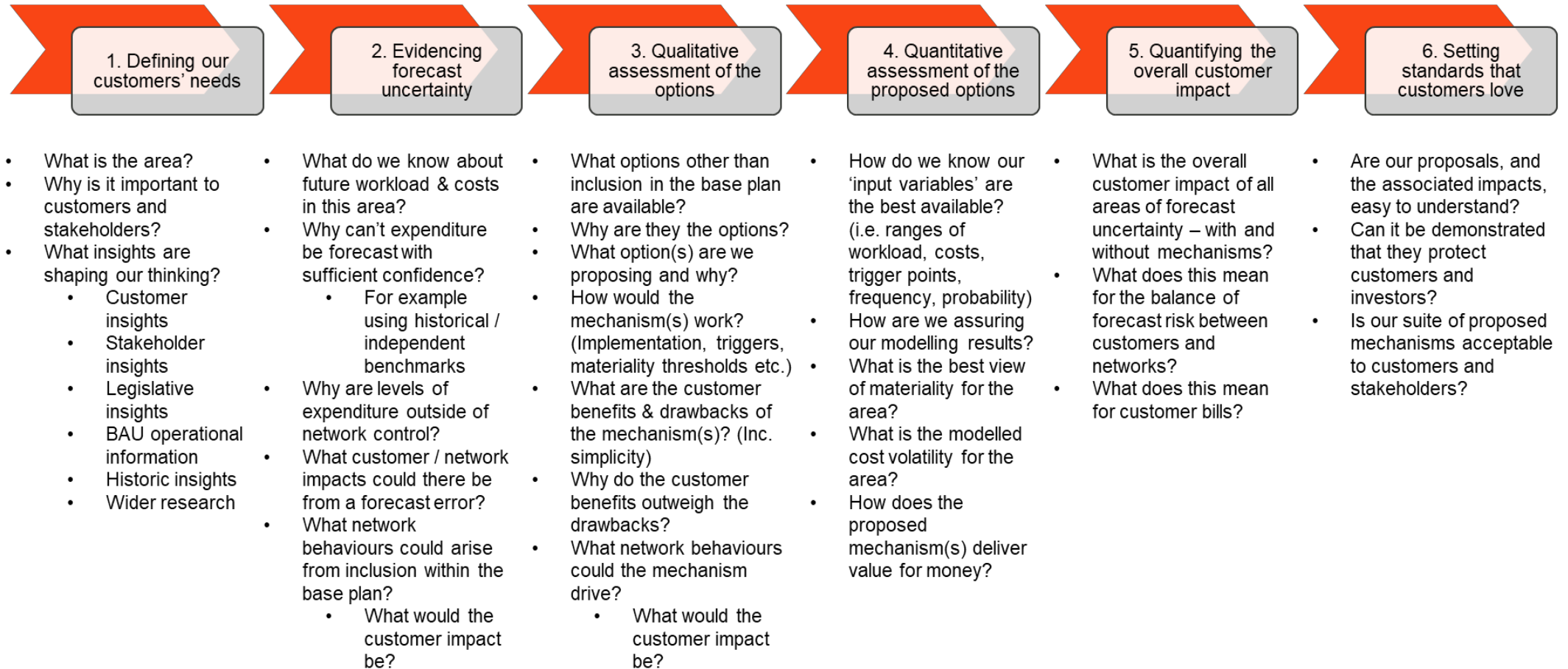


Appendix 10.10

Uncertainty Mechanism Case

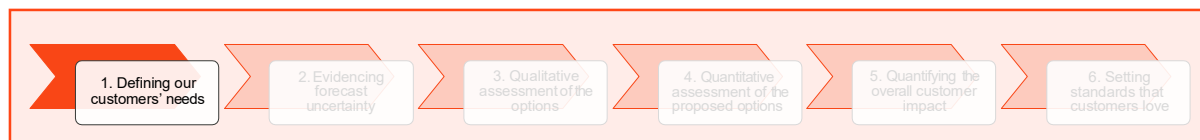
Obligations with respect to Multiple Occupancy Buildings (MOBs)

Cadent's systematic approach to developing uncertainty mechanisms to manage forecast uncertainty



