).

Ex ante price control mechanisms can be expected to achieve the greatest consumer surplus in the long-term. But they are open to the risk of network companies making large returns in any one price control. *Ex post* price control mechanisms can mitigate (or even eliminate) the risk of companies making large returns in a single price control period. But they have weaker dynamic properties, so in the long-term the impact on consumer surplus can be expected to be more modest. Price controls across the regulated sectors in the UK have relied predominantly on *ex ante* mechanisms.

In its stakeholder engagement on the framework for RIIO-2 Ofgem has discussed some of its initial thinking of how to calibrate returns.⁹⁷ Over the course of this project CEPA has identified a potential alternative approach – one we are terming a “competed pot” of returns on output incentives. The box below illustrates the concept.

Illustration – competed pot of return on output incentives

The idea is for Ofgem to set an amount of money (“pot”) that would be shared between network companies based on their performance across all output incentives that have a financial reward. Companies that outperform the output targets would earn a share of the pot, while those who underperform their targets would pay into the pot (effectively increasing the pot for those companies that outperform the targets).

The opening value of the pot (i.e. before any contributions by the companies) and the basis for allocating shares of the pot would both be set *ex ante* as part of the price control review. The size of the pot could be defined either in monetary terms or in RoRE terms (the latter would account for different company sizes). Each price control would have a single pot.

The “pot” has three key benefits:

- it retains the *ex ante* incentive for network companies to improve their performance on outputs;
- it generates competition between the network companies for additional returns; and
- because a set amount of reward is shared between network companies, it mitigates the risk of sector-wide and persistent returns that are higher than expected.

Below we provide a highly simplified illustration of how the mechanism might work and the outcomes under a range of scenarios for companies’ performance and an assumed pot of £100m. In order for the mechanism to work, each output incentive would need to be converted to an index so that they could be assessed on a consistent basis. A further key consideration is what weight to give different output incentives in the “pot” - for simplicity,

⁹⁷ [Ofgem, A Fair Return, slides from stakeholder workshop, 24 October 2017.](#)

the examples below use equal weighting.

Scenario 1 – modest outperformance across the sector

	Incentive target	Company A performance	Company B performance	Company C performance	Total
Incentive 1	100	102	101.5	103	N/A
Incentive 2	100	105	102	100.5	N/A
Incentive 3	100	101	104	101	N/A
Total performance points	-	8	7.5	5.5	21
Company share of performance	-	38.1%	35.7%	26.2%	N/A
Incentive pay-out	-	£38.1m	£35.7m	£26.2m	£100m

Source: CEPA

Scenario 2 – significant outperformance by one company

	Incentive target	Company A performance	Company B performance	Company C performance	Total
Incentive 1	100	111	100.5	101	N/A
Incentive 2	100	109	100	100.5	N/A
Incentive 3	100	108	101	102	N/A
Total performance points	-	28	1.5	3.5	33
Company share of performance	-	84.8%	4.5%	10.6%	N/A
Incentive pay-out	-	£84.8m	£5.5m	£10.6m	£100m

Source: CEPA

Scenario 3 – underperformance by one company

	Incentive target	Company A performance	Company B performance	Company C performance	Total
Incentive 1	100	98	105	103	N/A
Incentive 2	100	96.5	102	100.5	N/A
Incentive 3	100	99.5	104	103	N/A
Total performance points	-	-6	11	6.5	11.5
Company share of performance	-	-52.2%	95.7%	56.5%	N/A
Incentive pay-out	-	-£52.2m	£95.7m	£56.5m	£100m

Source: CEPA

4.7.1. Options for RIIO-2

Table 4.12 sets out an evaluation of some of the potential changes that Ofgem may consider introducing for RIIO-2. These range from the targeted ‘competed pot’ for output incentive to mechanisms that adjust the overall level of returns across the entire price control package:

- A cap and floor on RoRE borrows from the framework that applies to new electricity interconnectors. If a network company achieves returns that are between the cap and floor it retains those returns unadjusted. Returns above the cap are refunded to customers through lower network charges, and the opposite is true if a network company were to achieve returns below the floor. A company’s returns would not depend on other companies’ performance.
- “Anchoring” seeks to adjust returns for all companies in a sector at the end of the price control period, so that achieved returns align to some predetermined rules. For example, a rule might that average returns in the sector equal the allowed cost of capital. Different calibrations of “anchoring” would have different incentive properties but, importantly, a network company’s returns would be affected by other companies’ performance.

Table 4.12: Calibrating returns – evaluation of options

Option	Set a maximum amount of money available for performance under output incentives, which is allocated between network companies based on a pre-defined set of rules that relate to their absolute and relative performance levels.	Set cap and floor on RoRE; potentially with a sharing factor beyond	Ex post “anchoring” of sector performance to a defined level of RoRE.
Impact on risk allocation	<ul style="list-style-type: none"> Allocates less output delivery risk to network companies as a whole than in RIIO-1, but potentially allocates more risk for individual network companies 	<ul style="list-style-type: none"> Allocates less project scope/need, delivery, technology adoption, input cost, price, output delivery and emergency response risks to network companies than in RIIO-1 	<ul style="list-style-type: none"> Allocates less project scope/need, delivery, technology adoption, input cost, price, output delivery and emergency response risks to network companies than in RIIO-1
Pros	<ul style="list-style-type: none"> Ex ante mechanism would incentivise better performance Introduces competition for additional returns Overall pot and allocation rules mitigate risk of sector-wide and persistent returns that are higher than expected 	<ul style="list-style-type: none"> Mitigates the risk of very high or low returns Stakeholders are familiar with cap/ floor on returns for interconnectors, and for individual incentives Stakeholders are familiar with RoRE as a measure of returns 	<ul style="list-style-type: none"> Mitigates the risk of very high or low returns Would give Ofgem greater control over company returns (when measured on a notional basis)
Cons	<ul style="list-style-type: none"> The underlying calculation is likely to be complex, particularly given the need to account for different output incentives and different targets between companies May have a disproportionate impact on charging differences between regions 	<ul style="list-style-type: none"> Potential to introduce perverse incentives in how companies time expenditure and/or performance across price control periods 	<ul style="list-style-type: none"> By reducing the range of outcomes for network companies, would weaken the incentive to achieve efficiencies or improve performance Potentially very different impacts on company behaviour depending on how it is implemented Differential impact on network companies’ behaviour depending on their regulatory strategy and risk appetite
Practical implications	<ul style="list-style-type: none"> Would require extensive testing of the concept and design Ofgem would need to develop a model to show/stress-test how the pot is allocated under different performance levels 	<ul style="list-style-type: none"> Would require extensive testing of the concept and design Mechanism would need to be applied at the end of the price control period so as not to be influenced by companies’ forecasts (i.e. would not address persistent high returns during the price control period) 	<ul style="list-style-type: none"> Would require extensive testing of the concept and design If the rules for anchoring are set at the price control review stage they may involve complex calculations Otherwise would require the application of regulatory judgement

Source: CEPA

ANNEX A TERMS OF REFERENCE

Workstream 1 – Realising the Core Concepts of the RIIO model

The RIIO framework took the elements of the old RPI-X framework that worked well, adapted some elements to ensure they were focused on delivery of a sustainable energy sector and long-term value for money, and added elements to encourage the radical measures needed in innovation and timely delivery. Based on the performance of the companies in RIIO-1, we want to understand to what extent the different elements of the RIIO framework have been successful at realising the ambitions that were captured in a series of ‘core concepts’:

- **sustainable energy sector:** an energy sector that meets the broad needs of existing and future consumers. This includes delivery of low carbon energy and other environmental objectives, delivery of secure safe supplies, and delivery of value for money including meeting the needs of vulnerable consumers;
- **sustainable network services:** providing network services that are safe, reliable and available; minimising the impact of network services on the environment; providing connections and network services consistent with the delivery of a low carbon energy sector (low carbon generation and active demand management); and delivering social obligations mandated by government;
- **play a full role:** the regulatory framework is designed to encourage network companies to take a leading role in the delivery of a sustainable energy sector. We want network companies to be proactive in seeking the best way of providing sustainable network services for the long term, be open minded about how best to deliver and innovate to achieve desired outcomes. They should engage effectively with their existing consumers and respond to the needs of future consumers (and, as part of this, future government targets). They should take responsibility for managing the uncertainty that their businesses face, and learn and adapt in response to new information;
- **long-term value for money:** value for money is about delivering sustainable network services at as low a long-term cost as possible. Focusing on value for money rather than cost efficiency should ensure network companies do not make cost savings at the expense of delivering outputs but that they do focus on minimising the long-term cost of delivering those outputs, rather than necessarily minimising costs over the next price control period;
- **long-term cost:** in our definition of long-term value for money we emphasise that we want energy network companies to minimise long-term cost. We are focusing on total costs of delivering outputs, wanting network companies to make choices between infrastructure (capital) solutions and non-capital solutions on the basis of which is least cost over the long term. The relevant time horizon will vary by the activity being considered; for some costs ‘long term’ may be within the eight-year price control period whilst for others it will span a number of price control periods. We expect network companies to focus on the life-cycles of assets and to have asset management plans consistent with the long-term nature of network assets. When considering costs we expect network companies to consider the impact on the environment (‘environmental costs’), for example taking account of the price of carbon, when comparing the ‘cost’ of different options for delivering outputs;
- **consumers:** network companies provide the physical link between suppliers of gas and electricity and domestic and business consumers. They provide network services to generators, shippers, interconnectors, independent network operators (IDNOs and IGTs), suppliers and energy service companies (ESCOs). We think it appropriate to include users of network services as well as domestic and business end consumers, and their representatives, when considering ‘consumers’ in the regulatory framework. We recognise that the interests of the users of network services and end consumers will not always be aligned. Indeed, within each type of consumer category (e.g. generators, end consumers) there is unlikely to be complete alignment of interests. Furthermore, in

each group there may be more of a focus on what needs to be delivered today rather than a consideration of future requirements. It is therefore important that the Authority, with a principal objective to protect the interests of existing and future consumers, remains responsible for making decisions that balance the different viewpoints; and

- **stakeholders:** in our discussions on enhanced engagement we widen the group of parties that we and network companies may need to engage with beyond consumers (as described above). Government could have a key role in providing updates on the direction of government policy while local authorities could provide insight on the needs of consumers of network services. In addition, stakeholders could include parties that are affected by, or represent those affected by, decisions made by network companies and Ofgem that are not (in that role) direct consumers of network services. A key example is organisations representing environmental interests that are interested in ensuring that the impact of network services on the environment is consistent with broader environmental goals, such as reduction in greenhouse gases and protection of landscape.

The key outcome of this work would be to understand the extent to which these core concepts have been realised and provide recommendations for any amendments needed to RIIO Framework for RIIO-2. We require the consultant to review performance in RIIO-1 against performance in previous price controls in energy and where possible other sectors, in particular on the following areas:

1. Outputs

Map outputs across sectors in RIIO-1 and what higher level outcomes these were intended to achieve – relating back to the ‘core concepts’ described above. Provide assessment of whether outputs are proving to be measures of the higher level outcomes originally anticipated, particularly given changes in the energy landscape and adequacy of industry response - system operation, consumer behaviour etc (ie. growth of DG, storage, need for whole system solutions, readiness for EVs etc) . Does this highlight any issues with output definition or methodologies or missing outputs?

2. Incentives

Map out the range of incentive mechanisms including incentives linked to output delivery, Information Quality Incentive (IQI), Fast Tracking, totex incentive etc. Did these incentives achieve what was intended? Were incentives needed in addition to the flat targets? How much money have the companies received through these different incentives and is that money received by the companies shared with current or future consumers?

3. Length of price control and long term value for money/cost

- What evidence do we see that the change to an 8 year price control has driven different behaviours on the part of the companies?
- What evidence do we see that the companies have changed their approach to investment to demonstrate they are pursuing solutions that best demonstrate long term value for money and cost. Including progressing opex solutions in preference to capex and rolling out innovation into business as usual. What value does this represent to consumers? What have been the dis-benefits of this to the consumers?

4. Uncertainty

- Map mechanisms and associated value (both anticipated at the start of RIIO- 1 and actuals) in the framework to manage uncertainty across sectors and identify what external factors have impacted the companies during RIIO-1 and how have uncertainty mechanisms been used to help (hinder) their response to this? What indicators are there on prevailing levels of risk associated with each uncertainty mechanism?

5. Innovation

Is there a necessity for innovation fund for RIIO-2?

Finally, the analysis should also cover the following in the addition to the above:

1. an “evaluation framework” for assessing the core concepts of RIIO
2. establish whether each of these concepts apply to all the four sectors and if they are better suited to one more than the other?
3. establish if there are any exogenous factors for which the current framework may not be suitable.
4. at a higher level, based on research of other regulators and academic studies, confirm whether all elements of the RIIO model are still correct for example, the concept of single till Vs dual till etc.

Workstream 2 – How has the RIIO framework has driven company behaviour in RIIO-1?

The outcome of the work would be the results of an assessment for each of the 4 energy sectors in the areas (but not limited to) described below and over all recommendations for the RIIO model resulting from this assessment. The suppliers are encouraged to submit a methodology in their proposals for conducting this analysis. The consultants will be assessed, amongst other things, on their approach to the analysis of this work.

Our initial thinking (we are open to different approaches from the suppliers) is that the assessment will be largely based on information contained in the RIIO-1 final proposal documents, an analysis of the actual performance across the sectors till 31 July 2017 and the RIIO-1 Annual Reports produced by Ofgem for company performance till 31 March 2016 (with access to the Ofgem team that produce these annual reports to request any clarification questions). The successful consultant ultimately would need to establish in detail what information from Ofgem and the industry would be required for the purposes of this work.

A key area of interest is the level of return⁹⁸ companies have been experiencing and the extent to which the returns have been driven by a response to RIIO incentives or unanticipated changes in the external environment. We want an understanding of the parts of the control that drive high returns. Once established, we would also like further detail on specific areas such as output delivery and expenditure driven returns. Where it has been led by RIIO incentives to reduce cost or exceed output delivery or secure more efficient financing, we want to understand the extent to which companies have had to demonstrate improvement/innovation/efficiencies to earn higher returns. In particular on expenditure and outputs, we would like to understand the following:

1.Expenditure

- a) Was the lower spend because companies innovated, or achieved frontier efficiency performance improvement or cost deferral/avoidance – if so, did this impact output delivery/volumes? Also consider allowances not linked to outputs, Real Price Effect Mechanism, Tax payments made vs tax allowance, RPI / CPI / CPIH, Pension deficit repair

⁹⁸ Expressed as a return on regulatory equity (RORE). 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.

payments, Payments under TIRG / TOI, Cost of equity, Cost of debt and equity, Gearing, Depreciation.

- b) To what extent has the benefit of lower spend been shared with the consumers, in the current or future price controls?
- c) Where costs are higher, is this due to failure to achieve anticipated efficiency savings or unanticipated cost items?
- d) if there is no evidence of the above (c), did this suggest that business plan forecasts/price control allowances were overly generous/harsh? If yes, then what are the options for change and recommended option to take forward?
- e) where there is an overspend, is it because the forecasts were not correct, was our analysis in correct or are there other issues which resulted in the problem?
- f) consider the forecast and actual spend profile to understand and set out the reasons and benefits to the companies of the profile (using previous price control info).
- g) what trends are there across different cost categories – at a high level these should include asset replacement, capacity, opex (but further interrogation of annual reports may require more granularity within these categories)? Based on the trends across different cost categories, what implications does this have for assessing expenditure forecasts in these areas?
- h) report should identify how each company performed for each sector and the companies that most benefitted from 'step change' efficiency improvement and those companies that benefitted from cost avoidance or low benchmark.
- i) report should also provide recommendations for assessing expenditure forecasts – which cost categories best/least lend themselves to benchmarks that can only be exceeded through step change in efficiency/innovation?

2. Outputs

- a) Where outputs have been exceeded, how have companies achieved improvements in performance? Is this through a step change in performance underpinned by additional expenditure, innovation or organisational change? Once the reason is identified, the report should also provide recommendations for changes if necessary with appropriate options assessed.
- b) Where outputs have not been met is there evidence that companies attempted to change their approach in order to achieve targets?
- c) If no evidence of the above, did this suggest that price control output targets were overly generous/harsh? If so then in which areas? What are the options and recommendations for future?
- d) As for expenditure:
 - 1. provide recommendations for setting output targets primarily for existing areas but we would welcome additional areas identified as well – which areas best/least lend themselves to targets that can only be exceeded through step change improvements
 - 2. identify how each company performed and which companies most delivered step change improvements in performance, which most benefitted from step change improvement and which from low or poorly defined/measured targets.

ANNEX B APPROACH TO ASSESSING THE RIIO FRAMEWORK

This annex summarises our approach to assessing the RIIO framework and the RIIO-1 price controls.

