RIIO-T1 & RIIO-GD1: UNCERTAINTY ISSUES

A REPORT FOR CENTRICA

February 2011

Final report - for publication

Submitted by:

CEPA LLP

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EXECUTIVE SUMMARY

Purpose

Ofgem is consulting on initial views of the outputs and other aspects of the price control framework for the gas and electricity transmission companies and for the gas distribution network companies. One of the key issues Ofgem are consulting on is the framework for dealing with the uncertainty in the price controls. Ofgem are proposing to apply mechanisms for managing uncertainty that will allow the network companies' allowed revenue (and therefore network charges) to change within the price control period.

Predictability of network charges is important to suppliers and other market participants, as network charges impact on their investment decisions and what level of costs they must seek to recover from their customers. Suppliers wish to be able to meet customer preferences for stable prices, and unpredictable network charges raise the risk that their cost base may increase unexpectedly. For investors in electricity generation assets, for which there are high sunk costs, volatility and lack of predictability of network charges impacts on expectations of future operating profitability and so can undermine the incentive to invest in the generation asset.

Volatility of network charges for transmission and distribution networks has been increasing in recent years. Although network charges have reduced since privatisation, Ofgem now expects network charges to rise, to support the move to a low carbon economy. The use of uncertainty mechanisms that allow network companies' allowed revenue to change within the price control period will arguably now increase future volatility and unpredictability of network charges in the absence of counteracting measures. CEPA has been asked by Centrica to review Ofgem's proposals and to consider the options for providing more predictable network charges over the forthcoming energy network price controls.

Ofgem's proposals and the impacts on consumers

The broad range of investment needed in Britain's energy networks has been widely publicised. In this report we demonstrate the significant uncertainty that energy network companies now face in delivering this investment. We highlight that Ofgem's proposals for managing uncertainty in both the transmission and gas distribution price controls have a clear regulatory rationale and are likely to benefit consumers in a number of ways. However, our assessment also identifies many disadvantages for consumers, notably more volatile and unpredictable future network charges for use of both transmission and gas distribution systems.

We show that uncertainty with regards network charges places a material risk on suppliers and other market participants, who use the transmission and distribution systems. We show that this has negative impacts on investment decisions and creates uncertainty about what level of costs suppliers need to recover from consumers. We argue this brings inefficiency to energy markets in Britain, as suppliers and other network users, adopt strategies to manage this risk. In the case of retail markets,

we illustrate that suppliers seek to manage volatility of future network charges by adding an insurance ("risk") premium to final customer bills.

Ofgem's new regulatory framework for energy networks, known as RIIO (Revenue = Incentives + Innovation + Outputs) puts sustainability alongside consumers at the heart of what network companies do. Ofgem has recognised that there may an increase in the volatility of network charges from use of regulatory tools to help manage the uncertainties that the network companies face. In order to mitigate the adverse impacts for consumers, Ofgem has proposed that the price controls will contain measures to help manage charging volatility.

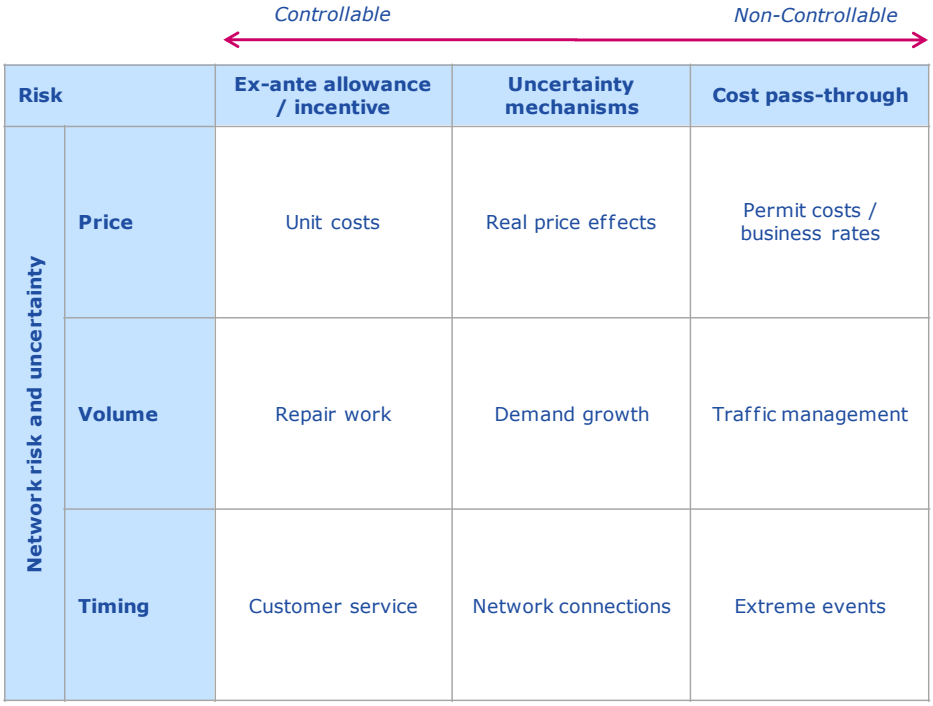
However, in our view, neither the RIIO implementation handbook, nor the price control strategy documents, seek to practically assess the potential negative adverse impacts of network charging volatility on consumers, and the implications this may have for the design of price controls. Indeed, the current approach to uncertainty in network price controls, in our view, focuses on the impacts on energy networks, rather than the wider "holistic" impacts of network charges on consumers and energy markets. Nor is there a structured framework for assessing the impacts of regulatory policy on the volatility of network charges, and the impacts that this may have on retail and wholesale market participants.

Framework for managing uncertainty

For this report, we adopt a relatively simple framework for assessing network uncertainty and the appropriate "tool" or "mechanism" for managing that uncertainty. Our analytical framework is summarised in Figure E1 below. It illustrates our differentiation of network risk according to price, volume and timing. We also differentiate whether the risk is controllable, partially controllable or non-controllable by the network company to assess who is best placed to manage the impacts of uncertainty and the appropriate regulatory treatment of expenditure.

While the regulatory "tool-kit" for managing uncertainty under RIIO is understandably broad to capture the different types and categories of risk network companies face, we show that there are a plethora of principles and processes network users will need to understand and monitor to manage network charges affected by uncertainty mechanisms in the forthcoming price controls. Therefore, while we agree that uncertainty mechanisms, appropriately designed and targeted, deliver benefits for consumers, and also protect networks ability to finance delivery, they may also increase the complexity and (potentially) the volatility of network charges, in the absence of additional measures to mitigate these impacts.

Figure E1: Framework for managing price control risk and uncertainty



Risk		Ex-ante allowance / incentive	Uncertainty mechanisms	Cost pass-through
Network risk and uncertainty	**Price**	Unit costs	Real price effects	Permit costs / business rates
	Volume	Repair work	Demand growth	Traffic management
	Timing	Customer service	Network connections	Extreme events

Source: CEPA

CEPA's proposals and the impacts on consumers

In this report, we set out a variety of proposals that we believe would help manage charging volatility and the adverse impacts on consumers. In gas distribution, we discuss the option of adopting a shorter price control period than the default eight years to help manage the business planning and regulatory challenges which face the sector in the next few years. In electricity transmission, we highlight the advantages of negative triggers[1] as a regulatory tool for managing the timing uncertainty affecting anticipatory investment in the sector.

We also outline three simple options to restrict network charging volatility within the price control to mitigate price volatility for final consumers. These include a cap and collar on movements against base allowed revenue, application of a smoothing algorithm and a logging-up mechanism. These would apply "top-down" across network companies' price control frameworks. We have modelled the impact of a cap and collar approach on customer gas bills, GDN's return on capital employed and a hypothetical supplier's profit margins, if price control uncertainty mechanisms were to cause GDN *outturn* allowed revenues to increase by a fixed percentage from the base revenue allowances predicted at the price control review determination.

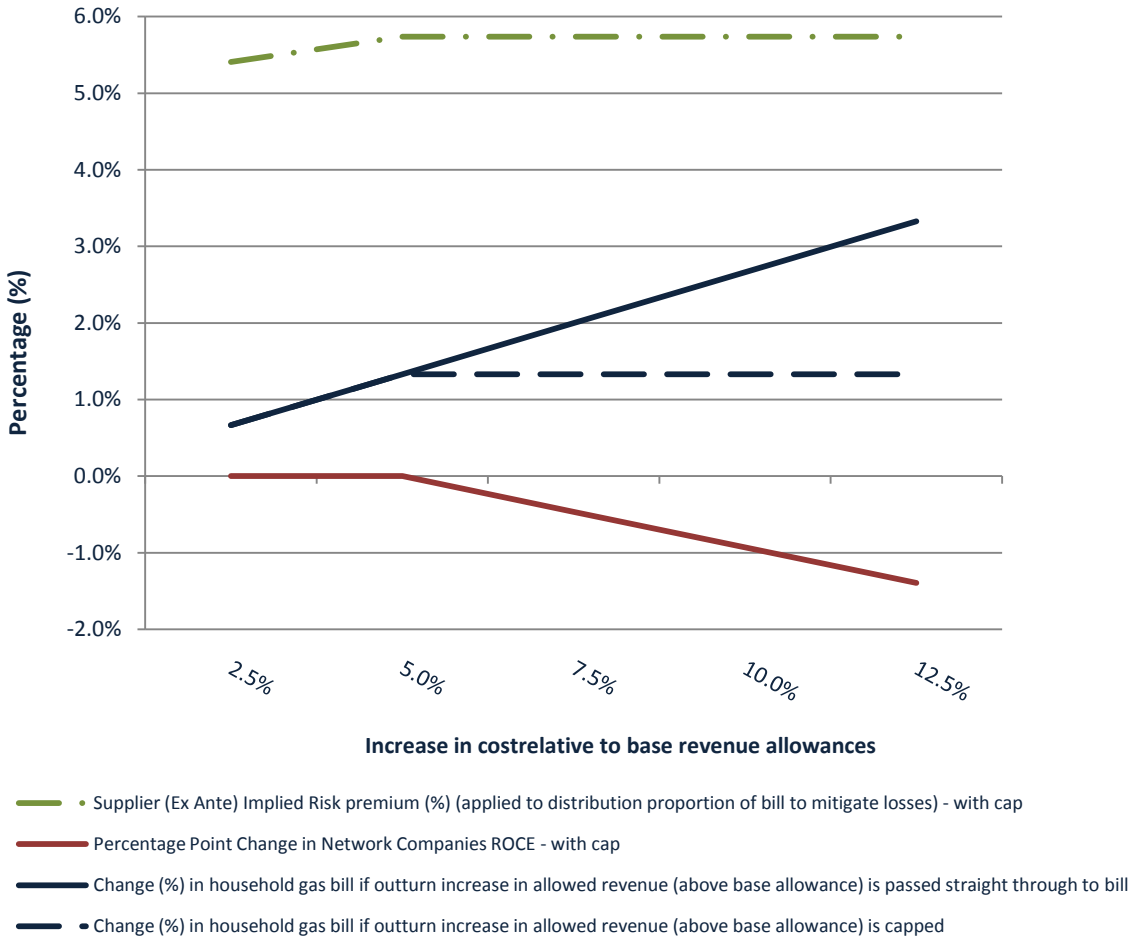
[1] A negative trigger mechanism would require anticipated investment in network capacity to be set at the beginning of the price control, but the network operators would be required to put in place price reductions for failing to deliver the investment within a pre-specified time frame (the trigger "criteria").

As illustrated in Figure E2, our analysis shows:

- A cap and collar mechanism (for our analysis we assume this is set at five per cent of base allowed revenues) would limit the impact price control uncertainty mechanisms would have on final customer bills *within* the price control period.
- A cap and collar system also provides greater certainty to suppliers of the network element of their retail cost base. This helps cap the *implied* risk premium suppliers might need to apply *ex ante* to network costs when setting their final retail tariffs.

A fixed charging profile (within an agreed tolerance band) reduces the risk for the supplier that network charges will rise unexpectedly. In a competitive retail supply market, this places a de facto cap on the *implied* charging risk premium suppliers would need to account for (ex ante) in setting future retail tariffs.

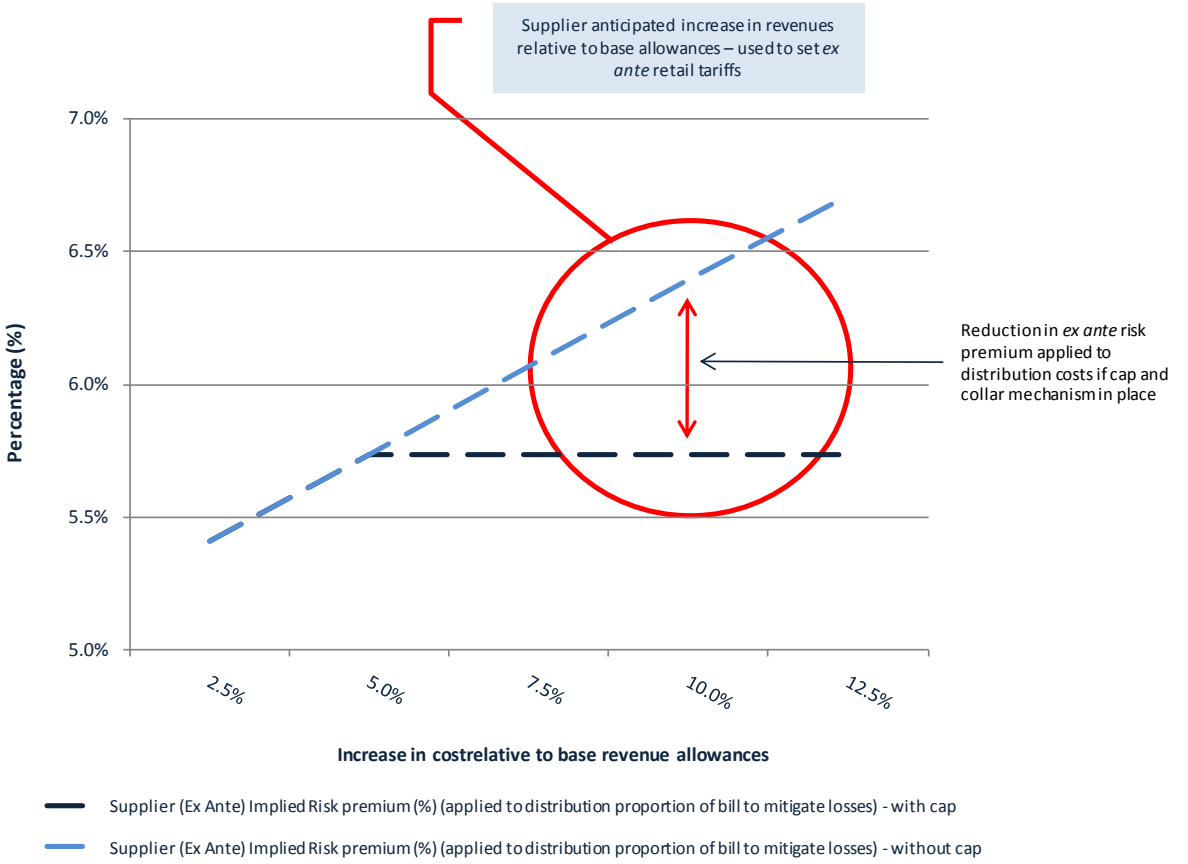
Figure E2: Impact on consumers, suppliers and GDNs of five per cent cap and collar mechanism



Source: CEPA analysis

Figure E3 illustrates the supplier *implied* risk premium (applied *ex ante* to distribution costs) with and without a five per cent revenue cap and collar mechanism. It shows how a cap on revenue allowances (recovered *within* the price control period) would provide greater certainty to the supplier of the distribution cost element of its retail cost base.

Figure E3: Impact on implied risk premium of 5 per cent cap and collar



Source: CEPA analysis

We estimate that:

- Were the supplier to anticipate a 10%-12.5% increase in allowed revenues when setting its customer retail tariffs, a 5% revenue cap would reduce the *implied* risk premium the supplier would need to apply *ex ante* to distribution costs by 1%-1.5%.
- The reduction in the supplier's risk premium, applied to the current average household gas bill in Britain, would reduce the final bill by £1 - £2 per annum.

The cap on the supplier risk premium must be balanced against the cost to the network companies of deferring allowed revenue (this is illustrated in Figure E2 by the change in return on capital employed over the price control which proxies the eventual NPV adjustment for deferral of allowed revenues recovered from consumers).