Uncertainty area			
Demand uncertainty	Legislative uncertainty	Cost confidence	Heat Policy
<p>Multiple Occupancy Buildings (MOBs)</p> <p>Cadent proposal</p> <p>Re-opener Uncertainty Mechanism</p> <p>We are focused on the safety of our customers and are regulated by the standards set by the Health and Safety Executive (HSE) and other Government agencies. These standards and regulations drive most of our investment.</p> <p>The Hackitt Review, in response to the Grenfell Tower tragedy, has increased focus on the safety standards for Multiple Occupancy Buildings (MOBs). With the conclusions of the phase-one report recently published, and a second phase due to commence, there is potential for further conclusions to be drawn that have implications for the supply of gas within these buildings.</p> <p>Alongside new requirements that may emerge from the Hackitt Review, society’s attitude to safety risk continues to evolve, and legislation and HSE enforcement approaches respond to this. Independent of conclusions from the Hackitt Review, recent focus from the HSE could result in Cadent being required to deliver further changes in requirements.</p>			

1. Defining the need



1.1. What is the area?

Throughout our operations, we are focused on the safety of our customers. As a company, we are regulated by the Health and Safety Executive (HSE) which sets the required standards of safety and construction.

These include specific standards for multiple-occupancy buildings (MOBs). Following the Grenfell Tower tragedy, ongoing reviews have been considering safety standards for MOBs. The Hackitt Review has recently concluded its first phase. This will now move to a second phase, which may have implications for our operations.

These reviews could lead to higher standards of design, construction or safety for MOBs, and specifically for gas assets in MOBs. They could also lead to more frequent inspections of our high-rise MOB assets. For example, gas conversions in High Rise MOBs may be enacted, requiring gas to be replaced with alternative heat sources such as combined heat and power (CHP) or communal heating. This would depend on all residents in a building agreeing to the removal of the gas supply.

1.2. Why is it important?

A significant number of our customers live in MOBs – blocks of flats or converted houses – particularly in our London network. During RIIO-1, there has been more focus on these assets from Ofgem and the HSE, which has led to significant changes in our approach, service and spend. These changes have been built into our base plan, as discussed further in Section 2.1.

We must also address any legislative changes proposed following the completion of reviews in response to the Grenfell Tower tragedy. These potential changes are unknown, and we are likely to have an obligation to comply with them.

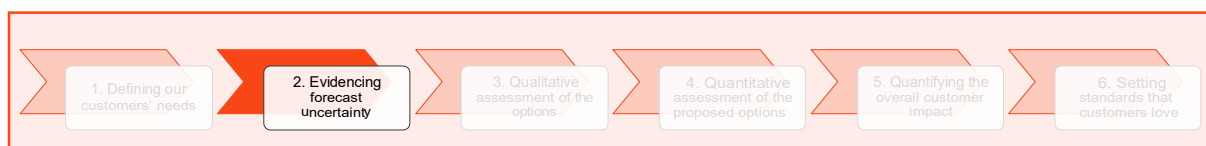
1.3. What insights are shaping our thinking?

We are focused on maintaining the security of supply to our customers, who have a primary expectation that we operate our assets in such a way as to keep them safe. We have engaged with our regulating agencies extensively around how we serve our MOB customers and have focused on improvement in this area as a priority. HSE has been clear that it will not allow changes in delivery that could decrease public safety.

Section 4.1 of our Appendix 09.04 (Transforming the experience for Multiple Occupancy Building Customers) describes in detail the work we have undertaken to engage a range of stakeholders and customers in developing our business plan. Below, we summarise key engagement undertaken with Government and regulators informing our UM process:

- **HSE:** In addition to our routine, ongoing discussions with the HSE, our four Gas Distribution Networks (GDNs) have held four specific discussions to discuss the RIIO-2 process. We have also held two bilateral meetings with the HSE, focused on our approach to MOBs. Appendix 09.04 outlines how this engagement has informed our plan.
- **Government and the Hackitt enquiry:** We have held meetings with the Ministry of Housing, Communities and Local Government in relation to the development of revised safety management for MOBs. We have also made submissions to the Hackitt enquiry. This engagement has informed our scenario analysis as part of the uncertainty-mechanism proposals discussed in Section 4.

2. Evidencing the uncertainty



2.1. What we know about the future

We have developed our base-plan expenditure for MOBs in line with the existing requirements under safety standards and legislation for RIIO-2. This includes changing our overall approach and improving the level of service we provide to MOB customers as outlined in Appendix 09.04. We have also designed our base plan to manage the uncertainty associated with opex-focused MOB work, including the improvements we have planned to deliver for our customers.

