Draft Determination Representation

Expenditure allowances:

Part 1: Introduction and base expenditure allowances

YKY-PR24-DDR-02-Cost efficiency-Part 1-Introduction and base costs - redacted

YorkshireWater

Contents

1. Introduction

We recognise that setting strong innovation and efficiency incentives is one of Ofwat's four ambitions for PR24 and we support the objective of having a regulatory regime that strives to improve performance while keeping costs to customers at an acceptable level.

We are supportive of the need to ensure efficient service delivery and the broad approach that Ofwat takes to setting efficient cost allowances that create the right incentives for companies to invest in innovative and efficient solutions.

We believe that the way in which Ofwat has calibrated the different models to determine cost allowances for PR24 does not achieve its stated objective of providing such incentives since:

- The required performance levels and cost efficiency targets are divorced from what is operationally feasible; and
- There is a significant disconnect between cost allowances provided for and the required performance levels that have been set.

Required performance levels and cost efficiency targets are divorced from what is operationally feasible

Ofwat's draft determination represents a 9.6% pre-frontier shift reduction from our plan submitted in January – which rises to an 11.1% reduction post-frontier shift. This includes a reduction of £266m from our base expenditure proposals, including £389.1m worth of cost adjustment claims being disallowed, as well as removal of £521.9m removed from our proposed enhancement spend (all numbers pre-frontier). Ofwat has also increased frontier efficiency by 86% on top of the significant efficiency challenge we had already embedded into our plans before submission.

Ofwat's draft determination is far removed from what we would consider a challenging yet achievable plan. The scale of the efficiency challenge makes the delivery of key improvement programmes, supported by our customers, unachievable. The disconnect between costs and outcomes in the draft determination and the downside risk associated with both the setting of performance commitment levels (PCLs) and the outcome delivery incentives (ODIs) can act as an incentive for reliance on short-term objectives (e.g. short-term opex solutions) that over time will lessen resilience, rather than longer term resilient solutions (e.g. larger capex projects that deliver an enduring benefit). The overall package undermines our incentives to innovate and look for alternative better value longer-term solutions, for example the application of PCDs with site-specific outputs, such as in the case of storm overflows, results in challenges in delivering a more efficient solution type or aggregation of interventions on a catchment basis, both of which could be more efficient.

Furthermore, the lack of operational feasibility of Ofwat's proposed cost efficiency targets would likely require Yorkshire Water to seek out short term fixes or 'second best solutions', prioritising investment to minimise the financial impact of likely penalties, rather than investing in longer term improvement programmes. This is not in the best interests of our current customers and could lead to undue costs being apportioned to our future customers and risks undermining Yorkshire Water's long-term resilience.

There is a significant disconnect between cost allowances provided for and the required performance levels in Ofwat's calculations

Ofwat's cost allowances do not take sufficient account of the interplay between costs and services. For example, Ofwat's modelling assumes an unproven negative relationship between cost allowances and service delivery, assuming that all efficient companies should be able to deliver both cost reductions and service improvements simultaneously. This simply is not the case. The proposed reductions in cost allowances do not provide for sufficient funding for companies to invest in service improvements to meet the stretching targets set out in the draft determination and the targets have been set too high to be achievable. In its approach, Ofwat risks introducing a penalty regime, rather than an incentive regime.

1.1 Cost development, benchmarking and assurance

Our costing approach delivers cost efficiency, across all programmes of work. Our costing methodology was described in chapter 8 of our business plan submitted in October 2023 and relies on the utilisation of outturn delivery costs from our unit costing database, which is supported by other specialist methodologies where required. Utilisation of cost models developed from historic outturn costs serves as an internal benchmark data point. This provides a detailed and representative cost base from recently delivered schemes, across a wide variety of assets.

Our Decision-Making Framework (DMF) and EDA suite of asset planning tools, including our Unit Cost Database (UCD) allows us to accurately build scheme costs at a detailed level, working from a bill of quantities approach which has been further evidenced in our submissions.

Yorkshire Water's cost-modelling capabilities have a long track record of providing robust estimation and cost-modelling capabilities, spanning 20+ years of data capture. Our cost models are built using measures which reflect the size and cost of an asset, and include cost allowances for design and supervision, reflective of historic outturn costs, as opposed to the use of estimates which routinely manage risk and uncertainty in delivery via overestimation.

External cost benchmarking has also been carried out across large sections of the programme – beside an internal review and technical assurance on the cost build up, we carry out commercial cost benchmarking across the base and enhancement programme. This benchmarking allows us to test our costs derived from the UCD against cost derived from commercial suppliers and other methodologies.

There are a number of approaches to this external cost benchmarking that are undertaken. These approaches and the findings are summarised in Table 1-1 below.

Table 1-1 External benchmarking approaches

Benchmarking approach	Findings
External costing provided by commercial consultant: Independent consultant costing of capital schemes using the PR24 scope submitted in business plan. 15 schemes costed by the consultant, primarily higher cost storm overflow programme schemes. The methodology employed was to use semi-detailed unit costs with an assembly level line of items.	Nine of the schemes would cost more than the PR24 submission and six would cost less. The costs ranged from 38% less than the PR24 submission to 43% more. Overall, we found our PR24 submission to be 11% higher than the estimates however, three of the schemes were originally to be delivered as DPC schemes and it was therefore difficult to reconcile the costs as they contained an element of WWTW upgrade that was apportioned to individual schemes. We plan to re-run these estimates on a like for like basis.
Costed by AMP7 contract partners: AMP7 contract partners were asked to cost some of our schemes based on like for like scope against the PR24 submission. Two contract partners supported this exercise costing a sample of reservoirs safety, water quality (DWI) and WINEP Phosphorous removal schemes.	This exercise was caried out across 17 projects with a total PR24 submitted value of c£50m. The overall partner costs submitted was c£53m, an approximate 5% increase against PR24 business plan.
Costs built up by YW, independent to the UCD: costing of 6 schemes on mains renewal and lead replacement based on NEC Option B contract rates and commercial cost plans, which were competitively tendered and will be used in delivery of AMP8 project.	In total this programme of work came to c£12m in the PR24 submission but has since been costed at c£17.8m with a significant increase at two schemes due to complexities of the schemes which were not included for in via the unit costing process in the business plan.

Partner tendered costs: There are 10 capital schemes which we already have partner tendered costs for, six of these schemes form part of the infrastructure accelerated spend as part of the WINEP programme.	Four of the accelerated spend CSO schemes were included in the business plan at a total of £11.4m, these were then tendered at a winning value of £12.6m.
Storm overflow schemes benchmarked against recently delivered schemes: Of 20 storm overflow schemes costed, 15 were costed by Mott MacDonald and a further five were costed based on recently completed schemes within our £180m AMP7 overflow programme.	We found that four of our schemes were approximately 25% more than we anticipated for AMP8, and one was 60% less but overall, the costs were broadly in line (within 13%) with our PR24 submission. We also benchmarked the cost per m^3 of storage for storm tanks across 28 different schemes completed within AMP7 and found those costs to be broadly in-line with our PR24 submission.

Across the price review programme, we have considered all aspects of the programme and ensured assurance checks and reviews are in place. We complete a risk assessment and define the level of assurance that will be carried out over the data and the contents of our submission. This process makes sure that the assurance we plan is adequate, timely and appropriate. It helps is create a risk-based assurance plan. From this risk-based assurance plan, we implement three levels of assurance, tailoring the amount of assurance in place to the risk assessment.

With regards to our costing information within our plan, we completed assurance over the cost models used within the company, which included independent external assurance over the data being inputted into the models, the data processing in place within the models, assurance over the asset hierarchy and the output of the models in terms of asset deterioration rates, investment needs and service impacts.

We also completed independent external assurance over aspects of our plan where potential schemes and proposals were relatively costly or have a higher than usual associated delivery risk and/or address a significant risk to the environment. Independent external assurance was appointed to provide confidence in options suitability and reliability, that schemes proposed were in line with relevant methodologies and that the proposals offer best value and are based on sound and robust evidence. This assurance concluded that our processes and methodology are compliant with the guidance provided, our approach to costing of options is generally based on sound data and the submissions contain the best central estimates of needs and costs.

1.2 Overview of the cost efficiency representation

We have submitted representations for cost assessment across several components of our plan. In this section, we have commented where:

- We have concerns with the approach taken by Ofwat in assessing our costs and have additional evidence to support concerns raised by Ofwat in their assessment.
- We have made amendments to our enhancement case due to changes in statutory requirements since January 2024, and /or
- Where Ofwat has presented an allowance for costs that had not previously been within our plan.
- We also respond to Ofwat's consultation questions on its approach to cost assessment.

For each specific area of the plan where we make a representation, we:

- Briefly set out Ofwat's proposals.
- Respond to each of Ofwat's challenges and provide further information where relevant.
- Identify those areas where we challenge Ofwat's findings or approach, setting out our rationale for this; and
- Where relevant we set out our required changes.
- Provide additional evidence of customer support for the proposed changes to our plan (see section 2 of this document).

The following sections set out in more detail our responses to:

- Base expenditure allowances (Section 3 - 13 of this document).
- Specific enhancement cases (clean water enhancement cases (YKY-PR24-DDR-03 and wastewater enhancement cases (YKY-PR24-DDR-04).
- Cross cutting issues (YKY-PR24-DDR-05).

1.3 Customer insight

In addition to the research that informed our October 2023 business plan submission, we also conducted further research with customers to better understand their views on several aspects of our original submission and thoughts on our plan at representation.

We wanted to understand customers' support for a number of areas of great importance to our plan; these included specified enhancement cases, and the cost adjustment claims (detail in excerpt below). In March 2024, we commissioned an independent third-party study aimed at understanding the detail of each of these cases and claims, including customers' views when shown the cost and bill impact of each of these in both 2025-2030 and up to 2050.

The research covered five cost adjustment claims and eight enhancement cases and used quantitative and qualitative methods, including online and face-to-face interviews, focus groups, and in-depth interviews. The sample consisted of 1,967 quantitative interviews and 154 qualitative consultations with household, non-household, and future customers. This is a very robust base size and goes beyond Ofwat expectations by engaging with future bill payers also. Weighting was applied to match the customer base profile as closely as possible.

Table 1-2 below outlines an overview of customer support for each area tested.

Table 1-2 Overview of customer support

EC/CAC	Audience Type	Support	Good value for money
Combined sewers	Household	78%	53%
	Future bill payers	84%	50%
	Non-household	85%	67%
Phosphorus removal	Household	82%	50%
	Future bill payers	96%	70%
	Non-household	86%	68%
WINEP	Household	88%	57%
	Future bill payers	94%	65%
	Non-household	95%	74%
WINEP: Freshwater pearl mussels	Household	87%	56%
	Future bill payers	96%	81%
	Non-household	96%	74%
Storm overflows	Household	90%	-
	Future bill payers	100%	-

EC/CAC	Audience Type	Support	Good value for money
	Non-household	97%	-
Inland bathing quality	Household	92%	-
	Future bill payers	98%	-
	Non-household	95%	-
Storm overflows & Inland bathing quality	Household	-	57%
	Future bill payers	-	72%
	Non-household	-	70%
Coastal storm overflows	Household	87%	60%
	Future bill payers	97%	71%
	Non-household	93%	82%
Appropriate measures	Household	84%	57%
	Future bill payers	100%	76%
	Non-household	91%	77%
Asset health	Household	76%	50%
	Future bill payers	90%	73%
	Non-household	85%	77%
Drinking water quality	Household	87%	59%
	Future bill payers	95%	59%
	Non-household	91%	73%
WRMP	Household	86%	54%
	Future bill payers	96%	69%
	Non-household	88%	76%
Water meter replacement	Household	70%	50%
	Future bill payers	90%	65%
	Non-household	77%	85%
Smart metering	Household	79%	53%
	Future bill payers	90%	66%
	Non-household	78%	88%

EC/CAC	Audience Type	Support	Good value for money
Water mains replacement/renewal	Household	82%	56%

The research findings were definitive. A third-party agency, working independently for us, confirmed that we received significant customer backing for the priority enhancement cases and cost adjustment claims tested. It also revealed that customers are environmentally aware and supportive of those enhancement cases and cost adjustment claims, particularly ones impacting the environment. Notably, there was considerable support for increasing investment in storm overflows and inland bathing waters, as well as strong backing for funding to protect the endangered freshwater pearl mussels in the River Esk.

After incorporating numerous changes and challenges to Ofwat's draft determination, we completed our customer research with an affordability and acceptability testing survey. This survey evaluated our draft representation plan by engaging 950 household customers, 60 future bill payers, and 111 informed customers. Our plan indicated Yorkshire Water's intention to exceed the proposals in Ofwat's draft determination, which would result in higher customer bills than those proposed by Ofwat. The findings revealed strong support for our plans: 84% of household customers, 84% of future customers, and 77% of informed customers found our plan at representation to be acceptable. Despite the potential bill increases, 41% of households stated that the bills would be easy to afford, and an additional 28% were neutral about the affordability. Support for our representation plan was notably higher compared to the initial submission, with saw 78% of customers find the plan acceptable following Ofwat's prescribed affordability and acceptability testing approach. Additionally, customers supported further investment in coastal storm overflows, presented as an extra option beyond the original plan.

In conclusion, our customers are invested in our performance and have a strong sense of pride in Yorkshire. They acknowledge that investment is crucial to enhancing performance and improving the environmental health of our region, our plan provides all of this to our customers and most importantly, is supported by them.

2. Base Econometric Models

2.1 Overview

The vast majority of our base cost allowances at draft determination were set using Ofwat's suite of econometric base models (85%). These models are relied upon to set efficient costs, so it is important that these are developed to be as high quality as possible.

The models form part of a key, wider regulatory discussion on 'what base buys' and what has been historically funded for companies to deliver. We discuss those issues elsewhere in our representation (for example, our views on the ongoing disconnect between cost and outcomes are set out in section 1 of the cost assessment cross cutting issues chapter (YKY-DDR-PR24-05), with this chapter focusing on our key comments on the specifics of Ofwat's draft determination modelling approach.

It summarises a more detailed report and analysis completed by Oxera which is attached as an appendix (YKY-PR24-DDR-14). The Oxera report provides detailed evidence and economic rationale for the changes we propose.

The key areas of representation covered are:

- the inclusion of 2023-24 outturn data,
- the stringency of the efficiency benchmark, and
- specific changes to the modelling specifications to improve the performance of the models.

2.2 Ofwat action reference

Not applicable.

2.3 Key messages and change requested

We consider that Ofwat should update all of its econometric modelling to include the (quality assured) APR data for the most recent year, 2023-24. Ofwat indicates in its draft determination technical appendix that it intends to do this, and we support the need for the most recent data to be incorporated into historical cost models.

The models as presented at draft determination remain uncertain, and it is this uncertainty that should drive the decision of what catch-up efficiency benchmark to choose. Ofwat indicates that a more stringent benchmark than the upper quartile (UQ) may be appropriate. We do not agree with this assertion as our analysis suggests that even a UQ benchmark may be overly stringent and unsupported by the evidence.

We also recommend some specific changes to the models that improve their performance and should be included in the final determination.

2.4 Yorkshire Water's response to Ofwat

We are representing on the Ofwat base econometric cost models as they are a material part of our cost allowances (around 85% of our base allowances at draft determination). The models are, by design, built at a high level and use a relatively small number of explanatory variables to describe what is an incredibly complex set of interacting activities across the wholesale and retail price controls. It is therefore critical that these models are as robust as they can possibly be and their use in challenging industry efficiency is proportional to their quality.

It is important that appropriate efficient costs are recognised by Ofwat to ensure that companies are properly funded to maintain their full range of assets and performance.

In section 1 of the cost assessment cross-cutting issues chapter, we set out our views on the ongoing disconnect with service and performance, and the funding gap that arises because these models do not account for the link between costs and service. We do not repeat that argument in this section, instead focusing on the specifics of the draft determination base models and how, in our view, they can be improved at final determination.

We note that we identified some small errors in Ofwat's modelling files, which we have communicated to Ofwat and corrected in the analysis undertaken. The exact models and estimated allowances in this document, and particularly in the supporting report produced by Oxera, will therefore differ slightly to what Ofwat presented in its draft determination.

We have worked with Oxera to thoroughly review the models presented at draft determination and update them to include APR24 data. We attach a detailed report (YKY-PR24-DDR-14) as an appendix which sets out the detail of our response and our views on the overall cost modelling approach as well as some specific comments on Ofwat's top-down and bottom-up models.

Our proposed changes to the models represent an improvement on Ofwat's draft determination models in terms of model fit and statistical significance.

General cost modelling

In its draft determination documents, Ofwat indicates that the 2023-24 outturn data will be incorporated into its final determination. We strongly agree that it should update its modelling to include the (quality-assured) APR24 data. These additional datapoints will improve the number of observations in the models and is likely to be the most reflective year in the dataset of the efficient costs of service achieved.

The models presented at draft determination remain uncertain, and it is this uncertainty that should drive the decision of what catch-up efficiency benchmark to choose. Ofwat indicates that a more stringent benchmark than the UQ may be appropriate. However, our analysis suggests that even a UQ benchmark may be overly stringent and unsupported by the evidence.

Water cost models

Based on the analysis completed on the draft determination models, our view is that the following changes should be made to Ofwat's water base models for final determination:

- **Include connected properties as a scale variable in the TWD models** – Ofwat argues that connected properties is an operationally relevant measure of scale in the TWD models, but states that it should not make too much difference to allowances given that connected properties and length of mains are correlated. We consider that this latter statement is incorrect. For example, Yorkshire Water's allowance in the TWD models increases by around £9m when using models with connected properties.
- **Model weighted average complexity (WAC) in levels rather than logs** – We set out our views on this in our initial response to the base cost modelling consultation, however, Ofwat has not engaged with this argument in its draft determination. Modelling WAC in levels rather than logs improves the interpretability of the coefficient and improves the statistical performance of the models, so it is unclear why the log specification is adopted.
- **Include booster pumping stations per length of mains (BPSPL) and average pumping head (APH) in the same model** – Our detailed response sets out why Ofwat's reasons for doing this are not statistically robust.

Wastewater network plus cost models

We recognise that Ofwat has adopted many of our recommendations included in our draft modelling consultation response in the network plus models, and that Yorkshire Water is

estimated to be broadly efficient in these models. Nonetheless, we consider that the following changes should be made to improve the models further:

- **Remove models that control for the proportion of load treated in size bands 1 to 3** — The engineering rationale for this variable is relatively weak compared to the weighted average treatment plant size (WATS) driver, as it assumes that there is a step-change in unit costs at a somewhat arbitrary threshold.
- Moreover, the driver performs worse than WATS in the SWC and WWNP models. Therefore, including models with this driver may add unnecessary 'noise' to the allowances. Alternatively, a lower weight should be placed on these models, given that they are comparatively less robust.

Bioresources models

We do not have any specific comments on the bioresources models, given that the models control for few drivers of expenditure, and we have not found any clearly superior model specifications. We consider, however, that limitations with the bioresources models should be recognised and be accounted for elsewhere in the framework (for example, when setting efficiency benchmarks challenges, by evaluating trade-offs with WWNP+ control).

Residential retail models

We consider that Ofwat should remove the Covid dummies from the model specifications. In so doing, it may consider targeted approaches to smoothing doubtful debt costs to mitigate the specific impact of the Covid years on model performance. There are better ways to address the issue on the extended dataset that includes the latest APR data.

2.5 Concluding points

In conclusion, Ofwat's base cost modelling is highly material and should be completed using the most up-to-date information possible (incorporating 2023-24 outturn data). The models should be made as robust as possible, and we make several suggestions to improve the quality of the models.