B.1. Overview of the evaluation framework and its purpose

The RIIO Handbook describes a set of ‘core concepts’ of the regulatory framework.⁹⁹ These are highly conceptual, so they do not provide a basis on which to assess the RIIO framework. For example, there is a lack of consistency and clarity on what Ofgem considered to be an ‘output’ in RIIO-1. This issue has emerged, for example, in the MPR of RIIO-T1.¹⁰⁰

To enable a structured and thorough assessment of whether the RIIO framework has achieved its stated goals, and what changes might be required for RIIO-2 to better align actual outcomes to expected outcomes, we used an Inputs – Outputs – Outcomes – Impacts evaluation framework. This framework is commonly used in a range of contexts – for example in economic development – to support a “theory of change” for how an intervention would lead to the desired end-goal being met. In this framework:

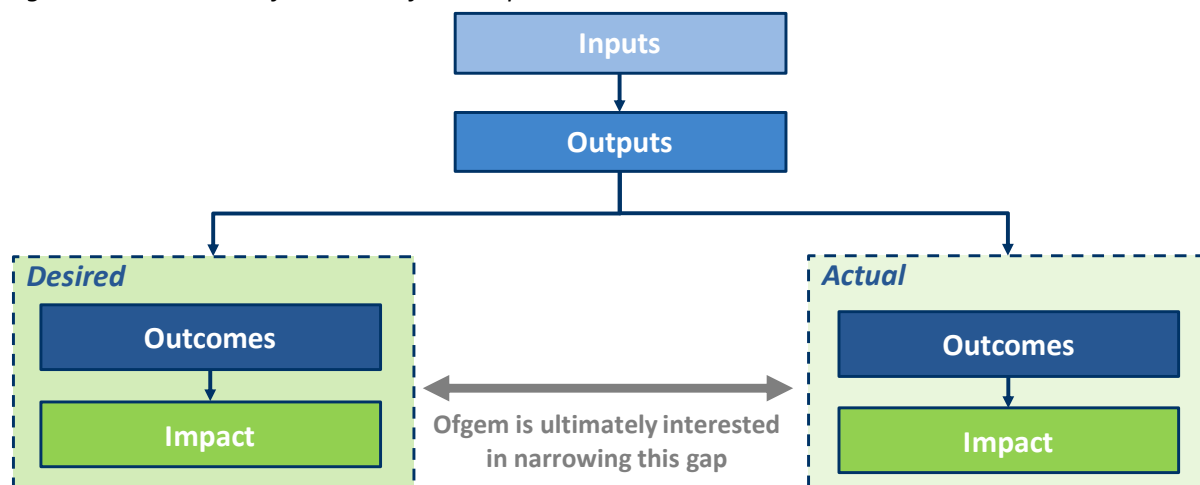
- **Impacts** on customers are defined at a high level and are what the intervention ultimately aims to achieve. In the context of RIIO, impacts themselves cannot be measured.
- **Outcomes** are the behaviours and actions by network companies that would result in the desired impacts on customers. In the context of RIIO, outcomes should be measurable.
- **Outputs** in the context of the evaluation framework are the allowances and targets set in RIIO-1 Final Decisions and in network companies’ licences. We note that this may be different from how the term ‘outputs’ has typically been used under RIIO.
- **Inputs** are the information, models and processes used to inform the relevant allowances and targets in RIIO-1 Final Decisions and in network companies’ licences.

In setting a price control, Ofgem can control the ‘inputs’ and ‘outputs’ and influence, but not fully control the ‘outcomes’ and ‘impacts’. Ofgem’s aim is for outturn outcomes (i.e. what network companies actually do) to be as close as possible to the desired outcomes envisaged when the price controls are set. This, in turn, would ensure that actual impacts on customers are as close as possible to the desired impacts. The evaluation framework is illustrated in Figure B.1.

⁹⁹ [Ofgem, Handbook for implementing the RIIO model, October 2010](#)

¹⁰⁰ See Ofgem website: [Ofgem, RIIO Mid-Period Review \(RIIO T1 and GD1\)](#)

Figure B.1: Evaluation framework for RIIO price controls



Source: CEPA

B.2. Mapping RIIO-1 price controls to the evaluation framework

The RIIO-1 price controls defined eight desired impacts on customers:

- long-term value for money network services;
- customers pay lowest cost for network outputs (within the price control period);
- environmentally sustainable network services;
- low carbon energy sector (enabling connection of low-carbon generation);
- network companies meet social obligations (distribution only);
- safe and secure network services;
- available (transmission only) and reliable network services; and
- customers are satisfied with network services.

The RIIO-1 price controls map consistently across our Inputs – Outputs – Outcomes – Impacts evaluation framework. We illustrate that for RIIO-GD1 in Table B.1.

Table B.1: Mapping RIIO-GD1 to the evaluation framework

Inputs	Outputs	Outcomes	Impacts
<ul style="list-style-type: none"> Proposals in GDNs' business plans Considerations of the length of the price control period Allowed revenue based on RAV building blocks Indexation of the RAV and allowed revenues to the RPI Considerations of asset life and expected future levels of utilisation CBAs of proposed non-mandatory investment Consideration of potential uncertainty mechanisms Innovation mechanisms Secondary deliverables for outputs delivered in RIIO-GD2 Financeability testing 	<ul style="list-style-type: none"> Eight-year price controls Revenue and totex allowances as per final proposals (subject to the annual iteration process) Forward-weighted depreciation profiles Transition of repex capitalisation rates from 50% to 100% Several uncertainty mechanisms End-of-period review of outputs with potential reward/penalty for over-/under-delivery, and with any under-delivery rolled over to RIIO-GD2 GDN-specific Network Innovation Allowance (NIA) 	<ul style="list-style-type: none"> GDNs' expenditure is lowest cost over the long term; takes account of long-term output delivery GDNs make efficient use of network and non-network solutions; change plans in response to new information GDNs manage assets in line with their long-term nature; plan for the long term GDNs remain financeable GDNs undertake technical and commercial innovation; facilitate competition in supply (including in energy services) Cost recovery balanced between current and future customers 	<p>Long-term value for money network services</p>
<ul style="list-style-type: none"> Proposals in GDNs' business plans Proportionate assessment of business plans depending on quality of plan, with option to fast-track Use of the IQI <i>Ex ante</i> totex allowances; Ofgem cost baseline set using cost assessment 'toolkit', with allowances interpolated 75:25 between Ofgem baseline and GDNs' proposal 	<ul style="list-style-type: none"> No GDNs fast-tracked Revenue and totex allowances as per final proposals (subject to the annual iteration process) Totex incentive rates and <i>ex ante</i> reward/penalty based on GDNs' IQI scores Allowances for RPEs and deductions for ongoing efficiencies Several uncertainty mechanisms End-of-period review of outputs with potential reward/penalty for over-/under- 	<ul style="list-style-type: none"> GDNs make efficient expenditure, while meeting output targets Efficiency gains (and efficient overspend) are shared with customers GDNs make efficient financing decisions and do not take on a disproportionate financial risk GDNs do not make higher than expected returns, are not rewarded for inefficiency, nor 'bailed out' from financial distress brought about by their own behaviour 	<p>Customers pay lowest cost for network outputs</p>

Inputs	Outputs	Outcomes	Impacts
<ul style="list-style-type: none"> • GDN-specific adjustments to cost allowances (e.g. for regional wage differences) • Short-term independent forecasts and historical averages used to set RPEs • Historical averages from EU KLEMS dataset used to set ongoing efficiency targets • Consideration of potential uncertainty mechanisms • Notional gearing and allowed return on equity based on market information, relative risk and RoRE analysis • Indexed allowed return on debt • 3-yearly review of established pension deficits; detailed assessment of tax costs 	<ul style="list-style-type: none"> • delivery, and with any under-delivery rolled over to RIIIO-GD2 • Allowed rate of return as per Final Proposals, with annual updates to the return on debt • Allowances for established pension deficits and tax, including tax clawback for excess gearing 	<ul style="list-style-type: none"> • Well performing GDNs can earn double digit equity returns; poor performing GDNs may earn equity returns below the cost of debt 	
<ul style="list-style-type: none"> • Shrinkage primary output • Department for Energy and Climate Change (DECC) non-traded value of carbon used to inform emissions incentives • GDNs' proposals for decommissioning gas holders 	<ul style="list-style-type: none"> • Shrinkage financial incentive with rolling mechanism • Environmental emissions financial incentives with rolling mechanism • Reputation incentive for GDNs' carbon footprint • Allowances for decommissioning gas holders 	<ul style="list-style-type: none"> • GDNs reduce leakage from their networks by 15-20% by the end of RIIIO-GD1 • GDNs minimise their business carbon footprint and other emissions • GDNs minimise visual impact of their networks • GDNs take account of environmental costs when deciding between different options for meeting outputs 	Environmentally sustainable network services
<ul style="list-style-type: none"> • GDN proposals for financial reward for meeting low carbon outputs • Consideration of whether GDNs can control the level of biomethane connections 	<ul style="list-style-type: none"> • Reputational incentive related to biomethane connections • Discretionary reward scheme for GDNs that deliver environmental outputs not funded at the price control review 	<ul style="list-style-type: none"> • GDNs to introduce (voluntary) connection standards for biomethane; and to report on biomethane enquiries and applications • GDNs and third parties implement new commercial and charging arrangements 	Low carbon energy sector

Inputs	Outputs	Outcomes	Impacts
<ul style="list-style-type: none"> • Network Innovation Competition (NIC) 	<ul style="list-style-type: none"> • £160 million available under the NIC over the course of RIIO-GD1/GT1 		
<ul style="list-style-type: none"> • DECC Heat Strategy • GDNs' business plan proposals for connections 	<ul style="list-style-type: none"> • Funding for connecting 77,450 fuel poor households; adjustment to GDNs' revenues at the end of RIIO-GD1 for failure to meet their individual targets • Discretionary reward scheme for GDNs delivering outputs not funded at review • Stakeholder engagement incentive - discretionary reward based on an independent panel's review of GDNs' annual stakeholder engagement report 	<ul style="list-style-type: none"> • Around 80,000 more connections for fuel poor households over RIIO-GD1 • GDNs to provide alternative heating and cooking appliances during interruptions, with priority given to vulnerable customers • GDNs engage proactively with consumers on an ongoing basis 	Networks meet social obligations
<ul style="list-style-type: none"> • GDN business plan proposals for iron mains abandonment volumes • <i>Ex ante</i> funding for repex • CBAs of non-mandatory repex based on 24-year appraisal period • Iron mains secondary deliverables • Emergency response primary output • Management of repairs primary output • Risk repair scores from GDNs' 2012/13 RRP • Major accident hazard prevention primary output • GDN surveys of sub-deduct networks • Carbon monoxide awareness primary output • Engagement with HSE 	<ul style="list-style-type: none"> • Allowances for repex programme based on iron mains abandonment volumes for each GDN • End-of-period review of outputs with potential reward/penalty for over-/under-delivery, and with any under-delivery rolled over to RIIO-GD2 • Secondary deliverables for occurrences of gas in buildings, occurrences of iron mains fractures and ductile main failures, and length of mains 'off risk' • Targets for emergency response, repair management and major accident hazard prevention • Requirement for safety case approval and safety report review by HSE • Allowances to enable all sub-deduct networks to be evidenced as being 'off risk' in RIIO-GD1 	<ul style="list-style-type: none"> • GDNs reduce the safety risk presented by the gas networks (iron mains replacement programme) by 39-56% during RIIO-GD1 (varies by GDN) • GDNs help reduce the number of deaths and injuries caused by carbon monoxide – improve public awareness of the risk of carbon monoxide poisoning • GDNs comply with the HSE's standards 	Safe network services

Inputs	Outputs	Outcomes	Impacts
	<ul style="list-style-type: none"> Reward for carbon monoxide awareness through stakeholder engagement incentive 		
<ul style="list-style-type: none"> Interruptions primary output Interruptions targets adjusted for repex tier 1 workload Assumption for deterioration rate of non-polyethylene services capped at the upper quartile of GDNs' proposed rates NTS exit capacity primary output based on short-term booked capacity and GDN forecasts for peak day demand Telemetered faults secondary deliverable 	<ul style="list-style-type: none"> Requirement for GDNs to develop common NOMs methodology NTS exit capacity financial incentive Targets for number and duration of telemetered faults End-of-period review of outputs with potential reward/penalty for over-/under-delivery, and with any under-delivery rolled over to RIIO-GD2 	<ul style="list-style-type: none"> GDNs reduce/maintain number of interruptions GDNs provide capacity to meet 1-in-20 peak day winter demand 	Reliable network services
<ul style="list-style-type: none"> Connections primary output Customer survey primary output Complaints primary output Stakeholder engagement primary output 	<ul style="list-style-type: none"> Penalty payments through guaranteed standards of performance Customer survey financial incentive Complaints penalty-only financial incentive Discretionary reward stakeholder engagement financial incentive 	<ul style="list-style-type: none"> GDNs connect users and suppliers in a timely manner (maintain guaranteed standards); provide high quality, transparent information on the conditions for connection GDNs monitor customer satisfaction via a survey covering interruptions, connections and general enquiries GDNs improve customer service to upper quartile 	Customers satisfied with network services

Source: CEPA analysis of Ofgem publications

ANNEX C ADDITIONAL DETAIL ON RIIO-1 PERFORMANCE REVIEW

This annex provides further detail on CEPA’s analysis that informed the review of network companies’ performance in RIIO-1 so far (as set out in Section 2). The annex covers:

- ongoing efficiencies;
- profiling of repex workload (RIIO-GD1);
- outperformance on the NTS exit capacity incentive (RIIO-GD1); and
- outperformance on the shrinkage and environmental emissions incentives (RIIO-GD1).

C.1. Ongoing efficiency

Ongoing efficiencies and RPEs can be considered two sides of the same coin – they are adjustments to totex allowances to reflect economy-wide trends that are considered outside of network companies’ control. Ofgem includes an RPE allowance in totex because network companies are assumed to face input cost pressures that they cannot control. By the same token, totex allowances are adjusted downward to reflect an expectation of economy-wide productivity improvements.

In section 2.5.1 we estimated the additional return earned by network companies as a result of outturn RPEs being lower than Ofgem’s forecasts. It is appropriate, therefore, to also ask what has been the impact on returns of outturn productivity compared to Ofgem’s ongoing efficiency assumptions.

Unlike RPEs, where it is possible to rely on the indices used by Ofgem to recreate the methodology applied for RIIO-1, for ongoing efficiencies Ofgem made a judgement call based on a number of different measures. As much as possible we sought to update the measures Ofgem used in its RIIO-1 Final Decisions with the latest information to see whether they point to changes in ongoing efficiencies.

Table C.1 summarises the ongoing efficiency assumptions that Ofgem used in RIIO-1.

Table C.1: Ofgem's assumptions for ongoing efficiency in RIIO-1

	RIIO-GD1	RIIO-GT1 (NGGT TO)	RIIO-ET1 (NGET TO)	RIIO-ED1*
Opex	1%	1%	1%	-
Capex	0.7%	0.7%	0.7%	-
Repex	0.7%	-	-	-
Totex	0.8%	0.7%	0.7%	0.8-1.1%

Source: Ofgem publications

Note that Ofgem did not apply a separate ongoing efficiency assumption during RIIO-ED1, as these were considered to have already been included in the DNOs’ forecasts. Those assumptions ranged 0.8-1.1% per year in DNOs’ cost allowances. Ongoing efficiencies were not published for the fast-tracked TOs.

Ongoing efficiencies for RIIO-1 were based on Ofgem-generated productivity measures that used the EU KLEMS dataset for 1970-2007.¹⁰¹ Table C.2 shows some of the productivity measures that Ofgem considered, and highlights those we understand were key to Ofgem's decisions on ongoing efficiencies for RIIO-1. The table shows the productivity measures' levels using the latest EU KLEMS data release (the September 2017 release). The latest data suggests that productivity for capex and repex has been broadly in line with Ofgem's assumptions for RIIO-T1 and GD1. For opex, the latest data suggests that productivity has been somewhat lower than Ofgem's assumption for RIIO-T1 and GD1.

Table C.2: Productivity estimates from EU KLEMS data

Sector (EU KLEMS sector code)	Total factor productivity (value added)				Labour productivity (value added) at constant capital			
	1970-2007 (Ofgem)	1970-2015	2007-2015	2010-2015	1970-2007 (Ofgem)	1970-2015	2007-2015	2010-2015
Manufacture of Chemicals & Chemical Products (24)	3.9%	3.2%	0.6%	-1.1%	5.8%	5.2%	1.1%	-2.3%
Manufacture of Electrical & Optical Equipment (30-33)	4.1%	2.8%	0.4%	0.3%	5.8%	4.0%	0.6%	0.4%
Manufacture of Transport Equipment (34-35)	3.3%	3.5%	4.3%	7.3%	3.3%	3.8%	5.3%	8.8%
Construction (F)	0.7%	0.7%	0.0%	2.3%	0.7%	0.8%	0.1%	2.5%
Sale, Maintenance & Repair of Motor Vehicles/Motorcycles; Retail Sale of Fuel (50)	2.0%	1.6%	2.2%	3.7%	2.4%	1.9%	2.7%	4.5%
Transport & Storage (60-63)	2.4%	1.6%	-1.0%	0.0%	2.6%	1.7%	-0.9%	0.0%
Financial Intermediation (J)	-0.6%	-0.5%	-2.2%	-3.6%	-0.9%	-0.6%	-3.2%	-5.5%
Unweighted avg. selected industries	2.3%	1.8%	0.6%	1.2%	2.8%	2.4%	0.8%	1.2%
Unweighted avg. selected industries (exc. manufacturing)	1.1%	0.8%	-0.2%	0.6%	1.2%	0.9%	-0.4%	0.4%
Unweighted avg. all industries	1.3%	0.9%	-0.4%	0.2%	1.5%	1.0%	-1.5%	-1.2%

Source: CEPA analysis of EU KLEMS data, and Ofgem publications

¹⁰¹ See: [EU KLEMS Growth and Productivity Accounts](#)

C.2. Repex profiling in RIIO-GD1

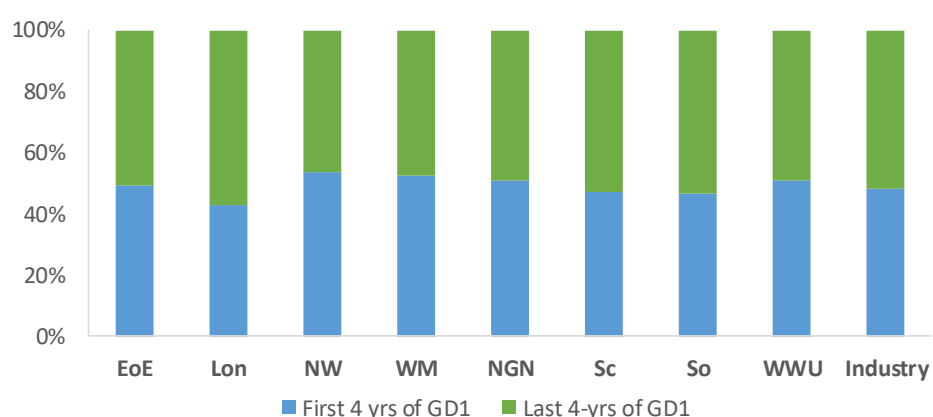
Ofgem's stated intention to fully capitalise repex was to better align the benefits that arise from iron mains replacement over the life of the asset with how the cost is recovered from customers. This differed from the previous approach where a 50% capitalisation rate was applied to repex. Given that this policy would reduce near term cash flows, Ofgem considered that transitional arrangements should apply in respect of repex to ensure that the GDNs maintain a 'comfortable investment grade' credit rating (BBB-A). Most GDNs proposed a uniform repex capitalisation rate of 75% over RIIO-GD1, whereas Wales and West Utilities (WWU) proposed a transition based on gradual increase in capitalisation rate from 50% to 100%. Ofgem decided to adopt a stepped transition similar to that proposed by WWU.

