10

Managing risk and uncertainty

This chapter sets out how we have assessed risk and uncertainty. We set out how we propose to address forecast uncertainty through the use of uncertainty mechanisms. Other financial and pass-through-related uncertainty mechanisms are discussed in other chapters within our Plan. We have followed a robust process, shaped by CEG feedback, to assess how risks should be managed to protect our customers.

This chapter has the following structure:

Key messages

We have followed a robust process to assess the risks and uncertainties facing us in delivering for our customers, and we have analysed which risks we are best placed to manage as well as those areas where uncertainty mechanisms have value in protecting the interests of customers and our business from changes to requirements or costs.

- We will continue to manage significant risk and uncertainty on behalf of our customers. The material financial risks that we are managing are discussed in **Chapter 11, Affordability and Financing our Plan**.
- We have proposed nine bespoke uncertainty mechanisms, in addition to the mechanisms that Ofgem have proposed for RIIO-2, and a specific output approach to the London medium pressure scheme.
- We have also assessed each mechanism in line with Ofgem's requirements, the behavioural incentives from the application of these uncertainty mechanisms and how we might manage any drawbacks from their operation.
- Our 'Monte Carlo' analysis estimates that the combined impact of Ofgem's common and our bespoke uncertainty mechanisms ranges from £348m to £895m over RIIO-2 (this is a range of 6% to 13% of totex and would translate to between £1.77 and £5.20 on an average domestic bill).
- A large proportion of the uncertainty relates to the development of heat decarbonisation policy and the resultant impacts. Without the heat policy impact, the range of uncertainty is £288m to £506m, which is just 4% to 8% of overall totex and a range of £1.53 to £3.45 on the domestic bill.
- We have sense-checked our approach with consumers and it received general support. However, there may be merit in further discussion around whether any additional areas could be included in our base plan, potentially through Price Control Deliverables ('PCDs').
- Our plans assume a lower materiality threshold for re-openers and a 1 year lag on revenue recovery for revenue drivers.

Managing risk and uncertainty

10.1 The importance of managing risk for our customers

The management of risk and uncertainty, including those relating to operational, financial and environmental activities, is critical. Learning from RIIO-1 suggests that we need to think carefully about how the impact of external events outside of our direct control are managed; we have been successful in managing the risks and mitigating the impact of events of changes such as the smart metering roll out and changes to Streetworks legislation.

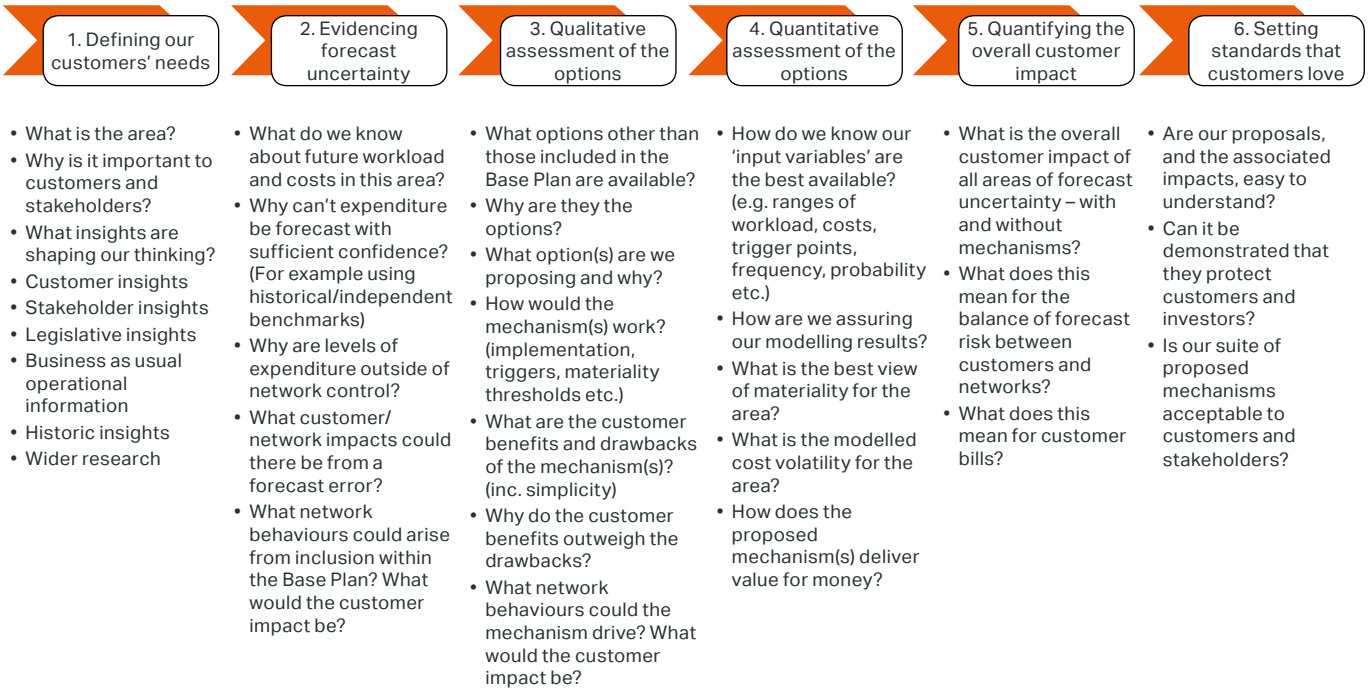
The risk of windfall gains and losses to customers from making ex-ante assumptions around cost forecasts needs to be considered and managed. Ofgem have set out strong penalties (10%) for unjustified cost forecasts where there is low confidence in setting a benchmark, and indeed have indicated that uncertainty mechanisms could be an effective means of managing these situations.

10.2 We have followed a systematic approach to managing uncertainty and risk

The identification of risks and uncertainties is derived from our ongoing stakeholder and customer engagement to assess the likely external factors that may impact on us or our ability to deliver what our customers need. We have also carried out a PESTLE assessment with our Customer Engagement Group which has been used to cross check the risks and uncertainties we have considered.