Next steps

We believe Ofgem and the network companies should consider the options we propose in this report. While there may be challenges with their implementation, we believe each proposal has the capacity to deliver value for consumers, whilst protecting network companies' capacity to finance delivery on their price control outputs.

Ofgem has outlined a commitment to managing charging volatility in the forthcoming price control periods. The issue for consumers, suppliers and other market participants is not only the volatility of charges per se, but also the predictability of how and when adjustments to allowed revenue are made and how these affect final charges. Therefore, for mechanisms to restrict network charge movements to be predictable for consumers, the governance processes for determining the form of re-profiling of allowed revenues (and therefore network charges) should, in our view, be clearly scoped in discussion with consumers.

While our modelling analysis is based on illustrative scenarios of how uncertainty mechanisms might affect base allowed revenues, we consider our approach to be a useful framework for illustrating the issues faced by suppliers (large and small) who will in reality need to manage how changes in network charges (driven by uncertainty mechanisms) are passed through to final consumer bills. CEPA would be happy to discuss how any of the proposals we have outlined, including our modelling framework, could be developed in the next stages of the price control review.

1. INTRODUCTION

1.1. Purpose

Ofgem is consulting on initial views of the outputs and other aspects of the price control framework for the gas and electricity transmission network companies and for the gas distribution network companies. One of the key issues Ofgem is consulting on is the framework for dealing with uncertainty in the price controls. Ofgem is proposing to apply mechanisms for managing uncertainty that will allow the network companies' allowed revenue (and therefore network charges) to change within the price control period.

Predictability of network charges is important to suppliers and other market participants, as network charges impact on their investment decisions and what level of costs they must seek to recover from their customers. Suppliers must respond to customer preferences for stable prices, and unpredictable network charges raise the risk that their cost base may increase unexpectedly. For investors in electricity generation assets, for which there are high sunk costs, volatility and lack of predictability of network charges impacts on expectations of future operating profitability and so can undermine the incentive to invest in the asset.

Volatility of network charges for transmission and distribution networks has been increasing in recent years. Although network charges have reduced since privatisation, Ofgem now expects network charges to rise to support the move to a low carbon economy. The use of uncertainty mechanisms that allow network companies' allowed revenue to change within the price control period will arguably now increase the future volatility and unpredictability of network charges in the absence of counteracting measures. CEPA has been asked by Centrica to review Ofgem's proposals and to consider the options for providing more predictable network charges over the course of the forthcoming price controls.

1.2. Regulating Britain's energy networks

Ofgem, the gas and electricity market regulator, recently reviewed energy network regulation in Britain. Ofgem looked at how best to regulate energy companies to enable them to meet the challenges and opportunities of delivering the networks required for a sustainable, low carbon energy sector. In the summer of 2010, Ofgem published its decision to implement a new regulatory framework, known as the RIIO model (Revenue = Incentives + Innovation + Outputs). RIIO will be used to regulate and develop future price controls for gas and electricity transmission and distribution network companies.

The transmission and gas distribution price controls (RIIO-T1 and RIIO-GD1) are the first price controls under the RIIO model. RIIO-GD1 will set the outputs that the gas network owners (GDNs) must deliver over the eight-year period 2013-2021 and the associated revenues they may collect from consumers. RIIO-T1 will do the same for gas and electricity transmission networks.[2] In

[2] The price controls for electricity distribution (DPCR5) were set in April 2010.

late 2010, Ofgem published its strategy documents (and supporting analysis) for both RIIO-GD1 and RIIO-T1. Amongst many issues, the two strategy documents set out Ofgem's proposed approach to setting costs, financing delivery and dealing with the uncertainty of outputs and deliverables within the eight year price control period.[3]

1.3. Managing uncertainty

One of the most high profile elements of RIIO is a move from five year to eight year price controls. Eight year price controls will include a limited window ("re-opener") after four years to review the price controls and other mechanisms to manage uncertainty within the control period. The objective of an eight year price control and RIIO more generally, is to promote longer term thinking from network companies, and requires the companies to engage with stakeholders, understand what consumers' value and work with others.

Under RIIO, the price controls set for energy network companies, will be based on forecasts of: demand for network services over time; what the network companies are required to deliver (output requirements); the cost of delivery and financing costs. As the price control will be set ahead of when investment and operations take place (that is, the regulatory framework is *ex ante* in design) there will always be uncertainty about the reasonableness of the forecasts. As price controls will be set for eight years, Ofgem propose to include provisions that allow companies allowed revenue (and therefore the charges they levy on users of the network) to adjust during the price control period in response to changes in operating conditions.

1.3.1. RIIO tools and principles for managing uncertainty

RIIO has a range of regulatory "tools" to help deal with uncertainty over the eight year price control. In RIIO-T1 and RIIO-GD1, network companies will have an opportunity as part of their business plans to set out which uncertainty mechanisms they are seeking to help them to manage risk and the benefits these would bring for consumers. Ofgem has set out a series of principles for using uncertainty mechanisms in price controls:

Principles Box 1: Overarching RIIO principles for managing uncertainty
"We expect network companies to manage the uncertainty they face. The regulatory regime should not protect network companies against all forms of uncertainty. The use of uncertainty mechanisms should be limited to instances in which they will deliver value for money for existing and future consumers while also protecting the ability of networks to finance efficient delivery."
Source: Ofgem

[3] Ofgem (2010): 'RIIO-T1 and GD1 Uncertainty Mechanisms'

Ofgem's uncertainty principles also highlight the importance of avoiding unnecessary volatility in network charges. However, in our view, neither the implementation handbook, nor the price control strategy documents, seeks to *practically* assess the potential negative adverse impacts of network charging volatility on consumers, and the implications this may have for the design of price controls. Indeed, the current approach to uncertainty in network price controls, in our view, focuses on the impacts on energy networks, rather than the wider "holistic" impacts of network charges on consumers and energy markets. Nor is there a structured framework for assessing the impacts of regulatory policy on the volatility of network charges, and the impacts that this may have on retail and wholesale market participants.

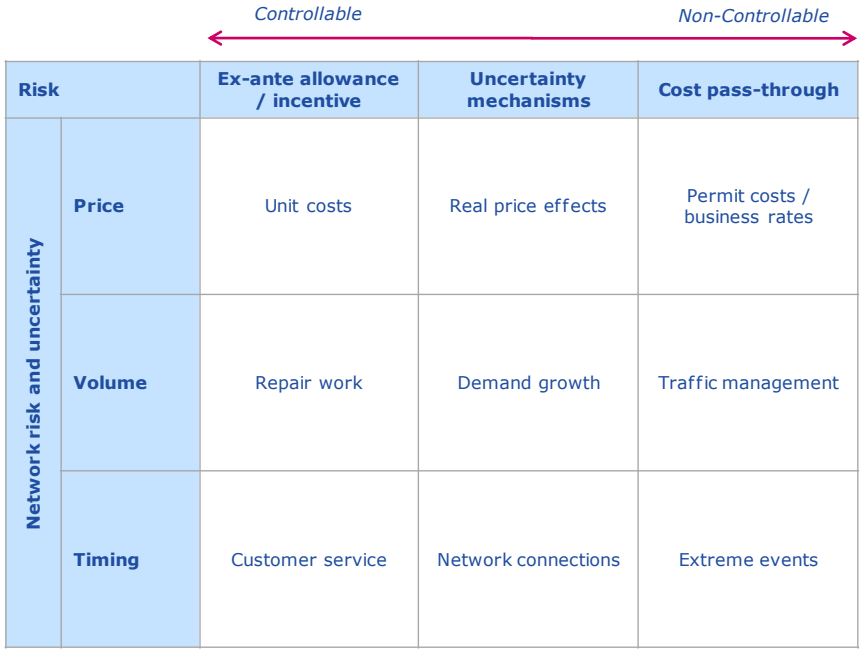
Stakeholders have also expressed concerns that eight year price controls will prove difficult to make work in practice, either because the re-opener after four years will in practice become very close to a full price control review, and/ or there will be a need for such a wide range of uncertainty mechanisms that the control will become very complex and its revenue profile very unpredictable. Major re-openers of the price controls and/or multiple mechanisms for managing uncertainty, have the potential to lead to volatile and unpredictable network charges compared to a fixed charging profile. As we demonstrate in this report, this increases risk for suppliers and market participants and ultimately imposes costs on final consumers.

1.3.2. Decision making framework for assessing uncertainty

Various frameworks exist for assessing risk and how this should be captured by a price regulatory regime. The RIIO approach is to consider what is controllable by the network company (and so an ex ante revenue allowance and incentive can be set to promote the management of risk) and what is not controllable (either because the network company is unable to "opt out" of the activity, or the network operator cannot predict with certainty the expenditure over the next eight years). Other considerations that should be taken into account include whether particular types of uncertainty can be separated from the overall commercial framework of the price control, and do risks in one area of the price control, impact on others.

We believe a relatively simple framework for assessing and managing network uncertainty should be adopted in RIIO-GD1 and RIIO-T1. Our analytical framework is summarised in Figure 1.1 below. It illustrates our differentiation of network risk and uncertainty according to price, volume and timing. We also differentiate whether the risk is controllable, partially controllable or non-controllable by the network company in order to assess who is best placed to manage the impacts of uncertainty and the appropriate regulatory treatment of expenditure. These principles, in addition to those in the RIIO framework, should in our view, inform Ofgem's final decision on the circumstances and design of uncertainty mechanisms in RIIO-GD1/RIIO-T1. This includes that the impacts of managing uncertainty in the network price controls should be assessed in the wider context of wholesale and retail energy markets.

Figure 1.1: Framework for assessing network risk and uncertainty



Risk		Ex-ante allowance / incentive	Uncertainty mechanisms	Cost pass-through
Network risk and uncertainty	**Price**	Unit costs	Real price effects	Permit costs / business rates
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Source: CEPA

Figure 1.1 illustrates different components of the price control that might be captured by our risk assessment framework. So for example, unit costs are a price risk that can be managed by the network company and so an ex-ante allowance / incentive can be set. In contrast, traffic management costs (both a volume and price risk) are less controllable by the network company and require an alternative form of regulatory treatment.

1.4. Structure of report

The rest of this paper is structured as follows:

- Section 2 reviews network charges in the context of Britain's energy markets.
- Section 3 discusses Ofgem's price control proposals.
- Section 4 discusses eight year price controls and the scope of the mid-period review.
- Section 4 sets out options for managing charging uncertainty.
- Section 5 concludes with next steps and proposals.

The main report is supported by a series of technical appendices:

- Appendix A reviews historical evidence of network charges.
- Appendix B presents our modelling analysis.
- Appendix C includes a series of sector case studies.

2. IMPACTS OF NETWORK CHARGING UNCERTAINTY

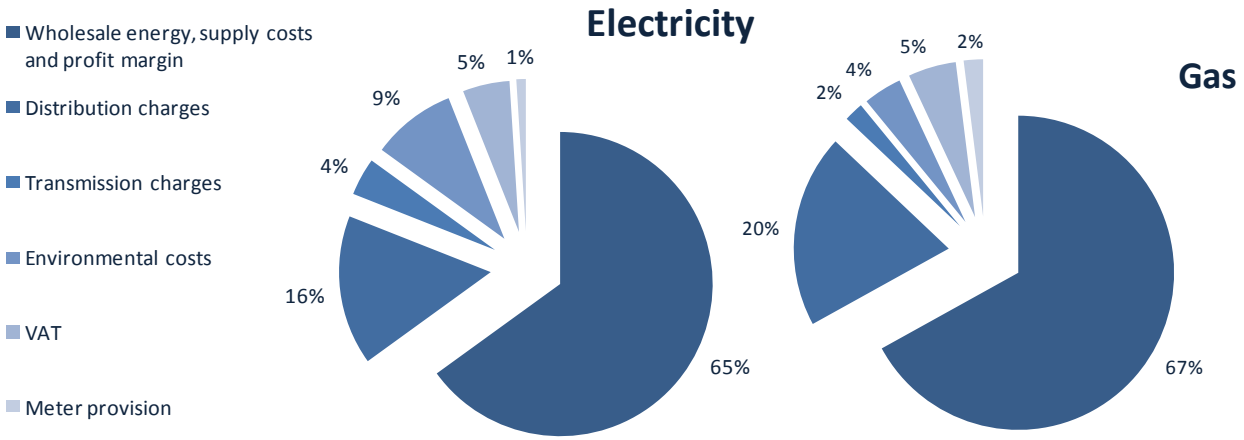
2.1. Overview

In this section, we review how network charges impact on wholesale and retail energy markets. We discuss the strategies adopted by suppliers and market participants to manage the uncertainty of future network charges.

2.2. Impact of network charges on household energy bills

A number of factors affect final household energy bills. Ofgem's consumer factsheet monitors the different components and how regulatory policy might affect household energy bills. As is illustrated in Figure 2.1, wholesale energy costs account for the largest share of customer bills, but other factors are also pushing bills up including Government environmental programmes. Ofgem also expects investment in gas and electricity networks to add to network charges which make up around 20-22 per cent of the final customer bill.

Figure 2.1: Breakdown of gas and electricity bills [4]



Source: Ofgem (2011)

Although network charges have reduced significantly since privatization (as a consequence of efficiency savings) Ofgem expects that network costs are now set to rise to support the move to a low carbon economy.[5] Ofgem estimates that around £30bn of investment is needed across transmission and distribution by 2020 to connect new sources of generation and accommodate continued increases in gas import capacity.[6]

[4] Note: the average bills are based on average annual consumption figures of 3,300 kWh for electricity and 16,500 kWh for gas, averaged across all big six suppliers and across Britain. The analysis reflects gas and electricity prices in 2011.

[5] Ofgem (January 2011): 'Updated household bills explained'

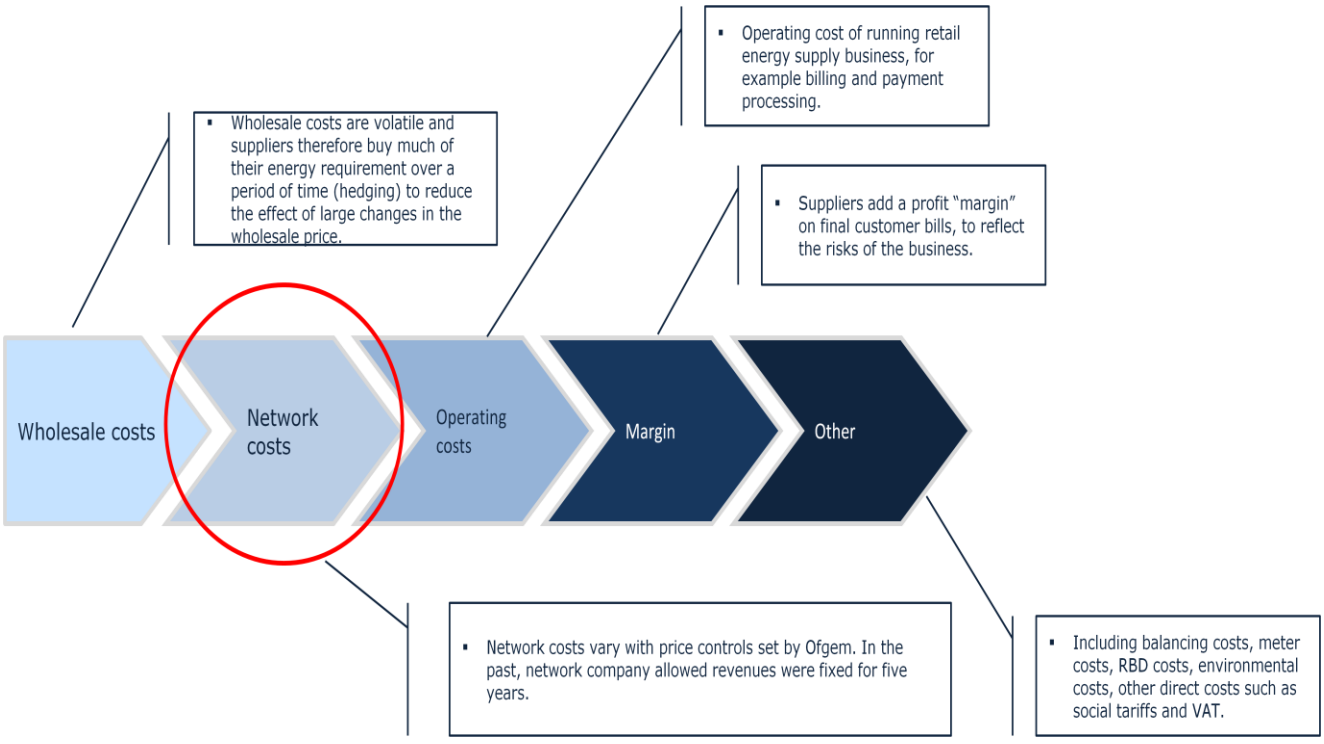
[6] CEPA's report on the Economic Asset Lives of Energy Networks shows an even greater impact of network investment on combined average household energy bills after 2020 (i.e. 2020 – 2050). See pages 135 – 156.