Once a final set of models is confirmed, it is important that the level of uncertainty in the models is used to determine what an appropriately stringent benchmark should be.

3. Post modelling adjustments: Energy

3.1 Overview

The approach to assessing energy costs set out in the draft determination contains several issues that, together, fail to appropriately adjust company allowances to reflect the above-inflation energy price increases seen in AMP7, and to forecast energy costs going forward.

We did not include a cost adjustment claim for energy in our plan due to uncertainty over how Ofwat would deal with the issue and set the efficiency benchmark. We noted that it was important that recent energy price rises were fully reflected in the base cost allowances. We also set out the need to protect customers and companies from future input price deviations from CPIH by introducing indexation and a true-up mechanism.

We therefore welcome that Ofwat has recognised these issues, and has introduced a post-modelling adjustment, real price effect (RPE) and true-up for energy costs at draft determination.

However, Ofwat's approach to estimating the post-modelling adjustment and future costs is flawed. It does not produce a reasonable forecast of the energy prices that companies are likely to incur. As Ofwat has not provided detail about how it plans to apply the true-up mechanism, or how it aligns with the post-modelling adjustment, we are concerned this approach will lead to companies facing a material gap until PR29, or not receiving sufficient additional funding for the impact of energy prices on base costs.

We set out our concerns around the methodology of future pricing in this response. We note that the issues we have identified are particularly amplified by the timing of Ofwat's analysis (using 2022-23 data and forecasts) and updating the analysis for 2023-24 outturn values leads to a materially different result. We also set out how a more accurate analysis of the requested uplift and forward-looking real price effect should be applied. Oxera has also looked at this issue in (YKY-PR24-DDR-15), as have Baringa in a report for Water UK (YKY-PR24-DDR-21), with both finding similar issues and results.

3.2 Ofwat action reference

While not a specific action, this document represents on the approach set out by Ofwat on pages 44-46 of the document *PR24 draft determinations: Expenditure allowances.*

3.3 Key messages

- The fundamental issue is that Ofwat, in its post-modelling adjustment, is using an incompatible combination of indices to forecast the RPE. The historical index is lagged in its response to energy prices as it includes hedging and reflects an average incurred cost for a large industrial user. In contrast, the forward-looking index does not include hedging so mixing the two indices causes a mismatch between the uplift to 2022-23 costs and the subsequent RPE adjustment.

- If this modelled approach is retained, we note that the uplift should be based on the difference between the five-year average (the cost benchmarking period) and the current cost of energy. We also note that there are, however, several alternative approaches that could provide a more reasonable forecast.

- Ofwat's methodology is also opaque. It has not provided detail on how it intends to apply the true-up mechanism, or how it aligns with the post-modelling adjustment. Companies may be left to bridge the gap until PR29 or not receive sufficient additional funding at all.

3.4 Change requested

We ask Ofwat to reconsider its forecasting models. When forecasting forward-looking assessment of costs, it should ensure that it reflects the costs that companies are likely to experience (including hedging). As indexation will be applied, we consider it appropriate to use the average, actual paid price by the water industry as the 2023-24 starting point (and indexation baseline) and the industry forecasts for 2024-25 to 2029-30 going forward. The present model is not an accurate representation of how companies will likely experience costs into AMP8.

3.5 Yorkshire Water's response to Ofwat

The approach to assessing energy costs set out in the draft determination contains several issues that, when taken together, risk inappropriate estimates of company allowances into AMP8. We are setting out an alternative modelling approach.

We noted in our submission that recent energy price rises must be fully reflected in the base cost allowances. While Ofwat has recognised some issues, its approach used to estimate the post-modelling adjustment and future costs does not produce a reasonable forecast of the energy prices that companies are likely to incur. With these higher costs not appropriately considered, water companies will be at considerable risk through AMP8. There is therefore an urgent need for Ofwat to address its approach to future cost forecasting, both to provide water companies sufficient allowances and to protect customers from higher bills and poorer service in the long term.

No detail has been provided on how Ofwat intends to apply the true-up mechanism, and how it aligns with the post-modelling adjustment. We are concerned that, at best, the approach will lead to companies managing a material gap to Ofwat's allowances until a true-up at PR29, and at worst that the cost of energy prices will continue to put significant pressure on companies' base costs.

Our representation sets out the need to protect customers and companies from future input price deviations from CPIH, by introducing indexation and true-up mechanisms. Failure to account for companies' additional energy costs risks failing to appropriately fund the service and environmental improvements that we commit to in our plan.

3.5.1 Key changes required to Ofwat's post-modelling adjustment approach

The indices must be aligned

Our analysis of Ofwat's post-modelling adjustment approach has identified a mismatch between two indices Ofwat uses to set a forward-looking RPE. This fundamental issue with Ofwat's post-modelling adjustment approach is failing to account for the lag between peak market prices and the water companies experiencing those peak prices as delivered costs.

The model switches from the historic delivered cost DESNZ index in the uplift factor calculation, to a combined index in the RPE factor calculation. The RPE factor uses an actual cost index (Ofgem Day Ahead prices) for single year 2022-23, then for the remainder of the period 2023-24 to 2029-30, a Bloomberg forecast price index, covering the wholesale electricity element of delivered costs.

The model assumes businesses incur the cost of purchasing wholesale energy within the same year as the relevant index. However, good risk management practice dictates that businesses do not approach any given year completely open to future market shocks but hedge a portion of their forward baseload as a minimum up to three years ahead. Therefore, there is a lag between peak market prices and water companies experiencing those peak prices as delivered costs.

This can be demonstrated by the historic DESNZ index itself, which measures actual delivered electricity prices. Ofwat's model only runs to 2022-23 with an DESNZ index price of £269, however in 2023-24 the DESNZ delivered price went up to £320, while the market actually peaked previously in August 2022.

By curtailing the uplift factor calculation in 2022-23, the year of peak market prices, the model has missed the impact of peak delivered electricity costs which were incurred by the water companies 12-18 months later in 2023-24.

Demonstrating the mismatch

The impact of this can be highlighted by simply updating the analysis using 2023-24 out-turn data:

a) Applying the DESNZ index up to 2023-24 actuals.
b) Beginning the RPE adjustment from 2023-24 using the latest out-turn Ofgem value as the starting point.
c) Keeping the Bloomberg forecasts 2024-25 to 2029-30 as in the original analysis.

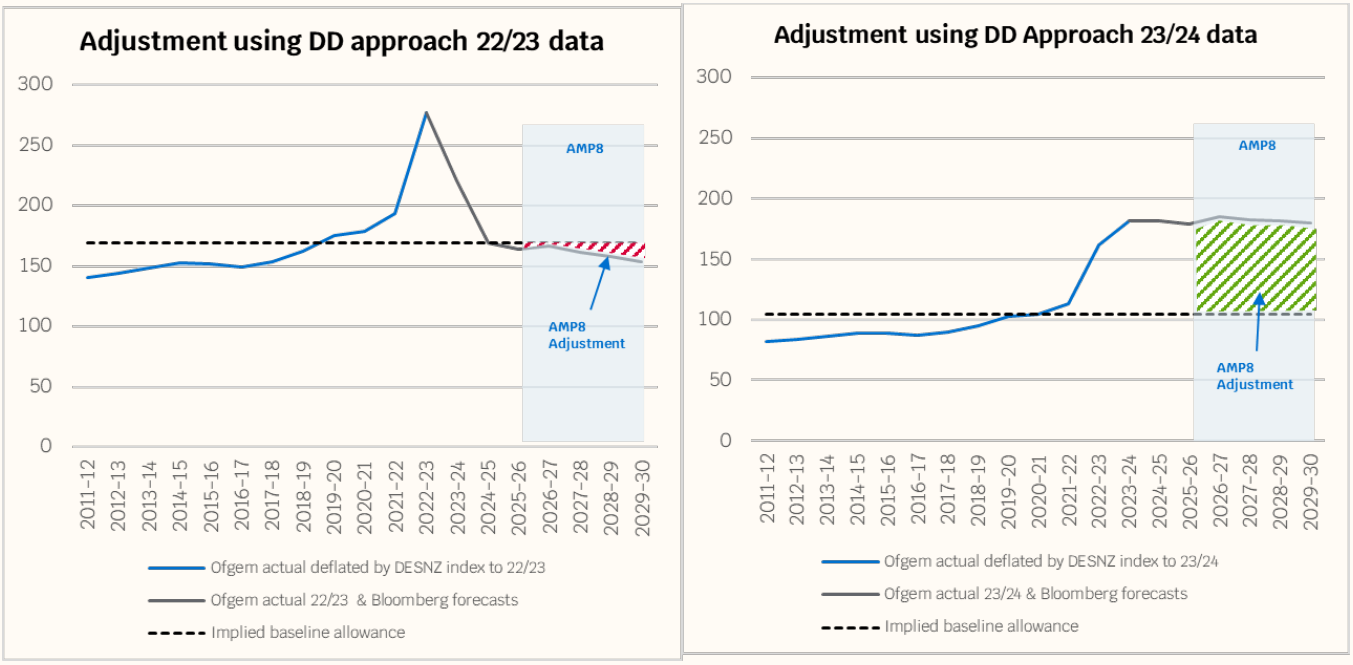
This both reduces the implied baseline cost allowed in the base models (1.0 uplift factor) and reduces the RPE reduction going forward to 2029-30.

Table 3-1 Impact on adjustments using Ofwat's approach by changing the assessment year from 2022-23 to 2023-24

Delivered Index - Uplift factor and RPE combined	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30
Using Ofwat Approach with 22/23 data	1.641	1.304	1.001	0.973	0.988	0.956	0.935	0.908
Using Ofwat Approach with 23/24 data	1.641	1.734	1.701	1.654	1.681	1.626	1.589	1.544

Figure 3-1 below shows this visually as the adjustment to AMP8 energy costs changes from a small negative value (shown by the shaded area in the first graph) to a large positive value once 2023-24 data is incorporated (shown by the green shaded area in the second graph).

Figure 3-1 Impact on adjustments using Ofwat's approach by changing the assessment year from 2022-23 to 2023-24



Updating the existing analysis for 2023-24 demonstrates the errors caused by the mismatch described above. It does not, however, get to the actual appropriate value for either the uplift or the real price effect.

A different forward-looking index must be used instead

The Ofgem value for 2023-24 and the Bloomberg forecasts do not account for the hedged element of costs that companies experience. This is therefore not an accurate representation of how companies will experience costs into AMP8. The DESNZ index is backwards-looking only, so cannot be used for forecasting either.

The RPE should be based on an energy price index that accounts for hedging strategies, in the same way as the uplift is calculated. One option is to use companies' forecasts of energy prices to estimate the RPE. While this data may be endogenous, consumers are protected from any overestimation risk via the true-up mechanism.

The required uplift should be recalculated

Companies' totex allowances are set using a backwards-looking five-year upper quartile benchmark in the PR24 cost models. In our view, Ofwat should determine the implicitly funded price level based on the benchmarking period (the last five years) rather than the entire modelling period.

This reduces the uplift value at the time of the draft determination models (2022-23) from 1.64 to 1.4. For a set of updated models to incorporate 2023-24, the value would be reduced from 1.73 to 1.37.

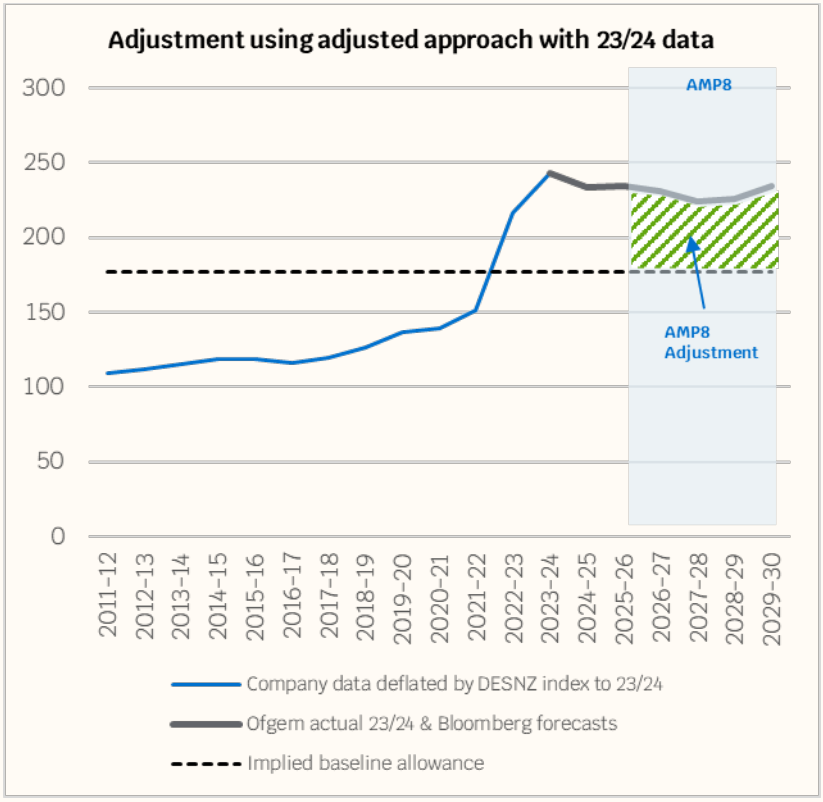
Using the industry average forecast of cost (PR24 additional data requests shared on websites) and updating the uplift as described in 3.2 above, the index would be adjusted as follows:

Table 3-2 Adjusted approach using an uplift compared to the 5yr average and water company forecasts from 'Additional Energy Request'.

	23/24	24/25	25/26	26/27	27/28	28/29	29/30
Industry Average Costs (£/MWh)	243.51	233.39	234.32	230.93	224.06	225.70	234.28
Delivered Index - Uplift factor and RPE combined	1.37	1.29	1.28	1.24	1.18	1.17	1.19

Figure 3-2 below shows this graphically in the same format as Figure 3-1.

Figure 3-2 Adjusted approach using an uplift compared to the 5yr average and water company forecasts from 'Additional Energy Request'.



As the bioresources price control is a net exporter of energy and receives income based on the wholesale price of energy (primarily from the recharging to the network plus controls) the impact of addressing this modelling issue has the reverse effect on bioresource allowances. The small uplift seen in Ofwat's approach for bioresources becomes a larger (but still small compared to the wholesale controls) reduction in ongoing allowance when the new approach is applied.

Cost shares should be updated to reflect the ongoing proportion of energy costs

The third part of Ofwat's post-modelling adjustment is to identify an efficient energy cost-share based on applying the historical energy share to the AMP8 modelled base totex and uplifting this value.

Using the historic cost power cost-share to do this does not reflect the much higher electricity price environment we now find ourselves in. Because of the increase in energy costs, power now makes up a greater proportion of totex in 2023-24 and into AMP8 than it did in 2018-19.

Ofwat applied a weighted average energy cost share for Yorkshire Water of 11.7% (10.5% WW, 13.1% WWNP) that is no longer relevant in the post-Ukraine crisis world. The value of 16%, seen in 2022-23 is the same value as our forecast energy share of the same base totex figures

through AMP8. We have already hedged 45% of our baseload for AMP8 and forecast the open positions using current market season prices to create a mark-to-market forecast wholesale cost. Combined with third party charges from PR24 business plan submissions detailed in the draft determination cost adjustment model, a realistic forecast can be made for our AMP8 delivered electricity costs, giving an AMP8 energy cost share of around 16%.

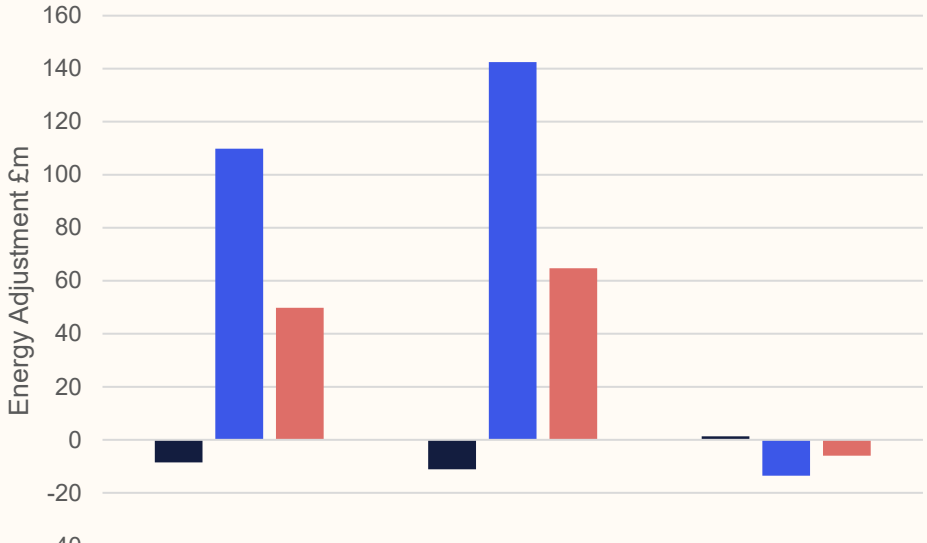
As we are seeing the Ofwat modelled 2022-23 energy cost share of 16% continuing through AMP8 using our actual mark to market AMP8 energy costs, we therefore submit that using a redundant historic energy cost share of 11.7% for the third major component of the AMP8 draft determination adjustment factor, produces an overall energy adjustment that will not reflect the high energy cost environment we operate in.

We also note that because the energy adjustment is linked to the final totex allowance, the approach is sensitive to decisions made elsewhere on cost adjustment claims. The size of energy costs should not be connected to whether capital maintenance cost adjustment claims are allowed elsewhere and should be completed on the basis of % of base modelled costs.

3.5.2 Materiality

To highlight the importance of getting this modelling correct, the below table shows the impact of the assumptions on Yorkshire Water's cost allowances.

Figure 3-3 Impact of approaches on Energy Post Modelling Adjustment



	Water £m	Wastewater £m	Bioresources £m
Ofwat Existing Approach (YKY)	-8.5	-11.1	1.3
Updating Existing Approach for 23/24	109.8	142.5	-13.5
Modified Approach*	49.8	64.7	-6

**Based on Oxera analysis*

3.5.3 Alternative approaches

Other approaches are available to Ofwat that should be considered:

Inclusion of a cost driver in the base econometric models

Using the DESNZ price index as a variable in econometric models would be a simple approach to ensuring base allowances were adjusted to reflect above inflation energy increases

historically. This would negate the need for a post-modelling adjustment, and forward-looking forecasts of the index could be developed to apply a real price effect within the modelling.

This approach has the advantage of being a simple approach that does not require multiple steps. Our initial assessment is that econometric models remain robust following the addition of this driver, however we are aware that the interaction with other cost-drivers would need exploring.

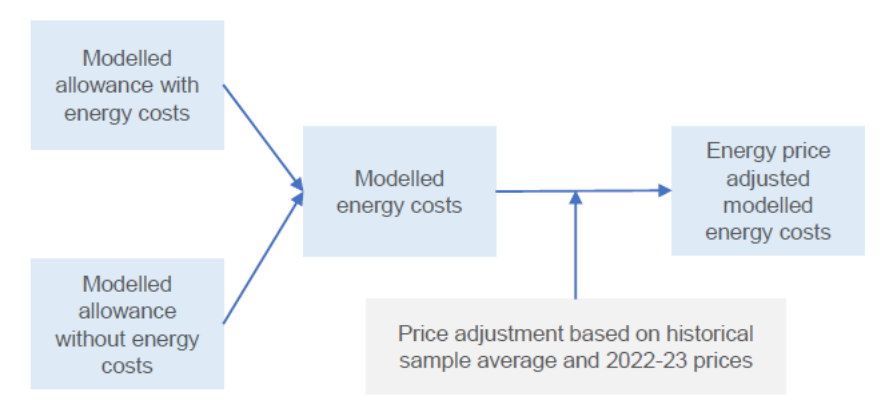
Given that chemical prices closely follow energy prices, this approach may also capture effects relating to chemical RPEs which are a further source of cost pressure but have been excluded from Ofwat's draft determination on the basis of materiality.