In addition, we have carried out research with our employees to test their assessment of the risks. We have engaged with customers as part of our acceptability testing phase of engagement to test our approach to using uncertainty mechanisms which has given us confidence in our approach. The figure below shows the process we have followed:

Figure 10.01: Our approach to managing uncertainty and risk



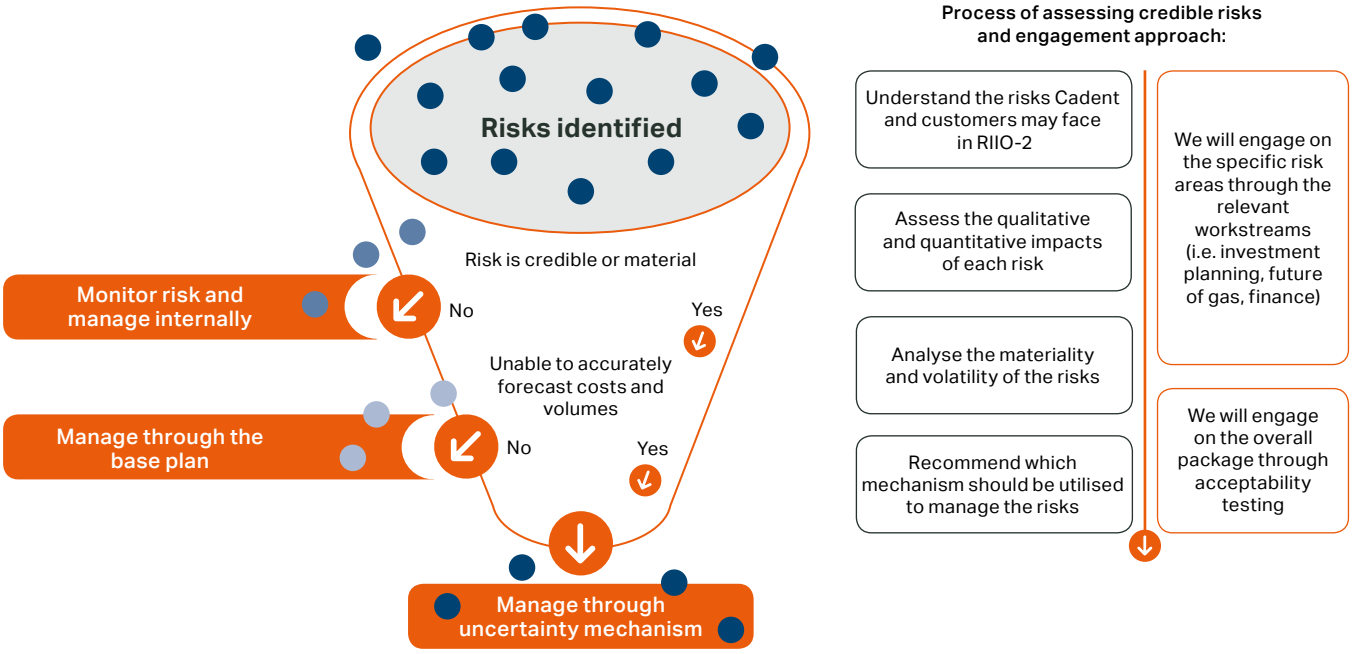
As part of an overall approach to risk management, uncertainty mechanisms play an important role in protecting customers and companies from risk neither can effectively control. These mechanisms enable companies to respond to evolving customer and stakeholder requirements. Without them companies would need to either include their best estimate of future costs, absorb the costs or delay the required work until the next price control period. As such, they protect companies from being exposed to costs they cannot forecast or control and can protect customers from companies having the opportunity for windfall profits if they ultimately do not need to deliver an output or indeed have overestimated the cost. In addition, uncertainty mechanisms can serve to protect both customers and companies from the impact of material external events that are uncertain.

We recognise that uncertainty mechanism can also drive behaviours that might not be in consumers' interests. We have assessed the different behavioural impacts of either setting ex-ante forecasts or using volume drivers, pass-through or re-openers in considering each of the proposed uncertainty mechanisms.

10.3 Where appropriate we are managing uncertainty for our customers

We have assessed a range of uncertainties and identified the areas we are best placed to manage and the areas where the risk is best shared. The diagram below illustrates the process we have been through and our **Appendix 10.00** outlines in more detail the PESTLE analysis we completed with our CEG, as part of the exercise.

Figure 10.02: Defining customers' needs and understanding risk and uncertainties



10.3.1 The uncertainties and risks we are managing for our customers

We will continue to be best placed to manage the predominant risks and uncertainties that face us in delivering our output commitments in the most efficient way for our customers. Our shareholders are managing risks around significant financial uncertainty from Brexit and political and regulatory uncertainty. We are also managing the risk of delivering the stretching efficiency targets we have set for the remainder of RIIO-1 and the RIIO-2 period as well as recalibrated incentive targets. These risks and uncertainties are discussed in **Chapter 11, Affordability and financing our Plan**. This chapter instead focuses on the uncertainties surrounding impacts on costs and customer output delivery. Examples of additional risks that we are proposing to manage for our customers include areas such as legislative risk around fatigue and the treatment of standby time which could significantly increase resource requirements across our emergency response and repair workforce. We also have a number of risks around policy interpretation on our mains replacement programme that could result in an increase in short length expensive work that we are proposing to manage for our customers. The costs for these risks have not been included in our plans.

We have assessed where risks and uncertainties can be managed without the need for additional spend and where risks may result in incurring additional cost. Where additional cost (volume and unit cost requirements) can be known with some certainty, the funding requirements have been included in our baseline plan. However, where there is a very high degree of uncertainty (in either volume or costs), it may not be in our customers' interests for these to be built into the baseline plans, instead, we have considered whether the risk is best addressed through an uncertainty mechanism.

We have assessed these risks and uncertainties against four key criteria:

Volume risk – how uncertain is the amount of work or activity that will be required to be delivered?
Unit cost risk – how uncertain is the cost of delivering the activity or work?
Impact on outputs – how strongly does the uncertainty impact on the outputs we have committed to deliver?
Materiality – how material is the uncertainty in terms of impact on customer bills and on the networks cashflow?

In addition to the four tests outlined above, we have also sought to ensure that:

Our proposals mirror Ofgem's desire to set simple price controls by avoiding unnecessary complexity:
Uncertainty mechanisms add a degree of complexity to the plan and to the way the regime is operated in practice. Ofgem recognises that some complexity is in the interests of consumers. We have identified the benefits for consumers of each of the uncertainty mechanisms we are proposing and believe the benefits outweigh the cost in terms of complexity. These benefits include avoiding the possibility that consumers pay for uncertain work that isn't needed and avoiding adjustments at the end of the price control (leading to a spike in bills or future customers paying for past work). This improved accuracy in our cost estimates will help protect customers from undesirable outcomes.