2.3. How are prices set in retail markets?

Britain has a competitive domestic and commercial energy market in which prices are set by energy companies in competition with each other. Retailers need to source wholesale gas and electricity by entering into bilateral contracts with companies that provide electricity generation and gas production capacity. In a privatised, competitive retail energy market, it is the responsibility of the energy retailer to manage their cost base. Retailers therefore enter into contractual relationships and hedging strategies to manage risk.

Suppliers employ tariff structures to recover the supply costs of energy. For example, standard energy tariffs are the basic energy deals which allow some components of consumers' energy prices to vary while other elements remain fixed. There are then numerous variations of the standard tariffs offered by suppliers, including fixed/price guarantee deals where the price a customer pays for fuel will not change for a set amount of time, regardless of price movements in the market. As energy retail is a business with a very high level of "pass-through" costs and low margins, an important part of the business is managing sales and billing and how different elements of costs are recovered through customers' final energy deals.

Figure 2.2: Breakdown of gas and electricity bills



Source: CEPA

2.3.1. Fixed price energy deals

To enhance predictability of household energy bills, suppliers have entered into long-term arrangements that fix customers bills. A capped or fixed deal ensures that prices can't rise beyond a certain limit, though in some cases they may also fall. These tariffs have been very popular with consumers, and DECC now estimates that around 9% of gas customers and 7% of standard electricity customers are on a fixed price tariff. At the time of the Energy Supply Probe (2008), Ofgem estimated that over one in seven households in Britain were on some form of fixed energy supply tariff. Some suppliers, including British Gas, have an even greater proportion of their customer base on some form of fixed price deal.

Research published in 2008 by the price comparison website uSwitch, showed that predicted price rises of 40% caused a surge in the uptake of supplier fixed/price guarantee tariffs. Household consumers wished to protect themselves from the predicted future rises in energy prices from the rise in wholesale costs:

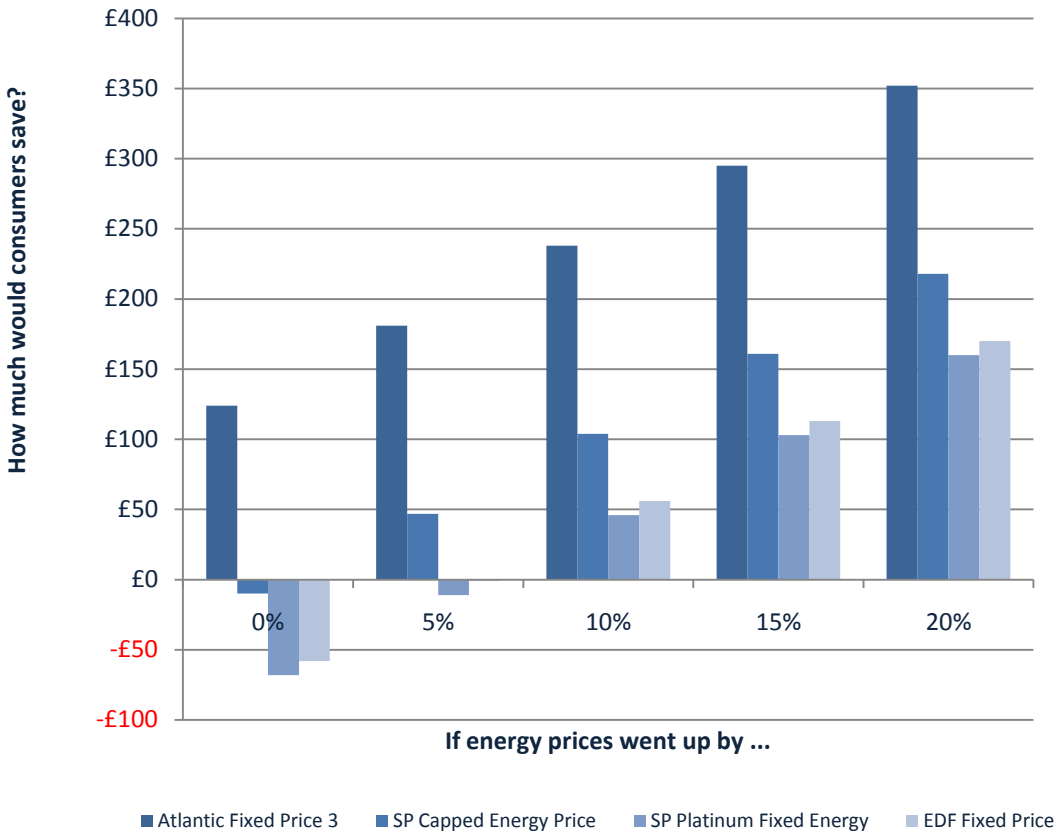
Evidence Box 2.1: Recent uptake of fixed price tariffs
"Predictions of a 40% price hike this year have sent consumers scrambling to secure a fixed or capped price energy deal in an attempt to starve off price rises that could add £419 on to the average household energy bills. According to uSwitch.com, in early 2008 less than 5% of switchers were opting for fixed and capped energy plans. But following the industry speculation that bills could hit £1,467 by the end of this year, this trickle has become a flood with uSwitch.com predicting that nearly 200,000 households a month, 45% of all switchers – could be signing up to fixed or capped plans."

Source: uSwitch (January 2011)[7]

Similar to fixed-rate mortgages, fixed supply tariffs offer customers the reassurance that the cost of energy will not go up for a year, two years, or even four years, depending on the length of the contract. This is because with fixed price plans, the price per unit of energy is fixed or capped for a set period and although the initial unit price can be more expensive than the standard energy supply tariff, the household will continue to pay the same agreed unit rate for the duration of the fix, even if prices increase significantly. Longer cap plans typically have slightly higher prices but also offer greater security to consumers. This is illustrated by recent analysis also published by uSwitch, which shows the potential benefits of fixed price gas and electricity tariffs if prices were to rise over the life of the fixed price contract.

[7] uSwitch (2008): 'Price rises have seen surge in consumers fixing energy prices for the future'

Figure 2.3: Breakdown of gas and electricity bills [8]



Source: uSwitch[9]

2.3.2. Summary

Fixed supply arrangements offered by suppliers often stretch across network price control periods and so retail suppliers need to take a view on what network charges will be in the future. **Where network charges are more predictable, suppliers face less risk and can therefore offer a better price to consumers.** However as we illustrate in Appendix A, the volatility of network charges across both distribution and transmission has been increasing and has at times been difficult for suppliers to predict. How suppliers seek to manage volatility in network charges is discussed in Section 2.5.

[8] Saving is calculated compared to the price of the average standard plan, paying by monthly Direct Debit.

[9] Based on medium energyuser consuming 3,300 kWh electricity and 20,500 kWh gas. Average variable bill sizes quoted for 4th January 2011 and averaged across all regions and Big 6 suppliers. Bill sizes for fixed/capped plans have been averaged across all available regions, taking the cheapest tariff for each fixed time period.

2.4. Drivers of investment in wholesale energy markets

Market participants in wholesale markets face different types of risks compared to retail suppliers. For example, investors in electricity generation assets face a series of internal (which can be controlled by the investor) and external (for example, structure of energy demand and fluctuations in input prices) uncertainties about the operating conditions of the generation asset. While the key value driver of electricity generation assets is wholesale electricity prices, the fixed and variable costs of the plant, and the regulatory framework that applies to the market, are also important to the economics of the investment.

Transmission access, and the connection and use of system charges levied by National Grid for providing such access, are a fixed cost to electricity generation projects. Generation assets have large sunk costs, and so future volatility of network charges directly impacts on the future profitability of the asset. Uncertainty and lack of predictability of future network charges can therefore reduce the incentive to invest in the sector. While National Grid publishes forecasts of locational tariffs for the next five years, the residual (revenue "scaler" element) of transmission charges (which is by far the largest component of transmission use of system charges) has increasingly become more uncertain, with new drivers of use of system costs, such as OFTO revenues, causing larger year-on-year changes in transmission use of system tariffs.

2.5. Managing network charges

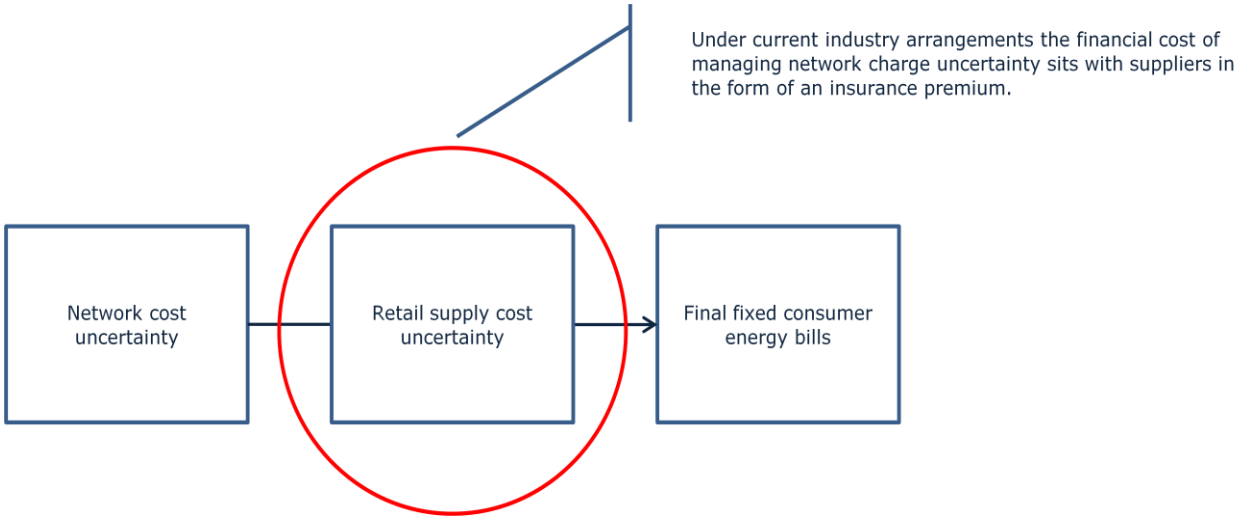
2.5.1. Market evidence

The evidence in Section 2.3 shows that consumers value stable, predictable energy supply tariffs. Is this evidence surprising? As with commercial energy companies who adopt hedging strategies and fixed price contracts to manage their own business risk and liabilities, energy consumers also value energy tariffs that protect them against volatility and uncertainty, and allow them to manage their income and finances more effectively. However, as with a commercial entity, consumers are only prepared to achieve this stability at a fair price.

Fixed or capped retail energy tariffs are increasingly popular with household and business consumers due to concerns that energy prices may rise in the future, and a view that these tariff types continue to offer value for money (as illustrated by Figure 2.3). However, the uncertainty that affects future network charges, even once final price controls have been set by Ofgem, places a risk on suppliers when considering the corresponding level of costs they need to recover from their customers when their retail supply tariffs are set.

Under current network price controls, cost items that are subject to an "uncertainty mechanism" (or indeed, any mechanism that allows costs (and therefore network charges) to change from the levels predicted at the price control determination) effectively passes the risk of changes in network costs from network companies to energy suppliers if they cannot be passed on to final consumers. As is typical with any commercial arrangement, suppliers, charge an insurance ("risk") premium, added to final customer energy bills, for managing the risk of network charges rising.

Figure 2.4: Managing network charging uncertainty



Source: CEPA

Where network charges are more predictable, suppliers face less risk and can therefore offer a better price to consumers by charging a smaller insurance ("risk") premium. Allowing suppliers and other industry stakeholders to better predict network company costs, and reduce charging uncertainty, is one reason why suppliers, and other market participants, supported the move to a common charging methodology in the electricity distribution sector. We summarise British Gas' response to Ofgem's common distribution charging methodology consultation below:

Evidence Box 2.2: Management of network charging uncertainty[10]
British Gas (August 2008)
"the resulting benefits to consumers [*of a common methodology and more predictable network charges*] through more effective competition and reduced risk premiums run into multiple £millions per annum [*and*] will easily outweigh the short-term, one-off implementation costs "

Source: CEPA analysis of consultation responses

While volatility of network charges imposes a cost on all market participants, it is particularly damaging for smaller suppliers. Uncertain and volatile gas and electricity network charges also impact on the ability of smaller suppliers and market participants to operate and compete in energy markets. The text box below summarises the views of Biz Energy[11], until October 2008, a small independent online energy supplier, who also responded to Ofgem's 2008 consultation on network charges in the electricity distribution sector:

[10] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=421&refer=Networks/ElecDist/Policy/DistChrgs

[11] Biz Energy went into administration in October 2008.

Evidence Box 2.3: Management of network charging uncertainty[12]

Biz Energy (August 2008)

"Suppliers who have a broadly representative mix of DNO customers ... take advantage of the [*relative*] revenue stability of the price control. Niche players do not have this and are thus exposed to disproportionate and unhedgeable risks in terms of the variability of Network Operator charges ...

... in the event of changes that we have not been reasonably able to predict, we either have to take the financial hit or pass through to our customers. Passing costs to customers through re-pricing in our experience can be very damaging to a supplier reputation as not all suppliers are affected to the same extent depending on their portfolio mix. We therefore value stability and predictability ...

... we also believe that customers would prefer a world of stability and predictability ... we favour some sort of year-on-year capping mechanism to further support stability. We would like to suggest that the rate of change of any costs attributed to a single customer should be limited to say 5% per annum. "

Source: CEPA analysis of consultation responses

While market participants, such as British Gas and Biz Energy, have voiced concerns about the impact network charging volatility has on their own businesses, consumer bodies, such as Energywatch and Consumer Focus, have also highlighted their concerns about the impact network charging volatility ultimately has on final consumer energy deals, as a result of the insurance (risk) premiums that are built into final energy deals:

Evidence Box 2.4: Management of network charging uncertainty[13]

EnergyWatch (August 2008)

"Suppliers will build a risk premium into their prices to consumers to compensate for perceived uncertainty about the future levels of charges from the DNOs. A number of factors can create this uncertainty, for example the potential for volatility over time ...

Uncertainty will also develop when there is a mismatch between a DNO's charging structure and a supplier's pricing structure ... we would urge Ofgem to focus on the simplicity, predictability and transparency of charges."

Source: CEPA analysis of consultation responses

2.5.2. Summary

In summary, there is a real financial cost of suppliers managing future volatility and uncertainty of network charges (in the form of risk premiums built into final household bills). While elements of a price control will always be fixed within the price control period, the adoption of mechanisms to manage uncertainty faced by network companies passes the risk, and therefore the cost, of managing uncertainty to suppliers and other market participants.

[12] Ibid.

[13] Ibid.

2.6. Who should manage charging uncertainty?

If there is a financial cost of managing network charging uncertainty this raises the question as to who is the best placed stakeholder to manage this risk? As Ofgem notes in its price control strategy documents, network companies will always face uncertainties about the appropriate outputs to deliver and around their expenditure over the control period. But network companies, as businesses with relatively stable, predictable cash flow streams, and who understand the expenditure drivers of investment in their networks better than any other stakeholder, may be better placed to manage the cost and form in which uncertainty is reflected in the final energy bills:

- If volatility in network charges is passed-straight through to final consumers then there is no *additional* cost of managing the uncertainty within the price control. But final consumers value stable, predictable final energy bills.
- Under current arrangements, it is therefore the supplier who is tasked with managing uncertainty within the price control. This is covered in a non-Net Present Value (NPV) neutral manner between the price controls in the form of an additional insurance premium added to the network cost element of the final customer bill.
- In contrast, if the network companies were tasked with managing the volatility of network charges (within the price control period) any additional costs of managing the uncertainty could be covered in an NPV neutral manner through the price regulatory regime. In this case, the *additional* cost of managing uncertainty arises from the carry costs of the company deferring its net allowed revenues.[14]

Why are current arrangements for managing network uncertainty the least efficient option? Energy supply companies' typically have tight margins and are concerned about their ability to recover money if they soak up changes in network charges.[15] So, under current arrangements, suppliers understandably have to charge an insurance premium that errs on the side of caution in order to cover the increased cost risks. They also fear customers will change supplier and so have to charge a closer to full cost premium rather than a probability adjusted one.[16]

The ability to recover costs that have been incurred but not passed-on to customers is also clearly a concern for supply companies. If additional costs are having to be recovered from customers but not all suppliers face the same degree of additional costs, or if new suppliers can enter the market, then recovering those funds would prove impossible without losing customers (or having customers on much longer-term "semi-fixed" contracts).