Post-modelling adjustment based on estimated implicit energy allowance and the energy price adjustment

This approach is similar to the one proposed by Ofwat but estimates the implicit energy cost allowance by running Ofwat's base cost models both with, and without, power costs. The difference between the modelled cost allowance outputs represents the implicit energy cost allowance.

The energy cost allowance is then adjusted as per Ofwat's, based on the difference between historical sample average and 2023-23 prices for energy (and forecast going forward, using a central estimate of costs).

The energy cost allowance can then be added back to the cost allowance, without power costs, to estimate new base cost allowances. RPEs can then be applied as appropriate.



This approach develops an alternative view to that set out by Ofwat at draft determination with regard to the level of energy implicit in the base models.

Post-modelling adjustment based on a standalone power cost model

Rather than applying a wedge adjustment factor to the implicit energy allowance, this option uses a tailored approach to estimating energy cost allowances. This is achieved through a modelling adjustment.

This could be done through the inclusion of an energy price index cost driver within the separate energy cost allowance model. The modelled energy cost allowance could then be apportioned back to the base cost allowance excluding energy to estimate total base cost allowance.

We note that the approach would add additional complexity to the benchmarking process, as it requires running two separate models.

This approach has similar benefits to the inclusion of a cost driver in the models while removing the risk of wider energy interactions in the models. However, it will not capture the impact of energy prices on other components, for example chemicals.

3.6 Concluding points

Ofwat's methodology for addressing the recent above inflation energy cost increases and forecasting energy prices is flawed.

It uses an incompatible combination of indices to forecast future water prices. The approach it has used to estimate the post-modelling adjustment and future costs does not produce a reasonable forecast of energy prices.

This would lead to insufficient totex allowances in AMP8 with companies obliged to bridge the gap until a PR29 true-up which will impact on company revenues and be detrimental to customers and the environment.

However, as Ofwat has not provided detail on how it intends to apply the true-up mechanism, or how it aligns with the post-modelling adjustment, it is difficult to be certain that the full shortfall will be returned to companies.

Our response suggests how the current modelling approach may be adjusted to create a more reasonable estimate of how the base cost allowances should be adjusted to reflect energy costs going into AMP8. We also set out some alternative approaches that could be used.

4. Post modelling adjustments: net zero

4.1 Overview

We welcome Ofwat's allocation of investment for Electric Vehicle (EV) charging and low carbon heat technology that is intended to enable a step change in emissions reduction.

Ofwat's modelling proposes a net zero base allowance of £2.1m and £3.0m in water and wastewater respectively at a median cost of £757.8/tCO2e to deliver a target reduction of 2.47%, which equates to 6,689 tCO2e in AMP8.

In this response, we set out a critique of Ofwat's approach and propose an adjusted net zero base cost adjustment that is representative of Yorkshire Water's circumstances. This proposal is for £2.3m and £2.7m in water and wastewater respectively to deliver a cumulative emissions reduction of 6,689 tCO2e.

However, we disagree with Ofwat's approach of applying stretching performance commitment levels (PCLs) on the basis of cumulative emissions. PCLs are based on in-year emissions rather than cumulative AMP8 emissions reduction. Therefore, we forecast this investment will deliver an annual 'in-year' reduction of 1,430 and 1,510 tCO2e by 2029-30, representing a reduction of 1.28% and 0.95% against baseline for water and wastewater respectively.

4.2 Ofwat action reference

While not a specific action, this document represents on the approach set out by Ofwat on p43-44 of the document *PR24 draft determinations: Expenditure allowances.*

4.3 Key messages

- The net zero base cost adjustment is welcome, however the model used to calculate the cost adjustment and targeted greenhouse gas (GHG) reduction benefits does not reflect Yorkshire Water's circumstances or take account of varying levels of net zero maturity in the sector.
- The application of cumulative carbon AMP8 reduction overstates the impact of the investment on PCL targets.
- We propose a net zero base cost adjustment of £2.3m and £2.7m for water and wastewater respectively for investments in EV charging infrastructure, heat pumps, and emergent opportunities that will deliver a reduction of 2,940 tCO2e and will contribute to a 1.1% reduction (in year by 2029-30) relative to Ofwat's proposed baselines, which is still a material and efficient rate of reduction. Please note that in our expenditure allowances – wastewater enhancement case representation we are putting a case for amendment of the wastewater baseline to 2024-25.

4.4 Change requested

Ofwat should adjust the proposed net zero base cost adjustment requirements detailed in PR24-DD-Net-zero-cost-adjustment.xlsx, to reflect the allowance allocation and reduction of targets across wastewater and water as per the Table 4-1 below.

Table 4-1 Ofwat's draft determination and Yorkshire Water's draft determination representation

Base allowance at draft determination and Yorkshire Water's representation for water and wastewater		
	Allowance (£m)	**Reduction (tCO2e)**
Ofwat's Draft Determination - water	2.1	2,755 (cumulative)
YKY Draft Determination Representation - water	2.3	1,430 (in year)
Ofwat's Draft Determination - wastewater	3.0	3,934 (cumulative)
YKY Draft Determination Representation - wastewater	2.7	1,510 (in year)

4.5 Yorkshire Water's response to Ofwat

We welcome Ofwat's proposed net zero base cost adjustment and agree with the stated rationale that the sector needs to deliver a step change in its performance if it is to meet interim and final UK and Welsh government net zero targets.

We also agree that EV charging infrastructure is needed to enable the transition to transport electrification. In addition, high capex costs and long payback periods for low carbon heating technologies such as air sourced heat pumps can deter investment. Therefore, a well-considered base cost adjustment mechanism is an appropriate approach to enable this transition.

The reason for our response is as follows.

Firstly, the net zero base cost adjustment model (PR24-DD-Net-zero-cost-adjustment.xlsx), used to calculate Yorkshire Water's allowances and targets does not reflect Yorkshire Water's circumstances or take account of varying levels of net zero maturity in the sector.

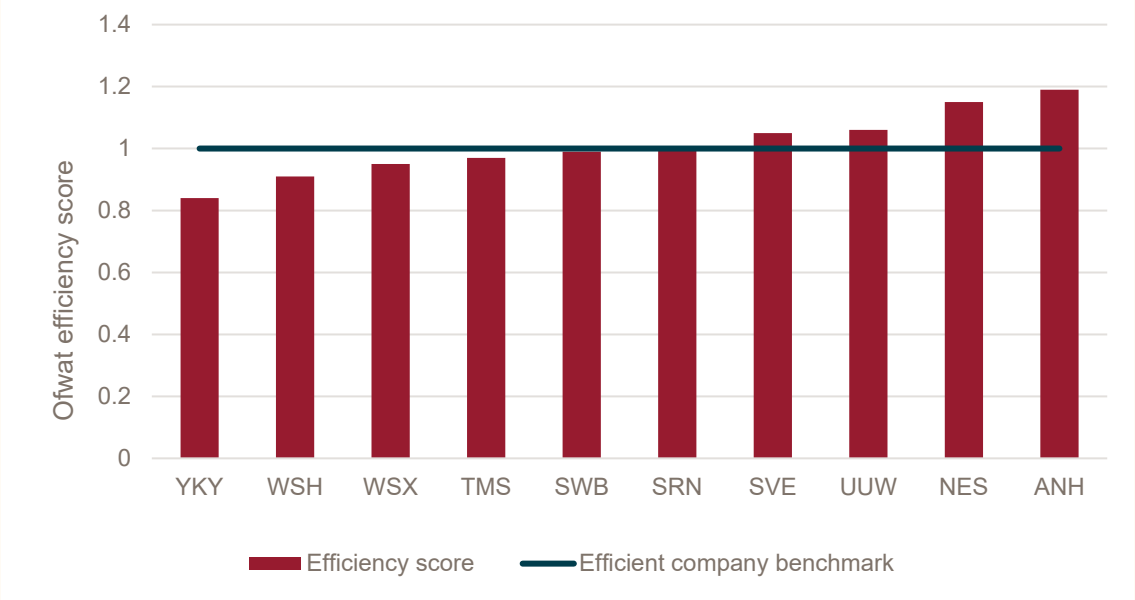
Ofwat's model has been developed from enhancement case proposals that have been provided by a limited range of water companies. As Yorkshire Water did not put forward an EV charging infrastructure or low carbon heat enhancement case, this calculation is not informed by the scale of investment, GHG reduction benefits, or allocation across wastewater and water as they relate to our circumstances. In addition, Ofwat expects companies to use this additional cost allowance to reduce fleet and heating emissions. However, not all companies are at the same level of GHG reduction maturity.

Yorkshire Water has already been assessed as having limited opportunity for additional improvement from base on fleet, burning of fossil fuels, and purchased electricity, and may therefore have less opportunities to decarbonise in these areas relative to other companies.

Ofwat has calculated an "efficiency score" for each company using an econometric model. Yorkshire Water was assessed to be efficient for water, and the most efficient company with respect to historic wastewater emissions across the whole industry (see Figure 5-1 below). In fact, Yorkshire Water was in the top three most efficient companies under all six specifications tested by Ofwat.

Ofwat has uniformly allocated a 2.47% GHG reduction target across the sector. Given such variability within the sector in relation to the extent in which prior efficient investments have already been made, a standard reduction target applied to every company does not reflect a realistic stretch for different companies.

Figure 4-1 Ofwat calculated efficiency scores for historical wastewater emissions



***Source**: Ofwat draft determinations models, Operational greenhouse gas emissions – wastewater model cells Z7 to AB27 in "PfB Adjustments". https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-DD-PCM_Operational-greenhouse-gas-emissions-wastewater.xlsx*

***Note**: A score below 1 means that company actual emissions are below modelled emissions and the company is considered by Ofwat to be efficient*

Secondly, the application of cumulative carbon AMP8 reduction as an additional stretch target overstates the impact of the investment on PCL targets.

The model suggests that the investment that Ofwat proposes delivers carbon benefits which amount to an additional 2.47% GHG stretch target.

For Yorkshire Water, this equates to a reduction of 6,689 tCO2 across waste and water. Ofwat proposes that this reduction is applied to PCLs as an additional stretch target. Our view is that this overstates the impact on PCLs as there is a difference between the assessment of the cumulative carbon benefit of the investment across the AMP8 period for the purposes of assessing the efficiency of the investment, and the annual carbon reduction delivered by these investments.

To establish a cost efficient £/tCO2e investment case for the allowance, Ofwat has used the cumulative emissions submitted by companies within their enhancement cases.

However, cumulative emission reductions overstate the impact the schemes have on the in-year PCL position.

To illustrate this, Table 4-2 shows the impact of our proposed investment for water in both EV charging infrastructure and heat pumps and its annual 'in-year' impact on the PCL. By 2029-30 these investments will reduce emissions by 752.14 tCO2e/year, a reduction of 0.67% relative to baseline.

In comparison Table 4-3 below shows the impact of the cumulative approach which reflects the removal of 1,469.77 tCO2e by 2029-30, a reduction of 1.32% across the AMP. The former will be used to determine the PCL 'in-year' reductions, and the latter will be used to assess efficiency.

Table 4-2 The impact of emissions reduction 'in-year' on PCL

Water – in year reduction	Baseline (tCO2e)	2025/26	2026/27	2027/28	2028/29	2029/30
Heat Pump	111,475	-41.90	-83.79	-83.79	-83.79	-83.79
EV Charging	111,475	-	-	-106.09	-318.26	-668.35
Impact on PCL		-0.04%	-0.08%	-0.17%	-0.36%	-0.67%

Table 4-3 The impact of emissions reduction 'cumulative' on PCL

Water – cumulative reduction	Baseline (tCO2e)	2025/26	2026/27	2027/28	2028/29	2029/30
Heat Pump	111,475	-41.90	-125.69	-209.48	-293.27	-377.07
EV Charging	111,475	-	-	-106.09	-424.35	-1,092.71
Impact on PCL		-0.04%	-0.12%	-0.29%	-0.65%	-1.32%

Finally, we are providing this response in order to propose a modified net zero base cost adjustment that is primarily targeted at investments in EV charging and heat pump technology. We also propose an allocation for emergent opportunities in infrastructure which enable a step change in the transition to net zero including low carbon transport infrastructure such as hydrotreated vegetable oil (HVO) fuel or hydrogen technologies.

We propose a net zero base cost adjustment of £2.3m and £2.7m in water and wastewater respectively to deliver a cumulative emissions reduction of 6,689 tCO2e, which would deliver an annual reduction of 1.1% by 2029-30 against the total water and wastewater baselines proposed by Ofwat.

We are proposing a base cost adjustment which,

- Will apply to the step-change technology that Ofwat proposes, namely EV charging infrastructure and low carbon heating.
- Provides an allowance to address emergent opportunities such as infrastructure investments to enable the adoption of low carbon fuels.
- Proposes the reallocation of emissions reduction targets appropriate to wastewater and water within Yorkshire Water's context.
- Assesses the impact on the PCL in terms of the annual 'in-year' reduction to be delivered by 2029-30 rather than the cumulative total of emissions avoided across the AMP.

The three areas for investment through the net zero base allowance are as follows.

EV charging

This is an investment of £3m which we have allocated across waste and water on an equal basis, this approach also applies to the associated GHG reductions. Yorkshire Water covers a large geographical area, including areas of low population density with limited access to public charging infrastructure. This investment will enable the transition of 63% of our light commercial vehicle (LCV) fleet from diesel, which currently consumes over 2 million litres of diesel per year, to battery electric models.

EV charging infrastructure does not, of itself, reduce emissions. Therefore, to be consistent with the approach taken within the net zero base case adjustment model, and the overrides applied to companies that submitted an EV charging related proposal, we have allocated 50% of the forecasted emissions reductions from the LCV fleet transition that this investment will enable to this spend.

LCV vehicles are essential for our service delivery and so the transition to electric vehicles, where issues of range and electric charger accessibility are critical. This must be done in a way that enables our vehicle users to maintain a reliable service for customers.

Given the large geographical area that our fleet of LCV vehicles operate within Yorkshire, our plan is to invest in a robust network of EV chargers across 200 Yorkshire Water sites throughout the region. This network will enable regional connectivity for our LCV fleet to ensure availability of charging points for our vehicle users across the region.

Low carbon heat

The electrification of heat has an important role in the delivery of our net zero objectives as this will displace natural gas or oil as heating fuels used in our sites and offices leading to the subsequent reduction of our scope 1 GHG emissions.

Across Yorkshire Water's estate, we have identified 19 large office and operational sites where either air or ground sourced heat pump technology may be viable. These systems would replace existing natural gas or oil-fired heating systems.

Our proposal for investment is in five most cost beneficial locations and is based on the deployment of air source heat pumps which deliver a reduction of 248 tCO2e/year across both wastewater and water.

Emergent opportunities

In addition to the two investments above, we propose an allocation for investment in emergent opportunities. We consider these to be investments in low carbon infrastructure that enables a step change in decarbonisation in areas not addressed in either our electric charging infrastructure or the wider roll-out of our low carbon heat proposal. Examples of the investment types that we would consider appropriate for investment includes infrastructure to enable the transition to lower carbon fuels for larger vehicles (for example HVO or hydrogen fuel infrastructure to decarbonise our HGV fleet), or additional deployment of low carbon heat technologies.

Table 4-4 Water net zero base cost allowance investment and GHG reduction

Water	Investment (£m)	Cumulative reduction	In year reduction 29/30	PCL impact (reduction/ baseline)
EV Charging	1.5	1,093	668	0.60%
Low Carbon Heat	0.5	377	84	0.08%
Emergent opportunities	0.4	1,693	677	0.61%

Total	2.3	3,163	1,430	1.28%

Table 4-5 Wastewater net zero base cost allowance investment and GHG reduction

Wastewater	Investment (£m)	Cumulative reduction	In year reduction 29/30	PCL impact (reduction/ baseline)
EV Charging	1.5	1,093	668	0.42%
Low Carbon Heat	0.9	739	164	0.10%
Emergent opportunities	0.4	1,693	677	0.43%
Total	2.7	3,526	1,510	0.95%

The need for investment

This investment is needed to support Yorkshire Water's net zero plans through enabling the delivery of further fleet and heat decarbonisation and the reduction of fossil fuel related scope 1 GHG emissions.

In addition, the following adjustments to the net zero base cost adjustment that Ofwat has proposed to Yorkshire Water are necessary.

Firstly, GHG reduction targets should be based on annual 'in-year' reductions rather than the basis of cumulative emissions submitted in related enhancement cases to ensure consistency with PCL outcomes.

Secondly, Yorkshire Water's investment allowance should be reallocated across waste and water as per our proposal to better reflect our circumstances.

Why this is right for a thriving Yorkshire, right for customers and environment

Our representation sets out the need to accurately reflect the environmental impact of emission reductions delivered by our proposed investments.

The risk to business, customer and environment if our proposal isn't followed

There is economic risk to the business if Ofwat conflates cumulative GHG reductions with PCL and returns money to customers. There is environmental risk if our planned investment is not funded, as this will limit our ability to transition our LCV fleet to EVs and invest in low carbon heat projects and so fail to reduce scope 1 emissions arising from transport diesel fuel consumption and fossil fuel heating systems.

Cost efficiency

We have sourced forecasted costs for EV charging infrastructure and low carbon heat proposals from supply chain partners. To ensure that any spend using this additional base maintenance money is efficiently spent, we will use existing Yorkshire Water procurement rules and frameworks to competitively tender and select the best value delivery of goods and services. To build the costs in this proposal we have not been able to provide detailed bottom up costs but have instead used benchmark figures supplied by our existing suppliers, which are reflective of the costs we will expect to see when we deliver this work in AMP8.

Customer views

As outlined in Chapter 6 of our October business plan we have engaged with customers on alternative solutions for achieving net zero, particularly with regards to the use of carbon offsetting. While customers have a range of opinions, there was a clear preference for us to work to reduce our emissions and act locally to deliver carbon insets through partnerships and our own efforts and use carbon offsets as a final measure for residual emissions.

4.6 Concluding points

The net zero base cost adjustment is welcomed, however:

- the net zero base cost adjustment model used to calculate Yorkshire Water's allowances and targets does not reflect Yorkshire Water's circumstances or take account of varying levels of net zero maturity in the sector.
- Ofwat's model does not account for varying levels of company maturity in the delivery of previous GHG reduction investments.

The application of cumulative carbon AMP8 reduction overstates the impact of the investment on PCL targets.

- To establish a cost efficient £/tCO2e investment case for the allowance, Ofwat have used the cumulative emissions submitted by companies within their enhancement cases.
- Cumulative emission reductions overstate the impact of the schemes on the in-year PCL.
- Ofwat should assess the impact on the PCL in terms of the annual 'in-year' reduction to be delivered by 2029-30 rather than the cumulative total of emissions avoided across the AMP.

We propose a net zero base cost adjustment of £2.3m and £2.7m for water and wastewater respectively for investments in EV charging infrastructure, low carbon heating, and emergent opportunities, that will deliver a combined reduction of 2,940 tCO2e, on an annual basis by 2029-30, and will contribute to a 1.1% PCL reduction relative to Ofwat's proposed baselines.