Managing risk and uncertainty continued

We promote the accuracy of the price control and minimise the risk of windfall gains and losses:
Ofgem and customer groups are very clear that they want to remove the potential for windfall gains and losses in the price control and Ofgem are keen for RIIO-2 to be a low-risk, low-return price control. Ofgem has reiterated this ambition through the design of their business plan incentive which will penalise any companies that include low-confidence costs in their base plan which are subsequently disallowed. These objectives have shaped our approach to managing risk and ensuring customers are protected.

We propose:
- to increase the accuracy of the price control by removing costs from ex-ante allowances where we do not have high confidence in the workloads and/or unit costs; and
- to use indexation, volume drivers and use-it or lose-it allowances.

We drive desired network behaviours and deliver positive outcomes for consumers:
Badly designed incentives can give rise to poor outcomes for consumers. A notable example of this is the Northern Ireland Renewable Heat Incentive, which was poorly designed and resulted in a situation where applicants could earn money by heating empty buildings.

10.4 Exploring uncertainty mechanisms

10.4.1 Ofgem proposed uncertainty mechanisms covered elsewhere in the plan

We have assessed Ofgem's proposed uncertainty mechanisms in the sector specific methodology decision documents (SSMD). These span all areas of our plan and hence for the areas shown in Table 10.01 we have covered the impact of these in other chapters and hence to avoid repetition we have not covered these further in this chapter.

Table 10.01: Summary of Ofgem proposed uncertainty mechanisms not discussed in this chapter

Risk	Proposed mechanism for RIIO-2	Where discussed in our plan
Ofgem licence fee	Pass-through	Chapter 11 – Affordability and financing our plan
Business rates	Pass-through	Chapter 11 – Affordability and financing our plan
Inflation indexation of RAV and allowed return	Indexation	Chapter 11 – Affordability and financing our plan
Cost of debt indexation	Indexation	Chapter 11 – Affordability and financing our plan
Tax liability allowance	Re-opener	Chapter 11 – Affordability and financing our plan
Pensions (pension scheme established deficits)	Re-opener	Chapter 11 – Affordability and financing our plan
Cost of equity indexation	Indexation	Chapter 11 – Affordability and financing our plan
Real Price Effects	Indexation	Chapter 9 – Costs and efficiency
Whole system 'Coordinated Adjustment Mechanism'	Re-opener	Chapter 6 – Net Zero and a whole system approach
Pension deficit charge adjustment	Pass-through	Chapter 11 – Affordability and financing our plan
Miscellaneous pass-through	Pass-through	Chapter 11 – Affordability and financing our plan
Cost related to theft of gas	Financial ODI*	Chapter 7 – Our commitments

* Ofgem SSMD proposed a pass-through uncertainty mechanism.

10.4.2 Four themes that we are proposing to manage through uncertainty mechanisms ('UMs')

Through the process we have identified a small number of areas that we believe are best managed through the use of Uncertainty Mechanisms. These areas are:
- **Demand Uncertainty** – there is uncertainty over demand growth on the gas network with a range of possible outcomes that can be effectively managed using volume drivers
- **Legislative Uncertainty** – there area areas where changes in legislation could have a significant impact on the activities we need to complete in RIIO-2
- **Cost Confidence** – we have identified areas that we believe are low-confidence costs and have proposed uncertainty mechanisms to manage this and protect customers from windfall gains
- **Heat Policy** – key heat policy decisions could have a significant impact on our activities and cost base and are best managed via uncertainty.

Ofgem have proposed some uncertainty mechanisms in this area too which we discuss under each theme.

For our bespoke proposals we have set out: the area of risk being managed, the uncertainty that is faced, our assessment of who is best placed to manage the risk, the materiality of the risk, the proposed uncertainty mechanisms, and how any drawbacks from the mechanism are being managed.

10.5 Our proposed uncertainty mechanisms

10.5.1 Demand uncertainty

Ofgem proposed mechanisms

Smart meter roll out costs

The roll out of smart meters has not yet been completed and will continue into the RIIO-2 period. Although we have worked hard to minimise the impact of the smart meter programme on the emergency response process, we have incurred incremental costs as a result of the roll out. We have yet to reclaim these additional costs through the re-opener mechanism in RIIO-1.

Based on the extensive work we have done in the current period, we have enough information to make a robust forecast of these incremental costs in our baseline totex forecasts (which are discussed in Chapter 9). For example, we can forecast the cost per intervention using information from the work carried out in the current price control.

However, in addition, we may have to interact with the Data Communication Company ('DCC') in RIIO-2. We may need to incur costs associated with system integration which we are not able to forecast accurately at this time as it is unclear when or whether this event will be triggered. If we do become a data user of the DCC, we would face significant ongoing operational costs. Hence, we would anticipate that the Ofgem proposed uncertainty mechanism should cover these costs.

We forecast this to be in the range £0m to £13m over RIIO-2 with a mean of £5m and with a bill impact of between 0p and 48p p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.06 – Smart meter roll out costs**.