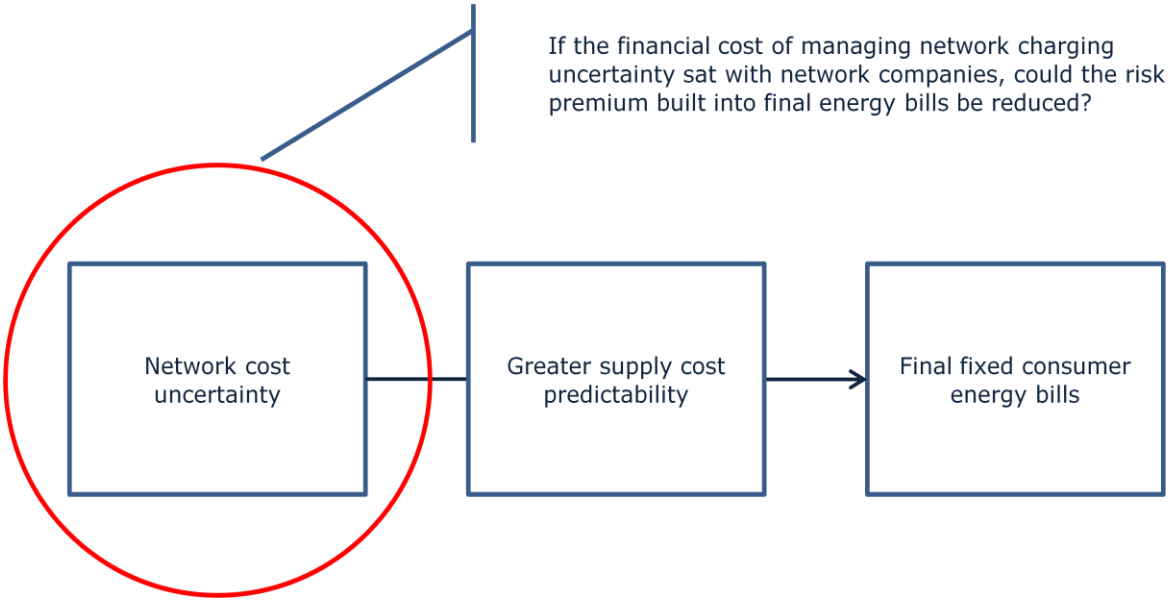
[14] Allowed revenues above base allowances driven by price control uncertainty mechanisms.

[15] See the quote from Biz Energy above.

[16] That is, to avoid volatility of charges which might cause the customer to switch, the supplier errs on the side of caution when setting the risk premium it includes in the customer's original quote.

As is illustrated in Figure 2.5, if network companies were tasked with managing the volatility of network charges this would arguably provide great predictability of retail supply costs and therefore final energy bills.

Figure 2.5: Managing network charging uncertainty



Source: CEPA

In many respects, it is an attractive option to pass the volatility of network charges straight through to final bills. But final consumers value predictability and because network companies' structure of charges and tariff periods may differ from that of suppliers, full cost pass-through may in reality not be achievable. Consumers may also act irrationally to increases in the volatility of final bills and avoid deals that provide the best value for money. Hence, there is an argument for making the network companies carry the cost of managing charging uncertainty unless there are circumstances in which the additional carrying cost will be greater than the supplier insurance premium. In the case of the gas distribution companies, our report on financial issues[17] and the expected capex profile for Gas Distribution Networks (GDNs) suggests that the extreme financeability problem which would justify passing management of the risk to the suppliers does not exist.

Based on the anecdotal evidence presented above, current industry arrangements for managing the cost of network uncertainty increase costs for consumers and, arguably, reduce competition and consumer choice in gas and electricity markets. We seek to quantify these impacts further in Sections 3 and 5 below. This raises the question whether new, more innovative, industry arrangements are necessary to manage network uncertainty more efficiently.

[17] See CEPA's accompanying report: RIIO-GD1/RIIO-T1 Financial Issues – a report for Centrica

2.7. Summary

In this section we have illustrated that consumers value stable, predictable energy prices. Consumers have responded to suppliers' offering fixed price deals, with over one in seven British households now on some form of fixed tariff. The uncertainty and volatility that affects network charges places a material risk on suppliers considering what level of costs they need to recover from consumers when setting future energy deals. We have illustrated that suppliers charge an insurance premium for managing the risk of network charges rising.

3. OFGEM'S PRICE CONTROL PROPOSALS

3.1. Overview

In this section, we review Ofgem's proposals for managing network uncertainty in RIIO-T1 and RIIO-GD1. We assess the impact the proposals may have on network charges and final consumer bills. While there are benefits arising from Ofgem's proposals, we argue the proposals will create charging volatility for consumers.

3.2. RIIO handbook principles

A number of elements of the RIIO framework help to deal with uncertainty, including tailored "uncertainty mechanisms", risk sharing through incentives, the potential disapplication of the price control, and a defined mid-period review of network companies' output requirements. Uncertainty mechanisms thus help to manage the uncertainty affecting network companies' businesses and expenditure requirements, and allow changes to the revenues a network company is allowed to collect over the price control period. Table 3.1 below provides examples of the types of uncertainty mechanism available to network companies under the RIIO framework. It also considers the issues each mechanism creates for network users who wish to manage and predict with some certainty future network charges.

The key points we draw from Table 3.1 are that there is a very broad range of mechanisms available under RIIO and that there are differing regulatory treatments of uncertainty under each mechanism. Understandably, these mechanisms have been developed as network companies face different types and categories of risk across their business. For example, as discussed in Section 2, there may be uncertainty about the level and the timing of expenditure on transmission connections. Uncertainty affecting particular elements of the price control may also be more or less predictable and controllable by the network company. Ofgem as the sector regulator also faces informational uncertainty about required expenditure and forecasts which may need to be managed differently depending on the circumstance. There is therefore a strong rationale for adopting a broad "regulatory toolkit" for managing uncertainty under RIIO. But Table 3.1 also shows the plethora of principles and processes network users will need to understand and monitor to manage network charges and changes in allowed revenue affected by uncertainty mechanisms under RIIO. Therefore, while we agree that uncertainty mechanisms, appropriately designed and targeted, deliver benefits for consumers, and also protect networks ability to finance delivery, they may also increase the complexity and (potentially) the volatility of network charges, in the absence of additional measures to mitigate these impacts.

Table 3.1: Uncertainty mechanisms and their implications for network charges

Types of uncertainty mechanism	
Tool:	**Description:**
Indexation	Adjusts the revenue a company is allowed to collect from customers according to changes in a specified price index (e.g. RPI). This passes the risk of movements in the price index to consumers. Retail suppliers can anticipate future price movements by predicting the future movement in the price index.
Logging-up	Compensates the network company for actual expenditure on certain activities, subject to an (efficiency) review of the relevant expenditure. Provided the time window when the expenditure is reviewed is fixed, logging-up can protect network companies and also reduce charging volatility for consumers.
Volume driver	Provision allowing revenue to increase/decrease as a function of a volume measure (e.g. number of connections). The impact on consumers depends on implementation, predictability of the volume adjustment and how the adjustments are passed through into network charges.
Triggers	Provision allowing for a specific part of the company's revenue allowance to be reviewed and potentially adjusted *during* the price control if and when specified conditions are met. Impact on consumers depends on the implementation and predictability of the trigger.

Source: Ofgem & CEPA analysis

3.3. Price control proposals

Qualitative assessment against RIIO principles

The RIIO-T1/RIIO-GD1 strategy documents outline relatively detailed proposals on uncertainty mechanisms. These include uncertainty mechanisms for all sectors, as well as sector specific mechanisms (for example, related to the iron mains replacement programme in gas distribution). In Table 3.2, we review the most material of these mechanisms and assess the potential impact on network charges of the treatment of uncertainty in each network sector. The purpose of the analysis, as with Table 3.1, is to illustrate, using a "scorecard" approach, how each proposal might impact on future network charges, and the impact on market participants and suppliers offering fixed or capped energy deals. In addition to these uncertainty mechanisms, there are also a number of smaller mechanisms proposed for each sector (for example, a logging-up mechanism for bio-gas related expenditure in the gas distribution price controls).

Table 3.2: Assessment of uncertainty mechanism proposals

Element	When might it affect charges?	How might it affect volatility of charges?	Materiality for consumers?
Cross sector proposals			
Cost of debt indexation	NWOs revenue allowance will be adjusted mechanistically each year.	Relatively small impact with proposed use of long term trailing average.	 Will affect the volatility of charges but will benefit consumers through removal of 'headroom' on allowed cost of debt.
RPI indexation of allowed revenues	NWOs revenues are indexed annually to RPI to provide protection against economy-wide inflation.	Causes NWO allowed revenue to vary but Ofgem's proposals are unlikely to increase volatility.	 Changes to RPI indexation approach will have relatively small impact on uncertainty of network charges.
Gas distribution proposals			
Repex policy	Reopener would change charges within the price control. A revenue driver would change the speed/amount of work.	Could significantly alter charges compared to final price control determination.	 May materially affect suppliers offering long-term fixed energy deals.
Gas transmissions			
Revenue drivers for incremental capacity	NWO revenues are adjusted according to the requirements for incremental entry and exit capacity.	Reduces consumer exposure to forecasting error. Impact dependent on whether costs are socialised.	 Important the design delivers VFM and facilitates investment in production.
Electricity transmission			
Network connections volume driver	Number of connections expected to be significant but exact level and costs of projects is difficult to predict.	Reduces consumer exposure to forecasting error. As with gas, the impact is dependent on whether costs are socialised.	 Important the design delivers VFM and facilitates investment in generation.
Wider reinforcement mechanisms	Would depend on the mechanism adopted. A trigger mechanism would provide greater certainty on timing impact.	Scale of costs will be significant. Interim-reviews or volume drivers could significantly increase volatility.	 Key issue is the predictability and timing of when and how TUoS charges might increase.

Source: CEPA

The key points we draw from Table 3.2 are as follows:

- Given that distribution charges form a more significant part of final household bills than for transmission, a reopener and revenue driver for the repex programme has the greatest potential to increase the volatility of network costs in household bill.
- But while a revenue driver and reopener applied to the largest single expenditure item in the gas distribution price control could lead to more volatile network charges, it is also clear there is a rationale for including each of these mechanisms.
- A similar logic applies to the proposals for transmission. A revenue driver for incremental gas entry and exit capacity, for example has a clear, demonstrable rationale given there is uncertainty as to where and when the capacity will be needed.

Therefore, while there may be drawbacks of the proposed uncertainty mechanisms (mainly more volatile network charges or limits on efficiency incentives) the key mechanisms are also likely to benefit consumers in various ways. As part of the justification of its proposals, Ofgem highlights wider benefits such as a contribution to a lower cost of capital and reduced consumer exposure to forecasting uncertainty. These benefits may indeed be substantial, although if each mechanism has a benefit, in terms of lower financing costs, it raises the question of what would be cost of capital in the absence of the suite of uncertainty mechanisms?

Investors' view of network companies as relatively low risk investments, we would argue, is not purely driven by the framework for managing uncertainty. So long as parts of the price control are interlinked, investors will consider overall the risks faced by the business and individual uncertainty mechanisms may therefore not deliver a step-change in financing costs e.g. due to different directional impacts on costs. Without explicit quantification and assessment of the financing benefits (as CEPA has sought to demonstrate repeatedly over previous price control reviews with regards to cost of debt indexation)[18] we would caution against protecting network companies against uncertainty and simply expecting benefits in terms of a lower financing costs and overall network charges. Not least because protecting network companies against all forms of uncertainty limits efficiency incentives.

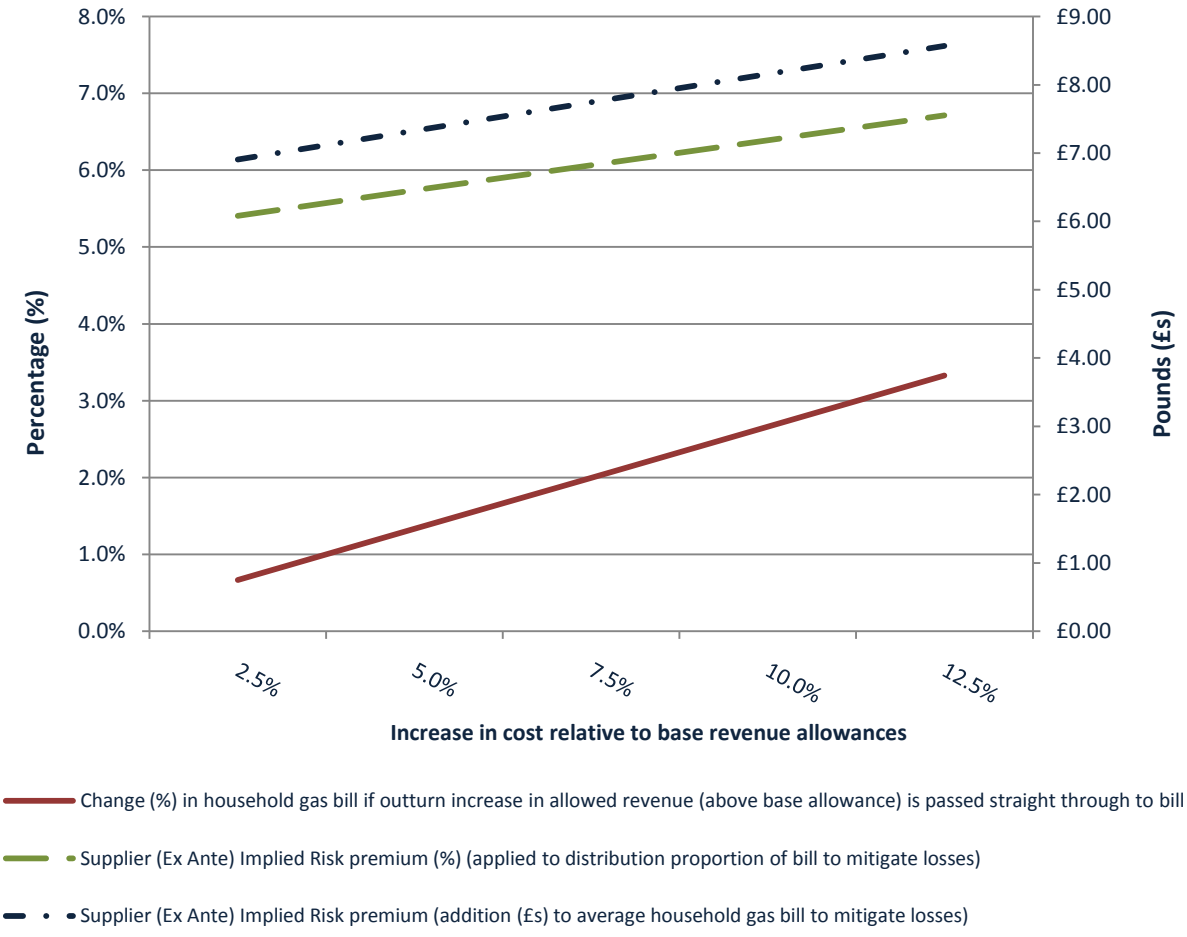
We would also argue a more nuanced and explicit consideration of the consumer benefit trade-offs is required than currently in the strategy documents. While uncertainty mechanisms may reduce consumer exposure to forecasting uncertainty, they also increase consumers' exposure to charging volatility. As we have demonstrated in the previous section, while there is a cost of failing to manage uncertainty in the networks sector, there is also a cost of passing this risk to market participants and suppliers. Both ultimately impact on final consumer energy bills.