In theory, if GDNs' true cost of capital is lower than the allowed rate of return, they could maximise their NPV returns by profiling their expenditure so that they are:

- spending less in the early years (thus retaining more cash in the year as "fast money" through the totex incentive mechanism); and
- spending more in later years (thus building up their RAVs and earning a 'RAV premium' for longer).

As part of our analysis of repex underspend, we examined the possibility that GDNs have been profiling their repex during RIIO-GD1 in order to maximise returns as a result of the transition of repex capitalisation from 50% in the first year to 100% in the last year. Our analysis of the 2016/17 RRP does not indicate a material increase in GDNs' forecast expenditure over the course of RIIO-GD1. Forecast repex in the second half of RIIO-GD1 is largely the same as actual repex during the first four years the price control period, as shown in Figure C.1. We suggest that more detailed analysis is done on this issue.

Figure C.1: Forecast split of repex across RIIO-GD1



Source: CEPA analysis of 2016/17 RRP

C.3. Output incentives in RIIO-GD1

Apart from repex, some other areas where GDNs have outperformed so far in RIIO-GD1 include incentive mechanisms for:

- NTS exit capacity;
- shrinkage; and
- environmental emissions.

We discuss each in more detail below.

C.3.1. NTS exit capacity incentive

Since October 2012, GDNs have to book NTS exit capacity in order to be able to offtake gas from the transmission network and serve customer demand. The incentive mechanism encourages GDNs to minimise the cost of NTS exit capacity booking whilst still providing sufficient capacity to meet its 1-in-20 peak demand output.

NTS exit capacity booking costs are determined by:

- **Volume of capacity booked** – driven partly by gas demand trends and partly by GDNs' capacity booking strategy.
- **Daily exit capacity charge** – set by NGGT based on approved charging methodology and not under the control of GDNs.

Actual costs of booking exit capacity are treated as non-controllable costs. Incentive performance is assessed by comparing actual capacity booking cost against targets. The IQI incentive rate is applied to any incentive revenue.

At Final Proposals Ofgem decided to take GDNs latest capacity bookings and hold these constant over the RIIO-GD1 period for the purpose of setting the incentive targets. Ofgem also seems to have assumed constant NTS exit capacity prices resulting in flat NTS exit capacity cost targets for all GDNs over RIIO-GD1. This decision has not taken into account longer-term trends in gas demand levels or potential evolution of offtakes during RIIO-GD1.

Over the first three years of RIIO-GD1, GDNs' actual NTS exit capacity costs have been 7% (£42m) below their target allowance. Based on the latest data including 2016/17, the NTS exit capacity incentive is expected to provide 19 basis points of RoRE outperformance for the industry as a whole across RIIO-GD1. GDNs' performance is ranging from no outperformance to 38 RoRE basis points outperformance.

Outperformance so far seems to be driven by:

- **Lower gas demand:** lower gas demand means less capacity bookings are needed to meet demand levels compared with the baseline that assumes nearly flat volumes.
- **Lower exit capacity prices.**
- **Technical improvements:** e.g. more efficient use of linepack and optimised capacity bookings.

Only the last point can be attributed to GDNs' actions. NTS exit capacity costs are treated as non-controllable costs, which reflects the fact they are largely outside the control of the GDNs. To the extent that lower costs have been the result of factors largely outside the control of GDNs, then outperformance seems to have occurred mainly as a result of forecasting errors in setting the incentive targets. This suggests there may be scope to consider mechanisms to adjust target allowances during or at the end of the price control period based on actual changes in gas demand volumes and exit capacity prices. This would mean that the scope for outperformance is restricted to factors that are under GDNs' control.

C.3.2. Shrinkage and environmental emissions incentives

Both the shrinkage and environmental emissions incentives encourage GDNs to reduce network losses and the environmental impact of their activities. We considered GDNs' performance in these two areas jointly as the underlying factors affecting performance under both incentives are similar. The structure and operation of the incentive mechanisms are also very similar.

Both incentives operate an eight-year rolling incentive mechanism with an enduring element for incremental performance, plus an adjustment applied at the end of the price control for any non-enduring performance. The IQI incentive rate is applied to any incentive revenue earned.

For RIIO-GD1, Ofgem set shrinkage and leakage targets for each company. The targets set at the price control stage required GDNs to deliver 15-20% reduction in gas transport losses over RIIO-GD1. There is a clear interaction between GDNs' performance in this area and the iron mains replacement programme. The targets set at RIIO-GD1 seemingly took this into account – e.g. targets for some GDNs were set at a more challenging level in the Final Proposals to reflect increased funding for repex.

All GDNs are currently outperforming, with the combined impact of the shrinkage and environmental emissions incentives expected to provide around 28 RoRE bps outperformance for the industry as a whole across RIIO-GD1. The combined outperformance across the two incentive mechanisms for individual GDNs ranges between 13 and 54 RoRE bps.

The level of outperformance seems to be due to a number of factors:

- mains replacement, particularly targeted replacement of most 'leaky' pipes;
- reduction in system pressure through, for example, the introduction of automated remote pressure regulation systems; and
- other GDN actions meant to reduce leakage, such as use of Monoethylene Glycol to swell joints between pipes and reduce leakage.

While these output incentives do not represent a major area of outperformance in RIIO-GD1, they are a useful illustration of the interactions between totex allowances and output incentives. This highlights the need to ensure that incentive targets/allowances take into

account the impact of the repex programme and other totex allowances on shrinkage/emissions.

In response to questions from CEPA during this project, at least one GDN mentioned that remote pressure management was a key investment outlined in its business plan and is now proving successful in helping to reduce shrinkage. In such cases, there is a risk that customers could be paying twice: for having the pipes replaced or for introducing remote pressure management systems, and also for rewarding GDNs for shrinkage reduction due to implementation of these programmes.

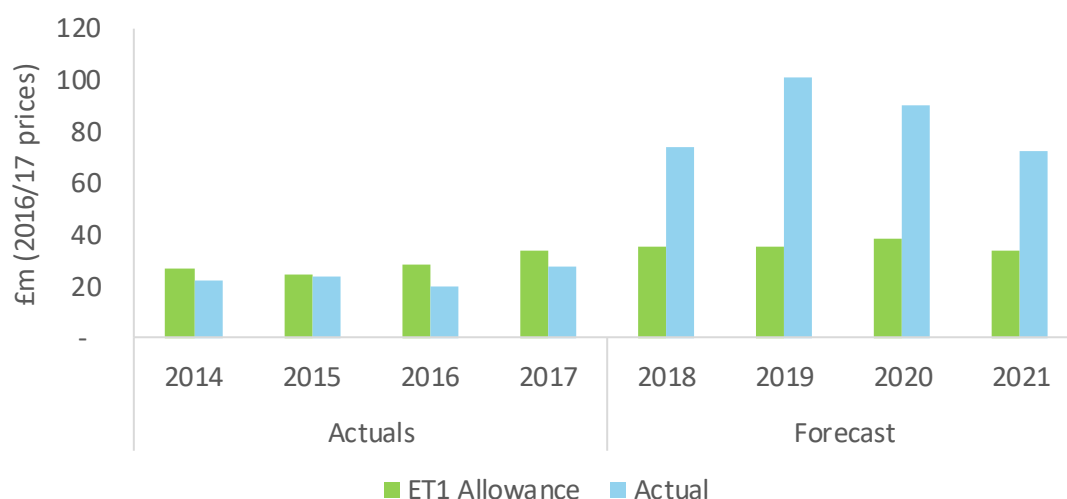
Another issue is the relationship between gas demand and shrinkage/emissions. If shrinkage is partly a function of throughput volume and targets are set as absolute volumes, then changes in annual gas demand could have an impact on GDNs' performance against targets without their being a chance in their activities.

C.4. Non load-related capex in RIIO-ET1

This section supplements the analysis of NLR capex from section 2.5.5, with focused on underspend by NGET.

Figure C.2 shows SHET's spending against allowances for NLR capex. While current underspend has been relatively small for SHET, it is predicting a large increase in actual spending for the second half of the price control period. SHET is expecting to overspend on NLR expenditure compared to its allowances, mainly as a result of some of its large overhead line asset replacement schemes being larger than originally anticipated, which is a result of SHET improving its asset condition monitoring.

Figure C.2: SHET annual NLR capex actual spending against allowances

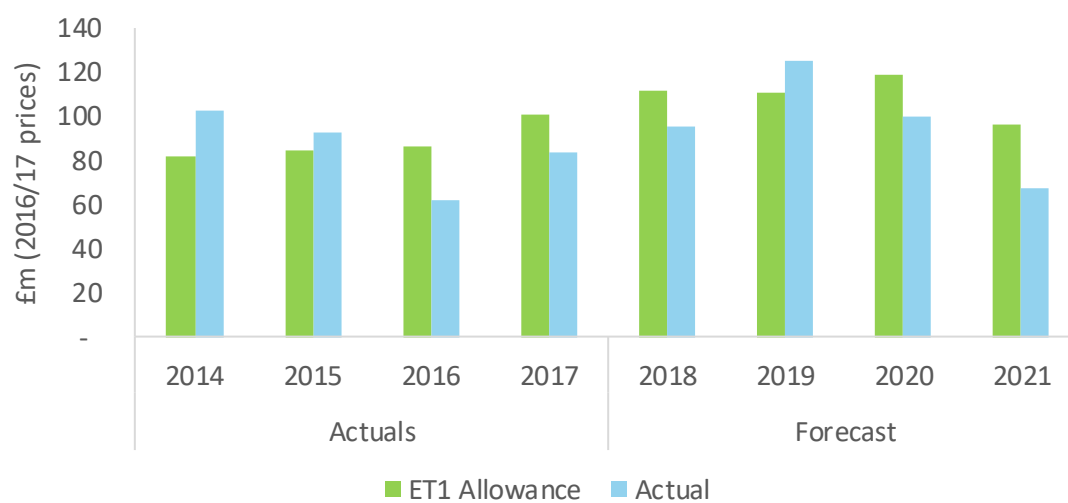


Source: CEPA analysis of 2016/17 RRP

Figure C.3 shows SPTL's spending against allowances. Compared to the large variations forecast for NGET and SHET, SPTL's NLR capex is expected to be only 8% below allowances. The main reason for variations in SPTL spending include asset condition assessments

suggesting that certain expenditure is no longer required, plus changes in the scope of some load-related projects has meant lower requirements for NLR expenditure.

Figure C.3: SPTL annual NLR capex actual spending against allowances



Source: CEPA analysis of 2016/17 RRP

ANNEX D PROPORTIONATE ASSESSMENT AND FAST-TRACKING

This annex summarises Ofgem's approach to the fast-tracking incentive in RIIO-1 and the outcomes in each RIIO-1 price control. It compares it to the approach taken by Ofwat.

D.1. Overview of the fast-tracking incentive in RIIO-1

In addition to the benefits of early agreement of the price control settlement, Ofgem introduced a financial reward for fast-tracking in RIIO-1. Under RIIO-1 price controls, a fast-tracked company would:

- face a totex incentive rate equal to what it would have had under the IQI had it been identified as frontier efficient company (for RIIO-T1 this was 50% and for RIIO-ED1 it was 70%);¹⁰² and
- earn an *ex ante* reward equal to what it would have earned under the IQI had it been identified as being in line with Ofgem's baseline (for RIIO-T1 and ED1 it was 2.5% of allowed totex).

Table D.1 summarises the timing of the fast-track process in the RIIO-1 price control reviews. The rest of this section briefly reviews how the process unfolded for each review.

Table D.1: Timetable for RIIO-1 fast-track processes

	RIIO-T1	RIIO-GD1	RIIO-ED1
Network companies submitted initial business plans	July 2011	December 2011	July 2013
Ofgem publishes assessment of initial business plans	October 2011	February 2012	November 2013
Ofgem published consultation on its fast-track decision	January 2012	February 2012	February 2014

Source: CEPA based on Ofgem publications

D.1.1. RIIO-T1¹⁰³

In RIIO-T1, Ofgem acknowledged that it was the first RIIO framework implementation and thus consisted of a learning experience for them, the network companies and the wider industry. To reflect this, Ofgem allowed the TOs to revise their initial business plans before it made its decision on fast-tracking. This was intended to be a one-off concession that would not be made in future price control reviews.¹⁰⁴ Ofgem did not apply a similar concession with regard to fast-tracking in RIIO-GD1 or ED1.

¹⁰² The higher incentive rate would enable a fast-tracked company to retain a larger share of any efficiency savings it makes. But it also discourages companies from submitting unrealistically low cost proposals, as they would be exposed to a larger share of any overspend.

¹⁰³ [Ofgem, Initial assessment of RIIO-T1 business plans and proportionate treatment, October 2011](#)

¹⁰⁴ Ibid.

Ofgem's initial assessment of the business plans demonstrated that the TOs responded positively to the RIIO framework. There was evidence that all TOs had sought to engage actively with their stakeholders in developing their plans. In addition, all strode towards developing plans that were outputs-led and reflected the consideration of stakeholders' views. Ofgem also found that TOs demonstrated how they had taken account of a wider range of issues, including their role in contributing to delivering a sustainable energy sector and the risk and uncertainties associated with delivering their plans.

As a result of RIIO, all TOs published significantly more information than they have had in any previous price controls. However, Ofgem noted that several areas required further work in all TOs' business plans. This included:

- providing more evidence of an overarching strategy to delivering environmental responsibilities;
- more detailed innovation strategies;
- providing further (and better) information; and
- financial proposals.

Ofgem's assessment resulted in fast-tracking SPTL and SHET, with Ofgem stating that the issues identified in their business plans were resolvable in the time available. Figure D.1 shows Ofgem's summary of assessment of initial business plans for RIIO-T1.

Figure D.1: Summary of assessment of TOs business plans

Category	NGET	SPTL	SHETL	NGG
Process		R	R	
Outputs		R	R	
Resources – efficient expenditure		R	R	
Resources – efficient financial costs	R	R	R	R
Uncertainty/Risk	R	R	R	R

Source: [Ofgem, Initial assessment of RIIO-T1 business plans and proportionate treatment, October 2011](#)

Note that 'R' in the above table indicates that Ofgem identified the related issues as resolvable in the time available to make a decision on fast-tracking.

D.1.2. RIIO-GD1¹⁰⁵

The fast-track process for RIIO-GD1 occurred over a shorter period than for RIIO-T1. This is because Ofgem allowed GDNs additional time to reconsider their business plans in light of the HSE' change of policy on repex.

Ofgem noted that the GDNs' plans were of much higher quality relative to previous price control submissions, and the plans were informed by a much greater degree of stakeholder engagement. Additionally, Ofgem noted that the GDNs demonstrated strong commitment to

¹⁰⁵ [Ofgem, RIIO-GD1: Decision on fast-track process, February 2012.](#)

the implementation of the new RIIO framework, which resulted in Ofgem applying a lighter-touch approach to certain areas in each individual plan.

However, Ofgem found that there were material issues with all GDNs' plans that would be difficult to resolve within the restricted RIIO-GD1 fast-track timetable. Ofgem highlighted asset investment plans and overall costs as key areas of concern. As a result of this assessment, Ofgem decided that the consumer interest would be better served by resolving such issues on an industry-wide basis, and over a longer time-frame than afforded by the fast-track process. As such it decided not to fast-track any GDN. Figure D.2 shows Ofgem's summary of assessment of initial business plans for RIIO-GD1.

Figure D.2: Sample: Summary of assessment of GDN's plans

Category	Sub-category	NGGD	NGN	SGN	WWU
Process					
Outputs					
Cost efficiency	Strategy				
	Efficient delivery				
Financial arrangements	Financeability				
	Technical accounting				
Uncertainty					

Source: [Ofgem, RIIO-GD1: Decision on fast-track process, February 2012](#)

D.1.3. RIIO-ED1¹⁰⁶

Ofgem considered that DNOs' initial business plans showed marked improvement over previous price control submissions, and that companies responded positively to the RIIO framework. Additionally, Ofgem noted that DNOs published significantly more information in RIIO-ED1 than in previous price controls. Ofgem also noted that DNOs' business plans were of higher quality than those submitted for RIIO-T1 and GD1. This implies that DNOs had learned from the first RIIO price controls.

Ofgem considered that the bar for fast-tracking should likewise be higher than in RIIO-T1 and GD1. It decided to fast-track the four DNOs that belong to the Western Power Distribution (WPD) group. Ofgem's assessment concluded that the other DNOs' plans showed areas of strength, but all had scope for improvement.

Figure D.3 shows the scores by company on Ofgem's assessment of business plans. Only WPD achieved the highest scores (green) in all assessment categories. 'Resources – efficient costs' was the area that resulted in being the most challenging for all DNO groups, except WPD.

¹⁰⁶ [Ofgem, Assessment of RIIO-ED1 business plans and fast-tracking, November 2013.](#)

Figure D.3: Summary of assessment of DNO's business plans

DNO Group	licensee ¹⁰	Process	Outputs	Resources – efficient costs	Resources – efficient finance	Uncertainty and risk
Western Power Distribution	WMID					
	EMID					
	SWALES					
	SWEST					
Electricity North West Ltd	ENWL					
Northern Powergrid	NPgN					
	NPgY					
UK Power Networks	LPN					
	SPN					
	EPN					
SSE Power Distribution	SSEH					
	SSES					
SP Energy Networks	SPD					
	SPMW					

Source: [Ofgem, Assessment of RIIO-ED1 business plans and fast-tracking, November 2013](#)

Note that Ofgem set lower financial allowances for all DNOs, including WPD, despite rating all companies' proposals as 'green' in this area. This was as a result of a parallel consultation on the allowed return on equity.¹⁰⁷

D.2. Ofwat's approach to fast-tracking

Ofwat introduced the concept of 'enhanced status' in PR14 as part of its risk-based review (RBR).¹⁰⁸ The goal of the RBR are similar to fast-tracking in RIIO – to deliver benefits for customers by incentivising companies to submit excellent business plan and to minimise the costs of regulation.