We also know, through official reviews, that Government is currently analysing information and taking evidence to better understand the safe management of MOBs. This includes the second phase of the Hackitt review, focusing on building-regulation standards. These

reviews may result in recommendations addressing the supply of gas into MOB, requiring adjustments to our proposed RIIO-2 investments.

Through our engagement with these review processes, we consider there is potential for additional requirements to be introduced for annual surveys of high-rise MOB instead of the existing ten-year cycle. This could arise from recommendations in the Hackitt review that duty holders be appointed for high-rise MOB with responsibility for developing a well-evidenced and robust safety plan.

Alongside these new requirements, we are aware that the HSE remains focused on improvements for MOB customers as a priority.

Comparing uncertainty to costs included in our base plan

Our base plan includes significant expenditure to transform the experience of our MOB customers. This also includes additional costs associated with riser work to facilitate associated mains replacement, and to undertake sample surveys and associated follow-on work. These costs are equivalent to approximately £xxx.xm. These costs are detailed in Appendix 09.04.

Table 1: Baseline costs associated with MOB

Base costs £m, 18/19 prices	2021/22	2022/23	2023/24	2024/25	2025/26
Total costs to manage the MOB and Complex Distribution System gas riser systems		Redacted due to commercial sensitivity			

Our proposal for an uncertainty mechanism does not interact with these costs. As discussed in Section 4, the costs we propose to reclaim through this mechanism are those that may be triggered in response to external changes in legislation. Our base plan has been developed to deliver our strategy in line with known requirements to date.

2.2. Why we face forecasting difficulties

Any changes made to safety legislation in relation to MOB, following ongoing surveys and inquiries, will impact our business. This is a significant area of uncertainty, particularly in our London network where there is a high concentration of high-rise MOB customers.

Either directly regulating for changes to gas supplies or changes to building design and construction requirements could have major knock-on effects on our assets. Given the existing levels of expenditure directed towards MOB, these changes could substantially affect our investment plans.

It is not possible for us to forecast the conclusions of the reviews or their implications for our business, which introduces uncertainty into our future workloads. Given the political focus on MOB safety, we would not envisage a reduction in safety standards during RIIO-2.

We are not able to control the conclusions of such reviews. While we will continue to participate in future policy conversations and undertake proactive engagement on the subject, the conclusions will ultimately be made by external bodies. As the outlook evolves,

we will use our engagement as an opportunity to develop a **better view** of the potential cost implications of new policy for Cadent.

2.3. Network impacts and behaviours from including in the base plan

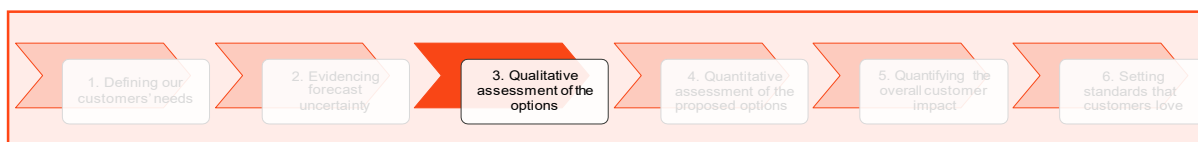
The risk with including costs in our base plan for policy changes associated with MOBs is that we would be required to forecast costs without knowing the details of any future policy change and, consequently, that our estimate fails to fund the activity mandated by new requirements or, alternatively, that we receive funding for policy changes that do not materialise in RIIO-2.

If we were to include costs in the base plan to address currently unknown requirements that may arise from external reviews or policy changes, there is a credible **risk to Cadent** that our estimates would fail to align with the specific actions we may be mandated to take. We would face an incentive to price in risk into our base plan estimates for MOBs, to pre-empt any changes from our regulators.

However, this creates a **risk to customers**. Future requirements that are introduced may not apply directly to our operations or may do so in a limited capacity. This may have an insignificant cost impact on our business yet creates an opportunity for windfall gains.

Excluding this expenditure from our base plan ensures that customers will only pay for actions that are mandated by new safety standards in the future. The alternative would be to include a speculative investment in our proposals, which will not have been developed in line with the specifics of any changes introduced by the Government or the HSE.