5. Post modelling adjustments: Phosphorous removal cost adjustment claim

5.1 Overview

Ofwat has provided a post-modelling adjustment for the increased operational costs incurred by companies as a result of the phosphorus removal programmes currently being delivered to achieve compliance with the AMP7 Wastewater WINEP.

We are pleased that Ofwat has recognised that these costs are not accounted for historic benchmarking models and that an approach to adjusting company costs needs to be developed.

Ofwat's modelling approach has proposed an uplift of £87m for Yorkshire Water whereas we maintain that the £110m cost adjustment claim included in our October plan is an appropriate, efficient adjustment. We do not agree that this significant gap in opex of £23m between the Ofwat models and our view should be considered inefficiency.

We note that our request is based on design estimates of the actual increases in opex our programme will require. We set out in this response a critique of Ofwat's modelling approach and propose alternative models that better explain the operating cost requirements for Yorkshire Water and their efficiency.

5.2 Ofwat action reference

While not a specific action, this document represents on the approach set out by Ofwat on p41-42 of the document *PR24 draft determinations: Expenditure allowances.*

5.3 Key messages

- Ofwat is right to introduce a post-modelling adjustment for phosphorus removal at draft determination.
- The proposed models are similar to those we proposed alongside our plan but are flawed for reasons that relate both to the model selection and to the benchmark selection.
- In our response we have developed alternative, better performing models that suggest that efficient costs for Yorkshire Water would fall between a value of £115m and £165m. Hence, our proposed uplift is efficient.

5.4 Change requested

Ofwat should allow, as a minimum, the £110m proposed in Yorkshire Water's plan to efficiently fund the increased costs of wastewater treatment due to the AMP7 WINEP phosphorus removal programme. This is an increase of £23m from the £87m allowance proposed in Ofwat's draft determination.

5.5 Yorkshire Water's response to Ofwat

We are representing on this because Ofwat's post-modelling adjustment does not adequately allow for the efficient operating cost required to operate the new phosphorus removal processes at 80 sites that we are installing during AMP7.

Ofwat's modelling approach has identified an uplift of £87m for Yorkshire Water whereas we maintain that the £110m cost adjustment claim included in our October plan is an appropriate adjustment. We do not agree that this significant gap in opex of £23m between the Ofwat models and our view should be considered inefficiency.

These sites are delivering compliance with the WINEP programme (Water Framework Directive and Urban Waste Water Treatment Directive drivers) and as the vast majority of these schemes are complete or near completion, our confidence in the required operating costs to meet these statutory obligations is high.

These multi-million-pound capital installations are being built to deliver river water quality improvements, however the benefits will not be delivered without their ongoing operation into AMP8 and beyond.

Improving our rivers is a key part of delivering a thriving environment in Yorkshire. If we are not given an appropriate allowance, there is a risk that these improvements cannot be achieved if we operated the works to meet the Ofwat draft determination operational expenditure allowance. The alternative is that we would be required to use opex from elsewhere, which will impact our ability to achieve our other performance commitments to customers and the environment.

5.5.1 Demonstrating efficient costs

We have worked closely with economic consultants Oxera, both in developing our initial claim and in creating this representation. The full analysis completed by Oxera can be found in Oxera Post Modelling Adjustment Report (YKY-PR24-DDR-15) and we summarise the work below, and confirm this represents the company view.

Ofwat's adjustment for increased phosphorus removal activity is—at a very high level—not dissimilar to one of the approaches that was proposed in our business plan. Specifically, Ofwat uses STW-level data to estimate the relationship between P-consent level and opex and uses this model to predict companies' incremental costs associated with increased phosphorus removal activity.

However, Ofwat's modelling is flawed for the following reasons:

1. Model specification.
    - Firstly, Ofwat estimates its model in levels rather than in logarithms (the latter specification is used for nearly all other expenditure assessments). This imposes an unintuitive restriction on the relationship between P-consent level and opex in that a decrease in P-consent has the same monetary impact on STWs' opex (c. £23k per mg/l reduction) for all STWs, regardless of their size. This is economically unintuitive, given that a tightening P-consent level should have a greater monetary impact on larger STWs.
    - Secondly, we consider that the models should account for a more flexible relationship between PE and costs by accounting for the step-change in costs that occur at particularly tight P-consent levels
2. Benchmark selection. Ofwat has selected a UQ benchmark (estimated at the company-level) to adjust the predicted costs, despite the estimated efficiency scores ranging from 0.42 (ANH) to 1.92 (NES). The wide range of efficiency scores suggests that there is significant uncertainty in this modelling, and that an average/median benchmark is more appropriate.

Alternative models for the phosphorus removal post-modelling adjustment that address multiple important shortcomings of Ofwat's draft determination models are shown in Table 5-1 below.

Table 5-1 Alternative Models for phosphorus removal Post Modelling adjustment

	PM_ALT1	PM_ALT2

Dependent variable	Log(OPEX per PE served)	Log(OPEX per PE served)
P-consent (assumed)	-0.272***	-0.111***
P-consent below 0.5mg/l		0.407***
Log(PE served)	-0.687***	-0.716***
Squared log(PE served)	0.057***	0.060***
Constant	-3.271***	-3.565***
N	1183	1187
Model fit	0.493	0.536
RESET test	0.702	0.742
Estimation method	Random effects	Random effects

Note: ***reflects statistical significance at the 1%level.. Standard errors clustered at the company level. Outliers excluded based on Ofwat's approach.
Source: Oxera analysis based on Ofwat data.

We consider that these models represent an improvement on Ofwat's model specification for the following reasons:

1. The models allow for tightening P-consent levels to have a proportionate rather than an absolute impact on opex, for example, model PM_ALT1 presented above predicts that a 1mg/l reduction in the P-consent level is associated with approximately a 27% increase in additional opex.

2. The models account for the fact that particularly tight phosphorus removal levels below 0.5mg/l are associated with disproportionately higher opex (as evidenced by the positive and significant coefficient on the P-consent below 0.5mg/l dummy variable). Specifically, the models suggest that phosphorus removal at particularly tight consent levels is associated with a c. 41% additional opex.

3. The models account more flexibly for economies of scale than Ofwat's models. The modelling suggests that an increase in scale is associated with a decrease in costs per population equivalent (i.e. economies of scale), but that the extent of the economies of scale is diminishing as STW-size increases. Given that the coefficient on the squared scale term is statistically significant, and the models only pass the RESET test (Ofwat's preferred test for model specification) when the squared term is introduced, we consider that such modelling is appropriate.

4. All cost drivers are statistically significant and (at least directionally) aligned with operational expectations.

Table 5-2 shows our calculated allowances for AMP8 based on these alternative models at the UQ and median benchmarks, and also includes Ofwat's results for reference.

Table 5-2 Alternative Models outputs

	Ofwat's draft determination model	Alternative models		
	PM2	PM_ALT1	PM_ALT2	Triangulated
Median	119.0	150.2	179.3	164.7
UQ	86.7	113.3	117.9	115.6

Note: All values in £m. Allowances for all relevant STW, incl. those excluded from modelling.
Source: Oxera analysis based on Ofwat data.

Based on Ofwat's draft determination models and using an upper quartile benchmark, our allowance relating to the phosphorus removal base cost post-modelling adjustment is £86.7m, whereas under the alternative models, our allowance would be around £115.6m.

This compares to actual costs of £110m built up from our detailed engineering analysis of the required costs (and in some cases the actual costs of operating sites that are already online) proposed in our draft determination submission and suggests that these should be considered efficient.

Customer support

We conducted additional quantitative research (speaking to a representative sample of 1,967 customers) and qualitative research (having in-depth conversations with 154 customers) to gauge customer support and perceived value for money of our cost adjustment claims. In this extensive and robust piece of research, we found the vast majority of customers to be in support of our proposed claim for phosphorus removal.

82% of household customers support the claim, with support levels rising to 86% of non-households and to 96% of future bill payers. Evidencing extremely high levels of support from all key customer cohorts.

The majority of customers we spoke to also believe the claim to represent good value for money with 50% of households agreeing that the measure represents good value, rising to 68% of non-households and 70% of future bill payers.

The vast majority of customers also believe this cost adjustment claim to be important to them, with 89% of households believing it to be important, rising to 100% of non-households and 92% of future bill payers.

Overall, the evidence from our extensive engagement with customers on this shows a strong desire for the inclusion of the phosphorus removal cost adjustment claim within our plan, with the quotes below demonstrating some of the reasons for this high level of support:

"If it's going to improve the quality of water then I think you've got to support it...it might be nice to have things itemised on the bill so you get a bit more of an idea of what you're paying for."

Household customer, Hull

"We have to think about...sustainability and over the long term...the damage we kind of do now to the environment can't really be undone...so Yorkshire Water need to stay on top of this."

Financially vulnerable customer

5.6 Concluding points

In summary, Ofwat's post-modelling adjustment is insufficient to appropriately fund expenditures required to operate our large phosphorus removal programme currently being delivered in AMP7.

Ofwat has calculated the adjustment using a model that doesn't justify an upper quartile benchmark and can be improved upon. Alternative, better performing, models confirm that our costs submitted in our plan remain efficient and should be allowed for in full.

Ofwat should allow, as a minimum, the £110m proposed in Yorkshire Water's plan to efficiently fund the increased costs as part of a post-modelling adjustment.

6. Post modelling adjustments: Mains renewal

6.1 Overview

In *PR24-DD-Mains-renewals-adjustments,* Ofwat set out its detailed response to our cost adjustment claim in relation to water mains replacement. We are pleased that Ofwat's response is supportive of the scale of our AMP8 programme and accepts its justification based on improving long-term asset health.

However, we consider that Ofwat's assumptions about the proportion of that programme which is required to be funded from our base totex allowances is inappropriate and that the assumed efficient unit costs for delivering the programme are unachievable. This view is borne out by a report we have commissioned by specialist economic consultants Oxera, a copy of which is included within our draft determination response and which we confirm represents Yorkshire Water's view. Oxera concludes that its analysis: "*suggests that Ofwat's current methodology is materially underfunding YWS for mains replacement activity, which would increase the risk that YWS is unable to deliver on its maintenance programme to the detriment of consumers and the environment".*

The combined effect of these changes would make our plans undeliverable or would require significant cuts in other areas of base activity, as to make it impossible to achieve our wider performance targets.

6.2 Ofwat action reference

Ofwat responded to our cost adjustment claim *CW02a Targeted Allowances for Asset Health - Infra: Mains replacement* in their document In *PR24-DD-Mains-renewals-adjustments.* It has partially accepted the claim, allowing a base adjustment of £106.17m against a requested allowance of £250.94m.

The key reasons for the reduction in allowed costs are:

- Different assumptions about the amount of mains replacement assumed to be covered within base allowances.
- Ofwat's application of a significantly lower unit cost on the basis that we have not sufficiently evidenced that our proposed unit cost is efficient.

We acknowledge Ofwat's support for the scale and objectives of our overall programme, and for clearly setting out the areas where we need to provide greater clarity to substantiate our position. There are several discrete tests which Ofwat has applied, and we set out below our response to the specific challenges raised.

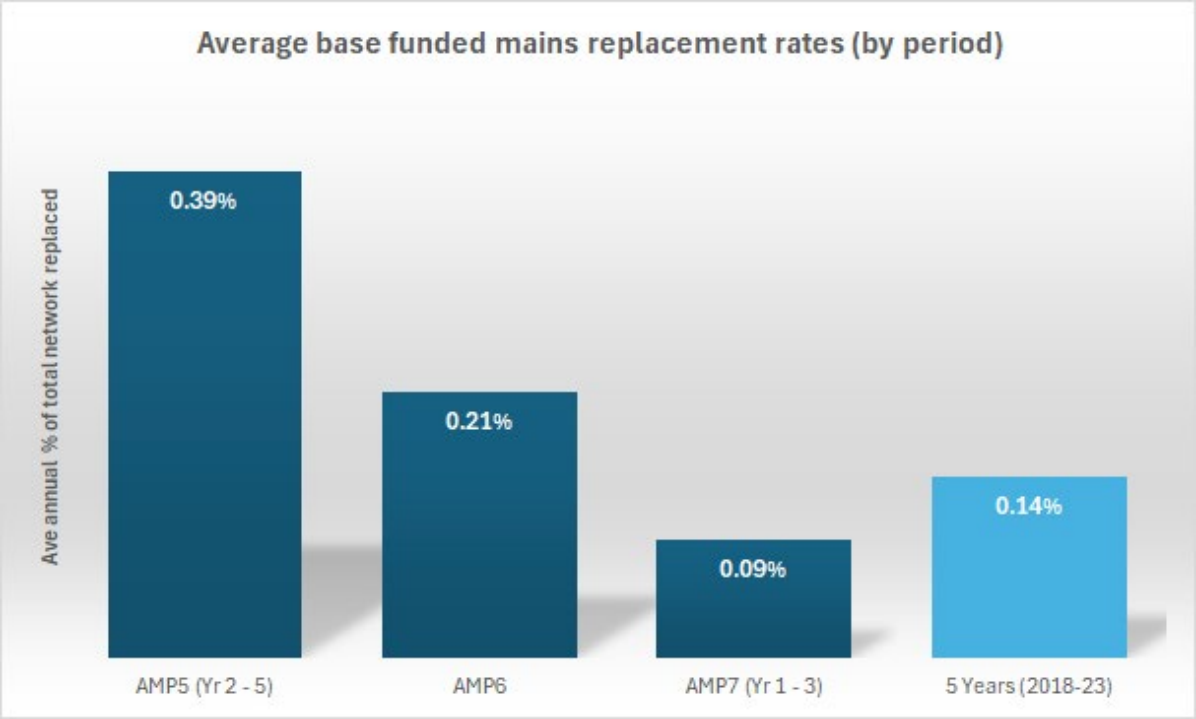
6.3 Key messages

Need for adjustment – unique circumstances

While we understand the principles behind the unique circumstances test, i.e. the possibility that a company may have unique characteristics that are not present in other companies and would therefore not be reflected in wider industry spending requirements, we do not feel that it is an appropriate test in this context of mains renewals. To make 'unique circumstances' a pre-requisite of a successful claim would preclude the possibility that Ofwat's econometric models could fail to capture a wider systemic issue of emerging needs which are masked by the focus on historical spending or that the effects of fundamental changes in the historical context within which spending decisions have been made (including changes in the regulatory environment) could render the assumptions about what base funding can cover in the future invalid. To be clear, we consider that this has happened in relation to Ofwat's base modelling for mains replacement contained in the draft determination.

It is evident that, across the whole sector, there has been a significant reduction in rates of mains replacement since AMP5 with clear step changes in AMP6 and AMP7, as Figure 6-1 below illustrates:

Figure 6-1 Average base funded mains replacement



In assessing the amount of mains replacement deemed to be funded within base allowances, Ofwat has included all three of the periods shown on the left-hand side of figure 6.1 above, resulting in an industry average of 0.3% per annum. We have some reservations about the calculation method, as we discuss later in this section, but more fundamentally we consider the inclusion of the AMP5 replacement rates in an assessment of 'what base buys' (or will buy) in AMP8 is inappropriate.

There could be a basis for arguing that 'all things being equal', it is reasonable to use this long-term average replacement rate, but that would ignore the fact that at PR14/AMP6 the introduction of stretching performance commitment targets (and associated ODI penalties) significantly changed the investment decision making environment for water companies from that point. This is reflected in the trends shown above. The lag between investment in long-life assets and the change in performance metrics has inevitably favoured shorter-term tactical and operational interventions to meet in-year performance, leaving limited base headroom to address more proactive long-term investment. This has happened across the spectrum of

companies with both the highest company replacement rates and the lowest company replacement rates having reduced.

We consider that this situation requires an industry wide re-set to set a trajectory towards sustainable asset renewal rates to secure long-term asset health. While each company's specific requirements in terms of replacement rates will be a unique function of the characteristics of their asset base and past investments, going forward we believe that at an industry level the inclusion of AMP5 data misrepresents what base allowances have bought and will be able to buy in the current regulatory regime.

We also note that Ofwat's method of calculating the industry average has tended to inflate the value of its assumed allowance. Ofwat has calculated the % of mains replaced each year from 2011-12 to 2022-23 on a company-by-company basis. It has then taken the average of those percentages to derive each company's long-term (12-year) average % replacement rates. Finally, it calculates the average of those long-term % replacement rates across all companies to give a sector wide long-term average of 0.3%.

An alternative method of calculation would be to look at the total length of mains replaced across the sector divided by the total length of the potable mains network to give a sector-wide average % replacement rate for each year within the assessment period and then take the average of those 12 years' worth of replacement rates. This results in a sector-wide average of 0.24%.

Applying Ofwat's 0.3% replacement rate to the length of potable network reported over the 12 years considered would result in an implied total length of replacement of 12,373 km whereas the actual reported length of mains replaced over that same period is 9,952 km (a +24% expectation gap from Ofwat). Table 6-1 below, based on the industry data presented by Ofwat in YW - PR24-DD-Mains-renewals-adjustments spreadsheet, summarises this point.

Table 6-1 Industry water network length replacement – *actual vs. Ofwat modelled*

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Average / Total
Reported Total Network Length (1,000 km)	338.2	339.2	339.8	340.5	341.6	342.9	343.9	345.0	346.4	347.6	348.7	350.3	**343.7**
Actual Reported Length Replaced (km)	1,770	1,433	1,221	878	634	723	781	856	662	296	337	360	**9,952**
Implied replacement at 0.3% p.a.average (km)	1,014	1,018	1,019	1,022	1,025	1,029	1,032	1,035	1,039	1,043	1,046	1,051	**12,373**

Given the lack of correlation between the drivers included in Ofwat's econometric models and mains replacement activity delivered, there is a legitimate question about the concept of a specific, explicit allowance for this asset type. Were we to accept the concept, it would still not be appropriate to include the full historical period, given that Ofwat sets a cost efficiency challenge based on a benchmark period of the last five years to set its base allowances. If the same approach was applied for the implicitly funded renewal rate the relevant industry average

figure would be **0.14%,** less than half the figure used by Ofwat in its draft determination proposals.

In responding to Ofwat's DD, while we think there is justification for arguing a much lower implicit allowance than the **0.205%** per annum we included in our original submission, we are content to retain that position in restating our case but would suggest that Ofwat may wish to consider the additional data from APR24 which is now available to it when setting its allowances in the final determination.

Need for adjustment – management control

In our original submission (CW02a Targeted Allowances for Asset Health - Infra: Mains replacement – YKY46) we provided Ofwat with a high-level view of how our base investment needs in AMP8 are built up and how this constrained our ability to invest sufficiently in mains replacement (see table below). Our management exercises control within the allowed base funding to prioritise areas of investment. What we do not have control over is the total funding envelope within which those investment decisions are made.

For reasons discussed above, we consider that Ofwat's models may have failed to reflect the changing requirements of the AMP6 and AMP7 regulatory environment and therefore not allowed sufficient base totex to meet all requirements. In that context our responsible exercise of management control will inevitably defer investment where the short-term impacts on service have the least impact, in favour of other areas where immediate shortfalls would otherwise occur.

We have undertaken a detailed analysis of Yorkshire Water historical base expenditure over the period 2015-16 to 2023-24 to provide further evidence that we have fully utilised our allowed base funding to target areas other than mains replacement based on the need to react to events and to respond to stretching performance commitment targets, as summarised in Table 6-2 below.