A water company that qualified for enhanced status obtained financial benefits – i.e. an enhanced cost performance (totex) menu – which gave the company a greater opportunity to retain outperformance during the price control period. Enhanced status also provided reputational benefits, which may benefit the company in accessing capital markets and in engaging with their customers.

For PR19, Ofwat revisited the concept of the RBR – it now calls it 'initial assessment of business plans' to better reflect its relationship to the overall price review, and to reflect that it is different to the approach to the one taken in PR14.^{109,110}

The purpose of the initial assessment of business plans is to incentivise all companies to produce well evidenced and efficient plans by:

- offering reputational and procedural benefits for companies whose plans do not require material intervention to protect the interests of customers; and

¹⁰⁷ [Ofgem, Consultation on our methodology for assessing the equity market return for the purpose of setting RIIO price controls, 6 December 2013.](#)

¹⁰⁸ [Ofwat, Setting price controls for 2015-20– risk and reward guidance, January 2014.](#)

¹⁰⁹ [Ofwat, Delivering Water 2020: Consulting on our methodology for the 2019 price review, July 2017.](#)

¹¹⁰ [Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017.](#)

- introducing procedural, reputational and financial disincentives to discourage less ambitious companies from preparing low-quality plans.

Table D.2 summarises the main incentives for the initial assessment of business plans. Table D.3 compares Ofgem and Ofwat's PR14 and PR19 approaches to multi-track determinations.

Table D.2: Summary of the main incentives Ofwat propose for the initial assessment of business plans

Category	Reputational incentives	Procedural incentives	Financial incentives	
		Draft determination	Financial reward	Cost sharing rates
Exceptional	Published performance relative to peers and public recognition	Early (March/April 2019) Early certainty principle applied to specified components and outcomes ¹¹¹	Allowance calculated as +0.2%-0.35% RoRE based on the notional gearing of 60%	Standard ¹¹²
Fast track	Published performance relative to peers	Same as 'Exceptional' category	Allowance calculated as +0.1% return on RoRE based on the notional gearing of 60%	Standard
Slow track	Published performance relative to peers	July 2019. Business plans will require a level of material intervention to protect the interests of customers ¹¹³	None	Standard
Significant scrutiny	Published performance relative to peers	July 2019. Business plans will require extensive material intervention to protect the interests of customers ¹¹⁴	None. Potential cap on ODI rewards	Reduced cost sharing rate and potentially capped ODI outperformance payments ¹¹⁵

Source: [Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017](#)

¹¹¹ Companies can opt out of the early certainty principle.

¹¹² As a function of the relationship between company estimates and Ofwat's baseline. These cost sharing rates vary depending on whether the company is over- or underperforming. For more details see [Ofwat's cost sharing rates spreadsheet \(Dashboard tab\)](#).

¹¹³ These companies may be required to resubmit some of their business plans or to provide additional evidence.

¹¹⁴ These companies may need to substantially rework their plans. Companies whose plans fall into this category will require increased ongoing regulatory scrutiny and assurance. Ofwat may put extra measures in place to protect customers from risks associated with poor business planning. These companies may also be subject to strengthened reporting requirements.

¹¹⁵ Cost sharing rate of 75% for underperformance and 25% for outperformance.

Table D.3: Summary of characteristics of multi-track determinations

	Ofgem	Ofwat PR14	Ofwat PR19
Process	<ul style="list-style-type: none"> Assess business plans and announce fast-track companies. Ofgem consult on decision to fast-track. Fast-track companies either accept or decline. Those who decline go through the slow track process. 	<p>Assess business plans and announce what companies have pre-qualified for enhanced status.</p> <p>To qualify for enhanced status, companies must:</p> <ul style="list-style-type: none"> Accept Ofwat's risk & reward package. If they decline they go through the standard process. Take the limited actions that Ofwat have identified; and as a result of those actions, the companies must remain affordable and financeable. 	<p>Initial assessment of business plans, and the associated categorisation of companies, will be a "one-shot" process for water companies.</p> <p>The companies' business plans would be assessed around four key dimensions:</p> <ul style="list-style-type: none"> test areas; characteristics of a business plans; categories based on quality of business plans; and incentivisation applied through rewards and penalties.
Business plan characteristics and test for early determination	<p>Characteristics:</p> <ul style="list-style-type: none"> quality of the business plans; performance during the previous regulatory control; and benchmarking of business plans. <p>Tests for:</p> <ul style="list-style-type: none"> delivering primary outputs; delivering long-term value for money; review of performance in delivering outputs; and review of historic cost efficiency. 	<p>Test for:</p> <ul style="list-style-type: none"> costs; outcomes; risk and rewards; affordability and financeability; historic performance (2010-15); and quality of Board assurance. 	<p>Characteristics: high quality, ambition and innovation.</p> <p>Test nine key areas:</p> <ul style="list-style-type: none"> engaging customers; addressing affordability and vulnerability; delivering outcomes for customers; securing long-term resilience; targeted controls, markets and innovation; securing cost efficiency; aligning risk and return; accounting for past delivery; and securing confidence and assurance.

	Ofgem	Ofwat PR14	Ofwat PR19
Categorisation of companies	<ul style="list-style-type: none"> • Fast-track • Slow-track 	<ul style="list-style-type: none"> • Enhanced status • Standard resubmission 	<ul style="list-style-type: none"> • Exceptional - high quality plans with significant ambition and innovation. • Fast track - high quality plans that do not require material intervention to protect customer interests, but which are not ambitious and innovative enough to attain exceptional status. • Slow track - plans where material interventions are required in some areas to protect the interests of customers. • Significant scrutiny - plans which fall well short of the required quality, and where material interventions are required to protect the interest of customers.
Benefits to customers	<ul style="list-style-type: none"> • encourage innovation; • encourage good outcomes for customers, wider society and the environment; and • protection of existing and future customers. 	<ul style="list-style-type: none"> • Secure the best possible outcome for customers • Reputational benefits from customers (if enhanced status is granted) • Affordability • Encourage good outcomes for customers, wider society and the environment 	<ul style="list-style-type: none"> • Encourage significant ambition and innovation for customers • Encourage affordability • Encourage good outcomes for customers, wider society and the environment • Protection of existing and future customers
Benefits to companies	<ul style="list-style-type: none"> • procedural benefits; • financial benefits; • favourable incentives; • reputational benefits; and • protection of 'no worse off' commitment. 	<ul style="list-style-type: none"> • procedural benefit of early settlement; • financial benefits; • reputational benefits; and • protection of 'no worse off' commitment. 	<ul style="list-style-type: none"> • procedural benefit of early settlement; • financial benefits; and • reputational benefits. • Reputational and procedural disincentives for those under 'significant scrutiny'.

Source: CEPA based on Ofwat and Ofgem publications

ANNEX E STAKEHOLDER ENGAGEMENT

This annex provides more detail on stakeholder engagement during RIIO-1 and summarises the approaches taken in other UK regulated sectors.

E.1. Stakeholder engagement in the RIIO framework

In its RPI-X@20 final decision Ofgem made clear that enhanced engagement under the RIIO framework would be used to supplement, but not replace Ofgem's decisions.¹¹⁶ A particular concern was in making sure that the regulatory framework achieves an appropriate balance between the needs of current and future customers.

Ofgem saw the primary benefits of enhanced engagement as being:

- improved legitimacy of price controls;
- ensuring that outcomes are aligned with the needs of consumers; and
- assisting with meeting the emerging challenges, especially around the transition to a sustainable energy system.

To achieve these goals, Ofgem provided high-level guidance on the key elements of what is expected from network companies' engagement, as well as Ofgem's own proposed approach to engagement.¹¹⁷ However, Ofgem did not prescribe how network companies should engage. In addition to the guidance on stakeholder engagement during the price control review, Ofgem separately issued guidance on its expectations for ongoing engagement by companies during the price control period.¹¹⁸

E.1.1. Enhanced engagement in practice in RIIO-1

Ofgem evaluated the network companies' business plans using five different criteria:

- Process
- Resources (finance)
- Outputs
- Uncertainty and risk
- Resources (costs)

The criterion on process included how stakeholder engagement was undertaken and how this engagement impacted areas of companies' business plans. Ofgem noted that there was significant improvement on previous price controls in both quality and depth of engagement.

¹¹⁶ [Ofgem, RIIO: A new way to regulate energy networks, Final decision, October 2010](#)

¹¹⁷ [Ofgem, Handbook for implementing the RIIO model, October 2010](#)

¹¹⁸ An incentive for ongoing stakeholder engagement was first introduced in DPCR5. Since then it has been updated to focus network companies on addressing consumer vulnerability issues. See: [Ofgem, Decision on the RIIO-ED1 Stakeholder Engagement and Consumer Vulnerability Incentive 2016-17 – Electricity Distribution Network Operators, November 2017.](#)

For RIIO-ED1 and GD1, all companies except SPEN scored well on process, although Ofgem noted areas for improvement in relation to stakeholder engagement. For RIIO-T1, Ofgem noted that business plans could have been better in terms of process and identified areas for improvement in relation to stakeholder engagement. In Table E.1 we summarise Ofgem's assessment of the companies' business plans in RIIO-1 with regards to stakeholder engagement.

Table E.1: Ofgem's feedback on the initial assessment of companies' business plans in RIIO-1





DNOs	GDNs	TOs
<ul style="list-style-type: none"> • DNOs adopted different approaches. • Engaged with a broad range of stakeholders. • Used engagement mechanisms targeted to reflect different stakeholder needs. • Improvements in engagement had a significant impact on the quality and transparency of business plans. • Stakeholder feedback generally positive but differences in quality between those DNOs where stakeholders influenced the development of the business plan proposals from the outset and those where stakeholders were engaged with more to endorse proposals. • Not always clear how companies evaluated and monitored the effectiveness of engagement approach. 	<ul style="list-style-type: none"> • GDNs demonstrated that plans were informed by extensive engagement with stakeholders. • Differences in the approaches taken across GDNs, but progressed through a number of similar stages, moving from identification of issues and priorities through to an assessment of the suitability of the resulting plan. • The engagement process was presented clearly. • Demonstrated how stakeholder feedback influenced the plan. • Not always apparent how the GDN balanced the views of different stakeholder groups. • Engaged with a wide range of stakeholders, but not always possible to determine how the interests of 'future' consumers were taken into account. 	<ul style="list-style-type: none"> • NGET and SHET demonstrated how stakeholder views influenced their plans. • NGET and SPTL tended only to quote stakeholders where they agree the TOs' views. • NGET, SPTL and SHET: lack of evidence regarding challenging stakeholder views to determine how they reached a final position in their plan. • NGGT: assessed with NGET, but limited evidence of engagement with GDNs. • SPTL: Process regarded as business as usual - no obvious consideration of future stakeholders. • SHET initiated engagement process at an early stage and set out a multi stage and iterative approach to engagement. • SHET did not provide any evidence of engagement with local communities or the voluntary sector.

Source: CEPA analysis based on Ofgem's initial assessment of network companies' business plans documents for RIIO-1

Examples of how stakeholder engagement has influenced outcomes in RIIO-1



Tables E.2 and E.3, respectively, provide a few examples of how stakeholder engagement has influenced outcomes in RIIO-1 and how it has influenced outcomes for future consumers.



Table E.2: Examples of how stakeholder engagement has influenced outcomes for consumers

Source	Example
	<p>“There were three aspects of our resubmission that we sought further stakeholder input on, to ensure that we are making the right decisions for stakeholders.”</p> <p>“Following feedback from stakeholders we have decided to make our plans for vulnerable customers more specific and explicit. In doing this, we have increased our previous five outputs to seven.”</p>
	<p>Question asked to stakeholders: “Planned replacement works should be programmed between February and November to avoid bad weather months.”</p> <p>Stakeholder feedback: “[Northern Gas Networks (NGN)] should not carry out planned replacement work in the winter months and focus on gas escapes and repairs.”</p> <p>NGN feedback: “We have examined this feedback and have discounted it for the following Reasons...”</p>
	<p>“In response to stakeholder feedback we are developing a process to align the connections and capacity processes to deliver improvements.”</p>
 RIIO-T1: Final Proposals for NGET and NGGT	<p>“Several respondents said that there was a key role for consumer WTP analysis for undergrounding new transmission infrastructure, and that this would help inform the ‘economic and efficient’ level of mitigation. They argued that we should require the TOs to undertake this analysis and that it should be done at a national level because it is greater than local significance.”</p>

Source: CEPA analysis based on Ofgem’s initial assessment of network companies’ business plans documents for RIIO-1

Table E.3: Examples of how stakeholder engagement has influenced outcomes for future consumers

Licensee/Regulator	Example
	<p>The specialist innovation panel provided one way of thinking about future consumers (and how needs might change faced with changing technology) and included academic as well as practitioner expert input.</p>
	<p>WPD held workshops for ‘future customers’. This involved engaging with interested students to give them the opportunity, as future electricity bill payers, to influence and feedback WPD plans.</p> <p>WPD held qualitative round-table discussions about their future plans with respect to:</p> <ul style="list-style-type: none"> • Reducing power cuts; • Customer communication methods and the use of social media; • Climate change mitigation and protecting the network from severe weather; and

Licensee/Regulator	Example
	<ul style="list-style-type: none"> Smart networks and low carbon technology.
 RIIO-ED1 Assessment of Business Plans	Commenting on WPD's plan: "It provides evidence to demonstrate that it has engaged with a broad range of stakeholders and we note it is the only DNO explicitly to incorporate the interests of 'future' consumers."
 RIIO-GD1 Initial Assessment of Business Plans	"Although each GDN made efforts to engage with a wide range of stakeholders, it was not always possible to determine how the interests of 'future' consumers had been taken into account. We recognise however that there is an inherent difficulty in identifying any additional or competing priorities that are distinctly associated with this group."

Source: CEPA analysis based on Ofgem's initial assessment of network companies' business plans documents for RIIO-1

How willingness to pay was used in stakeholder engagement in RIIO-1

WTP is a measure of economic value. In the energy sector, WTP is a measure of what individuals are willing to pay to secure positive changes or to avoid negative changes in the provision of energy services.

WTP studies were introduced into the regulatory regime in RPI-X. For example, in DPCR3, Ofgem commissioned market research on the quality of supply for domestic consumers. In DPCR5 Ofgem undertook qualitative and quantitative research with domestic and business consumers to understand their views on quality of service and their willingness to pay for improvements. This work informed Ofgem's proposed changes to the IIS.

WTP was considered more formally in the RIIO framework. The RIIO Handbook refers to WTP with respect to different areas of the price control:

- **Stakeholder engagement:** Ofgem mentions that network companies may need to engage on, for example, customers' WTP for certain levels of reliability.
- **Financial incentives:** Ofgem states its intention, as far as possible, to base the design of incentive mechanisms on information regarding consumer WTP for different output levels.
- **Value of delivering primary outputs:** Ofgem states an ambition to consider how WTP studies can be used to estimate the value that could be provided through delivery of different levels of performance of primary outputs.

Table E.4 presents examples of how WTP was used by network companies in RIIO-1.

Table E.4: Examples on how WTP was used by companies in RIIO-1

Price control	Example
RIIO-ED1	<ul style="list-style-type: none"> SPEN: used WTP along with priorities identified by stakeholders to prepare draft plans with financial implications for customer bills.

Price control	Example
	<ul style="list-style-type: none"> • UKPN: WTP research with over 1,200 customers. The research revealed three themes that stakeholders were most engaged in: investment in infrastructure, connections and network reliability. These themes were then used as the building blocks of UKPN's business plan. • WPD: the company's awareness campaign (via newsletters and TV ads) helped underpin the consumer research around willingness to pay. WPD tested WTP for different levels of these outputs and the conclusion showed a high level of WTP for improved service. But additional research showed that consumers preferred a lower cost solution than the original WTP research had indicated.
RIIO-T1	<ul style="list-style-type: none"> • Ofgem's strategy decision set out that allowances for mitigating the visual impact of transmission infrastructure in national parks and areas of outstanding beauty should be informed by a consumer WTP analysis undertaken by the TOs. • SPTL and SHET did not complete WTP studies. SPTL felt WTP should be used on a case by case basis in respect of new infrastructure. SHET felt that it would be difficult to make the case to customers to pay for visual impact and did not commission any WTP studies for existing infrastructure as a result. • NGET commissioned a study at the time to explore WTP in relation to undergrounding of existing and new lines. The results suggested a high dispersion in WTP depending on the geographical location of the lines (higher WTP for national parks, medium WTP for areas of outstanding natural beauty and lower WTP for other rural areas.

Source: CEPA analysis based on Ofgem's initial assessment of network companies' business plans documents for RIIO-1

E.1.2. Assessment of enhanced engagement in RIIO-1

Engagement by the network companies

A review conducted by former Ofgem Partner, Maxine Frerk, showed a consensus across stakeholders that the enhanced engagement model adopted in RIIO-1 has led to a step change in engagement by the network companies in developing their business plans compared to previous price controls.¹¹⁹

Ms Frerk's review also found that stakeholder engagement was more effective in RIIO-ED1 than in RIIO-T1 and GD1, with DNOs using a wider range of engagement techniques. This view is corroborated by CEPA's own research. We note that there are two potential contributing factors:

- stakeholder engagement requirements (including a customer satisfaction incentive) were already part of DPCR5, so DNOs had a stakeholder engagement strategy in place ahead of RIIO-1; and
- DNOs had a chance to learn from the approaches taken by companies in RIIO-T1 and GD1.

¹¹⁹ [Maxine Frerk, Consumer Engagement in the RIIO Price Control Process Review, November 2016.](#)

Despite the higher quality of stakeholder engagement in RIIO-ED1, Ofgem noted that some DNOs essentially consulted on the fleshed-out business plans instead of getting early input into shaping the plans. Additionally, only a limited number of companies brought in the perspective of future consumers; those who did engaged with students and technology experts.