3. Qualitative assessment



3.1. Options for addressing uncertainty

Given the uncertainty of future requirements for our MOBs assets in RIIO-2, we have identified and evaluated other mechanisms that could be used to address this risk:

Table 2: Evaluating options for uncertainty mechanisms

Mechanism Option	Description
Volume driver	A volume driver is not appropriate. Any future expenditure incurred in this area will relate to specific projects, which may not have associated unit costs. Furthermore, there currently is no certainty on the volumes of work that will be affected by future policy changes.
Re-opener mechanism	A re-opener would account for the current uncertainty in understanding costs when the designs and requirements for projects in RIIO-2 are currently unknown. This mechanism would allow us to effectively develop an evidence-based cost forecast in response to future policy changes once its timing and scope are known.

Mechanism Option	Description
Use it or lose it allowance (PCD)	This would involve a price control deliverable (PCD) as part of our RIIO-2 plan. While this would protect customers from under-delivery, a PCD does not address the challenge we face in forecasting a total cost when the scope of future requirements for MOB assets is unknown. There is also a risk that barriers are created if there are insufficient funds to deliver against any new requirements.

We have also undertaken a qualitative assessment of uncertainty in this area to further understand the need for an uncertainty mechanism for MOB.

Table 3: Qualitative assessment of risks posed by MOB

Volume risk	Unit cost risk	Impact on outputs	Material cost / bill impact
High	High	High	High

Further detail on our assessment is provided below:

- **Volume risk:** Our work is driven by external legislative requirements following surveys, inquiries and independent reviews relating to MOB. We are unable to control the workload driven by the conclusions of these processes.
- **Unit cost risk:** While we have experience from our existing work with MOB to develop unit cost estimates, there is considerable uncertainty over the scope of work in RIIO-2 that will be driven by external requirements, influencing the total cost.
- **Impact on outputs:** This area of uncertainty may have large implications for our proposed outputs relating to MOB, including customer service and interruptions.
- **Material cost / bill impact:** As discussed further in Section 5, this may be a material area of cost in RIIO-2 will bill implications. There is significant uncertainty over the timing and scope of future legislation.

3.2. Our proposed uncertainty mechanism

We are proposing to address uncertainty related to new MOB requirements using a **re-opener mechanism** in RIIO-2, with a 1% materiality threshold and an anytime trigger¹. This mechanism would allow us to make a submission to Ofgem during RIIO-2 once the materiality threshold is breached. This assessment of materiality is conducted at the individual network, rather than Cadent, level. In this submission, we would propose the costs we intend to recover from customers, providing evidence on why they are appropriate and efficient. This mechanism ensures that scrutiny remains over any costs we intend to reclaim. It also provides an opportunity to engage with MOB-specific stakeholders on the reopening of our determination.

¹ For the purposes of our modelling and analysis, we have used a 1% materiality threshold, as is used in RIIO-GD1. However, due to potentially significant changes in financeability and totex sharing arrangements in RIIO-2, we are assessing if the materiality threshold should be revised. Further details are provided in Appendix 10.00

Operation of the proposed re-opener in practice

- **Form of the trigger:** The need to undertake additional work under this re-opener would be triggered by the introduction of new safety standards that we are required to meet. This would include the passage of legislation following the Hackitt review in Parliament that has implications for our work. This would also include any mandatory programmes or notices made by the HSE in relation to MOBs. These triggers are externally determined, and readily observable.
- **Mitigating the likelihood of the trigger:** While the trigger would be externally determined, we would undertake proactive engagement with Government and our safety regulators on any new policy in development. We are also implementing plans as part of our base plan to transform the experience of MOBs customers, which may have the potential to reduce the need for policy changes.
- **Claiming costs through the re-opener:** As outlined above, we have proposed that costs can be reclaimed at any time during the RIIO-2 period for this mechanism, once a materiality threshold has been breached. We propose that this includes a point in time whereby evidence can be presented that the threshold will be breached in the near future. As part of this process, we would demonstrate costs incurred or expected to be incurred in response to new requirements for MOBs. This would include mapping costs to activities that can be directly linked to any published legislation or HSE notice.

3.3. Evaluating our proposed uncertainty mechanism

A re-opener allows us to respond to the final conclusions of independent reviews, and to effectively develop investment proposals in response to any requirements that relate to our operations. This provides an opportunity to develop a high confidence cost estimate. As outlined in Section 2.3, there are risks associated with including a cost estimate in our base plan at present, creating opportunities for Cadent to make losses or make windfall gains.

Nevertheless, it is important to fully evaluate the behaviours that our proposed uncertainty mechanism will encourage, to ensure they do not create perverse incentives. Below, we consider positive behaviours that a mechanism should promote.