Table 10.02: Cadent bespoke mechanisms - Demand uncertainty

Connections: Providing new connections at the request of customers. Supporting infrastructure growth.		**Uncertainty:** Volume is influenced by macroeconomic factors and future heat policy. **We have assumed a minimum level in our baseline totex but there is a range of potential outcomes.**	
Volume risk **High** – driven by external customer demand	**Unit cost risk** **Low** – insight from RIIO-1 on unit costs	**Impact on outputs** **Medium** – impact on customer service	**Material cost / bill impact** **High** – potential for significant costs, unknown timing
Cost £m, RIIO-2 total	**P10 cost:** £25.8m	**Mean cost:** £33.6m	**P90 cost:** £40.1m
Bill impact £, End of RIIO-2	**P10:** 10 pence p.a.	**Mean:** 13 pence p.a.	**P90:** 15 pence p.a.
Proposed mechanism: Volume driver, calibrated on the number of connection services undertaken and associated mains pipe laid (km). Assuming a one year lag on revenue recovery. Alternative would be a higher base plan number to set revenue driver from.		**Overcoming drawbacks:** Incentive to find efficiencies against unit cost. Volumes are determined externally by customers.	
Full details are presented in **Appendix 10.11 – Connections**			
Diversions: Undertaking diversions to support development and maintain network safety that are not paid for by the requestee.		**Uncertainty:** Volume is influenced by macroeconomic factors and site access with a number of large infrastructure schemes impacting our networks such as HS2 and Heathrow, unit cost risk for unknown workload.	
Volume risk **High** – driven by external customer demand	**Unit cost risk** **Medium** – element of costs is specific to each site	**Impact on outputs** **Medium** – impact on safety of supply	**Material cost / bill impact** **Medium** – potential significant costs, unknown timing
Cost £m, RIIO-2 total	**P10 cost:** £15.0m	**Mean cost:** £20.6m	**P90 cost:** £25.9m
Bill impact £, End of RIIO-2	**P10:** 6 pence p.a.	**Mean:** 8 pence p.a.	**P90:** 10 pence p.a.
Proposed mechanism: Re-opener applied to chargeable and non-chargeable workloads. Work triggered by external customer demand. **This mechanism is only proposed assuming the materiality threshold is reduced from 1% to 0.4% as discussed later in this chapter.**		**Overcoming drawbacks:** Incentive to present only efficient and relevant costs through re-opener process as ex post regulation.	
Full details are presented in **Appendix 10.12 – Diversions**			
Reinforcements: Undertaking general and specific reinforcements, and capacity upgrades. Maintaining the resilience of our network and delivering capacity.		**Uncertainty:** Volume is influenced by macroeconomic factors and future heat policy.	
Volume risk **High** – driven by external customer demand	**Unit cost risk** **Low** – insight from RIIO-1 on unit costs	**Impact on outputs** **High** – impact on safety of supply / network resilience	**Material cost / bill impact** **High** – potential for significant costs, unknown timing
Cost £m, RIIO-2 total	**P10 cost:** £41.8m	**Mean cost:** £62.0m	**P90 cost:** £84.8m
Bill impact £, End of RIIO-2	**P10:** 15 pence p.a.	**Mean:** 23 pence p.a.	**P90:** 31 pence p.a.
Proposed mechanism: Volume driver, calibrated on length of reinforcement undertaken (km) and number of capacity upgrades.		**Overcoming drawbacks:** Incentive to find efficiencies against unit cost. Volumes are determined externally by customers.	
Full details are presented in **Appendix 10.08 – Reinforcements**			

Managing risk and uncertainty continued

10.5.2 Legislative change

Ofgem proposed mechanisms

Specified streetworks – lane rentals (identified by Ofgem)

We are expecting changes in legislation on lane rentals and permits, potentially by the end of RIIO-1. However, at this stage, we are not clear on where and how these changes might apply. For example, we will be unable to confirm which Local Authorities will adopt the changes, whether Local Authorities will be able to opt in voluntarily, which roads the legislative changes will apply to, and when this will be enforced.

We forecast this to be in the range £26m to £35m over RIIO-2 with a mean of £30m with a bill impact of between 35p and 49p p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.07 – Specified streetworks (lane rental).**

Cyber resilience (identified by Ofgem)

Our plan includes actions and estimated costs to address cyber security risks. However, like other companies, we face cyber-related threats from increasingly sophisticated sources. Organisations and individuals continue to develop malware and bring targeted attacks. Moreover, there has been an escalation in attacks sponsored by nation states. Moreover, attacks have not been confined to the corporate IT estate: there is an increasing trend for attackers to target Operational Technology.

The less predictable elements of cyber resilience spending relate to the emergence of new threats or threat actors, and the extent to which such actors focus upon the UK or our utility industry or Cadent specifically. It is possible that unanticipated risks can only be mitigated by a significant investment on our part.

We forecast this to be in the range £12m to £15m over RIIO-2 with a mean of £13m with a bill impact between 6p and 8p p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.05 – Cyber resilience.**

Physical security upgrade programme ('PSUP') (identified by Ofgem)

We are focused on maintaining the security of supply for our customers and have requirements to comply with government regulations on the security of critical national infrastructure. The government's understanding of security risks is evolving over time. A resulting policy change in this area could impact the number of our assets that we would be required to protect and the nature of that protection.

We forecast this to be in the range £0m to £2m over RIIO-2 with a mean of £0.8m with a bill impact between 0p and 1p p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.03 – Physical security.**

Repex – Health & Safety Executive ('HSE') policy changes (identified by Ofgem)

If the HSE makes any changes to relevant policies during RIIO-2, this may drive changes to our repex work. This would have a cost impact on Cadent and its customers that we would not have been able to forecast in advance.

We forecast this to be in the range £0m to £14m over RIIO-2 with a mean of £6m with a bill impact between 0p and 5p p.a. by the end of RIIO-2. The small P10 to P90 range reflects our ongoing engagement with the HSE on the IMRRP and a low probability of any change being required in RIIO-2.

Full details are presented in **Appendix 10.02 – Repex – HSE policy changes.**

Table 10.03: Cadent bespoke mechanisms - legislative change

Obligations with respect to MOBs: The Hackitt review of building regulations could drive new or further work across our MOBs assets in response to policy changes. This will be in the area of maintaining safety and network resilience.		**Uncertainty:** The scope of requirements that may be introduced through new policy is currently unknown but could make fundamental changes to the high rise building management and requirements for our assets.	
Volume risk **High** – driven by future unknown policy decisions	Unit cost risk **High** – driven by any new future requirements	Impact on outputs **High** – impact on customer service and interruptions	Material cost / bill impact **High** – potential for significant costs, unknown timing
Cost £m, End of RIIO-2	**P10 cost:** £5.5m	**Mean cost:** £15.2m	**P90 cost:** £38.9m
Bill impact £, RIIO-2 average	**P10:** 11 pence p.a.	**Mean:** 31 pence p.a.	**P90:** 80 pence p.a.
Proposed mechanism: Re-opener applied to new or additional MOBs workloads, triggered by external legislative or policy changes.		**Overcoming drawbacks:** Incentive to present only efficient and relevant costs through re-opener process.	
Full details are presented in **Appendix 10.10 – Multi-occupancy Buildings**			

Table 10.04: Cadent bespoke mechanisms - legislative change continued

Traffic collision protection: We may be required to further intervene across our governor assets to install traffic collision protection. Maintaining safety of our people, customers and assets.		**Uncertainty:** The volume will be determined by future identified risk levels which are subject to further work to assess and through HSE policy.	
Volume risk **Medium** – driven by risk criteria and HSE policy	**Unit cost risk** **Low** – insight from RIIO-2 planning on unit costs	**Impact on outputs** **Low** – impact on asset safety	**Material cost / bill impact** **Low** – potential for some costs, unknown timing
Cost £m, RIIO-2 total	**P10 cost:** £10.4m	**Mean cost:** £15.2m	**P90 cost:** £20.4m
Bill impact £, End of RIIO-2	**P10:** 3 pence p.a.	**Mean:** 4 pence p.a.	**P90:** 6 pence p.a.
Proposed mechanism: Volume driver calibrated on number of interventions undertaken.		**Overcoming drawbacks:** Incentive to find efficiencies against unit cost. Volumes are determined objectively by risk or HSE policy.	
Full details are presented in **Appendix 10.14 – Traffic collision protection**			

10.5.3 Cost confidence

Ofgem proposed mechanisms

Repex – Tier 2A iron mains (identified by Ofgem)

The RIIO-1 framework provided for a volume driver to fund the replacement of Tier 2A mains and ductile iron mains which meet a certain risk criterion. Cost-benefit analysis is used to determine which of these pipes should be replaced. We anticipate the need to continue this mechanism as the mains replacement programme will continue into RIIO-2.