Overall, we consider that it was not entirely clear what was expected from engagement by the network companies, especially regarding key topics of discussion with stakeholders. This is despite the guidance provided by Ofgem on stakeholder engagement in the RIIO Handbook. As a result, it is difficult to attribute specific benefits to enhanced engagement in RIIO-1.

Engagement by Ofgem

To facilitate and inform stakeholder engagement during the price control review and throughout, Ofgem introduced new bodies or drew on existing ones:

- **Price Control Review Forum:** set up for RIIO-1 to get consumers, network companies and other stakeholders to discuss ‘big picture’ issues.
- **Consumer Challenge Group (CCG):** ‘critical friend’ to Ofgem to help ensure that the settlement is in the best interests of existing and future consumers.
- **Consumer First Panel:** meets regularly to discuss key issues impacting on consumers’ participation in the energy market, as well as other topics related to energy.

Stakeholders felt that there was limited opportunity for the Price Control Review Forum to explore issues in depth, as the forum had a broad agenda and only met occasionally. Similarly, the CCG was seen not to have been used to its full potential – it was used on broad topics, but could have focused on more specific issues. Equally, topics covered by the Consumer First Panel were not always tailored to the level of understanding of the panel – it engaged on several topics but struggled to understand and engage with the more technical issues and with the industry structure.

Overall feedback was that Ofgem seemed to put less emphasis on engagement later in the price control reviews, treating it as a secondary concern more akin to previous RPI-X price controls.¹²⁰ Finally, some network companies found themselves explaining Ofgem’s position to stakeholders, as Ofgem did not participate in company-run stakeholder events. Network companies felt that Ofgem could have had a greater presence in stakeholder engagement without compromising the intention that companies focus on stakeholder needs rather than on Ofgem’s expectations.

Overall, we consider that Ofgem’s own engagement activities needed to be targeted to the issues that stakeholders are best placed to engage with, and to the stakeholder groups best able to engage with these issues.

¹²⁰ [Maxine Frerk, Consumer Engagement in the RIIO Price Control Process Review, November 2016.](#)

Ongoing engagement in RIIO-1 – observations from the stakeholder engagement incentive

The stakeholder engagement incentives in RIIO-1 price controls were intended to encourage network companies to engage effectively with stakeholders to inform how they plan and run their businesses on an ongoing basis. The incentive carries a discretionary reward. A panel of independent experts assesses the network companies' stakeholder engagement activities and allocates the reward.

The panel reviewing GDNs and TOs' annual stakeholder engagement submissions between 2014 and 2016 made similar observations across these sectors. The panel considered that GDNs and TOs could be doing more to demonstrate how their future strategy is changing in light of engagement with stakeholders, but noted that there is evidence that GDNs and TOs have been using feedback to influence their decisions on certain projects.^{121,122} Additionally, there was a clear demonstration by some GDNs and TOs of what they want to achieve and whether their approaches have worked or not. The panel's expectations for ongoing stakeholder engagement have increased over time, which is reflected in lower scores for some GDNs and TOs in more recent years.

As with the business plans, DNOs appear to be ahead of GDNs and TOs on ongoing engagement. In the 2015/16 stakeholder engagement incentive, the panel noted a step change from tactical to strategic approaches to engagement, but considered that there is still a long way to go for some DNOs. In contrast to previous years, the panel noted that stakeholders have been more involved in thinking about future challenges, as demonstrated by some DNOs in their stakeholder engagement strategy. The panel also commented on the fact that it is important for DNO groups to set out how they are considering geographic differences across their regional distribution service areas.¹²³

In the 2016/17 stakeholder engagement incentive, the panel noted that stakeholder engagement is becoming more embedded in the businesses, but there is still a long way to go for some companies. It considered that DNOs could be doing more with respect to consumer vulnerability, particularly in how they engage with hard-to-reach customers. The panel also noted that the culture of working collaboratively is becoming more established and noted an improvement year-on-year.¹²⁴

Across all three sectors, the panel encouraged more sharing of ideas and collaboration to improve stakeholder engagement in the future. Additionally, network companies should

¹²¹ [Ofgem, Decision on the RIIO-GD1 Stakeholder Engagement Incentive 2015-16 – Gas Distribution Networks, October 2016.](#)

¹²² [Ofgem, Decision on the RIIO-T1 Stakeholder Engagement Incentive 2015-16 – Transmission Networks, October 2016.](#)

¹²³ [Ofgem, Decision on the RIIO-ED1 Stakeholder Engagement Incentive 2015-16 – Electricity Distribution Network Operators, October 2016.](#)

¹²⁴ [Ofgem, Decision on the RIIO-ED1 Stakeholder Engagement and Consumer Vulnerability Incentive 2016-17 – Electricity Distribution Network Operators, November 2017.](#)

explain more clearly how activities they presented in previous years have been developed or rolled out.¹²⁵

E.2. Stakeholder engagement in other regulated sectors

In this section we present case studies of the role of stakeholder engagement in water and airport regulation in the UK. Table E.5 summarises these case studies, with more detail in the subsequent sections.

Table E.5: Summary of notable approaches in other sectors and how they compare to energy networks

Regulator	Approach	Engagement mechanisms	Regulator's role	Sector's differences to energy networks
	Enhanced engagement	<ul style="list-style-type: none"> • Company specific consumer challenge groups • Ofwat sector-wide panel • Requirement for direct, local engagement 	<ul style="list-style-type: none"> • Ofwat hands off approach to company challenge groups • Panel for cross-sector challenge and advice 	<ul style="list-style-type: none"> • Water companies are also the local retailers (for household customers), so have existing relationship with customers • Limited technological change compared to the energy sector, so future customers' needs likely to be similar to current customers'
	Negotiated settlement	<ul style="list-style-type: none"> • Customer Forum, designed to secure agreement with Scottish Water 	<ul style="list-style-type: none"> • Water Industry Commission for Scotland (WICS) had significant strategic guidance role in practice 	<ul style="list-style-type: none"> • Publicly owned single water/wastewater company • Scottish Water is also the retailer, so has existing relationship with customers • Limited technological changes, so future customers' needs likely to be similar to current customers'
	Constructive engagement	<ul style="list-style-type: none"> • Heathrow to consult with airlines as part of developing their business plans 	<ul style="list-style-type: none"> • Light touch role for the CAA where direct customers are better placed 	<ul style="list-style-type: none"> • Airlines can distinguish themselves in passengers' eyes through the choice of airport they operate from

¹²⁵ [Ofgem, Decision on the RIIO-T1 and GD1 Stakeholder Engagement Incentive 2016-17 – Transmission and Gas Distribution Networks, November 2017.](#)

Regulator	Approach	Engagement mechanisms	Regulator's role	Sector's differences to energy networks
		<ul style="list-style-type: none"> Assumption that airlines adequately represent the views of passengers 	(cost and quality) <ul style="list-style-type: none"> More involved in other areas of the price control 	<ul style="list-style-type: none"> Airlines can compete for any added airport capacity (e.g. landing slots). This is not the case in energy, where connections are specific to the user

Source: CEPA review of regulatory publications

E.2.1. Water Industry Commission for Scotland (WICS)

In the last price control review (the Strategic Review of Charges (SRC) 2015 – 2021) WICS developed a new approach to customer engagement. The new approach relied on the Customer Forum, which was established in 2011 and played an important role in the price review process for 2011-14. WICS, Scottish Water and Citizens Advice Scotland signed a new cooperation agreement in March 2017 reforming the Forum for the 2021-27 control period. The Customer Forum is discussed below.

Table E.6: Role of the Customer Forum in SRC 2015-21

Approach
<p>The Customer Forum group was established through a cooperation agreement between Consumer Focus Scotland (now part of Citizens Advice Scotland); Scottish Water and WICS.</p> <p>The agreement states that the Customer Forum will have a formal role in the SRC process to cover:</p> <ul style="list-style-type: none"> Working with Scottish Water to complete research to establish customers' priorities for service improvement and expectations around charges. Understanding and representing customers' priorities and preferences to both WICS and Scottish Water. Seeking to secure the best outcome for consumers in the SRC process. <p>Overall the Customer Forum was responsible for negotiating directly with Scottish Water to reach agreement on its business plan. The agreement had to be consistent with Scottish Ministerial objectives for the water industry and within ranges for different elements of the price control that were set by WICS in advance of the negotiating process. Agreements outside of the ranges were permissible if evidence was provided that they were of benefit to consumers.</p> <p>Thus, the intention behind establishing the Customer Forum was to turn the price review process into a 'customer' negotiated settlement.</p> <p>The Forum managed its activities through 30 internal meetings that were held in the four-year period prior to the regulatory determination. In addition to this they held regular engagement meetings with Scottish Water and WICS, and also consulted with the Scottish government. The Forum also commissioned some consumer intelligence research and additional analytical work to support them. Research commissioned included:</p> <ul style="list-style-type: none"> Briefing Paper on the economic climate in Scotland Research report on customer willingness to pay for water and wastewater services Briefing paper on the economic conditions of people in Scotland

- Key benefits change – summary paper
- Briefing paper on factors placing household incomes under pressure.

Governance

The Customer Forum acts as an independent body, although the members are accountable to all three parties to the cooperation agreement and must act in a manner that is consistent with the aims and principles set out in the cooperation agreement.

The Forum has operational independence and flexibility to develop its activities, as long as it acts within the agreed budget and operates in a way that is consistent with the governance/ remit of Consumer Focus Scotland.

Composition

The Customer Forum consists of eight ordinary members and a Chair, all of whom were appointed jointly by the three parties.

Some of the key features of the team that was selected for the last price control review include:

- The members participated in the Forum in an individual capacity rather than as representatives of organisations/ groups of customers.
- The individuals came from a range of backgrounds with experience from consumer affairs, law and regulation, business and policy.

Funding arrangements

The 2011 cooperation agreement stipulated that the Customer Forum would have an annual budget of £175,000 from WICS' annual levy to cover staff, programme and running costs - including commissioning new research.

The 2017 cooperation agreement set an annual budget of £250,000 for the four financial years from 2017-21, with an increase to £375,000 in 2019-20 (i.e. £281,250 p.a.). WICS and Scottish Water are also providing un-costed hosting and support services.

Defined powers

The Forum had an 'ad-hoc' status in many respects. Whilst it had a formally recognised role within the review process, it had no statutory remit, legal status nor an individual operating procedure. WICS retained overall formal decision making within the price control process, but made it clear that it would be 'minded to accept' the agreements made by the Forum and Scottish Water.

Role of the regulator

If the Forum and Scottish Water had failed to reach an agreement, WICS was responsible for using the old approach to reaching a regulatory determination. If no agreement was reached the Forum would have to provide a report to WICS that explained the main issues on which agreement could not be reached.

Sources:

- Customer Forum, Legacy report, Lessons learned from customer involvement in the 2015 – 2021 Strategic Review of Charges, 2015.
- Commissioning letter to Peter Peacock, Chairman of Customer Forum.
- Co-operation agreement.
- WICS, Overview of the Strategic Review Process, appendix 3.

E.2.2. Ofwat

PR14

In PR14 Ofwat moved towards a new approach which focused on customer outcomes. Ofwat published a policy statement on its approach to customer engagement at the start of PR14, which set out the expected roles and requirements with regards to engagement for the regulator, the regulated companies and customers.

Ofwat's approach for PR14 included the use of CCGs, a customer advisory panel and direct local engagement by the companies (and Ofwat). Below we review the role of CCGs in PR14.

Table E.7: The role of CCGs in PR14

Approach
<p>Under the CCG approach each of the regulated water and sewerage (and water only) companies are responsible for establishing and supporting an independent CCG. The CCG is responsible for providing an independent challenge to the companies and acting as a source of independent assurance to Ofwat on the quality of the company's customer engagement and the extent to which the results of engagement affect the company's decision making and are reflected in the company's business plan presented to Ofwat. For PR19 Ofwat are considering taking steps to strengthen the process, including providing more clarity on the expected role and coverage of the CCGs and also the membership of the CCGs.</p> <p>In addition to supporting the PR14 review process a number of the regulated companies have retained the use of CCGs during the price review period, with the CCG being used to help validate the extent to which the company is delivering the business plan outputs.</p> <p>Effectively the CCG acts as a group of selected expert representatives of customers providing input on strategic issues. The company needs to strike the balance in ensuring that the views of the group reflect more general customer views and does not replace the company's direct engagement with consumers.</p> <p>Ofwat's policy statement states that it expects the CCG to have an important role in considering (but not providing assurance on) technical issues during the review process.</p>
Governance
<p>Apart from the fact that they are meant to be independent of the regulator and the companies, the governance of the CCGs is the responsibility of the different companies and the CCGs themselves. We summarise Affinity Water's CCG below.</p> <p>Affinity water</p> <p>Affinity Water publishes details relating to its CCG on its website including: composition of the group; terms of reference; minutes of the meetings; a report by the Chair that summarises the activities and findings of the Group; and other relevant papers.</p> <p>The terms of reference for the CCG were updated in light of Ofwat's statement with regards to customer engagement for PR19. The key points related to governance include:</p> <ul style="list-style-type: none">• The reporting requirements – an annual report that comments on the quality of Affinity's engagement; a report to Ofwat alongside Affinity's business plan at PR19 reflecting on the quality of engagement and extent to which it is reflected in the business plan.• The CCG is described as being 'ultimately responsible to Affinity'.

- The terms of reference set out expectations around the role of the Chair and the ways of working (maintaining confidentiality, declaring conflicts of interest, attendance at meetings etc.).

Composition

The composition of the different groups varies across the different companies. However, Ofwat's policy statement during the last price control stated that at a minimum it expects the group to include a representative from:

- Consumer Council for Water
- Business customers
- Other key stakeholders, including local authorities and local community
- Customers with special needs such as Age UK, Action on Hearing Loss
- The quality regulators.

The Chair of the CCG is to be independent and be supported by a secretariat.

In the case of Affinity Water, the terms of reference state that the CCG will have no more than 20 members. The Chair will be appointed by Affinity based on the recommendations of their independent non-executive Directors (who will also agree appropriate terms and remuneration).

Funding arrangements

The company will provide secretariat and administrative support and costs, as well as covering the salary of the Chair.

Defined powers

Ofwat retained the overall responsibility for decision making for the price control, taking a risk-based approach to the customer-focused outputs. The output of the customer engagement was described as being a 'key factor' in helping Ofwat to reach its decisions on the companies' business plans, however Ofwat noted that it is not the only factor.

Right to appeal decisions

The CCG does not have a defined role in the appeals process.

Role of the regulator

Ofwat did not provide prescriptive guidance on how companies should interact with customers. However, it did issue a policy statement on customer engagement that sets out the overarching requirements for the regulated companies, which included: describing the type of issues that it expected the CCGs to be involved in; the composition of the group; and some illustrative Terms of Reference. Ofwat expected that each company would adapt the terms of reference to reflect their local conditions.

Ofwat monitored the extent of engagement throughout PR14 in two ways: through CCG Chair Workshops that were held on a periodic basis and via email communication with the CCG Chairs.

Sources:

- Ofwat, Involving customers in price setting – Ofwat's customer engagement policy statement, 2011.
- Ofwat, Ofwat's customer engagement policy statement and expectations for PR19, 2016.
- Affinity Water, CCG Chair's report, 2016.
- Affinity Water, Terms of Reference for Affinity Water Limited Customer Challenge Group, 2016.

PR19

Ofwat has highlighted customer engagement as a top priority for PR19. It expects water companies to engage on affordability, customer service and resilience, and to adopt more innovative approaches to customer engagement.¹²⁶ Ofwat's customer engagement methodology outlines the roles of companies, CCGs and Ofwat in customer engagement.

The methodology document states that Ofwat expects companies to show in their business plans how they have started to take into account the following four themes:

- futures (similar to Ofgem's future consumers, Ofwat expects companies to engage customer on long-term issues, including resilience and to use creative ways to do so);
- action (customer behaviour change);
- community (community ownership); and
- experience (customer control and service experience).

Ofwat will test customer engagement in our initial assessment of business plans as follows:

Initial assessment test on customer engagement¹²⁷

What is the quality of the company's customer engagement and participation and how well is it incorporated into the company's business plan and ongoing business operations?

In assessing this test, Ofwat will take into account evidence that the company has:

- effectively addressed the principles of good customer engagement including, but not limited to, evidence from its CCG;
- effectively taken forward the themes of customer participation including, but not limited to, evidence from its CCG;
- engaged effectively with customers on longer-term issues such as resilience, and taken into account the needs and requirements of future customers.

Additionally, Ofwat provided guidance on customer participation in a separate report published in March 2017.¹²⁸ The report suggested some practical ways of carrying out customer participation and gave stakeholders a better understanding of what they could achieve.

E.2.3. Civil Aviation Authority (CAA)

The CAA's approach to consumer engagement during the last price control of Heathrow (Q6) consisted of three main elements:

- a process of 'constructive engagement' requiring Heathrow Airport Limited (HAL) to

¹²⁶ Including with vulnerable and hard to reach customers.

¹²⁷ [Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017](#)

¹²⁸ Ibid.

discuss its initial and final business plans with airlines during structured interactions;

- a consumer panel established by the CAA to provide scrutiny on its approach to understanding passenger priorities including, but not exclusively, in relation to price controls; and
- direct passenger research.

In addition to the above, for the next price review of HAL (H7), the CAA will introduce a H7 consumer challenge forum.

Below we discuss the CAA's use of constructive engagement. We also review the approach to ongoing engagement regarding HAL's capex programme.