Table 4: Evaluating incentives created by our proposed uncertainty mechanism

Behaviours and incentives	Evaluation
To minimise costs	The costs we submit to Ofgem through the re-opener process will be subject to review and challenge. Any costs identified as inefficient will be disallowed. This creates an incentive to focus on incurring or estimating efficient costs and demonstrating this with robust evidence.

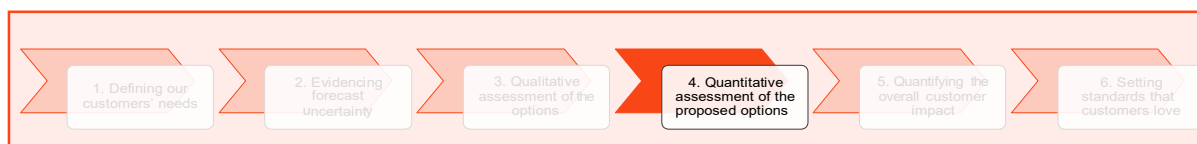
Behaviours and incentives	Evaluation
<p>To deliver required work</p>	<p>Alongside reviewing the efficiency of costs submitted through the re-opener process, Ofgem will focus on ensuring that these only relate to relevant activities. Any costs submitted for work Ofgem does not believe to be required will be disallowed, creating an incentive to focus on work with a compelling need and clearly related to MOB requirements.</p> <p>Compared to the base plan, one could consider that a re-opener does not maintain the same incentive to work itself. However, as identified in Section 1.1, this risk relates to work that we may be mandated to do in the future – Cadent would be compelled to move forward and support the implementation of any new policy. Failing to do so would create safety risks for customers and financial and reputation risks to our business.</p>
<p>To take a whole systems approach or identify strategic solutions.</p>	<p>Opportunities for taking a whole-system approach or identifying strategic solutions in response to any new MOB requirements will remain incentivised under the re-opener mechanism. This creates a further incentive to engage directly with our MOB stakeholders during the re-opener process to develop an appropriate response from our investment plan</p> <p>As described above, the evidential bar associated with the mechanism will encourage cost minimisation. Where this can be achieved by taking different approaches to future work, we would be able to demonstrate an efficient case to Ofgem.</p> <p>Furthermore, as policy changes will apply to all GDNs, benchmarking undertaken by Ofgem during a re-opener submission creates a further incentive to find the most appropriate solution.</p>

A potential drawback for customers is that any costs incurred through the re-opener mechanism may introduce some volatility to their bills, with adjustments made in period to account for the additional investment we have undertaken. However, our submission to reclaim costs will be subject to scrutiny by Ofgem before any conclusion is reached on revenue adjustments. Customers are also protected by the application of the materiality threshold, which ensures that adjustments are only made to our price control for significant deviations from our base plan.

Interactions with other uncertainty mechanisms in our proposed package

Our proposals are independent of the Ofgem prescribed mechanism for Repex – HSE policy changes. The scope of this mechanism is solely focused on HSE changes to the iron-mains replacement programme. Our proposals for MOB relate to safety related changes that are independent of this programme.

4. Quantitative assessment



4.1. Inputs for uncertainty modelling

The cost analysis outlined in Section 4 below is incremental to our base plan proposals, which already address known requirements and workloads in RIIO-2.

Inspection volumes

As outlined in Section 2.1, a potential change in requirements for our MOB assets is the movement away from a 10-year inspection cycle to annual surveying. For this to come into effect, legislation would be required following the Hackitt review. Table 5 below summarises our views on the likelihood of legislation coming into effect in each year of RIIO-2.

Table 5: Input assumption - likelihood of legislation being enacted and coming into effect to require annual surveying

Probability	21/22	22/23	23/24	24/25	25/26
Likelihood of legislative change	0%	25%	50%	25%	0%

Through our engagement with existing review processes and the initial conclusions of the Hackitt review, our central assumption is that Government legislation will be passed during the RIIO-2 period. However, the timing of this is uncertain. If legislation was to be proposed in Parliament in 2020, it could take until the middle of the RIIO-2 before it is implemented and comes into effect. Given current political uncertainty, we do not believe it is achievable for this to be implemented in the first year of RIIO-2. However, in practice a legislative change could take place at any future date.

Following the trigger of a legislative change, we have developed scenarios for the volumes of buildings that may be subject to changes in the inspection cycle. Our 'low scenario' in Table 6 below represents a view that changes will apply to High Rise MOB assets as a minimum. We have developed an estimate of this volume, accounting for inspections already accounted for in our base plan.