For RIIO-2, we are also exploring whether there is a requirement to expand this volume driver to cater for replacement of other metallic mains (higher-risk steel pipes and Tier 3 iron).

We forecast this to be in the range £6m to £8m over RIIO-2 with a mean of £7m with a bill impact of 3p p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.01 – Repex – Tier 2A iron mains including PAST.**

Table 10.05: Cadent bespoke mechanisms - cost confidence

Pipes above safety threshold: Replacing high risk pipes above a safety threshold that are not part of the existing Iron Main Risk Replacement Programme. Maintaining network safety.		**Uncertainty:** Volume determined by future asset health, which is challenging to forecast as dynamic.	
Volume risk **Medium** – driven by pipes meeting a risk criterion	**Unit cost risk** **Low** – insight from RIIO-1 on unit costs by work type	**Impact on outputs** **Low** – impact on network safety and reliability	**Material cost / bill impact** **High** – potential for significant costs, unknown timing
Cost £m, RIIO-2 total	**P10 cost:** £122.6m	**Mean cost:** £136.2m	**P90 cost:** £150.5m
Bill impact £, End of RIIO-2	**P10:** 53 pence p.a.	**Mean:** 59 pence p.a.	**P90:** 65 pence p.a.
Proposed mechanism: Volume driver, calibrated on the lengths of pipe replacement undertaken by diameter (km)		**Overcoming drawbacks:** Incentive to find efficiencies against unit cost. Volumes are determined objectively by risk considerations.	
Full details are presented in **Appendix 10.01 – Repex – Tier 2A iron mains including PAST**			

High pressure valves: Intervening across the HP valve population. Maintain asset safety and operability.		**Uncertainty:** Volume determined by future asset health, which is challenging to forecast.	
Volume risk **High** – driven by asset health measures	**Unit cost risk** **Low** – volume of future work unknown	**Impact on outputs** **Medium** – impact on interruptions / safety	**Material cost / bill impact** **Medium** – potential for significant costs, timing known
Cost £m, RIIO-2 total	**P10 cost:** £17.3m	**Mean cost:** £21.5m	**P90 cost:** £25.9m
Bill impact £, End of RIIO-2	**P10:** 6 pence p.a.	**Mean:** 8 pence p.a.	**P90:** 9 pence p.a.
Proposed mechanism: Volume driver calibrated on the number of interventions undertaken.		**Overcoming drawbacks:** Incentive to find efficiencies against unit cost. Volumes are determined objectively by risk considerations.	
Full details are presented in **Appendix 10.15 – HP valves**			

Managing risk and uncertainty continued

Lowestoft project: Interventions to address historic network health issues at Lowestoft Harbour. Maintaining safety and network resilience.		**Uncertainty:** Optioneering still underway to conclude on the most appropriate solution. This is an atypical scheme with underwater assets and complexity.	
Volume risk **Low** – certainty on need for intervention	**Unit cost risk** **High** – optioneering ongoing to identify solution	**Impact on outputs** **Medium** – impact on safety and resilience	**Material cost / bill impact** **Medium** – potential for significant costs, timing known
Cost £m, RIIO-2 total	**P10 cost:** £14.0m	**Mean cost:** £23.7m	**P90 cost:** £33.4m
Bill impact £, End of RIIO-2	**P10:** 7 pence p.a.	**Mean:** 11 pence p.a.	**P90:** 16 pence p.a.
Proposed mechanism: Re-opener applied to specific project at Lowestoft, triggered once preferred engineering solution identified.		**Overcoming drawbacks:** Incentive to present only efficient and relevant costs through re-opener process.	
Full details are presented in **Appendix 10.13 – Lowestoft Project**			

10.5.4 Heat policy

Ofgem proposed mechanism

Government heat policy (identified by Ofgem)

During RIIO-2, we expect an announcement on decarbonisation as part of the government's Heat Policy. This may influence work such as: the large-scale transformation to clean gas, infills where we extend the gas network to off gas grids, the role of electrification and hybrid technology and more. If government policy resulted in legislative changes, the business would have to comply. However, there would be great uncertainty in the costs and volumes associated with these actions. We have set out four possible End States in **Chapter 6, Net Zero and a Whole system approach**, and our Environmental Action Plan sets out the commitments we are undertaking to prepare for different pathways to decarbonisation.

We forecast this to be in the range £0m to £282m over RIIO-2 with a mean of £162m with a bill impact between 0p and £1.34 p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.04 – Heat policy (including Fuel-poor network extension scheme).**

Fuel Poor Network Extension Scheme (identified by Ofgem)

The Fuel Poor Network Extension Scheme helps households that are not connected to the gas grid switch to natural gas by providing funding towards the cost of the connection, in the form of a voucher. Future government policy, in response to any decision on the future role of gas in heat, may result in changes to the level of targets associated with the scheme. Therefore, a re-opener has been proposed by Ofgem to ensure that funding is returned to customers in the eventuality that the scheme is amended or ended.

We forecast this to be in the range (£9m) to £0m over RIIO-2 with a mean of (£3m) with a bill impact between (2p) and 0p p.a. by the end of RIIO-2.