Table 6-2 YW Base allowances to expenditures over time

	Base Allowance £m			Base Expenditure £m				
	Capex	Opex	Totex	Capex	Opex	Totex	Overspend	%
2015-16	312	357	669	190	348	538	-131	-20%
2016-17	296	358	654	271	406	677	24	4%
2017-18	271	359	630	310	382	692	62	10%
2018-19	275	360	634	311	440	750	116	18%
2019-20	287	361	648	279	460	739	91	14%
2020-21	305	386	691	322	437	758	67	10%
2021-22	296	383	679	265	399	663	-15	-2%
2022-23	282	377	660	273	415	688	29	4%
2023-24	240	378	617	263	411	674	57	9%
				Total Overspend			**299**	**5%**

Source: Ofwat final determination models / APR submissions (shown at 17/18 prices)

This supports our view that we could not have spent more on mains replacement during this period without sacrificing other key areas of investment, chiefly driven by the need to meet our performance commitments in other areas of service and resilience.

In this context, the total base funding allowed through Ofwat's econometric modelling is the exogenous factor over which we have no direct management control.

Ofwat's states that "*Companies have to manage a mix of assets, and mains are a part of this. Companies have control over which mains they replace, and when. We expect companies to carry out these replacements using their base allowances"*. The principle is not in dispute but clearly the overall level of the base funding allowance is crucial. Consistent with good asset management practice, we have to make balanced, risk-based decisions about allocation of available funding, this may necessitate making more short-term, least cost interventions rather than best whole-life value based interventions if the overall base allowance is insufficient.

Need for adjustment – adjustment to allowances

Ofwat's current econometric modelling approach for the water network plus price control, which has evolved over multiple AMPs, is based on four simple parameters and is a pragmatic basis for determining total base expenditure, in the round, for those activities required to operate and maintain water supply systems. The 'swings and roundabouts' which drive investment need, in different asset types and over different investment periods may have a tendency to even out such that the overall base allocation for individual companies in a given AMP is a reasonable baseline for its likely investment needs.

It is a significant leap from that position, however, to argue that the resulting base allocation includes a specific allowance for one particular activity (water mains replacement), when the models have no basis to differentiate between the condition, age, operating history and therefore investment need of all the different asset types, both within and between companies. There is no logical basis to support the assertion that companies have been funded for a specific level of mains replacement, any more than the models can determine a level of pumping station or reservoir maintenance.

The models cannot discriminate to that level, and it is unreasonable to argue that the models have allocated Yorkshire Water sufficient funding to deliver the industry average rate of mains replacement without any reference to all the other competing investment needs across our asset base. No company is 'average' and each company's respective historic investment levels in mains replacement may be entirely appropriate for that company in the context of the overall financial constraints and its statutory and regulatory commitments in any given AMP period.

Yorkshire Water's customers pay for a service to be delivered and expect us to manage our assets in the round, in order to deliver that service. If companies have made investment choices, in good faith and in the context of each AMP's funding levels, performance targets and external events, it is not intellectually sustainable to assert that our customers have paid for something they have not received because we have had below average rates of replacement. Nor is it reasonable to assert that our customers would be paying twice if we are able to increase mains replacement rates in the future.

As previously mentioned, and illustrated in the base totex expenditure table earlier in this document, we have spent over and above our base funded totex allowance despite the reduced rate of mains replacements, therefore customers have not paid for an output that has not been received

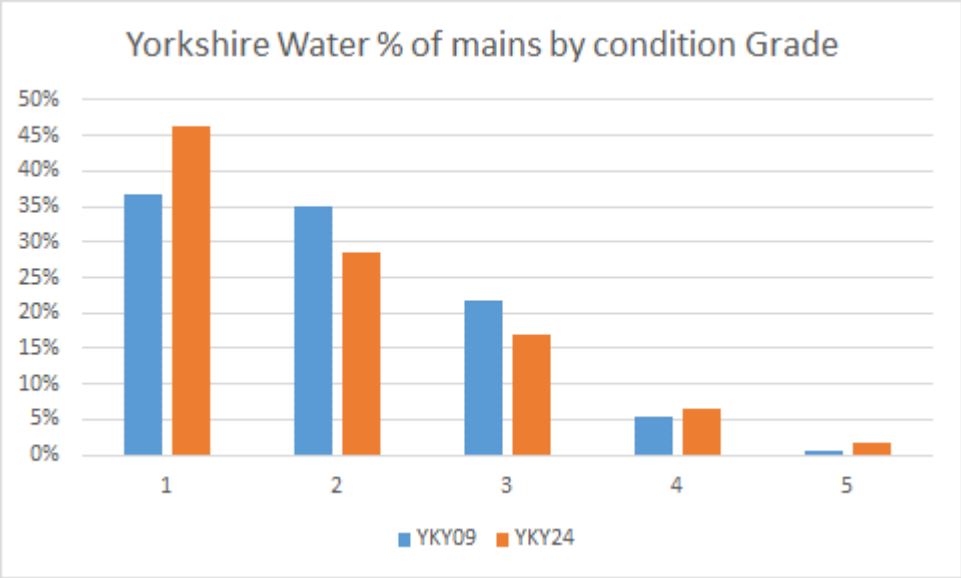
Notwithstanding the above fundamental concerns about Ofwat's approach, if the concept of implicit allowance was accepted as a pragmatic basis for assessing cost adjustment claims, for the reasons outlined in the previous section we do not consider that the expectation that all companies have the headroom to accommodate a 0.3% mains replacement rate is realistic or

appropriate in the current regulatory environment. Funding this level of activity through base could only be achieved at the expense of other critical programmes to the detriment of our customers' best interests.

Ofwat's draft determination approach further compounds this inequity by applying a 0.14% adjustment to the expected level of base funded mains replacement on the grounds of perceived deterioration of our asset base. Ofwat has used the change in the % of companies' mains in condition grades 4 and 5 between PR09 and PR24 as evidence of deterioration in asset health and for requiring companies to make up for that perceived deterioration through additional base funded mains replacement with no commensurate uplift in base allowances. We strongly challenge the validity and appropriateness of this approach on a number of grounds.

While the % of mains reported to be in condition grade 4 and 5 has increased over 15 years so too has, the proportion of our network in condition grade 1 (as Figure 6-2 below illustrates). Condition is only one of a number of factors which drive good asset management decision making and we take a broader view of asset health in terms of its impact on service to customers when making investment decisions.

Figure 6-2 Percentage of YW Network by Condition Grade



Within reasonable bounds, some variation in the condition grade 4 and 5 profile over time is not a cause for concern, particularly if those mains have lower impacts on service than others. Within a constrained funding context, it is service impact rather than burst rate alone which will determine which mains are replaced and it may be entirely appropriate to tolerate such marginal increases.

In adopting this approach, we consider that Ofwat has retrospectively reinterpreted its previous price settlements in order to impose an arbitrary output expectation on us (% of mains in condition 4 and 5), an output expectation that we had no knowledge of during the intervening period. Ofwat is now imposing a financial penalty on Yorkshire Water in AMP8 by effectively setting a cost allowance which by implication Ofwat recognises as insufficient to efficiently deliver our PCD obligation

It is worth noting Yorkshire Water's decision to adopt a relining approach during the section 19 water quality driven improvement programmes (AMP3 to early AMP5), rather than replacing mains purely on the grounds of discolouration risk. This was instrumental in keeping customer bills lower in that period but also means that we did not receive the asset health (condition grade) uplift that other companies would have received through their quality enhancement investment and may explain why our overall percentage of grade 4 or 5 mains is higher than some of our peers. We maintain that our historic relining decision was correct and in customers' interests at the time and it would be perverse if that decision now resulted in a perception of past under-investment to be absorbed as an additional pressure on already stretched base funding.

As a final point we observe that condition grade is not the only asset health metric in relation to our water infrastructure and had we not exercised good asset stewardship over multiple AMP periods, we would expect this to manifest itself through deterioration in our mains repair performance metric. In practice this shows a broadly stable performance over the period in which Ofwat has made its condition grade assessment. The absence of any obvious deteriorating trend from our mains repair data through that period supports our position that the unfunded asset health 'catch-up' through base allowances is unwarranted.

Cost efficiency

Ofwat has used an analysis of company-submitted data from a range of sources to determine an efficient unit rate at which they then expect all companies to be able to deliver their mains replacement programmes. The rate of £292/m is the median value from 11 companies (excluding Thames Water which is an extreme outlier). Of the remaining companies, Southern Water and United Utilities rates are also outliers (at the upper and lower end of the scale at around 50% above or below the average). Taking an average of the remaining rates (i.e. excluding Thames, Southern and UU) the rate would be £312 which is much closer to our unit rate than the figure adopted by Ofwat.

The median value of £292 / m, adopted by Ofwat to set funding allowance for our cost adjustment claim would represent a reduction of 13 % in our proposed rate at a time when outturn costs for Yorkshire Water current schemes are averaging at £390.5 /m (14% higher than our efficient business plan rate). It will be challenging to achieve the £336 rate in that context, and not possible to match Ofwat's proposed efficient rate. The mean position of £335 is in line with the proposed Yorkshire Water efficient rate.

Company	£/meter	Source
Thames	£ 1,458	TMS18
Southern	£ 661	Enhancement Case - resilience
Dwr Cymru	£ 420	WSH62
Wessex	£ 350	WSX09
Yorkshire	**£ 336**	**YKY45**
Severn Trent	£ 310	Ofwat calculation from leakage query
South West	£ 292	Ofwat calculation from leakage query
Bristol	£ 280	Ofwat calculation from leakage query
South East	£ 274	Ofwat calculation from leakage query
Northumbrian	£ 274	NES35
Anglian	£ 273	Enhancement Case - resilience
United Utilities	£ 218	Ofwat calculation from leakage query
Mean	**£ 335**	
Median	**£ 292**	

There is inevitably a challenge for both water companies and for Ofwat to reliably benchmark costs, given that the data available in the public domain is limited and may not be directly comparable. We have no way of knowing, for instance, what assumptions lie behind the figures in terms of the range of mains replacement techniques assumed, the range of pipe sizes and

locations / surface types assumed. These are factors which can have a significant impact on the ultimate outturn cost of mains replacement activities as can local authority practice in terms of traffic management costs and regulatory requirements (such as the 3-hour threshold for planned interruptions). Without being able to deep-dive into each company's programmes and assumptions, it is entirely possible that rates above the median are efficient in the context of the scale and complexity of that company's programme. Understanding weighted average costs across each company based on the length replaced at their average diameter, cost, number of connections, vicinity, rehabilitation technique and so on may be helpful in obtaining the efficient rate.

The unit cost we proposed in our cost adjustment claim was derived from our unit cost models which use actual outturn costs from projects completed in AMP6 and AMP7, indexed to 2022-23 cost base. These costs represent the typical blend of mains replacement techniques, pipe materials, diameters and locations we would expect to make up our AMP8 programme. We include evidence of the build-up of this rate through a detailed model run in Appendix YKY-PR24-DDR-23 of this document and summarised in Table 6-3 below.

Table 6-3 Summary of rate build-up

	Replacement Length	Replacement Cost	Unit Rate (Inflated to CPIH)
Highway	873,726	£303,744,912	£348
Non-Highway	191,695	£54,739,021	£286
Grand Total	**1,065,421**	**£358,483,933**	**£336**

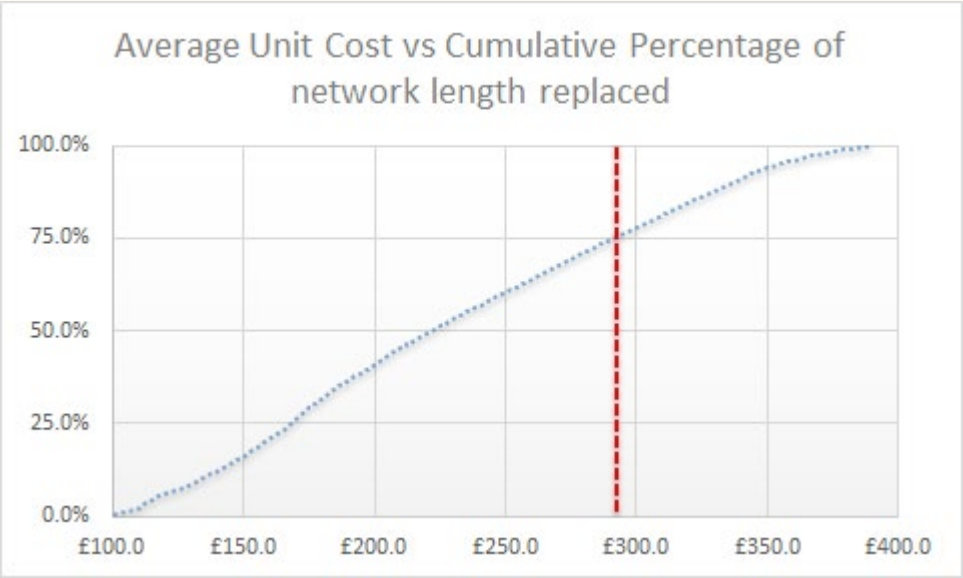
We would argue that a robust unit cost estimation method, based on real out-turn costs, using a methodology which has been independently assured, is a more appropriate basis for setting individual company programme costs than an arbitrary analysis of a small sub-set of data, which crucially was not requested or specified to be applied in this context. Our asset and cost modelling outputs were reviewed as part of our external technical assurance process, ensuring these are fit for purpose and provide robust costs.

In support of our response to Ofwat's draft determination, we have conducted additional analysis of recent mains replacement activity, as submitted in our 2023-24 Annual Performance Report. This includes the outturn costs for 156 mains replacement schemes covering 137.7 km of replaced mains delivered over the last five years. This data is assured as part of our overall APR assurance process by Atkins. A summary of the schemes is included in Annex 1, at the end of this document.

The total cost for the 156 schemes was £53.76m, resulting in an average unit cost of £390.5/m, with individual scheme costs ranging between £100/m and £1,470/m. We consider that this analysis reflects a realistic sample of the range of mains replacement activity likely to be included in our AMP8 programme and as such provides a robust estimate of current delivery costs, taking account of regional supply chain conditions and other delivery factors.

The figure below illustrates the cumulative scheme cost divided by cumulative percentage of network length (with schemes ranked in ascending order of unit cost). What this illustrates is that we could only have delivered the cheapest (lowest unit cost) 75% of our programme within an average unit cost of £292/m (represented by the red dashed line). It is important that the funding allowed in our base costs is based on a unit cost which will enable us to deliver the full range of scheme types necessary to achieve our asset health and performance objectives.

Figure 6-3 Average unit cost compared to cumulative percentage of network length replaced



Our proposed AMP8 programme being larger in scale and part of an intended long-term asset replacement strategy, with all the attendant benefits of forward planning and programme certainty will allow us to drive greater efficiencies and we maintain therefore that our proposed unit cost of £336/m is an efficient cost (14% below our current outturn costs) for the programme we propose to deliver in AMP8.

We could only achieve a unit rate of £292/m if we drove our programme based on unit cost, rather than cost benefit and service impacts and asset health priorities. This would require us to prioritise small diameter mains outside of urban areas where such low unit costs are achievable. This would not reflect good asset management practice or be in customers' best interests. There is a risk that historic base funding across the industry may already have discouraged companies from tackling the more costly dense urban DMAs, building in a bias to the historic costs which if not addressed would embed unsustainable expectations and preclude a long-term balanced approach to mains renewals, disadvantaging customers in those more challenging settings for mains replacement.

6.4 Change requested

Table 6-4 below summarises the key differences between our proposed programme and that implied by Ofwat's draft determination response.

Table 6-4 key differences between our proposed programme and that implied by Ofwat's draft determination response

Programme Component	YW Position - CW02a Targeted Allowances for Asset Health	Ofwat Draft Determination Position	YW Draft Determination Response Position	Comment
Base funded 'implicit allowance'	0.205 % p.a.	0.30 % p.a.	0.205 % p.a.	We disagree with the inclusion of AMP5 replacement levels within the calculation of implicit allowances and Ofwat's approach to averaging company replacement rates. We have presented our rationale for a more appropriate base allowance.

Base funded 'under delivery adjustment'	-	0.14 % p.a.	-	We do not accept that the retrospective imposition of an implied output requirement in previous AMPs (i.e. % of mains in CG 4 and 5) and explicitly funding us below the level required to meet the PCD requirements is consistent with Ofwat duties. We also maintain that our approach to managing long-term asset health is entirely consistent with our own duties in this regard
Base Additional asset health allowance	0.455 % p.a.	0.22 % p.a.	0.455 % p.a.	Based on the above we consider Ofwat's assessment of the necessary uplift to base maintenance is inadequate
Total replacement	**0.66 % p.a.**	**0.66 % p.a.**	**0.66 % p.a.**	
Unit Rate	£336 / m	£292 / m	£336 / m	We cannot independently audit other companies' mains replacement cost data, but we can demonstrate based on actual outturn costs that our proposed rate of £336/m represents a stretching level of efficiency

In the 'PR24 draft determinations – price control deliverables appendix' Ofwat stated mains renewal activity could only take place on those that are classified as condition grade 4 or 5 as part of the conditional allowance. Whilst we support investment to take place in the poorest performing assets, and it is our intention to reduce the percentage of pipes in condition grade 4 or 5 over the next decade, therefore in order to deliver the renewal programme efficiently and achieve the £336/m unit rate, we request that mains renewed through the targeted allowance applies to condition grades 3, 4 and 5. It is estimated that ~9% of pipes <321mm in diameter at condition grade 3 will need replacing over the next 10 years (those currently averaging >450 bursts per 1000km annual average). This will allow delivery efficiency and those mains in condition grade 3 which are likely to become condition grade 4 or 5 in the next 10 years to be replaced at the same time, preventing the need to go back and disrupt the customers, communities and highways twice.

Table 6-5 Summary of changes to the Infra CAC for mains renewal

Summary of changes to Infra CAC for Mains renewal	
	Allowance (£m)
October 2023 Business Plan submission	250.94
January 2024 Business Plan resubmission	250.94
Ofwat's Draft Determination	106.00
YKY Draft Determination Representation	250.94

6.5 Yorkshire Water's response to Ofwat

The reason for representing on this topic is that there is insufficient base maintenance expenditure to be able to renew the length of main that Ofwat feel is in the implicit allowance. In general, mains replacement rates halved from AMP5 to AMP6 and did so again from AMP6 to AMP7. Base maintenance can no longer fund the renewal lengths it was able to fund in AMP5. Upward cost pressures and the requirement to make PC improvements year on year means we have allocated investment rationally based upon the incentives that Ofwat has put upon us while continuing to manage and maintain a stable asset base. The required downward trajectory on

PCs through base allowances is faster than could be achieved through asset health improvement alone.

We feel the need is to allow us to renew a larger proportion of our water mains from within the cost adjustment claim (0.46%) and outside of the base allowance, this would allow base maintenance to fund investment where needed across a wider range of assets and outcomes within the water infrastructure asset base.

Customer support

We conducted quantitative research (speaking to a representative sample of 1,967 customers) and qualitative research (having in-depth conversations with 154 customers) to gauge customer support and perceived value for money of our cost adjustment claims. In this extensive and robust piece of research, we found the vast majority of customers to be in support of our proposed claim for mains renewal.

82% of household customers support the claim, with support levels rising to 84% of non-households and to 86% of future bill payers. Evidencing extremely high levels of support from all key customer cohorts.

The majority of customers we spoke to also believe the claim to represent good value for money with 56% of households agreeing it's good value, rising to 76% of non-households and 55% of future bill payers.

The vast majority of customers also believe this cost adjustment claim to be important to them, with 87% of households believing it to be important, 85% of non-households and 80% of future bill payers.

Overall, the evidence from our extensive engagement with customers on this shows a strong desire for the inclusion of the mains renewal cost adjustment claim within our plan.