[18] See for example CEPA's report for ORR/Ofwat on indexing the allowed rate of return: http://www.ofwat.gov.uk/pricereview/rpt_com_indexratereturn.pdf

Quantitative assessment of proposals for gas distribution

CEPA has developed a modelling framework to assess potential impacts of GDN price control uncertainty mechanisms on retail suppliers and final consumers. We have used publicly available information on GDN price controls to assess the indicative future profile of gas distribution charges. We have then assessed the impact on final gas distribution charges, final customer gas bills, GDN allowed revenues and a hypothetical supplier's profit margins if the price control uncertainty mechanisms were to cause GDN allowed revenues to increase by a fixed percentage each year from the base revenue allowances predicted at the price control review. Finally, we have assessed the *implied* insurance ("risk") premium a hypothetical supplier would *ex ante* need to build into its tariffs to mitigate the impact of anticipated price uncertainty within the price control period. Our results are illustrated in Figure 3.1.[19]

Figure 3.1: Impact of cost uncertainty over price control period on consumers and suppliers



Source: CEPA

[19] More detailed results are provided in Appendix B

Figure 3.1 shows:

- If *outturn* allowed revenues increase by more than 5% relative to base allowances (set *ex ante* at the price control review) this results in an increase in final gas bills of 1.5% or more – this would add £7.50 (or more) to the current average annual household gas bill.
- A gas supplier might *ex ante* need to apply a 5.5% – 6.5% *implied* risk premium to its gas distribution costs over the eight year price control to maintain targeted profit margins (assuming other elements of the household bill remain fixed).[20] This is a 1.3% – 1.4% *implied* premium on the total gas bill.
- Applying a 5.5% - 6.5% risk premium to the distribution element of the average household gas bill, increases the annual final bill by as much as £6 - £8 (depending on how the supplier anticipates GDN expenditure to increase relative to base allowances).
- Supplier losses, and the need for a supplier risk premium, are caused by *anticipated* network charges (used to set final retail tariffs) differing from *outturn* network charges (driven by the increase in revenues relative to base allowances).[21]

The assumptions we have used to illustrate these results are presented in Appendix B.

While our results are based on our assumptions of how the supplier anticipates future network charges and how price control uncertainty mechanisms affect GDN allowed revenues, we consider our approach to be useful in illustrating the issues faced by suppliers (large and small) who in reality need to manage how changes in network charges are passed-through in final consumer bills. Our analysis illustrates the risks volatility of network charges place on suppliers, in particular, with regards fixed price tariffs.

While Ofgem's proposals may be justified against its RIIO principles, we would therefore argue the proposals at present fail against "consumer value" principles.

A plethora of mechanisms applied "bottom-up" to individual components of the price control helps the network companies manage uncertainty. But for consumers, who value predictable network charges, the aggregate impact of the plethora of mechanisms (the "top-down" effects of the approach to dealing with uncertainty) fails to:

- assess whether the allocation of risk and uncertainty is efficient, in terms of the impact on final customer bills; and
- recognise the aggregate impact of volatility across the price control on market participants businesses (for example, suppliers fixed price energy deals).

[20] So for example, if the supplier anticipated an increase in GDN expenditure of 7.5% relative to base revenue allowances it would need to apply a 6% premium to distribution charges to mitigate losses across its portfolio of customers.

[21] On an individual basis, it is suppliers' long term fixed price deals, in particular, that are materially affected by the gas distribution network price uncertainty.

Although there are benefits of price control mechanisms that protect consumers from forecasting uncertainty, our analysis illustrates that even a relatively modest increase in the volatility of network charges increases risk for suppliers. As we discussed in the Section 2, current arrangements for managing network charging uncertainty are unlikely to be efficient as suppliers have a small profit base and so, under current arrangements, have to charge an insurance premium that errs on the side of caution to cover the increased cost risks and the risk the customer will churn if there is a step-change in the cost of the final bill. Hence there is an argument for making the networks carry the cost of managing the charging uncertainty unless there are circumstances in which the additional carrying cost of the network company will be greater than the supplier insurance premium. We investigate this issue further in Section 5.

3.4. Profiling network charges

Ofgem propose to manage charging volatility in the price controls by including provisions for re-profiling of revenue collection and amending the reopener processes (for example, fixed reopener windows) to improve predictability of price movements. The text box below summarises Ofgem's proposals on revenue re-profiling:

Text Box 3.1: Profiling of network charges
"As part of the price control review, we will reach a view on the expenditure required each year by each network company to deliver the agreed outputs. Our default approach is to set base revenue for each year of the price control consistent with the expected path of expenditure requirements … Normally, we would expect companies to manage the variation and adhere to the price profile assumed at the price control review. However, if a company needs to make a large but transitory change in its prices, compared to what was expected at the price control review, it would need to provide clear and robust justification, comparing forecast revenue for the remainder of the period with and without re-profiling."
Source: Ofgem

The key points we draw from the text box are:

- Ofgem's proposals are understandably high-level. But the issue for consumers is not only the volatility of charges per se, but also the *predictability* of how and when adjustments to allowed revenue are made and how these affect final charges.
- Therefore, although Ofgem propose to provide some protection against volatility within the price control period, the proposals in their current form, do not provide a mechanistic, and agreed regulatory treatment of how and when re-profiling would be applied.
- Therefore, as well as a transparent and predictable adjustment mechanism, the governance processes for a determination on re-profiling would, in our view, need be clearly scoped and agreed in discussion with consumers.

- There are also links between the profiling of charges and the financial package of the price control. We agree re-profiling[22] should ensure companies are neither penalised nor rewarded for re-profiling of revenues.

One of the questions posed by Ofgem in the price control strategy documents is: what are the appropriate criteria for assessing whether a proposed change to the revenue profiling is appropriate? While it is unlikely a simple set of criteria can be applied, we highlight our view of the issues and criteria in the text box below.

Text Box 3.2: Criteria for re-profiling of network charges

- As far as practicable, re-profiling should deliver improved predictability around the range of charging changes as well as removing price spikes over the price control period.
- The approach to revenue re-profiling should be as mechanistic as possible as opposed to a network operator "case-by-case" approach.
- Proposals for re-profiling charges should include increased industry reporting on how adjustments will impact on prices and a fixed consultation window of the proposed re-profiling.
- Given the impact of re-profiling on energy markets, consumers, as well as network companies, should be involved in the design of re-profiling.
- Revenue re-profiling should be applied on a value neutral basis consistent with network companies cost of capital (updated for cost of debt indexation).

Source: CEPA analysis

Re-profiling of network charges, in our view, provides one of many options for restricting network charge movements to improve the predictability of network charges. We summarise a proposal for how smoothing / re-profiling of price changes could be applied, along with other, arguably simpler, approaches such as a cap and collar in year on year price movements, in Section 5.

3.5. Summary

While there may be drawbacks with Ofgem's proposed uncertainty mechanisms (mainly more volatile and unpredictable network charges) the key mechanisms have a rationale and are likely to benefit consumers in a number of ways. The proposed mechanisms applied "bottom-up" to building blocks of the price control will help network companies manage uncertainty. From a network pricing perspective, there is a clear rationale for designing uncertainty mechanisms in this way. But for consumers, who value predictable network charges and who ultimately bear the cost of this volatility of network charges, the aggregate impact (the "top-down" effects of dealing with uncertainty) could be significant. Based on our modelling analysis, we have sought to illustrate these impacts and have shown the risks volatility of network charges places on suppliers and market participants over the course of the price control period.

[22] Or any other proposal to mitigate network charging volatility.

4. EIGHT YEAR PRICE CONTROLS AND THE MID-PERIOD REVIEW

4.1. Overview

In this section we review the concept of an eight year price control and the proposed scope of the mid-period review. We then discuss the practicality of eight year price controls for both gas distribution and transmission and the impact a mid-period review could have on perceived network price control uncertainty and charging volatility.

4.2. Eight year price controls and the scope of the mid-period review

4.2.1. Rationale for eight year price controls

The benefits of longer price controls were reviewed at length during the RPI-X@20 review. The main proposed benefit of longer price controls is to improve longer-term efficiency by focusing network companies on activities designed to reduce long-term costs (for example, R&D and longer term investment decisions). Other potential benefits include reducing the regulatory burden and perceived level of regulatory risk - the more frequent the price control reviews the more uncertainty created for investors that Ofgem might make changes to the regulatory rules and thus affect the companies' level of profitability.

For RIIO, Ofgem has adopted an eight year price control framework with a four year mid-period review. This is because it considers an eight year price control, with a four-year interim review of outputs to provide an appropriate trade-off of promoting long term thinking from the network companies, whilst also mitigating some of the drawbacks of longer price controls, notably uncertainty of business plan forecasts (both the informational asymmetry affecting the regulator and the genuine uncertainty affecting the network company) and reduced scope for Ofgem and the network companies to react to changes in the market to help ensure that networks continue to deliver what customers need.

4.2.2. Application of eight year price controls

The RPI-X@20 review assessed the concept of an eight year price control at a relatively generic level, rather than focusing on specific challenges affecting each of the transmission and distribution sectors (although consideration was given to overarching challenges such as promoting sustainable development and delivery in each sector). The detailed design of an eight year price control was therefore deferred for the sector price controls. The default position, however, was a movement away from a five year price control to an eight year control.

Ofgem has now started the detailed design of RIIO price controls for gas distribution and transmission. Consistent with the RIIO handbook, the default position is a movement to an eight year price control for both the distribution and transmission price controls. Although a great deal of analysis was presented on the length of the price control at the RPI-X@20 review, for the benefits

of eight year price controls to outweigh the potential drawbacks, we believe a number of additional *sector conditions* now need to be taken into consideration:

- The investment and operational challenges facing network companies must be longer rather than short term (hence the need for an eight year price control).
- Ofgem needs to be confident that a four year interim review can practically focus only on outputs (otherwise the benefits of reduced regulatory risk are undermined).
- A review/change in the price control outputs and deliverables must therefore be easily separable from the overall costs and commercial framework of the price control.
- Choices of the *network companies* over the initial four years must also be easily separable from external changes in the outputs of the price control.
- Ofgem must be confident that the scope of the mid-period review can be clearly defined at the conclusion of the ex ante price review.
- Finally and most importantly, Ofgem must be confident changes in scope of price control output measures[23] can be separated in terms of impact from other output measures.

The proposed scope of the mid-period review (i.e. an interim review that focuses very narrowly on output measures and deliverables) is likely to be appropriate if these conditions can be met (most importantly if changes in output measures can be separated from the overall financial framework of the price control, other output measures in the price control and the commercial choices made by the network companies). Otherwise there is a clear risk an interim review could collapse into an "in-kind" price review (as has been the case in the past in other regulatory sectors that have set long term price controls).[24] This would adversely impact both on companies planning decisions and the predictability of network charges for consumers.

But achievement of all these conditions we expect to be difficult; we therefore argue an "on-balance" decision (depending on the view of which conditions dominate) is required on whether an eight year price control (and interim review) is required at all. In the sections which follow, we discuss whether the benefits of an eight price control are likely to outweigh the drawbacks within the context of each sector (gas distribution and transmission).

[23] For example, data and output measurements of "risk reduction" on gas distribution networks.

[24] We review the ten year price controls set for the water and sewage sector following privatization in Appendix C. Ofwat abandoned the ten year price control after five years of the price control.

4.3. Gas distribution

We consider there to be a case for implementing a shorter price control in gas distribution rather than the default eight year period. For example, a fixed five year price control would allow many of the innovative ideas of RIIO to be implemented (for example, innovation funding; and increased focus on outputs) but would also allow the uncertainty affecting the sector to be managed more effectively. A five-year price control would provide commercial certainty for consumers and the GDNs, but would also allow more gradual adjustments to repex policy (if required) and phasing of new output measures and business planning processes (for example, risk reduction expenditure across the gas network) over the next few years.

Text Box 4.1: Length of price control in gas distribution sector

- GDNs face various challenges and uncertainties over the next few years. For example, the remaining economic life of gas networks, the form and funding of the repex programme and the future approach to risk reduction across the gas network.
- While sustainable development goals support a longer investment framework, given sector uncertainties there may be an "option value" of waiting for more information on key issues affecting the sector before a long-term price control and investment framework is set.
- The GDNs have only recently started to accumulate data on proposed network output measures. The key deliverables and outputs proposed in Ofgem's strategy documents, we would argue, are also focused on areas of the GDNs businesses which are subject to the greatest uncertainty.
- Compared to other network sectors, for example electricity transmission, separating output measures, uncertainty and the GDNs cost base, is likely to be relatively difficult. Maintaining a narrow scope for the mid-period price control review we believe will also be difficult.

Source: CEPA analysis

If repex (related to the iron mains replacement programe) remains broadly the same as under current policy then there would be a much stronger argument for setting a longer term eight-year price control. If in contrast a change in repex policy were put in place by Ofgem and the Health and Safety Executive (HSE) – even with certainty over the future direction of the programme for the next price control – we would argue there is still likely to be uncertainty over how new price control obligations will impact on the cashflow requirements of the GDNs. An eight year price control in this scenario, would increase charging volatility *and* reduce the future predictability of this volatility for consumers. It may also place pressures on the GDNs business plans that may not have been anticipated at the time the price control is set.

4.4. Transmission

We consider the case for an eight year price control, and the scope of the mid-period review, to be much stronger for transmission.

While we consider an interim review of outputs to be feasible and appropriate for transmission, we believe the final terms, conditions and governance of the review will require a tighter definition than is presented in the RIIO-T1 strategy documents. This will help to avoid the review being considered a regulatory risk but will also help to mitigate uncertainty for consumers. The focus of the interim review should be on events *exogenous* to the transmission network companies when considering the need for changes in outputs.

Text Box 4.2: Length of price control in transmission

- In order to promote more efficient delivery of upgrades and connections, the transmission companies require a longer term planning and regulatory period (for example, in relation to phasing of anticipatory investment and wider reinforcement works).
- The scope of the mid-period review, and the output measures that underlie its governance, we believe can be tightly defined and separated from the overall "commercial" framework of the price control and the choices made by the transmission companies (TOs) within the price control period, provided that appropriate uncertainty mechanisms are also put into place (see below).

Source: CEPA analysis

Like the GDNs, the electricity transmission companies also face major uncertainties over the forthcoming price control. However, in contrast to the GDNs (where uncertainty is driven by major regulatory decisions and the future form in which these will be implemented) for the electricity TOs the uncertainty is about when and where investment will need to take place, both for connections and wider reinforcement works. In the absence of uncertainty mechanisms, large ex- ante forecasts of capacity and associated revenue allowances would need to be built into the TOs price controls. In this scenario there might also be a case for a shorter price control for electricity transmission to protect consumers against forecasting uncertainty. However, with uncertainty mechanisms in place, both transmission companies and consumers are protected against the adverse impacts of forecasting uncertainty. In this scenario, we consider the benefits of an eight year price control to outweigh the drawbacks.

4.5. Charging uncertainty

An interim review of the eight year price control, as well as impacting on network companies, may also impact on the volatility of network charges. Ofgem's strategy document, although mentioning that charging volatility will be one of the considerations taken into account during the review of output requirements, does not specifically mention how changes in output measures at the interim review might be expected to pass-through into charges (we presume the changes will take effect in year five of the price control).

Consistent with the theme throughout this paper, we believe greater thought is required about how an interim review of output measures would impact on wholesale and retail sectors, in particular, how the interim review could avoid charging volatility for consumers. The options are similar to those identified for managing charging volatility from uncertainty mechanisms, and indeed a

consistent approach that applies to both uncertainty mechanisms and an interim review is likely to provide the greatest certainty for consumers.

4.6. Summary

We have argued that sector conditions need to be taken into consideration when assessing the length of the price control and whether the proposed scope of the mid-period review is appropriate. We consider there to be a case for implementing a shorter price control in gas distribution rather than the default eight years. A shorter price control will allow many of the innovative ideas of RIIO to be implemented but allow the uncertainty affecting the gas distribution sector to be managed more effectively. For transmission, we consider the case for an eight year price control, and the scope of the mid-period review, to be much stronger but appropriate uncertainty mechanism must be put into place to manage the timing and volume risk affecting the sector.

5. CONSUMER PROPOSALS

5.1. Overview

This section considers options for mitigating network charging and investment uncertainty. Each option focuses on the design of network uncertainty mechanisms from the perspective of the consumer. While our proposals have a greater focus on gas distribution network charges (as distribution costs are a much larger element of final household energy bills) we also consider the role of consumer principles in the objectives and design of uncertainty mechanisms for transmission network investment.

5.2. Options for supporting retail markets

Uncertainty mechanisms applied "bottom-up" to the building blocks of the price control will help network companies to manage uncertainty, whether the uncertainty is price, volume or timing related. From a network pricing perspective, there is a clear rationale for designing individual mechanisms in this way. But for consumers, who value predictable network charges, it is the aggregate impacts (the "top-down" impacts of the approach to managing uncertainty) which are the most material and costly.