Full details are presented in **Appendix 10.04 – Heat policy (including Fuel-poor network extension scheme).**

Table 10.06: Cadent bespoke mechanisms - heat policy

Entry charging and access review: Reviewing charging policy to encourage greater connections of clean gas. This will support environmental benefits through reduced carbon impacts.		**Uncertainty:** A charging regime change may increase demand for entry connections, triggering the need for reinforcement work; volume and timing uncertain.	
Volume risk **High** – dependent on future charging review	**Unit cost risk** **Medium** – uncertainty over reinforcement cost	**Impact on outputs** **Low** – potential environmental impacts	**Material cost / bill impact** **High** – potential significant costs. Charging review
Cost £m, RIIO-2 total	**P10 cost:** £60.5m	**Mean cost:** £83.8m	**P90 cost:** £107.5m
CVP: not included as already covered through social return on investment calculation			
Bill impact £, End of RIIO-2	**P10:** 24 pence p.a.	**Mean:** 33 pence p.a.	**P90:** 42 pence p.a.
Proposed mechanism: Initial re-opener triggered following a charging methodology change. Then, volume driver calibrated through actual work costs over time.		**Overcoming drawbacks:** Incentive to find efficiencies against unit cost. Volumes are determined externally. Spare capacity can be signaled to producers through charging review. Revenue driver recalibrated based on actual costs periodically.	
Full details are presented in **Appendix 10.09 – Entry charging and access review**			

10.5.5 Summary of our proposals

The table below sets out our proposals.

Table 10.07: Summary of proposed uncertainty mechanisms

	Risk	Range of impacts*	Proposed mechanism for RIIO-2	Identified by	Comparison to RIIO-1
Demand uncertainty	Smart Meter Roll Out Costs	£0m to £13m 0p to 48p	Pass- through mechanism (for system integration)	Ofgem	Re-opener
	Connections	£26m to £40m 10p to 15p	Volume driver	Cadent	Baseline allowance
	Diversions	£15m to £26m 6p to 10p	Re-opener (subject to materiality)	Cadent	Baseline allowance
	Reinforcements	£42m to £85m 15p to 31p	Volume driver	Cadent	Re-opener (for large loads)
Legislative change	Specified streetworks (lane rentals)	£26m to £35m 35p to 49p	Re-opener (subject to materiality)	Ofgem	Re-opener
	Cyber Resilience	£12m to £15m 6p to 8p	Re-opener (subject to materiality)	Ofgem	New for RIIO-2
	Physical Security	£0m to £2m 0p to 1p	Re-opener (subject to materiality) (engaging with BEIS[1] on risks)	Ofgem	Re-opener
	Repex – Health & Safety Executive ('HSE') Policy Changes	£0m to £14m 0p to 5p	Re-opener (subject to materiality)	Ofgem	Mid-Period Review Re-opener
	Obligations with respect to Multi-occupancy Buildings	£6m to £39m 11p to 80p	Re-opener (subject to materiality)	Cadent	Mid-Period Review
	Traffic collision protection	£10m to £20m 3p to 6p	Volume driver	Cadent	New for RIIO-2
Cost confidence	Repex – Tier 2A iron mains	£6m to £8m 3p	Volume driver	Ofgem	Volume Driver
	Pipes Above Safety Threshold (PAST)**	£123m to £150m 53p to 65p	Volume driver	Cadent	New for RIIO-2
Heat Policy	Lowestoft project	£14m to £33m 7p to 16p	Re-opener (subject to materiality)	Cadent	New for RIIO-2
	High pressure valves	£17m to £26m 6p to 9p	Volume driver	Cadent	New for RIIO-2
	Heat policy	£0m to £282m 0p to £1.34	Re-opener (subject to materiality)	Ofgem	New for RIIO-2
	Entry charging and access review	£60m to £108m 24p to 42p	Re-opener to trigger volume driver	Cadent	Re-opener
	Fuel poor network extension scheme	(£9m) to £0m (2p) to 0p	Re-opener	Cadent	Re-opener

* Range of costs per uncertainty mechanism over RIIO-2 (18/19 prices, pre sharing (Totex Incentive Mechanism (TIM)) basis). Range reported on a P90/P10 basis
** To be combined with Repex – Tier 2A iron mains.
1 The Department of Business, Energy and Industrial Strategy.