6.6 Concluding points

We have the following concerns with Ofwat's adjustment:

- Implicitly funded renewal rate—Ofwat assumes that companies are implicitly funded to deliver a mains replacement rate of 0.3% p.a. (the average mains replacement activity in the modelling period, 2011-12 to 2022-23). However, we consider that the models implicitly fund companies for the average mains replacement in the benchmarking period (2020 to 2024 with the latest data) where there is limited correlation between the activity and the included drivers. This reduces the implicitly funded renewal rate to 0.15% p.a. (or 0.18% p.a. focussing on UQ companies).

- Underdelivered activity—Ofwat has assumed that Yorkshire Water has underdelivered on its mains replacement activity, given that there has been an increase in the proportion of its network that is in poor condition (defined as grade 4 and grade 5), such that it has already been funded to deliver an incremental 0.14% p.a. renewal rate. There are several concerns with this, including:
    - higher level measures of asset health (such as mains bursts) have shown an improvement in asset health over time, and Yorkshire Water has materially increased the proportion of its network in the 'best' condition (grade 1)—relying on one, partial measure of asset deterioration to materially reduce the adjustment is inconsistent with good practice, when other sources of evidence suggest that Yorkshire Water's assets have not deteriorated.
    - companies were not historically allocated specific funding to deliver mains replacement, and if Ofwat's price controls are particularly stringent (as at PR19), companies may have to proportionately scale/prioritise maintenance activities in order to meet their obligations within expenditure allowances.
    We consider that the under-delivery adjustment should be removed.

- Efficient unit cost—Ofwat has taken the median unit cost for mains replacement activity from a sample of companies. The range in unit costs is particularly wide, suggesting that the unit costs may be capturing different activity (e.g. highway vs non-highway, differing pipe diameters, and relining vs replacement) and/or there are regional cost pressures that are not captured through simple unit cost comparisons. We consider that Ofwat should investigate the data in more detail to ensure that it is comparable, but we do not propose a specific unit cost that should be applied at this stage.

Making the above changes increases the adjustment from around £106m to £250.94m.

7. Cost adjustment claim: combined sewers

7.1 Overview

In our business plan, we set out evidence that several exogenous drivers were contributing to both the higher costs and poorer performance seen by the companies which are most impacted by them. These drivers were the proportion of combined sewers, proportion of cellared properties and food service establishments. We also noted urban rainfall as a contributory driver and are supportive of this reflected in Ofwat's draft determination models.

We proposed that Ofwat adjusted its econometric models to reflect one of these drivers, **proportion of combined sewers**, as it was based on an established APR dataset that would be easy for Ofwat to implement, and it would reduce the risk of interaction with the other drivers.

Our initial analysis was based on the Ofwat models provided in the 2023 Draft Model Consultation and we noted that including the CS% cost driver was statistically significant and was supported by engineering rationale. The inclusion of the driver resulted in a symmetrical cost adjustment claim to the value of £88m.

This claim was rejected by Ofwat, however we disagree with the rationale behind its exclusion.

In this response we set out:

- Our evidence that the claim is still valid and commentary in response to Ofwat's rationale for rejecting the claim.
- A reduced claim value which results from the applying our plan approach to the latest draft determination cost models.

We therefore maintain our view that Ofwat should reflect the impact on company costs of the proportion of combined sewers in its final determination cost models or apply a post-modelling adjustment to reflect this exogenous variable. The value of this claim is now £49.1m (based on draft determination models).

7.2 Ofwat action reference

While not a specific Ofwat action reference, we are addressing the reasons for rejection set out in pages 45-46 of *PR24 draft determinations: Expenditure allowances - Base cost modelling decision appendix.*

7.3 Key messages

- Combined sewer % is a statistically significant driver of costs and is one of several exogenous drivers that impact the ability of some companies to deliver common performance levels with common expenditure allowances.
- Ofwat's rationale for rejecting the claims are not valid.
- Based on Ofwat's new models, the claim value is reduced to £49.1m which remains material under the cost adjustment claim definition.

7.4 Change requested

Ofwat should reflect the impact on company costs of the proportion of combined sewers in its final determination cost models or apply a post-modelling adjustment to reflect this exogenous variable. The below table shows that we have reassessed the value of the claim to reflect the

draft determination cost models. We note that this claim decreases slightly to £43m when 2023-24 data is included in the cost models.

Table 7-1 Summary of changes to the CAC for the percentage of combined sewers

Summary of changes to the CAC for % combined sewers	
	Value (£m)
October 2023 Business Plan submission	88.0
January 2024 Business Plan resubmission	88,0m
Ofwat's Draft Determination	0.0m
YKY Draft Determination Representation	49.1m

We have updated our CWW18 data table to reflect this change accordingly.

7.5 Yorkshire Water's response to Ofwat

We are representing on this topic because our evidence shows that the % combined sewers remains a statistically significant driver of cost. We provide a detailed analysis produced by Oxera as an appendix (YKY-PR24-DDR-15) and confirm this analysis aligns with our view.

The need for this adjustment is to appropriately recognise the efficient costs that are required for companies impacted by this exogenous factor. We noted in our plan that several exogenous drivers were contributing to both the higher costs and poorer performance seen by the companies who are most impacted by them.

These drivers were the proportion of combined sewers, proportion of cellared properties and food service establishments and % mains laid pre-2001. We also noted urban rainfall as a contributory driver and are pleased to see this reflected in Ofwat's draft determination models. We show that Yorkshire Water is above averagely affected by each of these factors in Figure 7-1.

Figure 7-1 Exogenous Variables impacting on Sewerage Collection costs

We proposed that Ofwat adjusted its econometric models to reflect just the combined sewers driver, as it was based on an established APR dataset (table 7C) that would be easy for Ofwat to implement, and it would reduce the risk of interaction with the other drivers. We note that United Utilities proposed a similar claim developing a composite measure of its drainage issues which is a reasonable alternative approach.

Cost modelling

We have reviewed our claim, set out in our October business plan submission, to assess its ongoing validity in light of the draft determination models shared by Ofwat and incorporating APR24 data into the analysis. The detailed summary and associated analysis completed by Oxera, which we confirm represents Yorkshire Water's view, is set out in the appendix (YKY-PR24-DDR-15). In summary it finds that:

- the proportion of combined sewers remains a statistically significant driver of costs when included in Ofwat's Waste Water Network Plus and Sewage Collection cost models.
- The value of the claim reduces from £88.1m to £49.1m before the introduction of 2023-24 outturn data.

We set out separately (in our performance commitment representations) that combined sewers, cellars and rainfall, are material drivers of internal sewer flooding and that setting a common industry target for these performance levels is not appropriate. Adjusting the PCL does not mitigate the need to also adjust cost allowances.

Ofwat feedback

We set out below our views on Ofwat's feedback on our CS% claim. Ofwat statements are shown in italics with our responses indented below.

"It is not clear that having a high percentage combined sewers makes it more challenging to deliver good internal sewer flooding performance. For example, Dŵr Cymru has relatively high percentage of combined sewers and urban rainfall but performs well on internal sewer flooding."

> Our view is that combined sewers is one of several factors that drive costs in the wastewater network – some of these costs are incurred to drive sewer flooding reduction. We have chosen %CS as a driver for the reasons previously set out. We do

not consider that an isolated example of one company's (Dŵr Cymru) circumstances to be a robust assessment for combined sewers not to be an operationally relevant driver of costs. We note that there is a statistically significant positive relationship between combined sewers and ISF, as well as urban rainfall and ISF. That is, both a higher proportion of combined sewers and urban rainfall are associated with greater ISF incidents. This suggests both drivers impact performance separately,

"Percentage of combined sewers is a blunt instrument and does not consider the complexity of network configuration. Arguably, the focus should be on combined sewers in urban areas. And even then, a company may have lots of separated sewers that fall into a combined sewer on its way to a wastewater treatment works."

We agree that the combined sewers is part of a complex interaction of exogenous factors driving both costs and performance. We propose %CS in the cost models precisely because it is a simple, APR assured, statistically significant driver of cost. Inclusion of further cost drivers such as cellars (as we do in our performance adjustment analysis) would likely further increase the cost adjustment (as UU's drainage cost adjustment claim using a composite measure did).

"Sewer blockages explain a large proportion of internal sewer flooding incidents, as corroborated by United Utilities PR14 business plan submission that said only 13-15 percent of sewer flooding incidents are caused by hydraulic overload.26 One could argue that combined sewers reduce rather than increase the risk of sewer blockages due to rainfall clearing any blockages."

We agree that ISF is predominantly (unless during extreme events, such as 2007) driven by blockages as the majority cause. This is often in combination with other factors such as the age and condition of the combined sewer system. The argument that combined sewers reduce the likelihood of blockages occurring is counter to the argument proposed about Dwr Cymru where they have the second highest number of blockages (normalised) for the last four years.

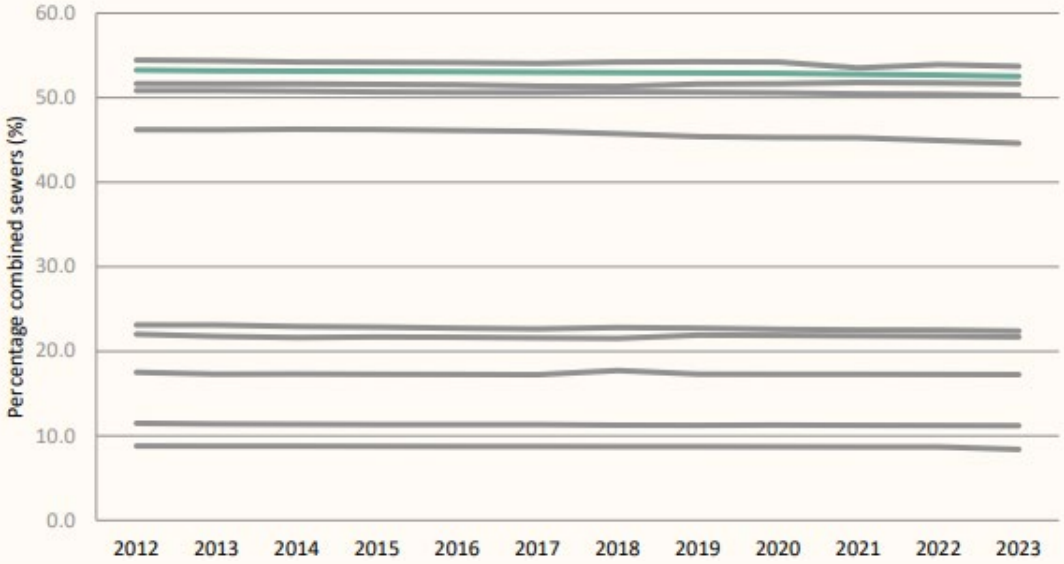
High rainfall (both annual, and days of rain) may or may not help to clear a blockage. Where solids are deposited in grade 1 condition pipes, then they will be re-entrained relatively easily.

Where pipes have a minor fault, even grade 2, solids can become snagged and therefore require more rainfall to move. In older properties, where combined sewers and an easy escape point for water such as cellars are present, then there is a higher potential for flooding to occur if the condition of the sewer with minor issues leads to a blockage forming, and more solids build up behind, meaning a greater rainfall depth helps and more frequent rainfall helps to keep it clean. Other variables such as pipe gradient can have an impact on whether pipes can be self-cleaning.

"Combined sewers is endogenous and including it in the base cost models may reduce the incentive to separate sewers and/or influence network configuration."

We reiterate the points made in our October plan that combined sewers is almost entirely exogenous and that company percentage of combined sewers is not a choice and remains broadly static over time. This is shown in Figure 7-2 below which shows the static nature of this variable across the industry (Yorkshire Water shown in green).

Figure 7-2 Combined sewer % by company over time



Replacing combined sewers with separate systems piecemeal is not an option. Large proportions of a network would need redesigning and replacing at once or in substantial stages – over multiple AMPs. If we have a collapsed combined sewer, it cannot just be replaced with a separated sewer as it needs to match with the surrounding sewers, which are likely combined. We would need to replace c.10,000km of combined sewers with separated systems in order for our network to match the average combined sewers of the industry. This would cost billions of pounds.

Separately, the new obligations and performance commitment related to storm overflow spill frequency provide companies with further incentives not to increase the lengths of combined sewers. Companies are investing significantly to keep water out of the network as a primary option (through SUDs etc.) rather than extending the combined sewer network and creating additional challenges to downstream compliance. The reputational impact of discharges is so high that this would counteract anyway any perception from Ofwat that allowing for the impact of combined sewers in the model would reduce the incentive to separate.

"Risk that percentage combined sewers captures other factors - Yorkshire Water and United Utilities both suggested including percentage of combined sewers in the wastewater network plus base cost models, and both companies have relatively poor sewer asset health based on the percentage of legacy sewers classified as condition grade 4 (poor) or 5 (very poor). So, there is a risk that this variable is acting as an asset health explanatory variable, which risks customers paying twice if the poor asset health reflects under-delivery of capital maintenance in previous regulatory periods. United Utilities has spent less than the industry average on sewage collection infrastructure capital maintenance in each of the last three regulatory periods"

We agree that combined sewers may interact with some other factors and consider cellared properties and asset age to be among those. In our view, condition grade 4-5 assets are just as likely to be influenced by the legacy assets of varying age and material than any perceived lack of investment.

Companies were funded for specific replacement rate outputs up to PR14, well below the implied rates required to maintain asset age and cannot be considered to have been 'funded' to achieve particular rates since the outcomes/totex regime was implemented (which set no specific outputs). Performance in the incentivised asset health metric (sewer collapses) has improved since that period.

We also note that we have we have visited 100,000s of properties and identified that blockages can occur on good to reasonable grades (1-3) and poor grades (4-5). Due to how blockages can occur from very minor defects, a condition grade-focused capital maintenance programme is unlikely to have driven significant blockage improvements.

Ofwat has previously stated that the cost-impact of this issue is already captured by the urban rainfall driver, but if this was the case then the coefficient on combined sewers (or urban rainfall) would be insignificant when they are included in the same models which we do not find.

"Due to data limitations, it is necessary to make an assumption on the percentage of transferred private sewers that are combined. The modelled outcome is somewhat sensitive to the assumption that is applied - all combined sewers; all separated sewers; or the same proportion of combined and separated sewers as legacy sewers. We are also concerned around the quality of company data on the length of combined and separated legacy sewers, which could skew the modelled outcome."

Splits of combined legacy sewers have been reported in the APR, and independently assured for several years it is therefore reasonable to assume that this are relatively correct. If not, we would have expected a request for action to address.

We agree that a better dataset for transferred private sewers would be preferable, however we find it unlikely that this assumption would lead to vastly different outcomes that are better than ignoring combined sewers entirely.

Several other datasets are used in the Ofwat base cost models where it may be reasonable to assume data issues are possible. These include the amount of impermeable area that contributes flow on an MSOA level (used in urban rainfall calculation), the average pumping head variable used in water models and the length of private sewers itself.

We agree that a programme to map and confirm legacy sewer lengths and types and should be required by Ofwat to improve the existing dataset.

Customer support

We conducted additional quantitative research (surveying a representative sample of 1,967 customers) and qualitative research (interviewing 154 customers in depth) to assess customer support and perceived value for money of our proposed cost adjustment claims for combined sewers. In this comprehensive and rigorous research, we found the vast majority of customers endorsed our proposed claim. Key findings are provided below:

78% of household customers support the claim, with support levels increasing to 85% of non-household customers and to 84% of future bill payers. This indicates very high levels of support from all relevant customer segments.

The majority of customers we consulted also believe the claim to offer good value for money, with 53% of households agreeing, increasing to 67% of non-households.

The vast majority of customers also consider this cost adjustment claim to be important to them, with 85% of households, 92% of non-households, and 92% of future bill payers expressing this view.

Overall, the evidence from our extensive engagement with customers on this demonstrates a strong preference for the inclusion of the combined sewers cost adjustment claim in our plan. Here are some of the comments we received, highlighting the reasons for this high level of support, such as the negligible bill impact and the urgency and necessity of this work:

7.6 Concluding points

In summary, combined sewers % is a statistically significant driver of costs and is one of several exogenous drivers that impact the ability of some companies to deliver common performance levels with common expenditure allowances.

Ofwat's rationale for rejecting the claims are not valid, particularly in suggesting that combined sewers is an endogenous variable.

We have updated the value of the claim based on Ofwat's draft determination models, the claim value is reduced to £49.1m which remains material under the cost adjustment claim definition.

8. Post modelling adjustment non-infrastructure allowances

8.1 Overview

The transition to outcomes-focused regulation in AMP6 and AMP7, and the requirement to meet stretching performance improvements funded through base allowances, has set the context for investment decision making across the sector over the last 10 years. In this context, allocating available funding to strategic, proactive investment in one area of the asset base, however strong the individual investment case, runs the risk of leaving insufficient funding for other areas and thereby increasing the risk of failing to meet performance commitment targets in other areas.

Achieving an affordable balance of investment across all asset groups, inevitably involves making risk-based choices within an overall funding envelope, this is the essence of effective asset management. In the last two AMPs, the combined impact of challenging totex efficiencies and stretching performance targets has resulted in an increased use of multiple short-term, tactical interventions across all assets and systems rather than, strategic long-term investment to meet particular, long-term asset health needs. This approach has safeguarded compliance and customer service in each period but if this is reinforced and amplified though successive price reviews, we are concerned that this will create a long-term risk to asset health which will impact upon future bill payers.

Our cost adjustment claim includes assets which pre-date the privatisation of the water industry, in some cases by many decades, and their replacement or major refurbishment has not been reflected in typical base investment levels over recent AMPs. For the asset cases we have presented in this cost adjustment case, we consider that we have exhausted options to extend the life of these assets economically, through tactical and operational interventions and there is a need now for an uplift in long-term, strategic interventions which will deliver long-term value for current and future generations of bill payers.

Ofwat rejected our cost adjustment claim at the draft determination. We set out below our response, additional evidence and arguments in support of the additional £186.75m investment.

8.2 Ofwat action reference

Ofwat's draft determination response to our requested cost adjustment claim for water non-infrastructure assets, as set out in CW02b - Targeted Allowance Asset Health - Non- Infra, considers that we have failed to demonstrate the need for additional base funding or that the costs we propose are efficient.

8.3 Key messages

We welcome the opportunity to present additional evidence and arguments in support of our cost adjustment claim. We demonstrate in this draft determination response:

- That we have made appropriate use of allowed base funding in previous AMPs to deliver a balanced outcome.
- That we have applied good practice in asset management to extend the performance of critical, long-life assets including – clarifiers, rapid gravity filters, clean water tanks and reservoirs
- That we are confident that the costs we have presented in our claim are efficient and that customers are protected against any cost uncertainty.

8.4 Change requested

We maintain that the allowance requested in our original targeted allowance submission is fully justified and we address in this document the concerns expressed by Ofwat in the draft determination.

Table 8-1 Summary of changes to targeted allowance asset health - non-infra allowances

Summary of changes to targeted allowance asset health - non-infra allowances	
	Allowance (£m)
October 2023 Business Plan submission	186.75
January 2024 Business Plan resubmission	186.75
Ofwat's Draft Determination	00.00
YKY Draft Determination Representation	186.75

8.5 Yorkshire Water's response to Ofwat

We make this draft determination representation because we are concerned that the base funding allowed by Ofwat for the water network plus price control will be insufficient to enable us to make the long-term investment needed to maintain the health and performance of critical long-life assets and that a step change in investment in this AMP is the fairest way to address this risk for current and future customers.