In our 'likely-' and 'high-case' scenarios, we have assumed that further inspections are required for medium-rise MOB assets. A duty holder is likely to maintain equal standards across all buildings they have responsibility for – therefore there may be impacts on the inspections of other buildings.

Table 6: Input assumption – volumes of additional buildings requiring inspections

Additional inspection volumes p.a.	High case	Likely case	Low case
Cadent	20,000	10,000	3,000

We have allocated 70% of these volumes to our London network, recognising the prevalence of MOB assets in London. Remaining volumes are split equally between our other networks.

The final component of the potential cost associated with additional inspections is the unit cost for high-rise and medium-rise MOB. We have aligned with the central assumptions used to develop our base investment plan, as shown in Table 7.

Table 7: Input assumption – volumes of additional buildings requiring inspections

Cost of building inspections (£, 17/18 prices)	High-Rise MOB	Medium-Rise MOB
East of England		
London	Redacted due to commercial sensitivity	
North West		
West Midlands		

Policy changes from our safety regulators

We have also considered the uncertainty relating to the likelihood that a change in policy is made by HSE, or our other regulators, that requires us to adapt our investment plan for RIIO-2 for MOB. We have assumed in each year of the price control that this occurs with a given likelihood, as summarised in Table 8 below.

Table 8: Input assumption - Likelihood of change in HSE legislation for MOB

Probability	21/22	22/23	23/24	24/25	25/26
Likelihood of policy change	0%	5%	5%	5%	5%

This assumption is based on our historical experience. Our mains replacement programme began in 2002 under legislation from the HSE. Since this date, there has been a single change of policy. We have also assumed for a change to occur in 2021/22, we would have greater knowledge and certainty through our existing engagement with the HSE. The above information implies a 1/20 chance of a policy change and makes best use of our historical experience. This is our best estimate based on stakeholder engagement to date.

We have also considered relevant cost information to include in our uncertainty analysis for MOB. For this purpose, we have developed low, likely and high scenarios for potential costs arising from changes in safety requirements, impacting the volume of work associated with MOB we will be required to undertake.

We have based our low scenario around an assumption that no further requirements are introduced beyond those we already meet and have accounted for in our **base plan**. This accounts for our judgement that there is a low chance of any conclusions from surveys, inquiries or reviews resulting in a reduction in safety requirements.

In our likely scenario, we have assumed that our total MOB workload increases by 25%, and in our high scenario, we have assumed a 50% increase. We have used these assumptions and cost estimates from our baseline plan to develop the total cost estimates presented in Table 9 below, which are increments above the base plan allowance. Further details on the baseline costs are summarised in Appendix 09.04.

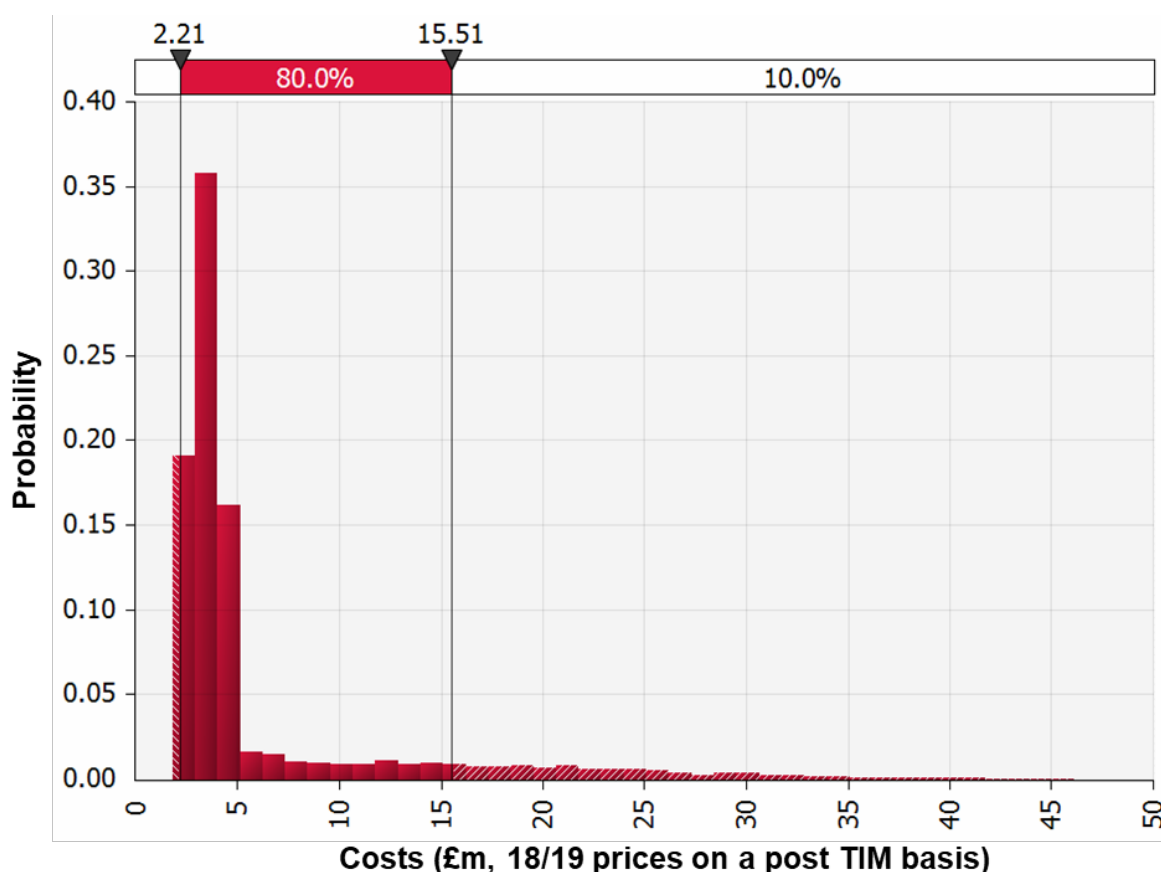
Table 9: Input assumptions – Annual cost per scenario (deviations from base plan)