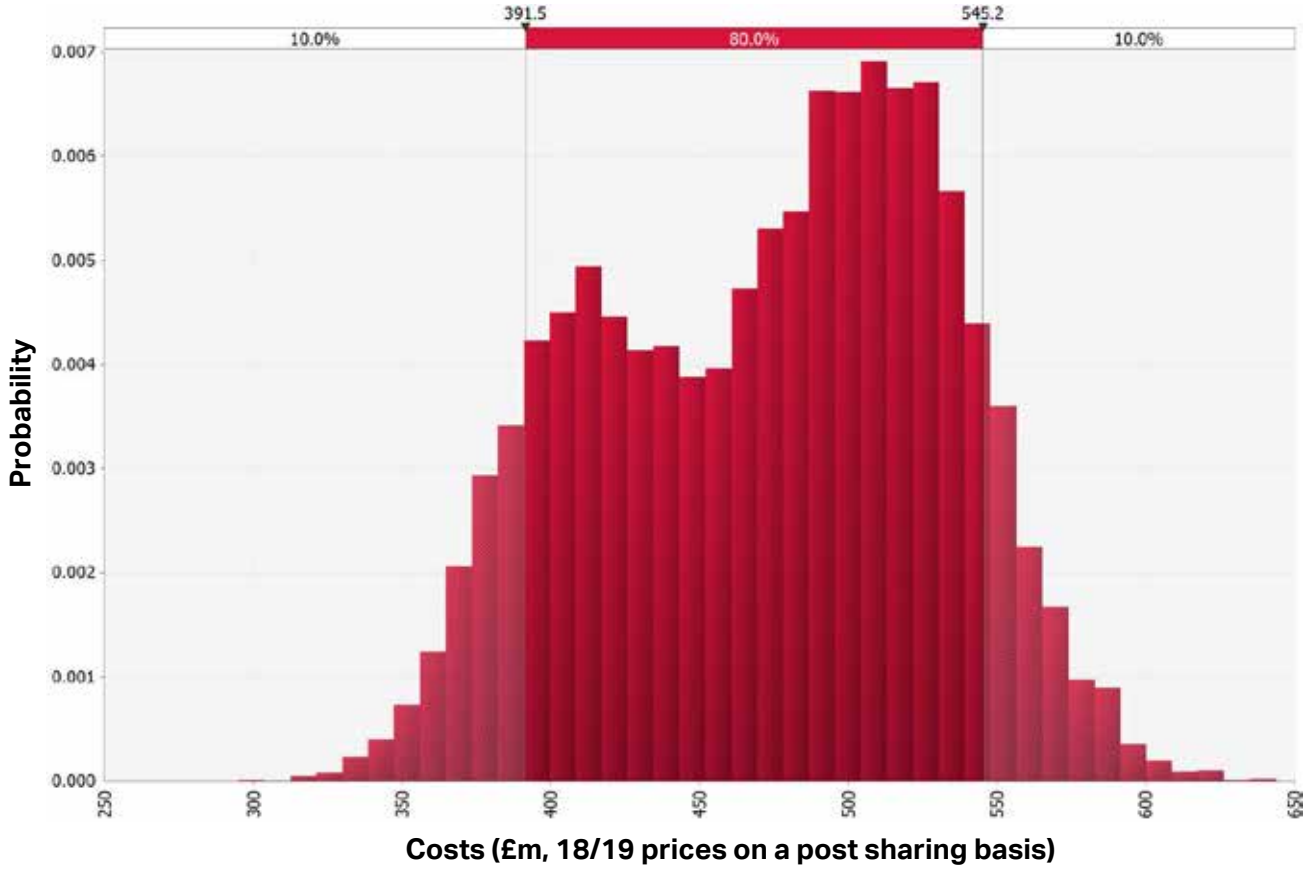
Managing risk and uncertainty continued

10.6 The impact on customers

10.6.1 Monte Carlo analysis

Our uncertainty mechanism cases, appended to this document, provide further detail on the specific inputs into our analysis across our proposed uncertainty mechanisms.

Figure 10.03: Monte Carlo analysis of the range of uncertainty



The full results of our 'Monte Carlo' analysis, including the distribution of potential outcomes across our uncertainty mechanisms package as illustrated here, are discussed in **Appendix 10.00**. This includes analysis on a post sharing basis to consider the implications of materiality thresholds on the cost risks that we have identified.

10.6.2 Overall bill impact

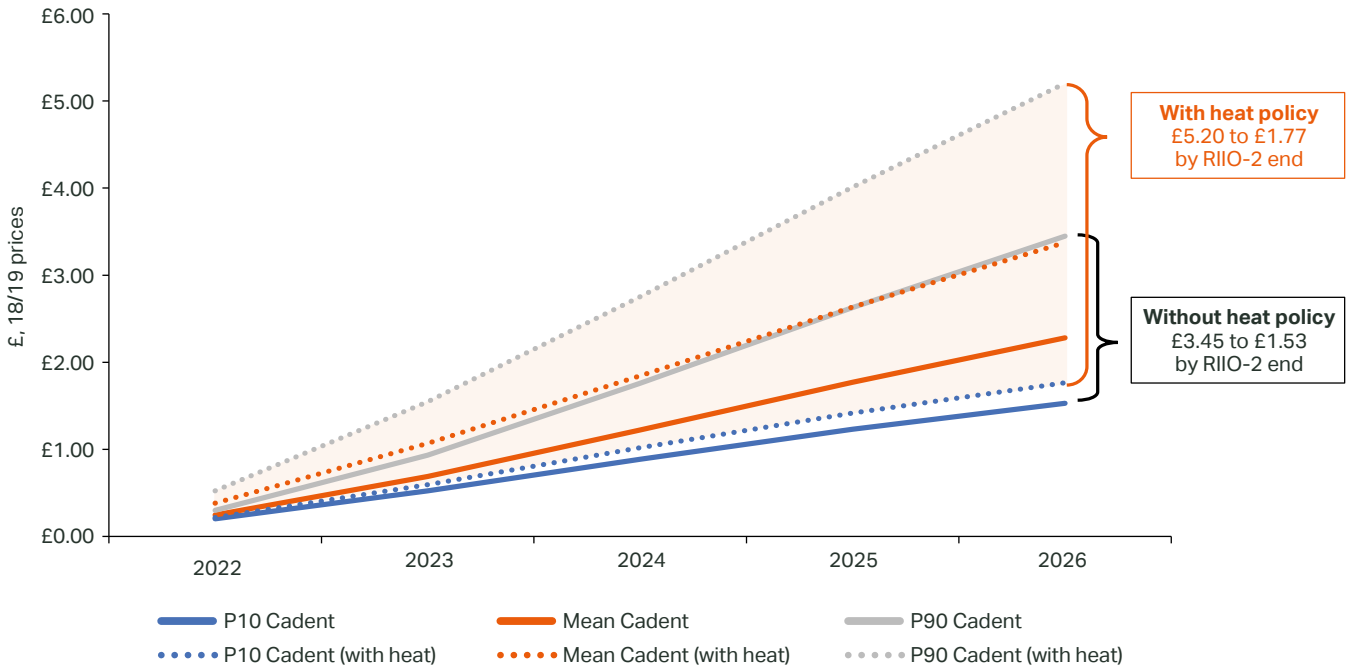
The core customer bill scenario presented in **Chapter 11** of our business plan includes the modelled mean of the volume drivers shown earlier in this chapter.

Our 'Monte Carlo' analysis estimates that the combined impact of Ofgem's and our bespoke uncertainty mechanisms ranges from £348m (P10) to £895m (P90) with a mean of £633m over RIIO-2 (this is a range of **5% to 13% of totex (mean 9%)** and would translate to **a range of impact of £1.77 to £5.20 on an average domestic bill**. This is a worst case scenario as it assumes that all materiality thresholds are hot for the uncertainty mechanisms and hence revenues flow through to bills. This overall level of impact does not seem unreasonable given the wide range of uncertainties that have been considered and shows why it is important to consider how to manage the impact on bills. Without the introduction of relevant uncertainty mechanisms, we would need to estimate these costs in our plan and seek funding to compensate us for greater risk exposure. This might result in higher bills for our customers than are needed given the range of uncertainty.

A large proportion of the uncertainty relates to the development of heat decarbonisation policy and the resultant impacts. Without the heat policy impact, the range of uncertainty is £288m to £506m with a mean of £387m, which is just 6% of overall totex and a range of £1.53 to £3.45 on the domestic bill.

Figure 10.04: Domestic bill impact for all uncertainty mechanisms

Domestic bill impact ranges from Uncertainty Mechanisms, with and without Heat Policy



Our analysis shows a central estimate of approximately £633m over RIIO-2 from the uncertain areas we have identified. The cost allocation is forecast to be:

- £364m associated with volume drivers (or pass through for smart meter costs).
- This leaves £269m associated with re-openers.
  - £161m would be recovered through the totex incentive mechanisms (assuming a 40% incentive rate).
  - £41m would be recovered through re-openers where a 1% materiality threshold is breached.
  - £42m would be additionally recovered through re-openers if the threshold was adjusted downwards to 0.4% (as discussed in 10.6.3 below).