If we cannot make this strategic change, the reactive cost to maintain service and compliance will continue to grow, creating further pressure on base funding and starving other areas of required investment. Customer service must inevitably decline overtime as a result and the costs of rectification may increase significantly. In extremis, it may become infeasible to both supply wholesome water and undertake the required renewal work.

We set out in detail below our response to Ofwat's specific challenges and provide additional evidence in relation to this cost adjustment claim which we trust will enable Ofwat to support the requested uplift in base allowances.

Need for investment - unique circumstances

As discussed elsewhere in this document, whilst we understand that unique circumstances is a potential justification for adjustments to the modelled base allowances, the absence of unique circumstances cannot be a reason for exclusion. It is not appropriate to exclude the possibility that the retrospective nature of the models could fail to reflect emerging future investment needs for long-life assets where past investment decisions to maximise life-extension has resulted in lower total costs than will be necessary to maintain long-term asset health.

This view was emphasised in independent responses to the CMA Water sector price determinations – Provisional findings: September 2020 from the Institution of Civil Engineers and from Professor Chris Binnie FREng (Visiting Professor at Exeter University. Former Director for Water Consultancy and past President of the Chartered Institution of Water and Environmental Management and a Fellow of the Royal Academy of Engineering)[1] Professor Binnie advocated:

"an approach which is forward-looking, and asset focussed, which is used to complement the wider regulatory tools for setting allowances such as econometric models".

[1] https://assets.publishing.service.gov.uk/media/5f9bf397d3bf7f03aef811e8/Chris_Binnie.pdf

In addition, the Institution of Civil Engineering expressed concern that *"disproportionate emphasis has been placed on the assessment of econometric models based on historical costs and that little weight has been given to future requirements based on engineering assessments of asset health, condition, and serviceability".*

It is on these principles that our cost adjustment claim is founded.

Need for investment – management control

Capital maintenance expenditure is under our control, within the overall base totex constraints determined by Ofwat and we exercise that control consistent with the principles of good asset management and financial controls. However, for the reasons outlined above, we do not agree that the long-term efficient base expenditure allowances determined through Ofwat's retrospective econometric models are sufficient to meet future investment needs across our large, diverse asset base. There is no basis in the historical data used by Ofwat to model base costs, for asserting that variations in investment need between asset types or over extended time periods will somehow be naturally self-compensating such that an emerging need for investment in one area will inevitably be offset by a declining need in another area.

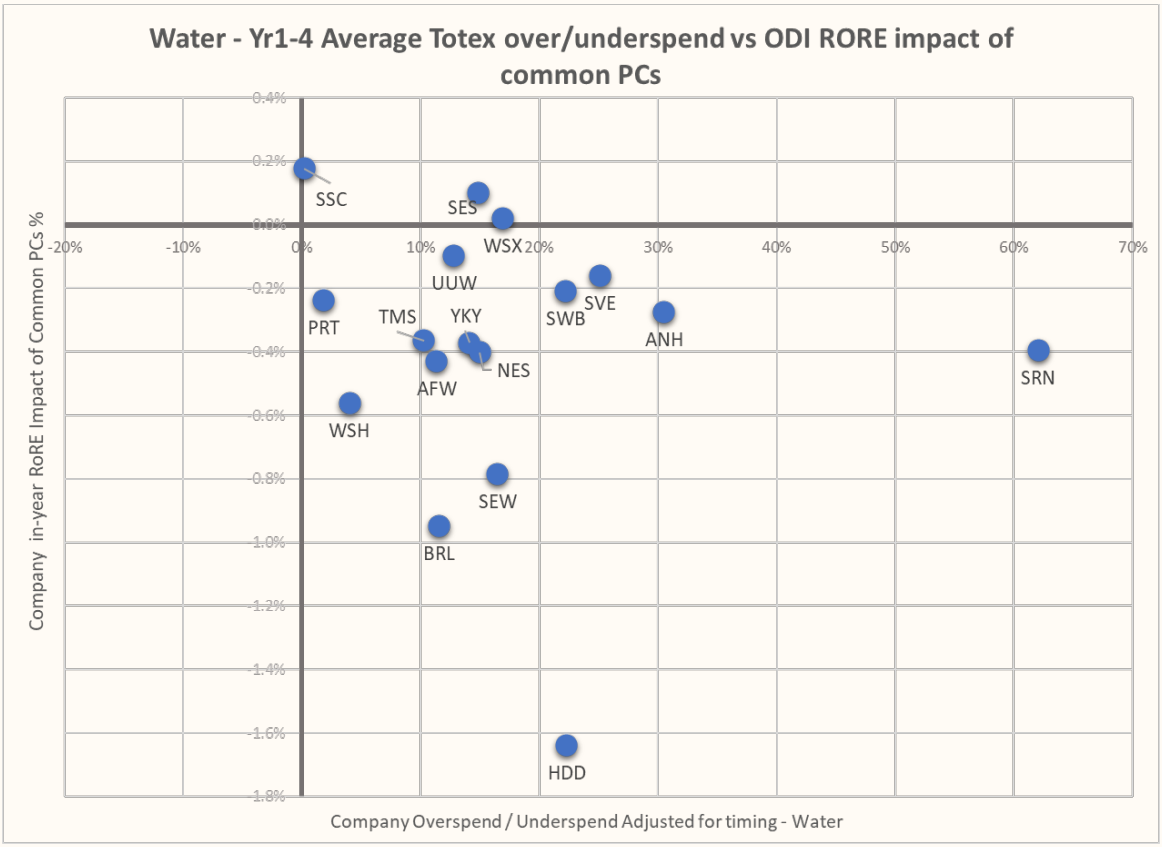
Our experience over the last two AMPs is that the growing need to invest in replacement or major refurbishment of long-life assets whose asset lives can no longer be extended through tactical and operational interventions is coinciding with rising demands for base investment to drive improved service. The implication that we can somehow turn off the tap on those other areas of base expenditure in order to create headroom for the investments included in this cost adjustment claim is untenable. Our assessment of asset condition and performance across our asset base indicates that there will be no significant reduction in any area of base expenditure needs in AMP8 that would enable us to accommodate the required investment which we seek through this cost adjustment claim.

Across the sector as a whole, it is evident that there are no 'troughs' in any area of investment which would allow us to accommodate the emerging needs to address the health of our long-life assets.

Figure 8-1 below shows that Yorkshire Water and the industry are both overspending and underperforming in the water price control against the PR19 final determinations.

If our existing base allowances are redirected to invest in non-infra assets that have less direct impact on ODI performance, the overspend and/or underperformance is likely to deteriorate.

Figure 8-1 Industry overspend and underperformance in water price control



We note Ofwat's comment in its response to our cost adjustment claim, that some companies have indicated in their APR commentaries that they have overspent in the current regulatory period to improve asset health. However, if Ofwat is implying that companies are expected to overspend in order to improve asset health, that would tend to indicate that existing base allowances and models are insufficient in the first place. Yorkshire Water has overspent allowances in certain years and periods where it is the right thing to do for service, outcomes and customers.

In our experience, any overspend relative to base allowances is driven by the need to achieve stretching PC improvements, even then, in such a stringent PCL regime companies are still unable to obtain the expected levels of performance within the base allowance and its associated overspend.

Our underlying concern is that Ofwat's approach is acting as a barrier to companies delivering the types of proactive, long-term, best-value, whole-life-cost interventions which would be in the best interest of future customers. The assumption that backwards-looking, modelled base allowances can deliver ongoing improvements in performance in all areas, whilst also meeting future asset health needs is flawed. Our cost adjustment claims reflect this growing gap.

Need for investment – adjustment to allowances

Throughout its response to our cost adjustment claims, Ofwat restates its position that capital maintenance to maintain asset health is included in base allowances, that companies have a duty to maintain their asset base, that they are expected to do so out of base allowances. Whilst none of those statements seem to be contentious, and indeed, we fully embrace our duty to maintain the health of our asset base, it is unarguable that if those base allowances are insufficient, companies' ability to maintain its asset base will ultimately be compromised.

As we have previously stated Ofwat's econometric modelling approach cannot take account of emerging future asset investment needs across a complex and ageing asset stock. To date, we have discharged our duty to maintain our asset base through risk-based allocation of available funding and shorter-term tactical interventions. We now need Ofwat's support to begin a

transition towards the strategic long-term interventions that will deliver an asset base fit for the future rather than passing the buck to future generations of bill payers.

Ofwat felt that our original cost adjustment claim submission did not demonstrate *"good asset management practices that have been put in place to promote and maximise asset health and life"*. We included details in our original submission to explain: -

- Our risk-based service reservoir and clean water tank inspection regime and rapid remediation policy.
- Our work with the supply chain to develop both capacity and improved repair techniques.
- The operation of our filter management group to monitor and respond to emerging risks and identify appropriate interventions.
- Our ongoing reactive maintenance of these assets to ensure compliance and service are maintained.

We consider these to be evidence of good asset management practice. These are not assets we have neglected and allowed to fall into disrepair, but ones we have actively monitored, inspected, risk-assessed and deployed targeted interventions to mitigate risks, but due to their size and physical characteristics there are limited options between an ongoing, reactive 'make do and mend' approach and a strategic refurbishment or replacement. We also wish to clarify that the investment sought is not solely to replace assets, but where appropriate to carry out major refurbishment.

We are happy to provide some additional case studies below which further demonstrate how we have effectively managed these assets over previous investment periods.

Case Study 1 – West SRE

This case study illustrates the challenges of managing our longer-life civil engineering assets such as service reservoirs, which in most cases were designed and constructed well before water industry privatisation, to design standards we would not deploy today.

The West SRE, is a 4.7ML single compartment treated water storage reservoir. It was, built in 1926 and is now 98 years old, far exceeding our standard design life of 80 years. It is considered to be in condition grade 5, due primarily to deterioration in the structural condition of its concrete walls, roof and joints.

Ingress of surface/ground water has been identified on each inspection (presenting a bacteriological failure risk); this frequency is annual due to its very poor condition. Capital maintenance work is undertaken on each inspection, however, it is very difficult to take out of service due to the inherited single compartment design of the structure (with more modern twin compartment design it is possible to isolate one compartment at a time).

The southwest wall has exhibited ingress on every inspection since 2012, in addition to the roof wall joint and upstand/roof interfaces. This ongoing process of historical repairs is visible throughout the structure and increases year-on-year. Internal cracking is widespread throughout the structure on the soffit and walls. A loose laid membrane (DRC Hypalon installed by Accrete in 2000) provides a barrier to ingress and bacteriological failure but any breach in its integrity would create a risk of multiple points of ingress and would be very difficult to locate for remediation. Extensive over-banding repairs can be seen in the images below, particularly on the longitudinal wall sections.

Being a single compartment asset, it is difficult to bypass and take the service reservoir out of service for any length of time which inevitably limits the scale and duration of any interventions.

The photographs included below provide an indication of the challenges faced in managing an asset of this nature.

Figure 8-2 Demonstrates the current SRE is built into the hillside and historically ingress is identified upon each cyclical inspection. The southwest wall in particular has exhibited ingress in addition to the roof wall joint and upstand/roof interfaces.

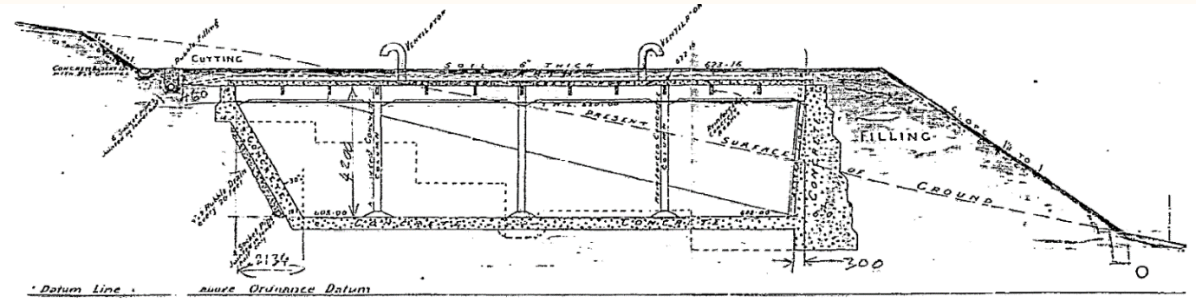


Figure 8-3 Showing Internal cracking and historic repairs on the structure roof.

Figure 8-4 Internal cracking widespread throughout the structure roof.

Figure 8-5 Demonstrates extensive over-banding repairs on the longitudinal wall sections

Figure 8-6 showing historic cracking to the roof structure. This shows any damage to the loose laid membrane on the exterior roof could lead to multiple points of ingress.

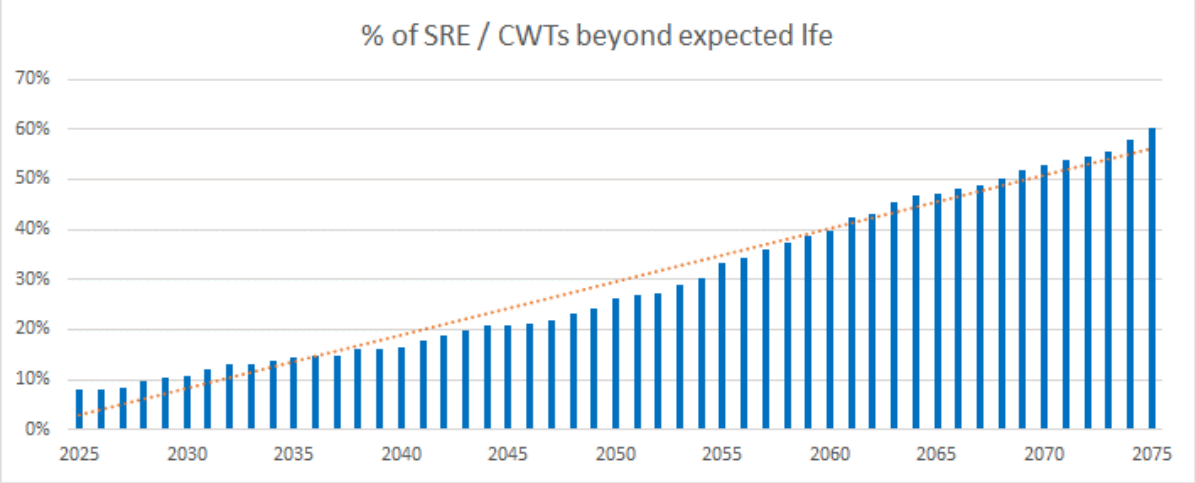
It is the function of a service reservoir to:

- balance out daily peaks in demand for water.
- provide a buffer against the risk of supply interruptions in the event of upstream network failures.
- protect public health by acting as a barrier to the risk of contamination of treated water supplies.

It is clear that despite our proactive management of this site over multiple AMPs, this asset is not fit for purpose with regard to the last two aspects of its function, and the continued inspection and repair cycle will not make it so. It is not possible to abandon this asset from a supply-demand or system resilience perspective, therefore the only remaining option is to replace it with a new reservoir designed to modern standards.

As we set out in our original submission, without a phased approach to asset replacement the proportion of our clean water storage assets operating well beyond their intended asset lives will increase, by 2050 a quarter of these critical assets could be in a similar condition to the one presented in this case study. We believe that this represents an unacceptable risk to our

customers over that period and ultimately an unfair burden falling on future customers if we continue to defer the transition to sustainable, long-term asset replacement rates in this area.



The fact that we have been able to extend the life of such assets which pre-date water industry privatisation, is one reason why the costs of replacement will not be reflected in historic costs, particularly over the last two AMPs and illustrates why a cost adjustment will be required to accommodate such investment going forward.

Case Study 2 - Loftsome Bridge WTW RGF conversion from Leopold floors to lateral system

Rapid gravity filters are essentially concrete tanks with a false floor or plenum. Filter media often sand on a layer of gravel sits above the plenum. The plenum acts as a support for the filter medium and gravel, collects filtered water evenly from the bottom of the filter and distributes air and water evenly across the bottom of the filter during backwashing. There are seven rapid gravity filter units at Loftsome Bridge WTW which were constructed in 2007 utilising the emerging technology of the Leopold flooring system. This offered potentially improved performance and cost of operation compared with more traditional designs.

In November 2018, one of the RGFs was taken out of service for investigation. The investigations showed poor filter performance was due to sand migration via the Leopold flooring system into the plenum (the space below the filter floor). We attempted to resolve the issue through the use of an improved Integrated Media Support (IMS) cap designed to prevent sand and media migration. However, subsequent monitoring and investigation by our Fiter Management Group (FMG) revealed that even with the improved IMS caps the system was vulnerable to blocking due to the release of fine particles from the aging concrete which comprises the walls of the filter units, an issue that was not known or predictable when the units were first installed.

To avoid progressive deterioration of RGF performance which would impact on works throughput over time the Filter Management Group considered alternatives to the existing system. Full scale replacement would be extremely costly, but a refurbishment approach including remediation of the poor condition concrete and installation of a less sensitive filtration system, would restore performance and extend the life of these critical assets.

This case study demonstrates good asset management in practice, which is all about learning and continuous improvement, and is also about finding the best balance of maintenance, refurbishment and replacement over the whole life of an asset, including life-extending interventions.

The nature of these long-life civil assets means that rates of change in condition and performance can take time (sometimes even years) to become apparent, and interventions required once an issue has been identified are often significant capital-intensive solutions.

Figure 8-7 RGF Concrete degradation at Loftsome WTW

This solution developed for the Loftsome Bridge RGFs has been successfully implemented for three of the existing units in 2021 and 2022. We will need to continue to roll this refurbishment process out to further RGF units in AMP8.

It would be impractical and unaffordable to make wholesale changes to our water treatment assets and processes and the substantial fleet of filter and clarification assets across our system will need to be retained in-situ and kept serviceable for many future AMPs. That requires us to adopt an approach which combines refurbishment of the main process elements whilst restoring the integrity of the concrete structures within which they reside. Effective asset management as demonstrated above, enables us to identify emerging needs, develop and refine effective interventions which will deliver required performance in a cost-effective way.

These are the types of interventions which our cost adjustment claim will allow us to make.

The exogenous factors driving the need for this increased investment is a combination of the maturity of the asset base in multiple areas creating a simultaneous asset health need which has hitherto been addressed through short-term tactical interventions and is therefore not reflected in historical cost models.

We note Ofwat's implication that our limited spending on water non-infrastructure in recent years (relative to other companies) is somehow indicative of inefficiency, but we have already set out how we have spent our base allowances for water in full in previous periods and would strongly suggest that relative spending on particular asset types between companies, or between different asset types within a company provides no evidence of efficiency. In an outcomes regulated context, with base funding allocated in the round, any such variation is more likely to reflect different priorities in terms of performance targets, impact of external events (such as droughts or extreme cold) and the diversity of companies' asset bases. Customers could only be considered to be paying twice if funding for a particular output had been requested in previous periods and was being requested for the same output in the current plans. We do not believe that is the case with respect to this cost adjustment claim.

We also note Ofwat's comments that the requested expenditure in this cost adjustment claim is intended to mitigate poor performance against the compliance risk index performance commitment and furthermore that compliance is funded through base allowances. This is analogous to Ofwat's position that maintenance of asset health is funded through base allowances. We take both duties very seriously and recognise that from a regulatory accounting perspective it is the purpose of base expenditure to maintain asset health and compliance, but it does not follow that the levels of base funding have or will be sufficient to enable sustainable long-term levels of investment to achieve the outcome. CRI performance is driven by multiple factors, the main ones being coliform failures at WTW, iron failures at customers taps and taste and odour problems. The proposed investment at treatment works in filters, clarifiers and clean water tanks may benefit our coliform failures at treatment works although the root cause or

causes of such failures is often difficult to determine and therefore there is no certainty that this investment will address those root causes. Improved CRI performance would be a welcome, unintended benefit of this investment but the primary driver is the need to address asset health in long-life assets, to continue to meet the needs of our customers in the future, in a sustainable way.