Cadent total cost for MOBs (£m, 17/18 prices)	21/22	22/23	23/24	24/25	25/26
High scenario	£21.99	£22.58	£23.21	£22.89	£23.09
Likely scenario	£10.99	£11.29	£11.60	£11.44	£11.54
Low scenario	£0.00	£0.00	£0.00	£0.00	£0.00

4.2. Assessing uncertainty

Using our input data described above, we have undertaken a Monte Carlo analysis to understand the range of cost impacts for this area of uncertainty in RIIO-2. This provides a distribution of the potential cost outcomes for MOBs, based on 10,000 iterations. This approach illustrates the high and low scenarios of uncertain costs, alongside the cost outcome and associated volatility. Figure 1 below summarises this distribution, while the following Table 10 provides a breakdown of this risk by network.

Figure 1: Monte Carlo - Total Cadent cost risk for MOBs, no mechanism.
Costs, £m 18/19 prices on a post TIM basis



Minimum	Maximum	Mean	Standard Dev	Iterations
£1.80m	£46.17m	£6.07m	£6.60m	10,000

The results of our Monte Carlo analysis demonstrate the scale of uncertainty associated with potential future costs to meet new MOBs requirements. Without the introduction of an

uncertainty mechanism, there is a considerable risk at the top end of the distribution that actual costs incurred in RIIO-2 may deviate from our base-plan allowance.

Table 10: Monte Carlo: Total RIIO-2 cost risk by network for MOBs, no mechanism. Costs, £m 18/19 prices.

Network	Minimum	Maximum	Mean	Standard Dev
East of England	£0.17m	£6.07m	£0.70m	£0.88m
London	£1.21m	£28.35m	£4.04m	£4.01m
North West	£0.16m	£6.32m	£0.70m	£0.92m
West Midlands	£0.15m	£5.43m	£0.63m	£0.80m

4.3. Impact of our proposed uncertainty mechanism

Table 11 below summarises the impact of introducing a re-opener mechanism to address this risk. As shown, the use of a re-opener reduces the materiality and volatility of the residual risk that remains in costs after sharing associated with MOBs. As the uncertainty mechanism would ensure we only recovered appropriate and acceptable costs from customers, this is an improvement from including a potentially higher base-plan allowance to mitigate against the risk identified without the presence of an uncertainty mechanism in Table 11.