This would leave a residual cost of risk of £24m over RIIO-2. This suggests with the operation and management of the uncertainty mechanisms the residual risks that the customers and the networks face could be much more contained.

10.6.3 Review of re-opener materiality threshold

The RIIO-1 framework uses a materiality threshold of 1% of average annual revenue (post sharing) that can be logged up over the length of the 8-year price control.

In their Sector Specific Methodology Decision document, Ofgem has set out that they intend to consult on the materiality threshold at draft determinations. We agree that this needs to be consulted on at that stage of the RIIO-2 price control review process, once more information on the package as a whole is available, including the financeability of companies' plans.

A decision has already been made on shortening the duration of the price control from 8 years to 5 years. This reduction will mean companies have less time to reach the materiality threshold and are thus less likely to trigger it and would need to absorb residual costs. As such, we believe that the materiality threshold should be adjusted in line with the reduction in control length from 1% of average annual revenue to around 0.6%.

It is also expected that the RIIO-2 sharing factors ('TIM') will be lower than in RIIO-1, this would also reduce the likelihood that a company will reach the materiality threshold and increase the likelihood that their shareholders will need to absorb costs. As such, we would suggest that a reduction in the materiality threshold would be required. If the sharing factor for GDNs was set at 40%, compared to c. 63% in RIIO-1, then this would suggest a further reduction in the materiality threshold from around 0.6% to just under 0.4% of average annual revenue.

Using a materiality threshold of 1% could leave a residual mean risk of more than £40m that our shareholders would need to bear.

Our proposed uncertainty mechanisms are built on the assumption that the re-opener materiality threshold will be materially reduced to c.0.4% of revenue. If this was not the conclusion of Ofgem's consultation we would need to adjust our plan accordingly.

10.6.4 Revenue driver recovery

In some of cases (such as Connections volumes) we have included a minimum volume of work within our base plan and have proposed a revenue driver for additional volumes that may be seen in RIIO-2. Given the scale of revenue drivers required to manage uncertainty, we believe that it is important that the licence drafting allows a one-year lag for recovery of revenue through these drivers rather than the 2-years that was introduced in RIIO-2. If this was not to the case we would reconsider our base plan and hence where the base for the revenue driver would be set.

Managing risk and uncertainty continued

10.6.5 Acceptability testing

We tested our approach to risk and the business plan proposals in our qualitative and quantitative survey as part of business plan testing. As part of the quantitative business plan consultation (led by Verve), the way that we plan for risks and uncertainties is felt to be acceptable and individuals trust that we can deliver the Plan given its thoroughness and a robust set of different mechanisms. Customers found this topic difficult to grasp and did not feel that they needed to 'see under the bonnet' to understand how risks and uncertainties are calculated - they want us to 'get on with it'. When offered the choice between infrequent, unpredictable costs / bills that are cheaper overall, and an up-front regular cost that is slightly more expensive, customers were attracted to any option that was lower cost, but on balance, there was a preference for greater certainty and predictability.

Uncertainty mechanisms were also discussed at our acceptability testing customer forums. The lead facilitator, along with a Cadent SME, began by presenting an overview on the 'pay now or pay later' options for uncertainties along with real life examples of the numbers of gas connections and government heat policy. Then, participants discussed their reaction to Ofgem's and Cadent's approaches.

Overall, most customers were supportive of receiving a stable bill from Cadent. They do not want their bill to drastically increase and they would prefer less difficulty in the process. The main findings from this session were:

- Customers recognised the pros and cons of both options.
- However, they preferred to ' pay now versus 'pay later' in most instances, whilst others said that the pay now' option was more 'transparent' and 'honest'.
- There were some customers who supported this option with a caveat as they highlighted concerns over whether any return of revenues would be passed on by their supplier.

However when the quantum of potential bill volatility of £1 to £3 per anum was discussed, all customers were less concerned over instability in the bill and hence had less of a strong preference between the options. Given this and the fact that this is not a direct impact on the customer bill as it will be amalgamated with the rest of the suppliers costs into the final bill to consumers, we believe that on balance we should maintain the bespoke mechanisms outlined. The risk analysis we have carried out shows clear benefits to managing the risk of windfall losses and gains and in reducing the residual risk to customers and networks. We recognise however that this is dependent on the level of materiality and other incentives in the price control such as the strong penalty incentive on low confidence costs. Hence we are open to further discussion with Ofgem over alternative approaches. There may be further information available in some areas ahead of final determinations that allows ex ante allowances to be set. For other areas it may be decided that using PCDs may be more appropriate. For example on reinforcements a PCD could be set at the best estimate level, so that if the demand is not realised costs are returned automatically to customers, with an accompanying volume driver for demand beyond this best estimate level.

10.6.6 Bespoke mechanisms contribution to the Consumer Value Proposition

These mechanisms reduce both the materiality and volatility of the risks we face from identified uncertainty. Customers benefit from the introduction of mechanisms, compared to including significantly uncertain costs in our base plan. Ensuring we have a mechanism to recover costs for future needs and requirements that are currently uncertain also means we will be able to continue to deliver for our customers in RIIO-2.

The Ofgem business plan guidance document suggests that "uncertainty mechanisms that highlight risks to consumers of which Ofgem would not otherwise have been aware" is an example that could constitute part of a Consumer Value Proposition (CVP). We discuss our CVP in **section 7.1 of Chapter 7**.

The value of a bespoke uncertainty mechanism to customers does not obviously lend itself to be monetised in the same way as some of the outputs commitments where we have calculated a social return on investment or have clear willingness-to-pay data. One way the value could be calculated is to look at the value that might otherwise have needed to be forecast into the base expenditure plan that may not have been subsequently needed if the uncertainty did not arise. For example, by taking either the low, medium or high case estimates of the uncertainty and multiplying this by the totex incentive sharing factor that the customer would be faced with (e.g. 60%). This gives a range of potential values. This is not as robust a method as SROI or willingness-to-pay; we have separated this out in our summary of the CVP and quoted the mean value in our analysis. This is shown in the summary section below and in more detail in **Appendix 07.01.00**.

10.6.7 Treatment in business plan data tables

In response to requirements in Ofgem's latest business plan guidance, we confirm that these modelled costs have been excluded from our base cost and volume Business Plan Data Table ('BPDT') submission. We have ensured there is no overlap between the costs associated with the uncertainty mechanisms we have proposed, and expenditure in our base plan. Instead, we have modelled the potential financial impact of our proposed uncertainty mechanisms as deviations from the base plan costs. We have included these uncertain costs within **BPDT 5.18** in line with requirements.