In this section we outline options that seek to mitigate network charging uncertainty for consumers by applying a "top-down" assessment across the price control framework. This does not prevent the inclusion of individual, "bottom-up", mechanisms to mitigate the uncertainty faced by network companies across the deliverables of the price control. But each "top-down" option provides some protection for consumers against adverse impacts of network charging volatility while also protecting the financial viability of the network companies.

5.2.1. Description of options

Each option in some form involves restricting changes in network companies' annual allowed revenue above the price control baseline allowance. The proposal is not that allowed revenues would be disallowed or subjected to a form of efficiency review (subject to the design of the "bottom-up" uncertainty mechanism). Simply the proposal is that collection of additional allowed revenues above the baseline allowance is deferred until there is a more suitable point in the tariff cycle in which to "pass-through" the collection of additional revenue into final network charges. Any deferral of allowed revenues would, therefore, need to be applied in a net present value (NPV) neutral basis. That is, there will be a financial cost of asking the network companies to manage revenue volatility over the eight year price control. But as we argued in Section 2, rather than financial cost of managing network charging uncertainty sitting with the supplier (and which form a part of final bills in the form of a supplier risk premium) this could facilitate a more transparent and, arguably, efficient method of passing-through uncertainty affecting network expenditure and deliverables to final household energy bills.

Our three proposed options for restricting network charges are as follows:

- **Option 1** – A simple cap/collar on individual price movement percentages. Each network company would face a restriction on the maximum increase/decrease in network charges between years. Deferred revenues would be collected on an NPV neutral basis.
- **Option 2** – Similar to Ofgem's proposal for re-profiling charges, this approach would apply a smoothing algorithm to additional revenue streams (those over and above Base Revenues) across a specified period (for example, five years).
- **Option 3** – Would involve logging-up of costs, whereby variations around the baseline of allowed revenues would be added to an administered log. Deferred revenues would be collected on an NPV neutral basis.[25]

The design of any mechanism to restrict network charging movements would require careful thought to balance the positive and negative impacts across stakeholders (including network companies, market participants and final consumers). For example, a logging-up mechanism would need to take account of how deferred revenues would eventually be recovered through network charges – should the deferred revenues be recovered in a single step change at the beginning of the next price review or should a proportion of the allowed revenue be recovered within the price control period (for example, following the completion of the four year mid-period review)? As regards a cap and collar approach, at what level should the cap be set? Should a collar be put into place at all (in this case the uncertainty mechanism would be asymmetric) and how would deferred allowed revenues be recovered from consumers? Some of the issues to be considered are sketched out in the table below.

Table 5.1: Assessment of uncertainty mechanism proposals

Options	Issues	Points for discussion
Option 1: Cap & Collar	▪ Correct size of cap / collar ▪ Rules for under/over recoveries	Does the cap and collar only apply to allowed revenues or variations in applicable volume and charging methodologies as well?
Option 2: Smoothing	▪ Mechanism for smoothing ▪ Reporting requirements	See discussion in Section 3.
Option 3: Logging-up	▪ Mechanism for logging-up ▪ Appropriate rate for NPV calculation	Limitations on revenue collection could materially affect network operators ability to finance their delivery[26]

Source: CEPA & Centrica

[25] This is essentially a variant of the cap and collar approach except in this case the cap and collar is set at zero (i.e. no movements of allowed revenue above the base line are passed-through into network charges within the tariff period.

[26] While revenues may be returned to investors on an NPV neutral basis, deferral of revenues may still be viewed negatively by investors.

5.2.2. Options discussion

In this section we discuss the advantages and disadvantages of each option. First we assess each option against the RIIO principles and a set of consumer value principles. We then illustrate the impact of a cap and collar system on network companies, consumers and suppliers by extending our illustrative network and retail tariff modelling analysis from Section 3.

Qualitative assessment

The table below summarises our assessment of each option against Ofgem's RIIO principles and our consumer principles.

Table 5.2: Assessment of uncertainty mechanism proposals

Criteria	Option 1: Cap & Collar	Option 2: Smoothing	Option 3: Logging-up
Protects financeability?	Depends on how wide the cap and collar is set.	Depends on the period over which smoothing is applied.	Applied on NPV neutral basis but requires most significant revenue deferral of three options.
Does the mechanism deliver VFM?	All the proposed options protect consumers in some from charging volatility. Net benefits depend on the cost savings outside network sector relative to financial cost of network companies managing revenue deferrals.		
Assessed in wider market context?	Balances stability for consumers and financeability concerns for network companies.		May be perceived negatively by investors.
Assessment of trade-offs?	Relatively simple to implement.	Relatively complex to implement.	Would depend on the complexity of the logging-up mechanism.
Risk borne by best party?	Consumers required to manage small price changes.	Depends how revenue profiling applied.	Network company manages the risk.

Source: CEPA

The option that performs best against the assessment criteria is a cap and collar scheme. A cap and collar system would require the network companies to manage charging uncertainty but only if this were to exceed an agreed tolerance level. While consumers would be required to manage relatively small changes in allowed revenue and low volatility of network charges, they would be protected against significant volatility within the cap and collar period. Out of all the options, a cap and collar system would also be the simplest to implement, provided that a mechanistic approach to logging up deferred allowed revenues were adopted and the point at which deferred revenues are passed-through into consumer charges was set sensibly relative to the regulatory cycle (for example, at the beginning of the next price control).

Mitigating financeability concerns

A cap and collar and price smoothing mechanism perform relatively well against Ofgem's ability to finance delivery principle compared to a full logging up mechanism because each mechanism limits (in some form) network companies exposure to deferrals in revenue collection. Mitigation of financeability concerns under a cap and collar system will depend on how wide the band of the cap and collar is set depending on the range of outcomes for additional revenues from Base Revenues. In the case of a smoothing mechanism, the issue is also how the smoothing is calculated and the period over which it is applied.

While we agree that ability to finance delivery must be a key concern for both the design of network companies and consumer led uncertainty mechanisms, we believe there a number of relatively simple approaches for helping to mitigate adverse financeability impacts under the charge restriction options we have set out above:

- First, the regulatory regime for deferral of allowed revenue must be based on an explicit rule / mechanism that provides commitment to investors by removing any regulatory discretion with regards eventual recovery of the deferred allowed revenue.
- Second, deferred revenues will need to be recovered on a NPV neutral basis using a discount rate proportional to the financial cost to network companies of managing revenue deferrals. This is the price control cost of capital.

The other option is clearly for the network companies to inject more equity into their businesses. We consider financeability issues in CEPA's accompanying paper on RIIO-GD1 and RIIO-T1 finance related issues.[27]

Regulatory precedent

One argument that might be presented against implementation of a mechanism that restricts network charge movements is that in other parts of the energy sector, and the wider economy, consumers are asked to manage price volatility and are not protected by similar price stabilisation mechanisms. However, as we outlined in Section 2, we would argue a review of pricing arrangements in other parts of the energy sector suggests quite the opposite. Indeed, our simple review of retail gas and electricity trading arrangements illustrates that suppliers offer their customers a range of fixed price deals. As with final consumers, wholesale market participants also value certainty of future prices, and so enter into different forms of fixed and hedging contract depending on the structure of their business.

As regards schemes to restrict price movements elsewhere in the UK economy, we note the Government's recent proposal for a fuel stabiliser mechanism as a good example of how, in other contexts, simple price stabilisation schemes have been proposed to protect final consumers against

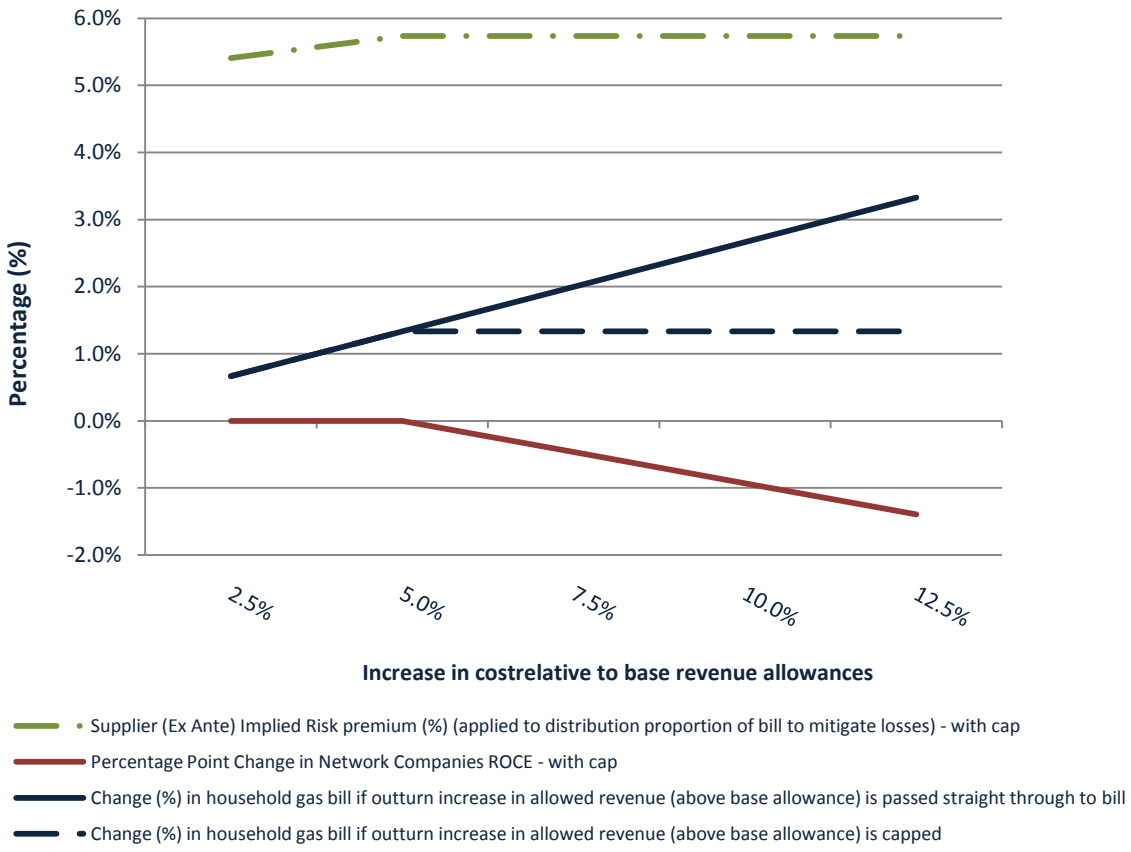
[27] In the case of the gas distribution companies, our analysis shows that the expected capex profile of the GDNs means the companies are unlikely to be affected by extreme financeability problems over the forthcoming control.

the adverse impacts of pricing volatility.[28] The Australian energy regulator for New South Wales (IPART) has in the past also implemented an electricity tariff equalisation fund scheme to protect consumers and standard retailers from excessive price volatility. We review each of these schemes in Appendix C.

Quantitative assessment

In Section 3 we presented modelling analysis of the impact of gas distribution charges being linked to changes in allowed revenue from uncertainty mechanisms. We showed the *implied* risk premium a hypothetical supplier might need to build into its gas bills to mitigate the impacts of the price control uncertainty mechanisms. We also illustrated the impacts changes in allowed revenues might have on final household gas bills. In Figure 5.1 we show the impact on consumers, the supplier and the GDNs under a scenario where a 5 per cent revenue cap mechanism is applied to restrict the movement in gas network charges.[29]

Figure 5.1: Impact on consumers, suppliers and GDNs of five per cent cap and collar mechanism



Source: CEPA analysis

[28] The fuel price stabiliser is also a good example as it illustrates how a stable revenue stream (public sector finances from fuel taxation) can be used to support price stability for final consumers.

[29] As with the analysis in Section 3, more detailed modelling results are presented in Appendix B.

Figure 5.1 shows:

- That a 5 per cent revenue cap and collar mechanisms significantly reduces the impact *outturn* changes in *allowed revenues* above base allowances (driven by uncertainty mechanisms) could have on final customer bills *within* the price control period (we estimate the cap on the increase in final household gas bills to be around 1.5%).[30]

- A 5 per cent revenue cap also caps the supplier's *implied* risk premium it would need to apply *ex ante* to distribution costs to mitigate losses.[31] With the presence of the cap, future network charges *anticipated* by the supplier are much closer to *actual* network charges, even with the outturn adjustment to base allowed revenues.

- The cap on the *implied* risk premium must be balanced against the cost to the network companies of deferring allowed revenue. This is illustrated by the change in return on capital employed over the price control (which proxies the eventual NPV adjustment for deferral of allowed revenues to be recovered from consumers).

Figure 5.2 illustrates the supplier *implied* risk premium (applied *ex ante* to distribution costs) with and without the five per cent revenue cap. It shows how a cap on revenue allowances (recovered *within* the price control period) would provide greater certainty to the supplier of the distribution cost element of its retail cost base. As well as limiting the impact price uncertainty mechanisms would have on the final customer bills within the price control, the revenue cap fixes the charge profile within the five per cent tolerance band and therefore reduces the risk for the supplier that network charges will rise unexpectedly over the course of the price control.

We estimate that:

- Were the supplier to anticipate a 10% - 12.5% increase in allowed revenues when setting its customer retail tariffs, a 5% revenue cap would reduce the *implied* risk premium the supplier would need to apply to *ex ante* to distribution costs by 1% - 1.5%.

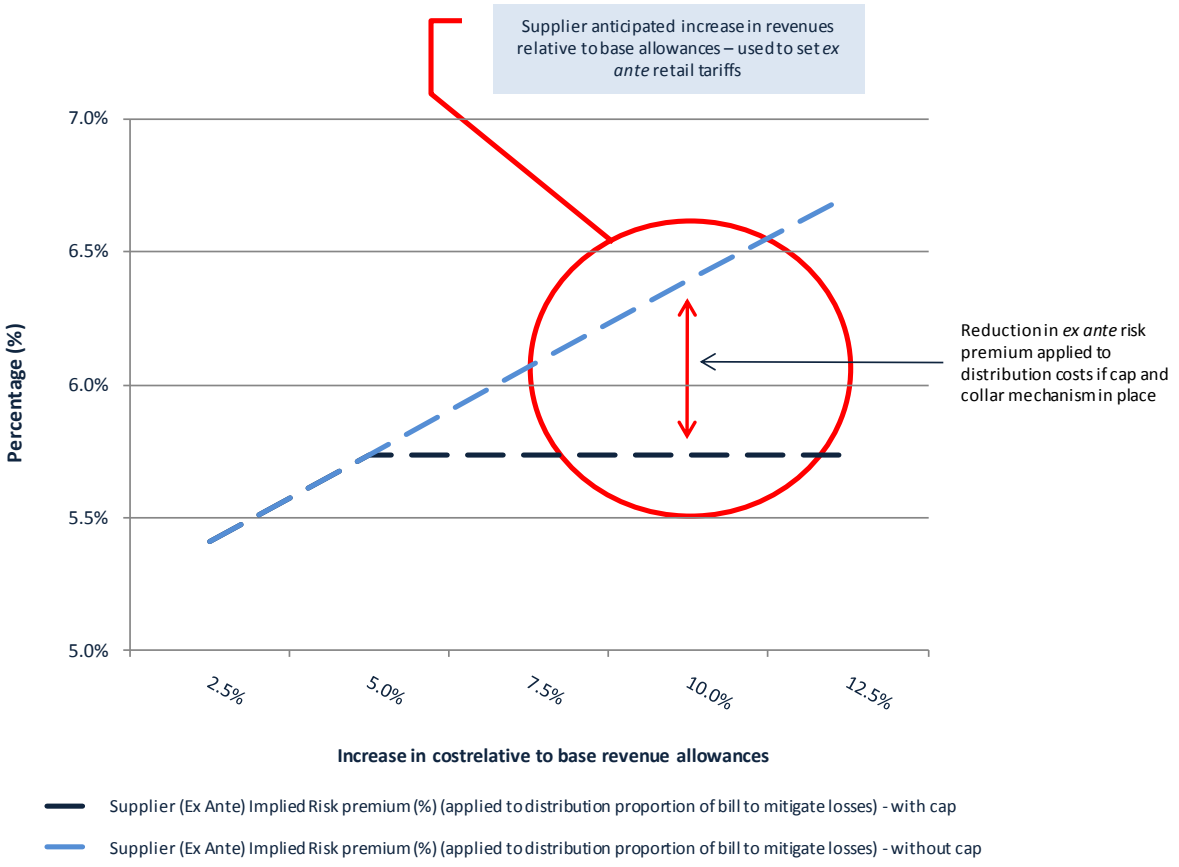
- This reduction in the supplier's risk premium, applied to the current average household gas bill in Britain, would reduce the final bill by £1 - £2 per annum, balanced against the increase in network company costs of deferring allowed revenue.