Table E.8: The role of constructive engagement in Q6

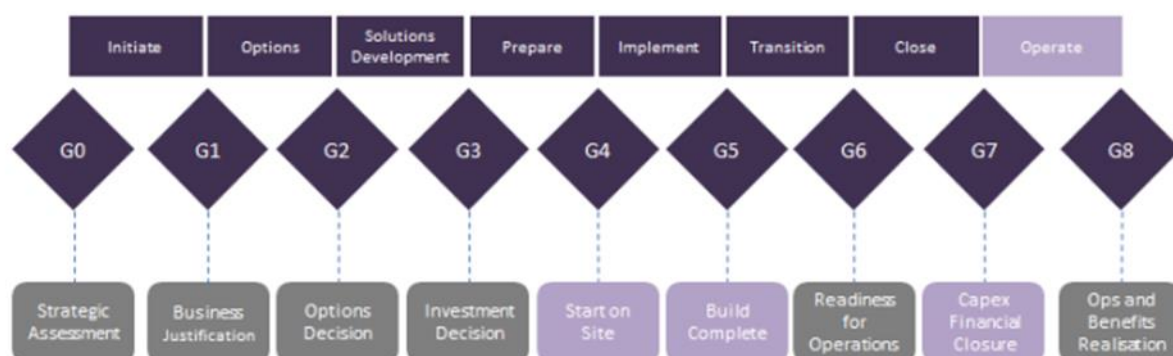
Approach
<p>One of the approaches used by the CAA to ensure consumer engagement is through the 'constructive engagement' model. This model requires the regulated airlines, airports and NATS (air traffic control) to consult with one another whilst developing their plans for price control periods. The airlines and airports are expected to engage directly on all areas relating to the regulatory building blocks to identify areas of joint agreement, or indeed where they do not agree. The coverage of constructive engagement was broadened for Q6.</p> <p>In Q6 HAL was required to establish a Constructive Engagement Working Group (CEWG) which was to include a fair representation of its airline customer base.</p>
Governance
<p>The CAA have issued guidance that sets out the process through which engagement is meant to take place. The guidance sets out the CAA's expectations of the different parties during the engagement process (e.g. levels of input and representation).</p> <p>Through the CEWG the airports and airlines are required to: agree a plan and code of conduct for proceeding through the constructive engagement process; provide both minutes of meetings and a record of statement that defines all areas of agreement and disagreement; and more generally to 'respect the process'.</p>
Composition
<p>Passengers are not directly represented; rather the approach assumes that the airlines can adequately represent the views of passengers. For H7 the CAA is introducing a consumer challenge forum.</p>
Funding arrangements
<p>HAL is required to host the meetings and provide the CEWG with meeting venues at its expense. The other costs, in terms of staff time etc. are presumably borne by the different participants.</p>
Engagement process
<p>There was no set number of meetings required, instead at the beginning of Q6 the CEWG was given a specific deadline by which it was expected to submit its report to the CAA.</p> <p>The final deliverables produced by the constructive engagement process are the minutes from the meetings and a report on findings following the high-level template set out in the guidance document.</p>

Defined powers
<p>The results of the constructive engagement process are expected to provide an input into the decisions made by the regulator; however legally the regulator retains overall decision-making powers.</p> <p>However, the CAA note that, subject to their view of the extent to which the agreed decisions emerging from the constructive engagement process are consistent with the best interests of consumers, the CAA 'would be minded to adopt agreed outcomes and to incorporate them into CAA's own proposals'.</p>
Right to appeal decisions
<p>There is no specific right to appeal within the process.</p>
Role of the regulator
<p>Within the engagement process, the regulator is able to step in should it become clear that the 'constructive engagement' approach is unlikely to produce an agreement. For instance, a lack of progress within Stansted Airport's price control resulted in reversion to the traditional regulatory model.</p>
<p>Sources:</p> <ul style="list-style-type: none"> • CAA, Airports' economic regulation review for Q6, CAA mandate for constructive engagement at Heathrow, 2012. • CAA, Airports' economic regulation review for Q6. CAA mandate for constructive engagement at Gatwick, 2012. • CEPA, Constructive engagement in the aviation sector, 2012.

Ongoing capex governance framework

As part of the Q6 price control determination, HAL stakeholders adopted a new approach to managing its capex expenditure to account for the high degree of uncertainty regarding the cost and scale of its projects at the time of the price control. Under this capex governance process, projects are managed over the five-year regulatory period under a framework whereby projects must pass a series of stages or “gateways” in order to allow costs to be recovered through Heathrow’s allowances. This gateway process is summarised in Figure E.1.

Figure E.1: Heathrow project gateway process



Source: Heathrow Capex Efficiency Handbook

Under this framework, projects are defined as either “development capex” or “core capex”, with the former referring to projects up until completion of Gateway 3 (G3, or investment

decision), while the latter referring to projects that have completed G3. At the start of a price control period, projects are allocated to development and core capex “pots”. The core capex pot is fixed at the time of the price control decision, given the higher degree of certainty around scope and timing, while the development capex pot is indicative. The price cap calculated at the time of the determination is revised within the five-year period to account for projects that transition from development to core capex. At the time of determination, all development capex projects are expected to be delivered during the five-year price control period.

Prior to G3 or investment decision, extensive discussions are held regarding the design and options for delivering projects, and in general investment programmes must be agreed with the airline community. This is achieved through their involvement in the Capital Portfolio Board (CPB), which manages and monitors the HAL portfolio of projects (£3.3bn in Q6). It is comprised of representatives of both HAL and the airlines, with the CAA as an observer.

This approach reflects the CAA’s relatively light-touch approach to regulation, with airlines seen as having a better understanding of the technical detail of projects. It is also assumed that airlines’ interests and views are to a great extent aligned with airport passengers in terms of obtaining services at reasonable costs and achieving value for money.

CPB meetings are held monthly, and a number of working groups and meetings are also held to inform the CPB, including meetings held between airlines before CPB. In their pre-meetings, the airlines decide which projects listed for investment decision they agree upon, and which they do not have as much comfort or assurances to agree on. CPB meetings then focus on the latter projects. For projects where airlines have less comfort, rather than rejecting projects altogether, the airlines may place additional requirements on HAL or insist that projects are split so that they proceed in parts.

CEPA recently reviewed the HAL capex governance process. Below we summarise our key observations from the review.¹²⁹

Cost escalation

Project costs have often escalated significantly between G2 (options decision) and G3, and because airlines may not have been involved in earlier gateways or because of significant changes in project design, there is a considerable degree of explanation required from HAL on why the changes have taken place and the processes it has gone through to establish scope and costs. This degree of change places a significant burden on the airport and airlines as they work towards being able to agree on investment.

Resourcing to carry out project scrutiny

Airlines tend to have relatively limited resources and skill set to carry out capex scrutiny. While they seek to use these effectively, airlines are not in a position to act as an *ex ante*

¹²⁹ For further details please see [CEPA, Review of Heathrow Airport’s Q6 Capex Governance Framework, 2017](#).

arbiter on many of the projects they are expected to review. Airlines are often reliant on HAL for information and data, which makes it even more difficult to carry out an independent assessment. Some of these issues are alleviated by the Independent Fund Surveyor (IFS), which acts as an independent party that reviews the extent to which projects are delivering efficient costs. There are also benchmarking requirements on HAL when considering projects.

However, the IFS is an independent advisor to the CAA, HAL and the airlines themselves. As such, airlines do not see or perceive the IFS as a true advocate of their view. In some cases, airlines have undertaken their own benchmarking of costs and found that unit costs offered on the market are significantly lower than those proposed by HAL. However, it is often not possible to make such comparisons for more complex projects due to resourcing issues, meaning that airlines are generally unable to review costs appropriately and consider that they are not able to extract value for money.

Reluctance to halt investment decisions

Participants in the CPB often feel that it is not acceptable to halt project progress at the critical G3 stage due to the potential knock-on effects on the wider programme and the associated costs of doing so. This has often resulted in project managers not being fully prepared for the G3 decision, and has also added further tension to the relationship between airlines and HAL, as airlines often feel they are being pressured into decisions. The process can also create additional work when compromises are reached on projects (such as splitting them rather than requesting that they are re-designed).

Summary of HAL capex governance

Notwithstanding the issues outlined above, many have noted that the Q6 capex governance process is a substantial improvement on the previous price control period, and there is a commitment by all stakeholders to make the governance process work and to improve on it. Many have praised the role of the IFS as an informed and independent stakeholder that has given more confidence to the airlines on the capex governance process, and has also provided more transparency and clarity on the process. Many have also praised the introduction of cost benchmarking on contracts, which is taken by another independent third party, as a good mechanism to verifying the costs and risk management processes.

Observations and lessons for Ofgem

Rationale for processes

The introduction of this capex governance process for Heathrow was primarily to overcome the high degree of uncertainty associated with its capex programme at the time of the price control determination. In addition, HAL's capex programme contains several large and relatively unique projects. Some lessons could be drawn for larger more unique projects in energy, such as those being considered as part of SWW.

While there is an element of consultation included in SWW programmes, the role of the equivalent stakeholders in the energy sector (such as generators or shippers) is far less involved than airlines' role in HAL's capex programme. In SWW, expenditure assessments are largely taken by Ofgem (with support of consultancy assessments). While Ofgem's decision takes stakeholder decisions into account, there may be benefits of stakeholders having a greater role in the determination of SWW expenditures.

One key element of the governance process is the formalising of meetings between companies and HAL via the CPB to determine whether projects should be approved for G3. The appropriateness of this for the energy sector depends on the nature of the projects. For example, connection projects may only be of interest to those directly affected by the project, with others be less willing or interested to participate. As such, a platform arrangement whereby individuals are permitted but not required to engage could be more appropriate.

Role of the regulator and direct customers

In both energy and aviation there are concerns on the extent to which direct customers' (suppliers, airlines) interests are aligned with those of end-customers. For example, airlines may place greater weight on certain expenditures being taken than customers, such as projects that help to improve airline operations but have limited or no material impact on customer prices or airline experience.¹³⁰

Issues regarding the alignment of customers and suppliers in energy are well-known. For example, given the relatively inelastic demand for energy, to what extent do suppliers in the energy sector face the same incentives as airlines to reduce regulated costs for customers? Energy network costs affect all suppliers in the same manner, whereas the degree to which airport costs affect individual airlines varies given alternatives available in terms of the different airports that can be used by passengers. As such, the extent to which there are parallels between the incentives of suppliers and airlines to act as the provider of scrutiny may be limited.

Further, as noted above airlines have often felt that they have not been in positions to adequately challenge expenditure programmes given that they lack the skill set or resources to do so. Such issues may also resonate with energy sector stakeholders, given the wide information asymmetries that apply in the sector. If more formalised engagement were to be pursued in the energy sector, an independent role such as that played by the IFS for HAL capex governance may be appropriate to ensure a balanced view is taken into account. However, this would also need to account for the relatively more involved role that Ofgem has had in regulating networks relative to the CAA approach to regulating HAL, and specific roles for such a body would need to be defined in order to avoid duplicating the work of Ofgem.

¹³⁰ An example of this may include projects to improve the speed at which baggage is handled at the airport, which while may support airline operations may not necessarily impact customer experience.

ANNEX F DEALING WITH UNCERTAINTY

This section reviews the use of a number of uncertainty mechanisms in RIIO-1, as well as summarising the approach other UK regulators have taken to dealing with RPEs.

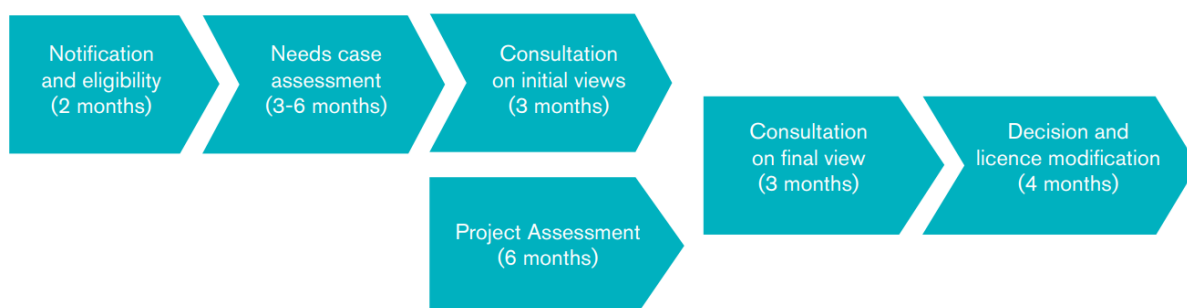
F.1. Uncertain investment in RIIO-1

Below we discuss a number of examples of where uncertainty mechanisms have been used in RIIO-1 price controls.

F.1.1. Strategic Wider Works

Figure F.1 shows the processes that are undertaken during a SWW determination.

Figure F.1: SWW process



Source: Ofgem SWW Factsheet

Since April 2013, the following projects have had funding approved as part of SWW, all of which are within the SHET area:

- Kintyre-Hunterston;
- Beaully Mossford; and
- Caithness Moray.

In addition, as of January 2017 seven projects were being assessed or being considered for assessment under the SWW mechanism. These are highlighted by the System Operator as part of the annual Network Options Assessment report. Table F.1 provides key information on allowances and experiences included under the SWW mechanism.

Table F.1: Summary of proposed projects

Project	Kintyre-Hunterston	Beaully Mossford	Caithness Moray	Total
Initial proposed cost (2013/14 prices)	£212m	£54m	£1,223m	£1,489m
Final allowance (2013/14 prices)	£197m	£53m	£1,118m	£1,368m
Difference	-£15m	-£1m	-£105m	-£121m

Project	Kintyre-Hunterston	Beaully Mossford	Caithness Moray	Total
% difference	-7%	-2%	-9%	-8%
RIIO T1 final determination estimation (2009/10 prices)	£188m	£35m	£937m	£1,160m
Final allowance (2009/10 prices)	£174m	£46m	£976m	£1,196m
Difference	-£14m	£11m	£39m	£36m
% difference	-7%	31%	4%	3%

Source: CEPA analysis of Ofgem publications

Note: Some 2009/10 prices have been estimated using ONS data on annual RPI figures. Numbers have also been rounded.

Over the three projects, SHET was able to recover an estimated £36m (3% more) in additional revenues compared to total cost estimations made at the time of the final determination. This is equivalent to less than 1% of SHET's totex allowance for RIIO-T1.

It is too early to make definitive conclusions on the appropriateness of the SWW. But we note that significant cost reductions were made between SHET's initial proposals and final allowances, suggesting the mechanism can help introduce some efficiencies. Given the relatively small impact lower value SWW projects have on efficiencies, and the administrative burden of the mechanism, it may be appropriate to increase the cost threshold for projects to be considered under SWW, particularly for SHET and SPTL.

Further details of their implementation are discussed below.

Kintyre-Hunterston

The Kintyre-Hunterston project reinforced the transmission system around the Kintyre peninsula in the South West of Scotland, and will accommodate future renewable generation projects in the area. The project specifically comprises:

- a new substation in Crossaig Forest;
- replacing the existing overhead line between Carradale and Crossaig with a higher capacity double circuit overhead line; and
- installing two subsea cable circuits from the new substation around the north coast of Arran to Hunterston.

While the majority of this project is within the SHET transmission region, 3.5km of cable and associated substation works are in the SPTL area. However, the SPTL share of the works were covered within its RIIO baseline allowance and therefore were not subject to the SWW arrangements.

SHET issued its needs case (stage one) for the project in January 2013, and following Ofgem's assessment and consultation published their "minded-to" position in July 2013, which saw

the project as being justified, having an appropriate timetable and technical scope and being in the interests of customers. The scale of the project benefit was expected to be in the order of £526m over the life of the project, depending on the generation connected.

Ofgem then appointed independent consultants to help conduct the project assessment (stage two). A summary of this assessment is provided in Table F.2.

Table F.2: Project assessment and decision - Kintyre-Hunterston

Focus area	Description	Decision
SWW Output	The additional project capacity would be available from Q4 of 2015/16, although spending on the project would continue into 2016/17. The consultants saw the construction programme as challenge in terms of its timetable, but good given time constraints. The delivery schedule would be heavily dependent on subsea cable installation.	Additional transfer capability of project was agreed at 270MW.
Project cost	Project costs were seen as being appropriate and consultants considered the procurement processes as being robust and efficiently applied, although it was noted that had the process started earlier there may have been scope for increased efficiencies and subsequently lower risks. Costs were determined appropriate with the exception of some costs under risk and uncertain elements (see below). However, adjustments were made in light of further detail being provided following the signing of key contracts.	Allowed expenditure reduced by £6m to reflect new information.
Risk and uncertain costs	Risk allocation and uncertainty were determined to be dealt with appropriately with the exception of two areas. First, SHET was seeking a risk allowance of P70, but this was subsequently revised to P50 to allow for risks of overruns to be equally shared by the company and customers as opposed to greater risk being borne by customers. Second, some uncertain costs were included in construction funding that were assessed to be uncertain by consultants. As a result costs were included in the risk allocation, lowering the amount included in the funding for construction.	Allowed expenditure reduced by £9m to reflect alternative treatment of risk.

Source: Ofgem

As a result of the project assessment, Ofgem allowed SHET an additional totex of £197m (2013/14 prices), which was £15m less than the initial requested allowance.

Beaully Mossford

The Beaully Mossford project consisted of a reinforcement of the transmission system in the North West of Inverness being undertaken by SHET. This included:

- the construction of a new substation at Corriemoillie;
- the replacement of the existing 132kV overhead line and tower infrastructure with a double circuit 132kV overhead line; and
- an element of underground cable.

Prior to the implementation of the RIIO price control, funding for the construction of the

substation at Corriemoillie was provided under the Transmission Investment Incentive. However, it was agreed as part of the final price control determination that from 2013/14 onwards remaining funding would be addressed through the SWW mechanism.

The project assessment submission for the final stage was submitted in May 2013. Details of this assessment are provided in Table F.3.

Table F.3: Project assessment and decision – Beaully Mossford

Focus area	Description	Decision
SWW Output	The Project Assessment consultants saw no major issues with the programme nor the proposed outputs.	Additional transfer capability of project was agreed at 252MW.
Project cost	Overall costs were seen as reasonable and in line with benchmarks. In addition, procurement processes were seen as robust. However, Ofgem felt that the tendering process could have started earlier so that efficiencies could be incorporated into project costs. Following the finalisation of contracts, costs also increased marginally from initial estimates. The majority of concerns for the project were associated with risks and uncertain costs (see below). Some costs were also transferred from the Beaully Denny project to this project, which resulted in an increase in project costs but a transfer in allowances	Costs excluding provisional sums and risk allowances increased from \$44.5m to £45.1m. Costs of the project associated with the Beaully Denny project were £4m.
Risk and uncertain costs	SHET wished for the level of risk protection to be at the P70 level. However, Ofgem decided to set it at the P50 level, reflecting the risks of the project and the protection provided to SHET for non-residual risks (e.g. through insurance, the sharing factor and re-opener provisions). SHET also requested greater provisional sums to cover uncertain construction costs. However, Ofgem felt that these risks were due to the limited amount of site inspection that was taken by SHET before tendering the work, which SHET stated did not take place due to uncertainties associated with obtaining planning consents. As a result, rather than providing certain provisions for these costs, Ofgem provided them under a P70 scenario.	Allowances for the project were reduced by £1.6m.