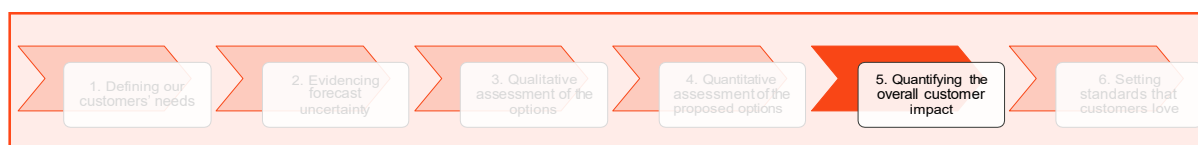
Table 11: Range of cost risks with and without mechanism – MOBs

Value	Without mechanism	With mechanism
Range of Impacts	£1.80m to £46.17m	£0.00m to £10.24m
Materiality (mean risk)	£6.07m	£3.81m
10 th Percentile	£2.21m	£2.20m
90 th Percentile	£15.51m	£5.65m
Standard Deviation	£6.60m	£1.53m

Several assumptions have been made to produce these results:

- Figures are presented on a post TIM basis, using a totex incentive rate of 40%.
- In the case of re-openers, we have assumed a 1% materiality threshold of average annual revenues. We have also assumed 100% of costs are reclaimed in re-openers.
- Finally, we have not considered the phasing of income in this analysis – we have focused on the value of risk and potential incomes.

5. Quantifying the customer impact



In Section 5 of Appendix 10.00 Our approach to managing risk and uncertainty, we have analysed the overall customer impact of uncertain costs with and without our proposed package of mechanisms. We have also evaluated how our proposed package recognises the trade-off between sharing exposure of cost risk between Cadent and our customers. In Chapter 11 of our business plan, we also quantify the impact of our proposed package of uncertainty mechanisms on customer bills in RIIO-2.

We have also quantified the bill impact associated with the MOB re-opener individually. As our assumed scenarios allocate most of the uncertainty impact to our London network, the bill impact is predominately focused in this area. **Error! Reference source not found.** below summarises the potential bill impact per annum by the end of RIIO-2 for the mean, P10 and P90 costs estimated in our Monte Carlo analysis. As costs for this re-opener are categorised as opex and repex, bill impacts beyond the RIIO-2 period are limited.

Table 12: RIIO-2 end bill impacts, P10 mean and P90 costs from uncertainty analysis

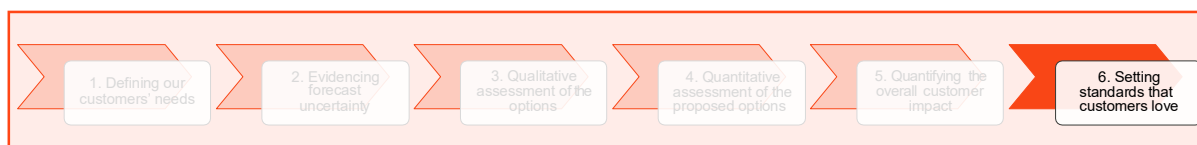
RIIO-2 end bill impact (£, 18/19 prices)	P10	Mean	P90
East of England	£0.04	£0.10	£0.25
London	£0.38	£1.04	£2.65
North West	£0.05	£0.14	£0.35
West Midlands	£0.05	£0.15	£0.38

For the purpose of constructing bill impact estimates, we have focused on the central costs from our Monte Carlo analysis and have not considered the potential timing effects on revenue recovery from the use of a re-opener. In practice, bill impacts would materialise with a lag following a successful claim through the re-opener process.

As outlined in Chapter 10 (Managing risk and uncertainty), Ofgem’s business plan guidance 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 of some of our 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, you could take our likely cost estimate, and multiply this by the totex incentive sharing factor that the customer would be faced with (e.g., 60%). This is not as robust a method as SROI or willingness to pay but provides an indicative estimate. In the case of MOB re-openers, this is equivalent to approximately **£9.11m in RIIO-2**.

6. Setting the standards



Our proposals for a re-opener mechanism are clear and simple for our customers to understand. These proposals have also incorporated challenges we have received from our CEG. We only propose to request funding for the costs associated with new requirements that we may be mandated to meet by the Government and our safety regulators.

When making a notification through the re-opener process, we would clearly articulate to customers the supporting detail and rationale behind our proposed expenditure. This would also provide an opportunity for further engagement during the re-opener window.

Our evaluation on the implications of including costs for MOB's policy changes in our base plan, as outlined in Section 2.3, and of the incentives associated with our proposed re-opener mechanism demonstrate the benefits of this approach for customers and stakeholders.

Our overall approach to managing risk and uncertainty using uncertainty mechanisms has been tested with customers through our acceptability testing. A full discussion of this engagement is provided in Chapter 10 – it is noted here that customers found this approach to be acceptable and that we had been thorough in our work to manage cost risk in RIIO-2.