The application of the "top-down" cap and collar mechanism (or any other proposal for restricting the volatility of network charges) does not prevent the use of "bottom-up" uncertainty mechanisms to address network price, volume and timing uncertainty. But a cap and collar mechanism helps to limit the impacts and distortions volatility of network charges have on consumer prices and supplier pricing /product decisions in retail markets.

[30] That is, if *outturn* allowed revenues increase by more than 5% above base allowances (set *ex ante* at the price review) the cap and collar mechanism places a cap on the increase in the final household gas bills of around 1.5% (the blue dotted line on Figure 5.1).

[31] We estimate the supplier's implied risk premium to be capped at around 5.75% (the green line on Figure 5.1).

Figure 5.2: Impact on implied risk premium of 5 per cent cap and collar



Source: CEPA

5.3. Options for supporting wholesale markets

As we discussed in Section 4, a key concern for Ofgem (and consumers) is that the electricity transmission price control, in the absence of uncertainty mechanisms, will need to build in large ex-ante projections for anticipatory investment and wider network reinforcement works even though there is uncertainty about when increases in investment will need to take place and what will be necessary at particular locations on the network.

Ofgem has identified various options to help incorporate flexibility into the electricity transmission price control to manage this investment, including potential trigger mechanisms, provisions that will allow Ofgem to make within-period determinations and provisions under which the network companies would have flexibility to choose what level of capacity to deliver. Ofgem are also considering a fourth option, which is an incentive mechanism as opposed to an uncertainty mechanism.

In our view, one of the most appropriate mechanisms for managing the material uncertainties facing transmission network companies (timing uncertainty of large lumpy investments) are negative trigger

mechanisms. A negative trigger is a regulatory tool that has been successfully implemented for UK airports to protect consumers against possible delays in large investments that are expected to be charged within the price control (we review the negative trigger mechanism employed by the Civil Aviation Authority (CAA) in Appendix C). A negative trigger mechanism for electricity transmission, would require capacity and associated revenue allowance forecasts to be set at the beginning of the eight year price control, but the transmission network operators would be required to put in place price reductions for failing to deliver the investment within a pre-specified time period (or simply over the price control period).

We note that triggers are an uncertainty mechanism that Ofgem has previously adopted for transmission connections in the 2001-06 price controls but there were issues then with their practical implementation.[32] We would argue negative triggers are now a practical option, as the volume of future generation connection is known with greater certainty (in the form of the generation queue for connections to the transmission system). It is the *timing* of when these connections will take place and the wider accompanying reinforcement works affected by new generation connecting that remains the main uncertainty in the sector.

We believe the benefits for consumers of a negative trigger mechanism (which falls under Ofgem's proposed Option (a)) for managing wider electricity transmission reinforcement work uncertainty are clear: relative to other proposed options, negative triggers provide the greatest certainty to consumers that prices won't unexpectedly rise within the price control period as the trigger criteria is designed to be asymmetric. Given the simplicity of the trigger approach, the process is also relatively straight forward and provides more certainty to smaller market participants with less resources to monitor more complicated mechanisms such as within-period determinations and network capacity volume drivers.

We have not outlined a detailed design for a negative trigger mechanism given the stage of the price control. However, we would be happy to discuss with Ofgem and the transmission companies, how such a mechanism could be developed so as to benefit consumers, while also providing revenue certainty for the companies.

5.4. Summary

In this section we have reviewed a number of simple options for mitigating network charging and investment uncertainty. To mitigate the costs of charging volatility for final consumers, we have highlighted the advantages of a cap and collar approach for restricting network charge movements. We have illustrated, using a simple modelling framework, the impact this type of mechanism could have on network companies, suppliers and final consumers. We have also recommended the use of

[32] Uncertainty in the generation market that existed at the time of National Grid's 2000 price review meant that future generation connections could, according to National Grid, lie anywhere in the range of 5-20GW due to uncertainty from the introduction of NETA and the amount of new generation capacity necessary to meet the renewable generation targets. Ofgem recognised the uncertainty of new connections by introducing an Error Correction Mechanism whereby allowed revenues were increased or reduced for above or below realisation of connection capacity targets.

negative triggers as a consumer focused uncertainty mechanism for managing the timing risks affecting electricity transmission investment.

6. CONCLUSIONS AND NEXT STEPS

In this report we have sought to demonstrate how network charging volatility adversely impacts on consumers and energy markets. We have shown that volatility of network charges places a material risk on suppliers and other network users when considering investment and what level of costs they need to recover from their customers. This brings inefficiency into the market, as suppliers and other network users adopt strategies to manage this risk. In the case of retail markets, we illustrated that suppliers manage volatility and unpredictability of future network charges by adding a risk premium to final customer bills.

We have set out a variety of proposals that can help manage the future volatility of network charges. In gas distribution, we discussed the option of adopting a shorter price control period than the default eight years to help manage the business planning and regulatory challenges which face the sector in the next few years. In electricity transmission, we highlighted the advantages of negative triggers as a regulatory mechanism for managing the timing and investment uncertainty affecting anticipatory investment in the sector.

We also outlined options to restrict network charging volatility within the price control period. We set out three simple options (for example, a cap and collar on network charge movements) that mitigate volatility by applying a "top-down" assessment across the price control framework. We illustrated the impact on consumers, suppliers and network companies of a simple cap and collar approach using a modelling framework.

While we are the first to recognise the limitations of our modelling framework, we believe that approaching the design of uncertainty mechanisms using the principles we have used, could help to inform a robust discussion and assessment of how management of uncertainty in network price controls might impact on final consumers. CEPA would be happy to discuss how any of the proposals we have outlined, including our modelling framework, could be developed and made more effective in the next stages of the price control review.

APPENDIX A: REVIEW OF GDN NETWORK CHARGES

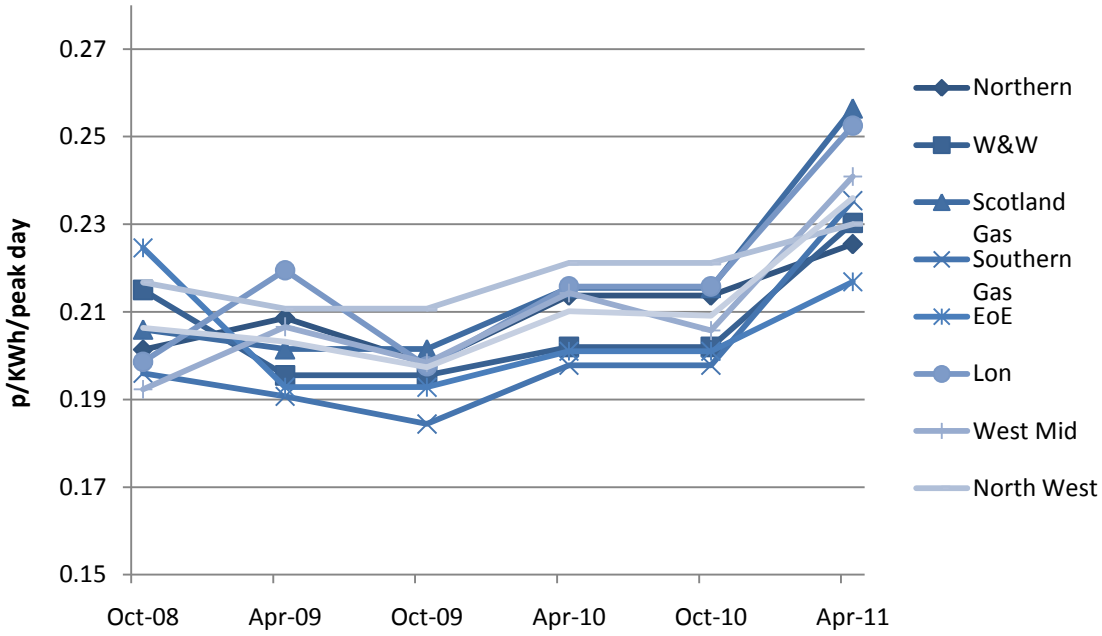
Overview

In this appendix we review GDN network charges. First we review historic evidence of gas distribution charges. We then present a case study of how (within industry governance processes) price control reopeners can impact on network charging predictability.

Distribution charges

Figure A1 shows the level of domestic gas distribution capacity charges since October 2008. It illustrates a degree of volatility in network charges in recent years.

Figure A1: Total domestic distribution capacity tariffs



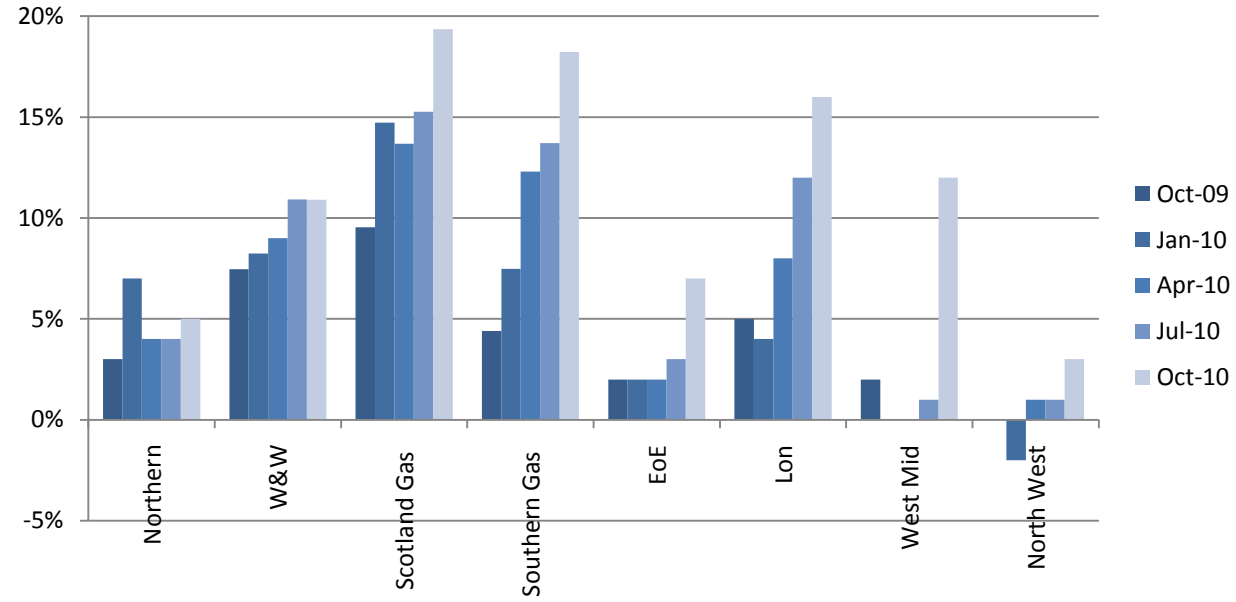
Source: Office of Gas Transporters and Centrica

Various factors can affect the level of gas distribution charge. For example, changes in the charging methodologies used by the GDNs can result in a reallocation of costs to different customer group tariffs. However, while The Joint Office of Gas Transporters[33] has recently consulted with industry on a number modifications to GDN charging methodologies, the general approach to cost allocation has remained the same for the current price control period.

[33] http://www.gasgovernance.co.uk/

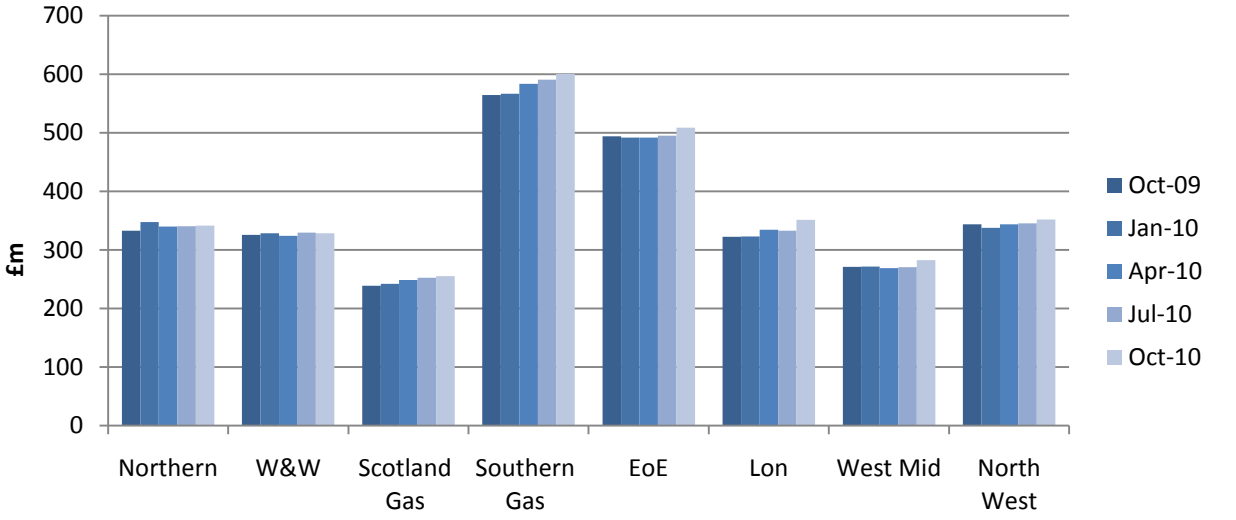
Assuming GDNs charging methodology ("cost allocation") does not change, changes in charges are predominantly driven by changes in allowed revenue. Figure A2 and A3 illustrate volatility in GDN price changes and allowed revenue forecasts for April 2011 price changes. Both charts illustrate the difficulty faced by suppliers and other market participants in predicting and forecasting future gas network charge movements.

Figure A2: GDNs forecast of April 2011 price movements



Source: Office of Gas Transporters and Centrica

Figure A3: GDNs allowed revenue forecasts 2011/12



Source: Office of Gas Transporters and Centrica

Industry governance

There are various industry processes to help consumers manage and predict gas network charges. For example, GDNs publish an approved charging methodology and annual charging statement. There are also industry groups (for example, the Distribution Charging Methodology Forum (DCMF)) that publish information on network charges. On behalf of the gas transporters, the Joint Office publishes information regarding transportation charges.

Although industry governance processes are a very effective consumer mechanism for managing charging uncertainty, they only partially mitigate forecasting risk in the absence of more mechanistic approaches of adjusting network charges, for example, through the price control regime or risk premiums built into customer charges. The text box below presents a case study of how an in year allowed revenue adjustment recently impacted on the predictability of network charges in the electricity distribution sector.

Case study: CE Electric losses incentive

- In December 2010 Ofgem published a decision[34] on CE Electric's request to calculate distribution losses for 2009-10 on a basis that differs from that used for 2002-03 (the calculation at the previous price control review DPCR4).
- Based on a material change in the quality of information used to drive distribution losses information, the Authority agreed to the restatement of CE Electric's losses information for 2009-10. The approximate affect on CE Electric's revenue reporting for 2009-10 is set out below.

£m	NEDL before restatement	NEDL after restatment	YEDL before restatement	YEDL after restatement
Losses incentive adjustment	-13.2	-0.7	-21.5	6.48
Allowed demand revenues	181.9	195.6	226.3	256.5

- DCMF is the electricity distribution stakeholder charging working group. The group publishes quarterly updates on revenue collected and the potential implications for future network charges (Mod 186 Reports).
- While these reports are in general very useful mechanisms to help consumers manage and forecast changes in network charges, in the case of the CE Electric losses decision, the Mod 186 reports had an adverse impact on customers.
- The allowed revenue projections in CE Electric's DCMF report differed from the updated allowed revenue forecast included in the Authority's determination. This case study illustrates how unpredictable network charges can impose costs on market participants.