Source: Ofgem

Following the project assessment, an additional £53m (2013/14 prices) was awarded to SHET for undertaking the SWW, which is £1.4m less than the original request made by SHET. The project was successfully delivered at the end of 2015.

Caithness Moray

The Caithness Moray project is a large reinforcement of the transmission system in the far north of Scotland, providing additional transmission capacity to export power from the expected increase in onshore renewable generation in the Caithness area, as well as new generation located on the Shetland and Orkney islands.

The project assessment undertaken by Ofgem for this project was submitted in October 2014, and the overall costs of the project were considered not to have been justified. In particular, Ofgem considered that the construction costs for the HVDC link and the onshore works were at the higher end of the efficient range. However, the main concerns were with SHET's proposed staff resourcing and the residual risks it was managing, which Ofgem determined were excessive based on the evidence SHET presented. This differs significantly from the experience of the other two projects that were subject to the SWW mechanism, where only minor changes were envisaged.

Following initial assessments and consultations on the proposed costs, Ofgem finally agreed to allow SHET to recover an additional £1,118m (2013/14 prices), which was £105m less than the original amount proposed by SHET.

F.1.2. Re-openers

Table F.4 summarises the re-openers related to network use where Ofgem has published a consultation or decision.¹³¹ We make the following observations:

- Re-openers have been used for a wide range of network-related expenditure, which demonstrates their relative flexibility and applicability for overcoming uncertain costs.
- Ofgem has used the re-opener mechanism to reject or reduce initial requests through re-opener mechanisms, suggesting that in some cases the mechanism has enabled allowances to be lower than what might have been allowed if these projects were included in the baseline at the price control review stage.
- It should be noted that re-openers with associated revenues attached to them have only been triggered when costs go above a certain materiality threshold, which are set out in the special licence conditions. This means that re-openers are only triggered for significant cost variations from baseline assumptions.

As is the case with SWW, the benefit of re-opener mechanisms depends on the extent to which both network companies and consumers may value them. For companies the benefit of these over *ex ante* allowances is the reduction in risk relating to allowances being sufficient to cover the costs incurred where those costs might be highly uncertain at the time of price control review. For consumers, the benefit is derived from ensuring that such uncertain costs are not provided with significantly higher *ex ante* allowances than realised costs.

The other factors that need to be considered when assessing the benefits of re-openers are the implementation costs in terms of resources required to assess whether costs should be allowed, both internally to Ofgem as well as external support required to undertake assessment. While this may be small, in some cases these could account for a high proportion of what cost allowances are being considered.

¹³¹ Note that re-openers are in place for some areas not related to network use (e.g. smart metering).

Table F.4: Re-openers used in the RIIO price control related to network use to date

Re-opener (sector)	Description	Requested allowance	Status (date)	Ofgem position
Industrial Emissions Directive (IED) (gas transmission)	Additional allowance to allow NGGT to comply with the IED.	£41m	Decision (September 2015)	Additional allowance rejected due to a full CBA not being included by NGGT in the request, plus NGGT did not provide sufficient information on the project to enable stakeholders to engage effectively. NGGT is able to submit another re-opener request during the 2018 window.
IRM allowance (electricity transmission)	Request from SPTL to install a new type of conductor on two transmission lines, as opposed to building a new line to reinforce the network to accommodate new wind generation.	£24m	Decision (September 2015)	Additional allowance accepted due to Ofgem viewing additions as providing value for money to customers and environmental benefits.
Deferral of application window for Subsea Cable Costs of SHEPD (electricity distribution)	Request from SHEPD to defer application for recovering costs related to protection costs of subsea cables under the National Marine Plan. Deferral request from 2016 to 2018. This would allow SHEPD more time to take full CBA and assess cost efficiency.	N/A	Minded-to (May 2016)	Accept deferral of window to 2018.
SHEPD Competitive Process Costs (electricity distribution)	Additional funding request for implementing a competitive process to identify an enduring New Energy Solution in Shetland.	£2m	Decision (September 2017)	Accepted adjustment to SHEPD allowances.
SPMW and SPD Link Box costs (electricity distribution)	Proposed increase of SPMW costs related to managing the asset risk for Link Box costs, as well as a proposed decrease in SPD costs.	SPMW: £28m SPD: £8m decrease (proposed by Ofgem)	Minded-to (October 2017)	Ofgem minded-to provide an additional £23.4m for SPMW costs, £4.8m less than requested, due to proposing lower unit costs and reducing indirect cost allowances. For SPD, Ofgem is minded not to reduce allowances.

Source: CEPA analysis of Ofgem publications

Note that figures are in 2012/13 price base.

F.2. How should the regulatory framework address uncertainty around future utilisation of the networks?

The risk of asset stranding and/or under-utilisation differs between gas and electricity. In the electricity sector, high levels of distributed generation may result in lower demand for network-supplied electricity. Specific assets may also become stranded as a result of generation plants being decommissioned before the connecting network assets have reached the end of their asset life. In gas, overall demand has been declining for a number of years. There is also a risk of specific assets becoming stranded due to displacement of suppliers to the grid with, for example, alternative entry points being used due to previous supply contracts expiring.

The relevant considerations for how the regulatory framework addresses these risks are likely to be different between existing assets and those that have not yet been constructed. Therefore, the appropriate solutions would also be different.

Outside of the RIIO price controls, cost-reflective network charging is the key for ensuring efficient use of existing assets and has a role in signalling the need for new investment. Within the RIIO framework the risk of stranded existing assets can be addressed through front-loaded depreciation profiles, which bring forward the recovery of sunk network costs. Ofgem introduced front-loaded depreciation profiles in RIIO-GD1, and this could potentially be further enhanced in RIIO-GD2. However, this would increase charges in the short term, potentially incentivising customers to reduce demand or disconnect from the network altogether.

An alternative has been offered by Professor Michael Pollitt in a paper for the RPI-X@20 Review. Professor Pollitt suggested that, as distributed energy resources become more viable alternatives to network-supplied energy, it may be efficient to introduce the right to buy parts of a local network in order to optimally configure a micro-grid and/or local energy service company.¹³²

F.3. Approach to RPEs in other UK regulated sectors

Generally, the other UK regulators no longer specifically address RPEs in their price reviews. Ofwat implicitly included the effects in the time trend of its econometric modelling, while both the ORR and CAA removed RPEs in their most recent price control reviews. Both the ORR and CAA noted the uncertainty inherent in forecasting RPEs, and low or negative RPEs as two possible justifications for removing them.

¹³² [M. Pollitt, Does Electricity \(and Heat\) Network Regulation have anything to learn from Fixed Line Telecoms Regulation?, paper for Ofgem's RPI-X@20 Review, April 2009](#)

F.3.1. ORR: Network Rail Control Period 5 (CP5)¹³³

ORR considered it possible for Network Rail to efficiently control the effect of input price inflation and so determined that Network Rail should be exposed to the risk of any deviations from RPI during CP5 (2014-19). The ORR considered that the risk surrounding a forecast of input price inflation should be dealt with through Network Rail's balance sheet buffer.¹³⁴

Ultimately, the ORR decided to make no explicit adjustments for input price inflation due to the following considerations:

- Network Rail assumed a low level of price inflation over CP5 (see Table F.5);
- the uncertainty in forecasting and measuring input price inflation; and
- ORR's financial framework of not providing Network Rail with upfront funding for risks.

The ORR noted that at the previous price control it did adjust allowances for forecast RPEs, but that actual levels of input price inflation during CP4 were significantly lower than the adjustments. This led to Network Rail financially benefitting from these forecasting errors.

Table F.5: Network Rail's input price inflation forecasts over CP5

Expenditure	Input price effect (per annum)
Support and operations	0%
Maintenance	0%
Renewals	0.7%

Source: [ORR, Periodic Review 2013: Final determination of Network Rail's outputs and funding for 2014-19, October 2013](#).

F.3.2. CAA: Q6 Heathrow (2013-19) and Gatwick (2014-21)¹³⁵

For capital expenditure, the CAA has in the past included an extra allowance in addition to RPI to provide for the tendency of construction prices to rise faster than general inflation. However, comparisons of Construction Output Price Index (COPi) and RPI forecasts (see Table F.6) suggested COPi will be lower than general inflation across the price control period. Given this and the uncertainty involved in the forecasts, the CAA did not include an allowance for COPi in excess of RPI for Q6 final proposals.

¹³³ [ORR, Periodic Review 2013: Final determination of Network Rail's outputs and funding for 2014-19, October 2013](#).

¹³⁴ The balance sheet buffer is the difference, at a point in time, between Network Rail's actual level of financial indebtedness and the level of financial indebtedness allowed by its network licence.

¹³⁵ [CAA, Economic regulation at Heathrow from April 2014: final proposals, October 2013](#). [CAA, Economic regulation at Heathrow from April 2014: final proposals, October 2013](#). [Civil Aviation Authority, Economic regulation at Gatwick from April 2014: final proposals, October 2013](#)

Table F.6: Comparison of COPI and RPI

Financial year	COPI	RPI	Real COPI
2012/13	3.9%	4.0%	-0.1%
2013/14	1.7%	3.8%	-2.1%
2014/15	1.0%	3.5%	-2.5%
2015/16	1.4%	3.3%	-1.9%
2016/17	2.6%	3.3%	-0.7%
2017/18	3.3%	3.3%	0.0%
2018/19	3.7%	-	-

Source: [CAA, Economic regulation at Gatwick from April 2014: final proposals, October 2013](#).

F.3.3. Ofwat: PR14 (2015-20)¹³⁶

In previous price controls Ofwat has applied RPEs but for PR14 RPEs were implicitly captured in the time trends of the econometric models used to set cost allowances. This process resulted in an implied real annual change in costs of +0.4%.

The CMA considered the use of RPEs during Bristol Water's appeal of the PR14 determination. It found Ofwat's implied cost trend of 0.4% to be overly generous – it was, for example, higher than that assumed in Bristol Water's own business plan analysis (-0.9%).

¹³⁶ [CMA, Bristol Water plc: A reference under section 12\(3\)\(a\) of the Water Industry Act 1991: Report., October 2015](#).

ANNEX G INNOVATION

This annex reviews the innovation mechanisms used in Ofgem's regulatory framework, and summarises the approaches taken in other UK regulated sectors and in the energy sector in Australia.

G.1. Ofgem's approach to innovation

Ex ante price controls incentivise network companies to seek efficiencies that provide the highest immediate returns. Research and development (or innovation) requires upfront expenditure, with no guarantee that it will lead to savings in the longer term. As such, *ex ante* price controls incentivise companies to minimise expenditure on innovation. This reduces the scope for dynamic efficiency that could result in lower costs and better service for customers over time. Ofgem has previously observed that the RPI-X framework was successful at driving operating efficiency, but less so in encouraging network companies to adopt technological changes or develop new commercial arrangements.¹³⁷

To facilitate the transition to a low carbon energy system and to ensure security of supply, Ofgem introduced the Innovation Funding Initiative (IFI) in DPCR4 to support testing of network equipment, and the Low Carbon Networks Fund (LCNF) in DPCR5 to trial new technologies.

The RIIO framework aims to put innovation at the heart of what network companies do. Sustainability and long-term value for money – two of the customer impacts that RIIO seeks to achieve – are directly relevant to innovation. For example, through innovation projects, network companies can help enable the transition to a low carbon energy sector, as well as minimising their own environmental impact. Innovation projects can also deliver long-term value for money for customers whereby cost savings materialise in the future as a result of investment in innovation projects during the current price control periods.

Incentives in the RIIO framework, such as on totex over-/under-spend and the customer satisfaction incentives, promote certain forms of innovation by the network companies. Additionally, the framework includes specific mechanisms aimed at stimulating innovation:¹³⁸

- the Network Innovation Competitions (NIC);¹³⁹
- Network Innovation Allowances (NIA);¹⁴⁰ and
- the Innovation Roll-Out Mechanism (IRM).

¹³⁷ [Ofgem, Regulating energy networks for the future: RPI-X@20 Emerging Thinking - A specific innovation stimulus, 20 January 2010.](#)

¹³⁸ Note that different terms are used to describe these mechanisms at different stages of the RIIO-1 price control reviews.

¹³⁹ There is one competition for electricity and one for gas. The NIC replaced the LCNF.

¹⁴⁰ The NIA replaced the IFI.

Ofgem has stated that these mechanisms are intended to be time-limited, in order to foster a culture amongst network companies where innovation is “business as usual”.¹⁴¹ In the rest of this section we review the existing innovation mechanisms, discuss whether the learnings from innovation projects have been incorporated as business as usual by network companies, and consider whether separate innovation mechanisms are required for future price controls.

G.1.1. Overview of the RIIO innovation mechanisms

To further encourage innovation in the RIIO price control, Ofgem designed a time-limited innovation stimulus package that incorporated existing, redesigned and new innovation mechanisms along with different rules around them. Table G.1 provides a brief description of the RIIO innovation mechanisms.

In developing the RIIO framework, Ofgem noted that a single innovation scheme that spans all four sectors would have allowed to better recognise the interactions between gas and electricity, and between distribution and transmission. However, such a scheme was ultimately rejected.

Table G.1: Description of the RIIO innovation mechanisms

	NIC	NIA	IRM
Purpose of scheme	<ul style="list-style-type: none"> Annual competition to fund large, more complex, flagship development and demonstration projects. Focused on innovative projects with potential low carbon and environmental benefits to customers. 	<ul style="list-style-type: none"> Set annual allowance to fund smaller research, development and demonstration projects that can deliver benefits to customers as part of the price control period. Can cover all types of innovation. 	<ul style="list-style-type: none"> To facilitate the roll-out of proven innovations that meet certain requirements into business as usual only when such a roll-out cannot be financed under other mechanisms in the price control or does not give commercial benefits to the network company during the current price control period.

¹⁴¹ [Ofgem, RIIO: A new way to regulate energy networks, Final decision, October 2010](#). This view was recently reiterated by Ofgem: “Over time, [Ofgem] expect[s] the incentives within the RIIO framework to encourage Network Licensees to innovate as part of business as usual. In the meantime, [Ofgem] introduced a time-limited innovation stimulus package within the RIIO framework to provide additional funding to kick start a cultural change where Network Licensees establish the ethos, internal structures and third party contacts that facilitate innovation as part of business as usual.” Source: [Ofgem, Version 3.0 of the Network Innovation Allowance governance document, July 2017](#).

	NIC	NIA	IRM
Who can benefit from the funds?	<ul style="list-style-type: none"> • Network companies • Third parties (e.g. offshore transmission operators and independent DNOs (IDNOs)) can bid for NIC funds jointly with network companies. 	<ul style="list-style-type: none"> • Only available to network companies. 	<ul style="list-style-type: none"> • Only available to network companies.
How funding is awarded	<ul style="list-style-type: none"> • Companies submit bids and compete for project funding. • A panel advises Ofgem on which projects should be awarded funding.¹⁴² 	<ul style="list-style-type: none"> • Allowance set at the price control review based on Ofgem's assessment of the quality of each network company's innovation strategy (capped at 1% of allowed revenue in RIIO-1). 	<ul style="list-style-type: none"> • Companies submit their applications to Ofgem. To award IRM funding, Ofgem must be satisfied that the application related to a Proven Innovation and it also meets the IRM eligibility criteria set out in the network license.
Funding available each year¹⁴³	<ul style="list-style-type: none"> • £90m for electricity networks for 2015/16¹⁴⁴ • £20m for gas networks 	<ul style="list-style-type: none"> • Ofgem allowed between 0.5% and 0.7% of network companies' allowed revenue in RIIO-1 	<ul style="list-style-type: none"> • Two application windows throughout price control period • Depends on applications received

Source: [Ofgem, The network innovation review: our policy decision \(page 1\), March 2017](#). [Ofgem, Decision on the 2017 Electricity Distribution Innovation Roll-Out Mechanism, October 2017](#).

G.1.2. Have the learnings from innovation projects been incorporated by network companies into business as usual?

At the end of DPCR5 Ofgem commissioned a review of the LCNF – the innovation competition that was used prior to RIIO. Ofgem's consultants (Poyry) concluded that the "LCNF has encouraged DNOs to include innovation as core business, with encouraging sign of transfer to business as usual – but this is still progressing".¹⁴⁵ Poyry noted significant funding for innovation projects under the NIC, NIA and IRM, but considered that it was too early to assess the full benefits of the schemes, especially in RIIO-ED1.

¹⁴² CEPA's Non-Executive Vice Chairman, Professor David Newbery, is a member of the gas NIC expert panel.

¹⁴³ Funding levels remain constant in nominal terms, i.e. there is no adjustment for inflation.

¹⁴⁴ As the NIC tends to be underutilised, Ofgem decided to adjust this number downwards so that a total of £70m per annum is available until at least 2021 to fund flagship projects in the electricity sector. Source: [Ofgem, The network innovation review: our policy decision, March 2017](#).

¹⁴⁵ [Poyry, An independent evaluation of the LCNF: a report to Ofgem, October 2016](#), p. 2.

Implementation of innovation as ‘business as usual’ in RIIO-1

As part of this project CEPA requested every network company to explain how it implemented any innovations discovered/tested under the innovation mechanisms into its business as usual activities.

Several DNOs and one GDN highlighted that they have developed ‘initiative tracking processes’ or established an ‘innovation board’. These have been introduced in order to formalise the adoption of innovations into business as usual activities. They: assess innovation project learning, decide on areas to pursue to reduce operating costs, develop roll-out plans, allocate the projects to business owners, update the company’s policies and processes, and review and conduct training.

We present below a few examples of innovation projects that network companies have said they adopted as business as usual. CEPA has not independently verified the claims by the network companies. We note that DNOs were able to provide more evidence in response to this question than the GDNs and TOs. This reflects DNOs having had access to innovation mechanism in previous price controls.

Case study – SSEN: Constraint Managed Zones

Using learning from other innovation projects on flexibility, energy storage and demand-side solutions,¹⁴⁶ SSEN developed a new solution – Constraint Management Services – without the need for further funding.

Constraint Management Services make use of technologies providing flexibility to alleviate network constraints, and are deployed as an alternative to traditional network reinforcement to manage peak demand. A Constraint Managed Zone (CMZ) is a geographic region served by an existing network where security of supply is met through demand reducing or shifting techniques – for example Demand Side Response, Energy Storage and stand-by generation.¹⁴⁷

In 2016, SSEN announced that CMZ would be deployed as business as usual, stating that the cost of implementing CMZ will be more than offset by the savings made in network reinforcement, demonstrating clear value for their customers.¹⁴⁸

Case study – UKPN: Plug and Play

In 2011, UKPN was awarded £6.7m (out of a total project value of £9.7m) from the LCNF to fund the Plug and Play innovation project trialling distributed generation, such as wind or

¹⁴⁶ It draws from other SSEN projects that had LCN funding; Northern Isles New Energy Solutions and Thames Valley Vision, Orkney Energy Storage Park, as well as those from other DNOs. The Northern Isles New Energy Solutions and Thames Valley Vision both used localised areas (the Shetland islands and the Bracknell region respectively) as case studies for applying multiple new technologies, including demand side management, at once.

¹⁴⁷ [Scottish & Southern Electricity Networks, SSEN opens Constraint Managed Zone procurement process.](#)

¹⁴⁸ [Scottish and Southern Energy, Innovation Strategy Update, March 2016.](#)

solar power. One aspect of the trial was regarding Active Network Management—autonomous software-based control systems that monitors and instructs distributed generators to determine the level of generation in real-time. The duration of the trial was three years, from January 2012 to December 2014.

As a result of the project, UKPN committed in their RIIO-ED1 business plan to integrating Flexible Plug and Play (also known as flexible distributed generation connections) into business as usual. There has been accelerated roll-out of such connections in the Eastern and South Eastern networks. UKPN plans to complete this by 2021.

Techniques from the UKPN project have been employed by other DNOs. For example SPEN's Accelerating Renewable Connections project, which was awarded LCNF funding in 2012, built upon lessons learnt from the above trials.

Case study – NGN: Acoustic Camera and Core & Vac

In 2014, NGN combined acoustic leak detection equipment – a technology used in the water industry – and NGN's existing Core & Vac minimal excavation technique to identify leaks. This innovation project was awarded NIA funding.

167 jobs were completed during the trial period which resulted in a number of substantial benefits. We list of few below:¹⁴⁹

- increased accuracy of leak reduction;
- 33% reduction in the time taken to pinpoint leaks;
- average repair time down from four days to four hours; and
- 95% of trial jobs delivered a cost saving of 12%.

This technique has been deployed as business as usual since 2014.

Case study – SPTL funding for the project under the IRM

In 2015, SPTL applied for funding for a project under the IRM to deploy a new type of conductor on parts of its network to increase capacity.¹⁵⁰

SPTL estimated the total cost of the work as £44.5m and was seeking £24m in funding from the IRM. Ofgem found that SPTL's proposal related to a proven innovation that was not feasible to propose as part of its RIIO-T1 business plan and that the project was expected to deliver clear carbon and environmental benefits to consumers.

Ofgem's assessment concluded that SPTL's proposal was eligible for full funding under the IRM.

¹⁴⁹ [Northern Gas Networks, The Annual Network Innovation Allowance Report 2015.](#)

¹⁵⁰ [Ofgem, Decision on SP Transmission Limited's submission to the 2015 Innovation Rollout Mechanism application window, September 2015.](#)

RIIO-ED1 Smart Grids case study

The RIIO-ED1 draft and final determinations suggest that Ofgem believes DNOs should have been able to demonstrate the extent to which the LCNF and other innovation incentives have resulted in smart solutions that are expected to generate savings in RIIO-ED1 and onwards.¹⁵¹ Below we review Ofgem's approach to smart grid benefits in RIIO-ED1.

Smart solutions giving rise to Smart Grid Benefits have developed through the use of public funding (i.e. electricity consumers) through schemes such as the LCNF and through the smart metering programme.

In RIIO-ED1, Ofgem wanted network companies to demonstrate the extent to which the LCNF and other innovation incentives have resulted in smart solutions that are expected to generate savings in RIIO-1 and onwards.¹⁵² Ofgem's analysis of the business plans submitted by slow-track companies showed that not all DNOs had sufficiently considered and demonstrated the potential benefits of smart grid solutions and the associated cost savings to consumers by adoption smart grids solutions.^{153,154} In the draft determinations for slow-track companies, Ofgem defined savings related to smart grids as:

- smart metering data;
- network capacity (through avoiding or delaying work to increase the capacity of the network); and
- other smart grid savings (other benefits related to smart solutions).

As a result of Ofgem's analysis, it decided to reduce the slow-track DNOs allowances to take account of additional savings companies did not include in their business plans. Ofgem estimated that a reduction of 2.2% of totex should be applied to all slow-track DNOs to reflect smart grid savings – this is on top of the smart grids savings the DNOs have already included in their plans.¹⁵⁵ Northern Powergrid (NPG) appealed Ofgem's price control decision to the CMA on the basis that the smart grid benefit adjustments made to NPG's totex allowances was disproportionate and unjustified.

The CMA reviewed the evidence and concluded that it was not "satisfied that [Ofgem] had established that there was risk of a material underestimation of [Smart Grid Benefits] that

¹⁵¹ By 2016 consumers will have contributed up to £450m in LCNF and Network Innovation funding. Source: [Ofgem, RIIO-ED1: Draft determinations for slow-track electricity distribution companies - Overview, 30 July 2014](#), p. 30.

¹⁵² By 2016 consumers will have contributed up to £450m in LCNF and Network Innovation funding. Source: ED1 Draft determinations for slow tracked companies, p. 30.

¹⁵³ [Ofgem, RIIO-ED1: Draft determinations for the slow-track electricity distribution companies \(page 5\), July 2014](#).

¹⁵⁴ Ofgem added: "It is important that consumers receive adequate returns on their investment in innovation trials and the roll-out of smart meters. Evidence suggests that the DNOs can save around £400m more than they have forecast."

¹⁵⁵ [Ofgem, RIIO-ED1: Final determinations for the slow-track electricity distribution companies - overview](#).

had not been adequately addressed through [Ofgem]’s general cost benchmarking exercise.”^{156,157} The CMA determined that the adjustment applied to NPg was not justified.¹⁵⁸ The issue as far as the CMA was concerned was that Ofgem’s final decisions were not in line with its own strategy decision documents. The CMA granted NPg an additional £31.5m in allowed totex, of which £11m are reflected in higher allowed revenue (after applying the IQI) during the eight years of RIIO-ED1, with the rest recovered in future price controls.¹⁵⁹

In Ofgem’s guide to RIIO-ED1, Ofgem flagged that it intended to review the level of funding available to DNOs via the NIC.¹⁶⁰ To assess DNO progress in adopting smart grid solutions, Ofgem has asked DNOs to report on the solutions they have deployed and the saving they have delivered to customers. Stakeholders will be able to use the published reports to assess DNO’s progress against the smart grid savings in their settlements which will also provide evidence for assessing the potential level of smart grid savings achievable in RIIO-ED2.¹⁶¹

G.1.3. Views on the future of the innovation mechanisms

In the latest Network Innovation Review (March 2017), Ofgem consulted on a number of changes to the NIA and NIC aimed at delivering greater value for money to consumers:¹⁶²

1. the industry to develop an industry innovation strategy;
2. increasing third party involvement;
3. potential direct access for third parties to the NIC;
4. the removal of successful delivery reward; and
5. the removal of provision to recover bid preparation costs.

Points 1-2 above demonstrate that there is a strong case for the industry to work together to develop innovation projects that are aligned with the GB energy strategy. Technological advances, such as growing uptake of distributed energy resources, mean that third parties may be able to provide solutions to network issues in ways that may not have been envisaged with the RIIO innovation mechanisms were developed. This is reflected in Ofgem’s proposed changes. We note, however, that Ofgem decided not to pursue legislative changes with

¹⁵⁶ [CMA, Northern Powergrid \(Northeast\) Limited and Northern Powergrid \(Yorkshire\) plc v the Gas and Electricity Markets Authority: Final determination, September 2015.](#)

¹⁵⁷ In ruling on the appeals by NPg and British Gas, the CMA was careful not to act as a second regulator. Instead, the key question for the CMA was whether Ofgem made a decision that was wrong on one of the statutory grounds according to which Ofgem must act.

¹⁵⁸ [CMA, Northern Powergrid \(Northeast\) Limited and Northern Powergrid \(Yorkshire\) plc v the Gas and Electricity Markets Authority: Final determination, September 2015.](#)

¹⁵⁹ Ibid.

¹⁶⁰ [Ofgem, Guide to the RIIO-ED1 electricity distribution price control, January 2017.](#)

¹⁶¹ Ibid.

¹⁶² [Ofgem, The network innovation review: our policy decision, March 2017.](#)

regards to Point 3, and that the introduction of Point 2 was deemed sufficient at this point in time.

In their responses to Ofgem's RIIO-2 open letter, most network companies argued for the retention of the current mechanisms. For example, National Grid considered that "the incentives inherent in the RIIO model alone are unlikely to deliver the big scale innovation required".¹⁶³ Many responses highlighted that the changes faced by the energy industry in the coming years call for innovation funding. For example, a number of DNOs suggested that innovation funding should be used as they transition to a 'distribution system operator' role.¹⁶⁴ Similarly, National Grid System Operator considered that funding should be available in RIIO-2 to enable cross-industry partnerships and support whole-of-system solutions.¹⁶⁵

UKPN offered a different perspective, arguing that by the end of RIIO-ED1 DNOs will have had 13 years of access to the innovation funding and that a different approach to innovation may be warranted for RIIO-2.¹⁶⁶ In particular, UKPN argued for the removal of the NIA as a way of reducing the administrative burden of the current mechanisms. It sought to re-focus the NIC on large scale projects with whole system benefits or longer payback periods than the duration of price controls.¹⁶⁷ We note that such an approach has important interactions with Ofgem's decision on the length of future price control periods (see section 4.6), and that there may be practical limitations on Ofgem's ability to commit funding beyond the length of a single price control period.

Based on the evidence reviewed and stakeholders' perspectives, we consider that there is likely to be a benefit for customers from having a dedicated innovation mechanism in future price controls.¹⁶⁸ Network companies appear to be adopting innovations funded through the RIIO (and preceding) mechanisms. Price controls with *ex ante* revenue allowances, such as under RIIO, are unlikely to incentivise appropriate levels of new innovation given the upfront cost and uncertain future benefits of innovation projects.

G.2. Australia: demand management innovation allowance (DMIA)

Australia's energy sector has an innovation mechanism similar to that employed by Ofgem. In 2015, following requests from the Council of Australian Governments (COAG) Energy Council and the Total Environment Centre, the Australian Energy Market Commission (AEMC) implemented a rule change to improve the way this mechanism functions. The objective of the DMIA is to provide electricity distribution network companies with funding for research and development in demand management projects that have the potential to reduce long-

¹⁶³ NGET and NGGT, Response to Ofgem's open letter on the RIIO-2 Framework, September 2017.

¹⁶⁴ For example: UKPN, Response to Ofgem's open letter on the RIIO-2 Framework, September 2017.

¹⁶⁵ National Grid System Operator, Response to Ofgem's open letter on the RIIO-2 Framework, September 2017.

¹⁶⁶ UKPN, Response to Ofgem's open letter on the RIIO-2 Framework, September 2017.

¹⁶⁷ Ibid.

¹⁶⁸ This view was corroborated by informal discussions with consumer representatives during this project.

term network costs. The allowance is expected to fund innovative projects that have the potential to deliver ongoing reductions in demand or peak demand.¹⁶⁹ The Australian Energy Regulator (AER) has lately been consulting on how to implement the rule change.

G.2.1. Why was the innovation mechanism seen to be required?

In its rule change request, the COAG Energy Council stated that the rationale for the DMIA was focussed on providing an alternative source of funding for distribution businesses to experiment and trial innovative approaches to demand management and the connection of embedded generators. It considered that this recognised the approaches to demand management and the connection of embedded generation were highly uncertain with respect to their costs and benefits. As such, they were unlikely to be undertaken by distribution businesses in the absence of additional funding.

Similarly, the TEC stated that while it considered that the DMIA was "grossly underutilised" by distribution businesses, the allowance nevertheless provided a source of income for innovative demand management projects that may otherwise be hard to justify on economic grounds alone, so was worth retaining.¹⁷⁰

The AER sees effective demand management as important because it can defer or limit the need to invest in expensive assets needed to ensure supply can meet network demand. Demand management can also help coordinate and manage new, consumer-controlled technologies. Although such technologies can change how the grid works in unpredictable ways, they also offer great opportunities for distribution businesses. Ultimately, the innovation mechanism, as part of a policy of encouraging effective demand management, can help deliver substantial savings to consumers.¹⁷¹

G.2.2. How is the AER proposing to implement the mechanism?

Current AER proposals will revise the existing DMIA in the following ways:

- increase funding available (by roughly 30% compared);
- tighten the criteria for project eligibility to encourage more innovative projects, whilst maintaining an option for indicative project pre-approval to maintain certainty; and
- clarify project reporting requirements to place a greater emphasis on sharing project learnings across the industry and with consumers.¹⁷²

The allowance is calculated as \$200,000 + 0.075% of the relevant distributor's maximum allowed revenue¹⁷³ The first component acknowledges smaller distributors could have been

¹⁶⁹ [AEMC, Demand Management Incentive Scheme, Rule Determination, August 2015, p. i-ii.](#)

¹⁷⁰ *Ibid*, p. 67

¹⁷¹ [AER, Fact Sheet – Draft demand management incentive scheme and innovation allowance mechanism, August 2017.](#)

¹⁷² *Ibid*.

¹⁷³ 2017 prices, and adjusting for inflation each year in the regulatory control period.

prevented from undertaking some projects due to small innovation allowances under the current DMIA. The second component reflects that larger distributors may have more opportunities to trial technology, given the size of their networks. The AER will provide the allowance *ex ante* in five allotments (one for each year of the regulatory control period. Any unspent allowance will be recovered from distributors through a carryover amount deducted from the distribution business allowed revenue during the next regulatory control period.¹⁷⁴

G.2.3. What types of innovations are expected to be covered?

The DMIA specifies that projects must involve technologies or techniques that have not previously been used in the electricity market (unless in a market segment of customers that is significant different) to be thought of as innovative. This is to prevent the funding of projects that are too similar, which would mean redundant projects were being funded, limiting the effectiveness of the funding.¹⁷⁵

The rule change requests suggested certain activities they might consider appropriate for funding under the innovation allowance. These activities included:

- both technology and pricing based approaches;
- efficient connection of embedded generators; and
- the costs and impacts on network system operations of these approaches.

These are not directly specified by the AER or AEMC. However, the AEMC ruling does specify that the DMIA should provide funding to distribution businesses for undertaking projects that deliver a reduction in demand and/or peak demand.¹⁷⁶

Previous demand management research and development undertaken by distribution businesses includes:

- using embedded generators and/or storage to provide network support;
- trialling mini grids and virtual power plants;
- trialling different ways to deploy demand response/voluntary load curtailment;
- conducting tariff trials;
- applying different methods to screen for demand management solutions, including through stakeholder engagement activities; and
- using network solutions to manage demand on the network, including by installing network assets like smart feeders, conductors and inverters.¹⁷⁷

¹⁷⁴ [AER, Draft demand management allowance mechanism, August 2017.](#)

¹⁷⁵ Ibid, p. 22.

¹⁷⁶ [AEMC, Demand Management Incentive Scheme, Rule Determination \(page 74\), August 2015](#)

¹⁷⁷ [AER, Explanatory Statement \(page 12\), August 2017.](#)

G.3. Innovation mechanisms in other sectors

Table G.2 summarises the use of innovation funding in other UK regulated sectors.

Table G.2: Innovation mechanisms in other sectors

Sector	Market	Approaches to innovation	Examples of areas in which innovation is delivered	Funding
Telecoms	<ul style="list-style-type: none"> National-level competition in mobile National-level competition in fixed with incumbent having significant market power Technical innovation common due to continued improvements in digital technology, as well as competitive pressure 	<ul style="list-style-type: none"> Innovation delivered through facilitating competition such as access pricing 	<ul style="list-style-type: none"> Fibre roll-out 4G network development 	<ul style="list-style-type: none"> Government initiatives
Rail	<ul style="list-style-type: none"> National monopoly or infrastructure provision Services subject to competitive franchising 	<ul style="list-style-type: none"> Stimulus package Innovation Fund Strategic R&D fund Through the price control 	<ul style="list-style-type: none"> Track renewal efficiency Alliancing 	<ul style="list-style-type: none"> Government Department for Transport Through companies existing revenue mechanisms
Water	<ul style="list-style-type: none"> Regional monopolies for water and sewerage infrastructure provision Non-household retail market open to competition Innovation delivered through competition for major projects 	<ul style="list-style-type: none"> Through the price control Public-Private Partnerships Co-operation with third parties 	<ul style="list-style-type: none"> Leakage management Ice Piggings Separating out markets for bio-resources Markets for eco-services Thames Tideway Tunnel 	<ul style="list-style-type: none"> Initiatives funded by companies through competitive procurement In PR19, companies with the most innovative and ambitious plans will receive an additional return.
Airports	<ul style="list-style-type: none"> Large number of airports with effective competition Only two airports regulated on the basis of the market power test 	<ul style="list-style-type: none"> Non-funding stimulus activities Through the price control 	<ul style="list-style-type: none"> Service Quality Regime Future Airspace Strategy 	<ul style="list-style-type: none"> Through companies existing revenue mechanisms

Source: [UK Regulators Network, Innovation in regulated infrastructure sectors, January 2015](#). Table supplemented with CEPA analysis.