Source: CEPA analysis of Ofgem documents

[34] http://www.ofgem.gov.uk/Networks/ElecDist/Policy/Documents1/Decision%20on%20request%20from%20CE%20Electric%20UK%20to%20restate%20losses%20for%202009-10.pdf

APPENDIX B: MODELLING ANALYSIS

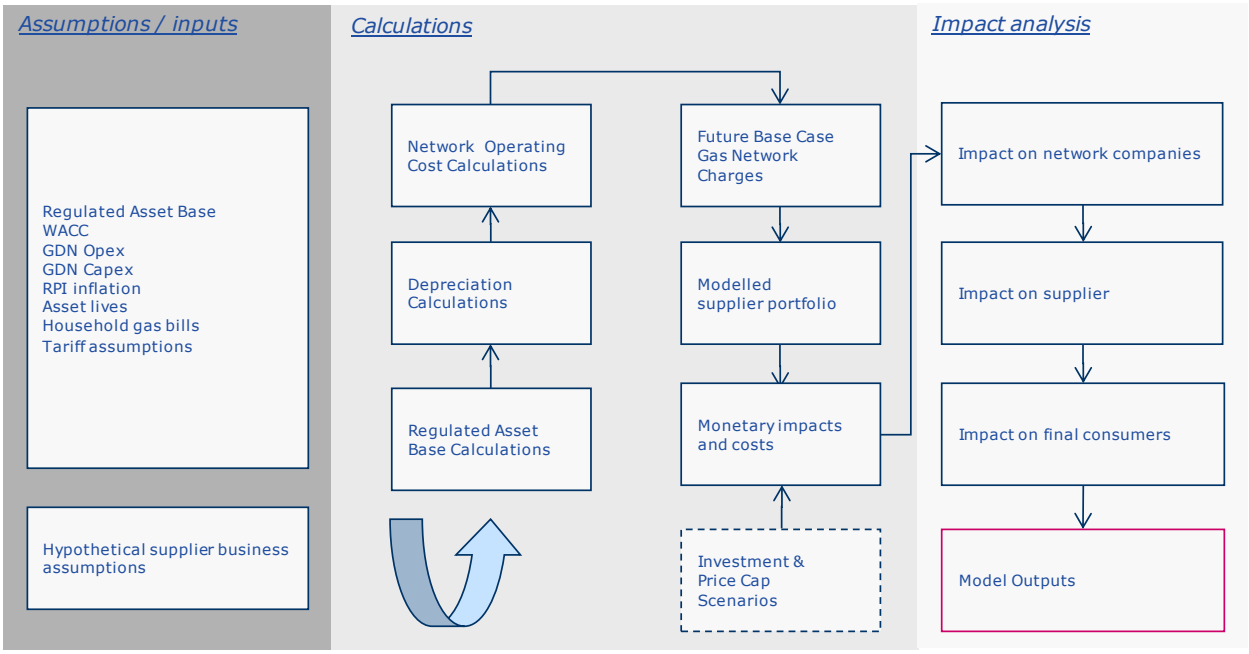
Overview

In this appendix we summarise indicative modelling analysis of the impact of gas distribution network uncertainty mechanisms on GDNs, suppliers and final consumers. We have approached the modelling from the perspective of a hypothetical retail gas supplier offering a range of retail tariff products across its portfolio of customers.

Approach

We have used publicly available information on GDN price controls to assess the indicative future profile of gas distribution charges and the impact on final customer gas bills. We have then developed outturn scenarios of how each uncertainty mechanisms for gas distribution costs could impact on final gas distribution charges, final customer gas bills, GDN allowed revenue and the hypothetical supplier. We then assess the "implied" insurance ("risk") premium the hypothetical supplier would *ex ante* need to build into its tariffs to mitigate the impact of uncertainty under each modelling scenario. Finally, we have assessed the financial impacts if movements in gas distribution network charges were restricted (for example, with a cap and collar) and any deferred revenue logged-up recovered on an NPV neutral basis. A summary of our modelling approach is provided in Figure B1 below.

Figure B1: Modelling framework



Source: CEPA

Input assumptions

Our key input assumptions are summarised in the table below:

Input	Assumption	Source
Controllable opex	6 percent of RAB	CEPA
Non-controllable opex	3 percent of RAB	CEPA
GDN discount rate	4.9375%	Ofgem
Tax	28%	HM Treasury
Capex	CEPA forecasts	CEPA
Starting RAB	GDPCR Final Decision Document	Ofgem
Household consumption	16,500 kWh	Ofgem
Consumer discount rate	3.5%	HM Treasury
Total gas consumption	450 TWh	CEPA [1]
Average household gas bill	£608	Ofgem

Source: Various

Note 1: CEPA assumption based on DECC 2009 (468 TWh)

The table below shows the breakdown of household gas bills we have assumed in the modelling:

Element	Percentage
Wholesale, supply, profit margin etc.	65%
Distribution charges	Derived
Transmission charges	3%
VAT	5%
Environmental costs	4%
Meter provision	2%

Source: Ofgem and CEPA analysis

The table below shows the portfolio of the hypothetical supplier we have assumed in the modelling:

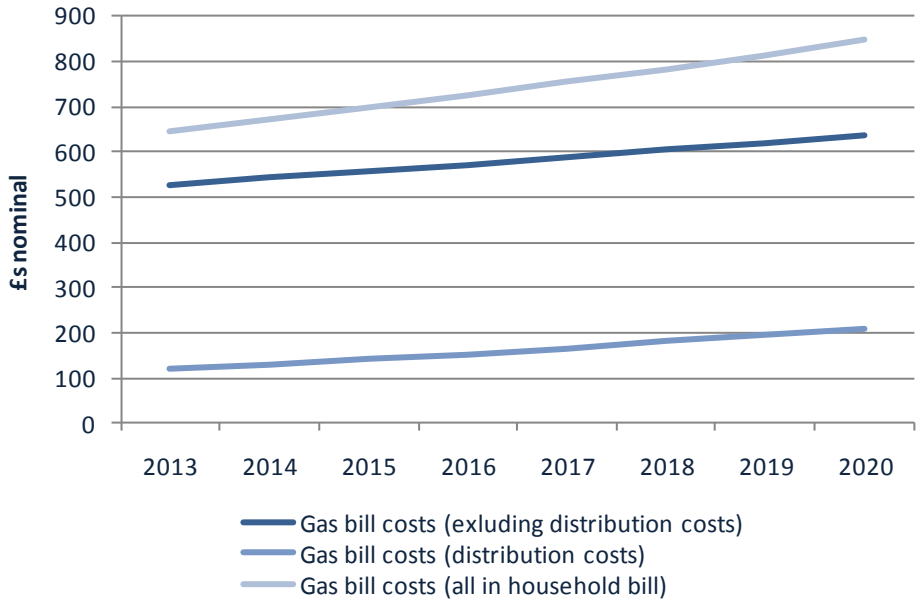
Tariffs	Percentage
Variable tariffs	75%
Fixed tariffs – of which:	25%
2 year fixed tariff	6.25%
3 year fixed tariff	6.25%
4 year fixed tariff	6.25%
5 year fixed tariff	6.25%

Source: CEPA

Modelling assumptions

- We assume 75% of the hypothetical supplier's tariffs are variable customers but tariffs can only be updated at the mid-year tariff change if there is a change in gas network charges relative to the GDN base allowed revenue forecast.
- We assume the hypothetical supplier forms its expectations about what will happen in the future to gas network charges based on what has happened in the past to gas network charges (adaptive expectations).
- Therefore, if there is a *change* in gas networks charges (relative to the GDN base allowed revenue forecast) and the supplier can update its customer tariffs, then the supplier (for the first half of the year) assumes the previous year gas distribution charges will rollover into the current tariff year. In the second half of the year, the supplier is able to update its tariffs to fully account for the actual change in GDN allowed revenue forecasts.
- As illustrated in Figure B2, we uplift the average household gas bill[35] by RPI inflation to calculate supplier's total income in each year of the eight year price control. Distribution costs are calculated in the model and remain in the range 19% - 24% of the final customer gas bill over the price control period.

Figure B2: Household gas bills



[35] Ofgem (2011): 'Updated Household energy bills explained'

Model outputs

The results of our analysis show the:

- Change in network companies Return on Capital Employed (ROCE) – i.e. percentage point reduction in network companies' within period cost of capital.
- Present value of deferred allowed revenues (where revenues are logged up under a cap and collar system) – calculated using the GDN discount rate.
- Present value of deferred allowed revenues (where revenues are logged up under a cap and collar system) – calculated using the consumer discount rate.
- Absolute value impact on final gas customer bill if the change in GDN revenues relative to the Base Case scenario pass straight through into final customer bills.
- Percentage change in final gas customer bill if the change in GDN revenues relative to the Base Case scenario pass straight through into final customer bills.
- Supplier implied risk premium (%). Calculated as the average premium that supplier needs to add to bills to recover distribution costs that differ from its expectations.
- Supplier implied risk premium (£s). Calculated as the average premium that supplier needs to add to bills to recover distribution costs that differ from its expectations.

Results

The table below summarises the results from the modelling analysis without a five per cent revenue cap and collar mechanism.

Summary of modelling results – without cap and collar mechanism

Increase in costs relative to base revenue allowances	↑5%	↑7.5%	↑10%	↑12.5%
Network company impacts				
Change in ROCE (%)	n/a	n/a	n/a	n/a
Present Value (PV) of deferred revenues (£m)	n/a	n/a	n/a	n/a
Consumer impacts				
Present Value to consumers of deferred rev. (£m)	n/a	n/a	n/a	n/a
Absolute impact on average final gas bill (£s)	£8.10	£12.14	£16.19	£20.24
Percentage change in average final gas bill (£s)	1.3%	2.0%	2.7%	3.3%
Supplier impacts				
Supplier implied risk premium (%)	5.7%	6.1%	6.4%	6.7%
Supplied implied risk premium (£s)	£7.30	£7.74	£8.16	£8.57

Source: CEPA analysis

The table below summarises the results from the modelling analysis with a five per cent revenue cap and collar mechanism.

Summary of modelling results – with cap and collar mechanism

Increase in costs relative to base revenue allowances	↑5%	↑7.5%	↑10%	↑12.5%
Network company impacts				
Change in ROCE (%)	-	-0.5%	-0.9%	-1.4%
Present Value to NWO of deferred rev. (£m)	-	580	1159	1739
Consumer impacts				
Present Value to consumers of deferred rev. (£m)	-	617	1235	1852
Absolute impact on average final gas bill (£s)	£8.10	£8.10	£8.10	£8.10
Percentage change in average final gas bill (£s)	1.3%	1.3%	1.3%	1.3%
Supplier impacts				
Supplier implied risk premium (%)	5.7%	5.7%	5.7%	5.7%
Supplied implied risk premium (£s)	£7.33	£7.33	£7.33	£7.33

Source: CEPA analysis

APPENDIX C: SECTOR CASE STUDIES

Case Study 1: Fuel price stabiliser

One of the Conservative Party's environmental policies at the 2010 election was to change fuel duty by introducing a fuel duty stabiliser. Under a fuel duty stabiliser, when fuel prices go up, fuel duty would fall. And when fuel prices go down, fuel duty would rise. The aim of the stabiliser would be to stabilise pump prices for final consumers. The Conservative Party noted that the fuel duty stabiliser would bring three key benefits:

- greater stability for family finances:
- greater certainty about the price of carbon; and
- greater stability of public finances.

The fuel duty stabiliser illustrates a scheme where Government (public sector finances) would manage the impacts of "input" price volatility in order to cushion consumers against the shocks of "final" price volatility. While some of the benefits of the scheme have been questioned (as argued by the Institute for Fiscal Studies (IFS) in an election briefing note on the subject) a fuel price stabiliser does illustrate how a relatively simple pricing rule and adjustment mechanism can be adopted to protect final consumers against adverse impacts of price volatility.

Sources:
Conservative Party (2008): 'A Fair Fuel Stabiliser: a consultation on the future of fuel taxation'
IFS (2010): '2010 Election Briefing Note – Environmental Policy Proposals'

Case Study 2: Ofwat 10 year price controls

In 1994 Ofwat set what it intended would be a ten-year price control for the UK water and sewerage companies – though they included provisions for a mid-control review, which might then lead to a new review after five years. However, in practice the process did not work as intended and as a result by 1999 Ofwat had to carry out a new review and subsequently moved to five-year controls.

When initially setting the ten-year control Ofwat expected the length of the control to help:

- To help enable the industry to achieve long-term efficiency benefits by enabling the companies to keep the benefits of innovation and efficiency savings over the ten-year control period.
- To help Ofwat and the industry to manage the large scale investment requirements (particularly due to the need to meet the requirements of the Urban Waste Water Treatment Directive for the sector without passing on price volatility to customers).

As stated above the intended benefits were not realised; soon after setting the 1994 price control Ofwat determined that a five-year review was preferable, as emphasised in their 1998 consultation on the form of the 1999 price control:

"*The Director suggested that a five year period adequately balances the need to maintain a stable long-term framework that gives incentives to companies with the speed with which the benefits of efficiencies are transferred to customers.*

… The majority of respondents (to Ofwat's consultation) accepted that five years is an appropriate period and the Director concurs with this."

In deciding to move towards five-year price controls Ofwat also determined that the five year fixed period would be appropriate to ensure that the benefits of cost efficiencies achieved by regulated companies were passed on to consumers.

"*The Director believes that five years is an appropriate period to provide companies with adequate incentives to make efficiencies but for customers to realise the benefit of them as quickly as possible*"

While Ofwat's proposed ten-year control did not achieve its intended results, it should be noted that it was initiated in 1994 at a time when the operation of price controls in the UK was relatively new. Thus part of the reason for the failure of the longer price control may have been Ofwat's general lack of regulatory experience of managing the review process. Though as Ofwat and other UK regulators have gained more experience of regulating private companies they have not in general determined that significant benefits would be achieved by moving to longer-term price controls.

Sources:
Ofwat (1998), Setting price limits for water and sewerage services: the framework and business planning processes for the 1999 periodic review

Case Study 3: Electricity Tariff Equalization Fund

This case study is presented to provide an example of the implementation of a mechanism designed to manage the risks around excessive price volatility emerging from the functioning of a competitive energy market. We discuss the implementation of the Electricity Tariff Equalisation Fund (ETEF) (a transitional risk-sharing mechanism), introduced to facilitate retail competition for electricity in New South Wales, Australia.

Upon the introduction of competition for retail markets in New South Wales, wholesale prices were allowed to fluctuate up to a cap of $A 10,000 per MWH – however, regulated 'default' rates were put in place for customers using no more than 160 MWH per annum. The ETEF was implemented primarily to protect both small retail customers and standard retailers (those providing electricity at the regulated rates) from any excessive price volatility. In addition the ETEF is designed to be fully compatible with the functioning of the spot-market, and to be financially self-sustainable.

The ETEF works by requiring the standard retailers to pay into the fund when spot market prices fall below the reference price set by the Independent Pricing and Regulatory Tribunal (IPART), they are then compensated by the fund when spot prices move above the reference price.[36] In simple terms, surpluses accrued during periods of lower wholesale prices are banked to enable the retailers to manage periods of higher prices. The fund is backstopped by payments from the publically

[36] The reference price set by IPART is meant to based on the long-run marginal cost of electricity generation.

owned generators – if the fund lacks the reserves to compensate the retailers the generators pay into the fund, but receive reimbursements when the fund generates more reserves.

Since its operation the ETEF has played an important role in protecting both consumers and standard retailers from excessive price volatility. Though clearly its effective operation is dependent on IPART setting an appropriate reference price (i.e. one that reflects long-term conditions in wholesale energy markets) and the effective governance of the fund itself to ensure that it remains financially viable.

Sources:
Grid Lines (2008): 'Protecting electricity retailers against price volatility: the Electricity Tariff Equalization Fund in New South Wales.

Case Study 4: Use of negative triggers in UK Airport Regulation

For the fourth quinquennium review of Heathrow and Gatwick airports (2003/4 to 2007/8) one of the key issues within the sector was the need to finance large lumpy investments – for example, the cost of Terminal 5 at Heathrow was about equal to 25% of the existing value of BAA. This led to a focus on investment issues, including pre-payment for new assets through the inclusion of assets in the course of construction in the RAB. Ongoing uncertainty over the actual delivery of investment and the failure of the approach adopted in the previous price control period meant that an alternative approach was adopted to protect consumers against delays in investments that were being pre-charged in the price control.

The CAA adopted a new negative trigger approach whereby the company was penalized for not doing something – i.e. it is penalized for failing to deliver investment. The triggers were linked to very specific aspects of major investments. For Heathrow this related to elements of Terminal 5. At Gatwick this related to the completion and opening of the Pier 6 investment project. The triggers had very defined timing criteria. For example:

- Handing over of the visual control room to NATs in 2005/06.
- Core terminal building weather-proof in 2006/7.

A trigger term was included in the price indexation formula. If the trigger element was not completed then the revenue allowance was reduced. The mechanism was asymmetric, in that it only applied to the failure to deliver the investment on time. If a trigger was missed then the price-cap was adjusted downwards until the trigger was met.

Sources:
Alexander / Harries (2005): 'The regulation of investment in utilities – concepts and applications. World Bank Working Paper 52'