We will continue to investigate and address these coliform risks and their potential causes, including through operational management actions such as quarterly inspections including grounds maintenance, vermin checks, overflow and underdrain checks, hatch and fly screen integrity and site security and through inspecting and repairing any potential points of ingress which our inspections identify. Historic base funding has enabled us to undertake such activities in the past and enabled us to manage compliance risks. These past activities are distinct from the future investments now requested to improve asset health.

Cost efficiency

Ofwat makes a fair challenge that our evidence around the costing of our solutions presented in our cost adjustment claim, and our explanation of how those costs were derived, was high level and lacked detail. We welcome the opportunity to address that in this response.

As described in our initial submission, our unit cost database (UCD) has been developed using actual outturn costs from projects delivered over the last 20 years (indexed to the appropriate base year). The database includes granular models for over 800 discrete asset types, with thousands of points and interventions allowing us to generate very accurate costs against a defined scope of activity and asset type. Examples of the types of cost models used in building up our business plan, and cost adjustment claims are shown below

- **COM/GEN Kiosk - GRP - c/w base slab - kiosk plan area (m2)** - GRP only kiosk c/w base slab with cable trough and associated surrounding footpaths. Kiosks for control panels, MCCs, LV, blowers and pumps. Concrete bases include reinforced concrete and raised reinforced concrete bases with external access stairs.

- **WTW/CML Chemical Dosing - Powdered polymer prep and dosing system - flow through the works (m3/day)** - Powdered polymer prep and dosing system compatible with big back loading system, associated with sludge thickening (centrifuge), RGF dosing and lamella dosing. Prep unit consisting of vacuum loader, feed hopper, screw feeder, blower and eductor, make up tank and ageing tank. 1 or 2 no dosing skids c/w 2 no. pumps each and dosing lines, c/w catch pots, to point of application. Connection to existing wash water feed. Indirect costs include flow meters, level instruments, MCC/Control panel, interconnecting pipework, valves and lifting equipment.

We present further detailed examples which evidence of the application of this bottom-up costing approach and these models to the specific cases in this cost adjustment claim in clean water enhancement cost evidence appendix (YKY-PR24-DDR-26).

Given that the models are based on the cost outputs from commercially-tendered capital delivery frameworks we consider that the basic building blocks of our models already have efficiency built into them. The models output the contract delivered cost to Yorkshire Water.

We develop a scope definition for a particular intervention using an SIC (Solution Information for Costing) sheet, examples of which are included in clean water enhancement cost evidence appendix (YKY-PR24-DDR-26). On the basis of this scope definition sheet, the appropriate models are selected and populated with the relevant sizing parameters be that volume, area, flow rate etc. enabling a scheme cost to be generated. These are captured within our EDA system (Enterprise Data Analytics) which underpins our Decision Making Framework. We then apply a standard uplift to the EDA cost estimate to cover on-costs, corporate overheads, and indexing to 2022-23 price base. DMF is also the system within which we carry out cost benefit assessment by considering the impact of each solution using our six capitals framework.

The figure below illustrates how the SIC sheets, unit cost models and EDA are utilised to develop robust, detailed bottom-up costs for our solutions.

Figure 8-8 Illustration of SIC, Unit Cost Models and EDA in developing scheme costs

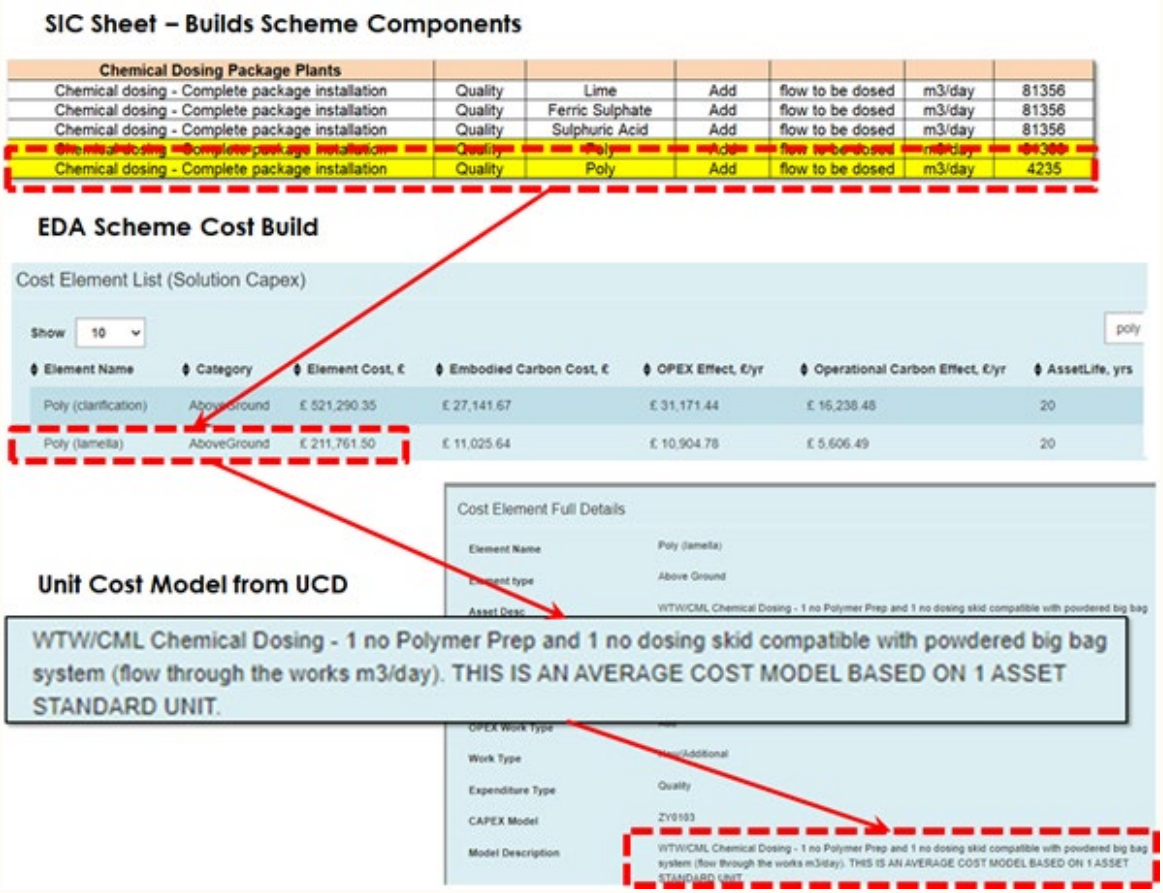


Table 8-2 below summarises the build-up of the costs included in this cost adjustment claim presented in descending order of risk within each asset group. We present examples of the individual EDA outputs associated with each one in the abovementioned appendix.

Table 8-2 Cost adjustment claim cost build up

Site / Asset	Solution	Cost £m 2022-23 Prices	Risk Score
Aysgarth WTW	Replace CWT at WTW	4.2	25
Loftsome Bridge WTW	Replace 3x temp RGF's with permanent units, refurb 3x units & replace DWW system	10.2	25
Chellow WTW	Addressing Clarifier concrete degradation	15.4	25
Bradley SRE	Replace SRE	3.8	24
Headingley WTW	GAC refurb	2.7	24
Barnoldswick Parkhill SRE	Replace SRE	7.0	23
Bracken Bank SRE	Replace CRE	6.6	23
Chellow Heights WTW	Replace Clean Water Tank	71.4	22
Hainworth SRE	Replace No1 and No2 SREs	7.8	22
Hartlington Raikes SRE	Replace No1 and No2 CREs	7.3	22

Site / Asset	Solution	Cost £m 2022-23 Prices	Risk Score
Thornton Moor SRE	Replace No1 and No2 SREs	5.2	22
Eccup 1 WTW	Major Refurbishment of 8 x RGF Units and associated plant	9.9	22
Albert WTW	Major Refurb 1x RGF and back wash water system	3.3	22
Loftsome Bridge WTW	GAC refurb plus penstocks	3.7	22
Top Hill Low WTW	Enhanced carbon regen to maintain T+O	6.7	22
Eccup 1 WTW	RGF Units open to environment. Solution to cover	6.0	21
Eccup 2 WTW	RGF Units open to environment. Solution to cover	8.7	21
Chellow WTW	RGF Units open to environment. Solution to cover	5.7	21
Chellow WTW	Major Refurbish 2x RGF	1.3	21
Elvington WTW	Major Refurbish 3x RGF	2.0	20
Huby WTW	Repairs to GAC tanks	0.2	19
Huby WTW	Replace 1x RGF unit and backwash tank	1.7	17
Eccup 1 WTW	Addressing concrete degradation	0.8	16
Thornton Steward WTW	Install pressure monitors	0.1	
Total		**191.7**	

The rigorous process through which we derive our scheme costs should give Ofwat confidence that they are robust and efficient.

The very specific nature of these interventions makes it very difficult to benchmark them against any publicly available data, however we have undertaken some benchmarking comparing our modelled cost with costs for similar schemes recently delivered by Yorkshire Water or comparing them against costs generated by the TR61 database. TR61 is a comprehensive cost estimation tool developed by WRc and is now in its 47th year and 15th version (issued in January 2024). It uses data submitted by UK water companies in accordance with rigorous data specification.

Firstly, we compared the TR61 cost for a new 75 MLD water treatment works with our estimated cost for the new Bradford WTW's which is being submitted as part of a proposed resilience enhancement, DPC scheme, within our PR24 business plan. That comparison is shown below:

NEW WTW SIZE MLD	COST (inc YW on costs) £ at CPI-H as per BP submission in Oct23	EDA Cost Build up (Excluding Items not included in TR61 Model)	Difference %
75	59,849,791	57,629,426	-3.9%

The EDA modelled costs for a complex asset like a water treatment works draw on multiple individual cost models from our UCD. It is reassuring that they closely align with a completely independent, industry recognised costing system like TR61.

For the service reservoirs which form a large part of our requested non-infrastructure cost adjustment claim, we have been able to do some limited benchmarking against internally generated outturn costs for schemes of comparable size – as illustrated in the table below.

Scheme	Size/flow	YW PR24 Business Plan Costs	Actual Costs	Comment
Proposed in CAC BARNOLDSWICK PARKHILL/SRE	4.8 ML	£7.0 m £1.5 m / ML	N/A	
In delivery - SRE (Harton)	10 Ml	N/A	£ 12.79 m £1.3 m / ML	The two sites here are currently in delivery. The cost per Ml aligns with the cost for a similar sized scheme in our CAC.
In delivery - SRE (Scotton)	4 Ml	N/A	£ 6.28 m £1.6 m / ML	

Service reservoir construction involves deep excavation. These engineering projects can be challenging, and may involve very high temporary works costs – particularly on small operational sites in proximity to live assets. As such, volume-based unit cost comparisons can be misleading, and outturn costs for similar sized projects can vary significantly. The table above provides some reassurance that the costs proposed in this cost adjustment claim are appropriate and efficient.

We trust that the additional evidence provided above will satisfy Ofwat that the costs upon which our cost adjustment claim has been based are robust and efficient. In addition to the reassurance that this additional evidence provides, we also propose to retain the financial PCD, set out in our original cost adjustment claim submission which will ensure that the requested investment is deployed within these critical asset groups and will deliver the required improvements in asset health.

Best option for customers

As discussed above, the large, long-life, fixed assets which are the subject of this cost adjustment claim perform a vital role within our treatment works and distribution systems and need to continue to do so for the foreseeable future. Managing the asset health risk is similar to managing other risks in terms of the broad options, which are to:

- **Tolerate** – if the level of risk remains acceptable with the current level of risk controls in place.
- **Treat** – to reduce the risk to an acceptable level if existing controls are insufficient.
- **Transfer** – pass the risk to another party (usually through insurance).
- **Terminate** – stop the activity within which the risk arises.

In practice, there is no opportunity to transfer the risks associated with deteriorating health of these assets to another party, nor can we terminate the activity within which that risk arises. That leaves us with two options: either to tolerate the risk for at least another five years (thereby accepting that current controls are sufficient) or to take effective action to treat the risk. The options to treat the risk (above and beyond our current monitor, inspect and reactively repair approach) are limited to refurbishing or replacing the assets in-situ.

As discussed in previous sections of this document, the assets which are the focus of this cost adjustment claim are critical to the safe and reliable functioning of our water supply system. They are also long-life assets, some of which are notionally already life expired (beyond their assumed working asset lives). We have been able to extend those asset lives through a

combination of short term, tactical mitigations together with operational responses and reactive maintenance. We do not believe that is in the best interest of future customers to continue to defer the inevitable replacement or major refurbishment of these assets.

By targeting the most high-risk assets and developing a programme that aligns with the age profile of the asset base and emerging evidence of deteriorating asset health, we consider that this is a no regrets course of action, which our customers support.

Customer opinions

A further legitimate consideration in terms of whether the proposed investment represents the best option for customers, is whether customers themselves support the proposed investment. We conducted quantitative research (speaking to a representative sample of 1,967 customers) and qualitative research (having in-depth conversations with 154 customers) to gauge customer support and perceived value for money of our cost adjustment claims. In this extensive and robust piece of research, we found the vast majority of customers to be in support of our proposed claim for asset health non-infra.

76% of household customers support the claim, with support levels rising to 85% of non-households and to 90% of future bill payers.

The majority of customers we spoke to also believe the claim to represent good value for money with 50% of households agreeing it's good value, rising to 77% of non-households and 73% of future bill payers.

The vast majority of customers also believe this cost adjustment claim to be important to them, with 84% of households believing it to be important, rising to 94% of non-households and 92% of future bill payers.

Overall, the evidence from our engagement with customers shows a strong desire for the inclusion of the asset health non-infra cost adjustment claim within our plan, with the quotes below demonstrating some of the reasons for this high level of support.

8.6 Concluding points

We believe that Ofwat and Yorkshire Water share a common objective, to deliver a resilient and sustainable water industry, where the water companies support a healthy and thriving environment and communities in all regions including our own.

That is what motivates us to submit the cost adjustment claims we have submitted as part of our PR24 business plan. We welcome Ofwat's feedback and the opportunity to present additional evidence and arguments in support of those cost adjustment claims. In this draft determination response, we trust that we have demonstrated: -

- That we have made appropriate use of allowed base funding in previous AMPs to deliver a balanced outcome.
- That we have applied good practice in asset management to extend the performance of critical, long-life assets including – clarifiers, rapid gravity filters, clean water tanks and reservoirs.
- That we are confident that the costs we have presented in our claim are efficient and that customers are protected against any cost uncertainty.

We hope that Ofwat will recognise that at this important juncture for our sector, there is a need to recognise that the econometric modelling approach which has underpinned previous price reviews, needs to be complemented by an approach which is forward-looking, and asset focussed as reflected in our cost adjustment claims. Grasping this opportunity will benefit future current and future customers and deliver wider economic benefits to the communities we serve.

9. Post Modelling Adjustment: Metering

9.1 Overview

We are pleased that Ofwat has included a post modelling adjustment for meters which sees our costs as efficient. This section provides some comments on Ofwat's model.

Since October, we have made some changes to our metering requirements. The detail behind the changes is set out in our metering enhancement case cost efficiency part 2 (YKY-PR24-DDR-03). In summary, the change is a result of:

- a confirmed unit rate from the output of our extensive tendering process and
- a reduced overall metering programme after a detailed audit of metered property numbers.

We have completed an update of our CW7 and CW18 data tables to reflect our latest view of metering cost and numbers accordingly.

9.2 Ofwat action reference

While not a specific action, this document represents on the approach set out by Ofwat in the document *PR24 draft determinations: Expenditure allowances p37-40.*

9.3 Key messages

- Our metering programme has changed slightly since October with a more accurate unit rate and a slight reduction in the number of meters. These have resulted in changes to our data tables accordingly.
- We welcome that Ofwat agrees with the need for a post modelling adjustment and that its approach sees our costs as efficient. We propose some further builds to improve Ofwat's modelling approach
- We have completed additional customer research in support of this.

9.4 Change requested

Ofwat should consider the additional evidence set out below when assessing the efficient costs for the metering post modelling adjustment at final determination.

9.5 Yorkshire Water's response to Ofwat

We are representing on this area because it is important that the efficient cost is appropriately assessed at final determination. Oxera's report (YKY-PR24-DDR-15) finds that Ofwat's approach in its metering post-modelling adjustment has some similar issues to that used to set the post modelling adjustment for water.

The substantive issue is that Ofwat's assumption that the models implicitly fund companies for the average renewal activity over the modelling period (2012–23) is incorrect, given that Ofwat adjusts the models based on the performance of companies in the last five years (at the time of the DD, 2019–23; now, 2020–24). Estimating the implicitly funded rate of meter renewal activity over 2019–23 reduces the implicitly funded activity from 1.6% p.a. to 1.5% p.a. (for household meters) and from 2.5% p.a. to 1.9% p.a. (for non-household meters). It also identifies some broader concerns with the efficient unit cost and the under-delivery adjustment.

It finds that addressing these elements increases the view of our efficiency by around £2m for the post-modelling adjustment for meters.

Customer support

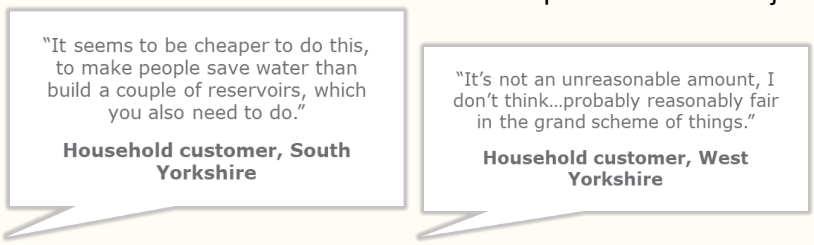
We conducted quantitative research (speaking to a representative sample of 1,967 customers) and qualitative research (having in-depth conversations with 154 customers) to gauge customer support and perceived value for money of our cost adjustment claims. In this extensive and robust piece of research, we found the vast majority of customers to be in support of our proposed claim for water meter replacement.

70% of household customers support the claim, with support levels rising to 90% of future bill payers. 77% of non-households are also supportive of the claim.

The majority of customers we spoke to also believe the claim to represent good value for money with 50% of households agreeing it's good value, rising to 65% of future bill payers and 85% of non-households.

The vast majority of customers also believe this cost adjustment claim to be important to them, with 88% of households believing it to be important, rising to 89% of future bill payers. 79% of non-households agree it is important

Overall, the evidence from our extensive engagement with customers on this shows a strong desire for the inclusion of the water meter replacement cost adjustment claim within our plan.



9.6 Concluding points

In summary, we welcome that Ofwat agrees with the need for a post modelling adjustment and that its approach sees our costs as efficient. We attach as an appendix as report that suggests some further builds to improve Ofwat's modelling approach.

There have been some changes resulting from our ongoing tender process to confirm our actual unit rates and to reflect our best view of metering numbers for this programme.

We have completed additional customer research in support of our claim.

10. Unmodelled costs

10.1 Overview

We are asking Ofwat to consider unmodelled costs differently to how it has in the draft determination in the following areas:

- Business rates - Ofwat has rejected our forecast of increased business rates. It has instead kept rates at similar levels to AMP7 but allowed a 10:10 cost-sharing mechanism. Whilst we welcome the retention of the PR19 cost sharing rate we feel the proposed scenario which addresses the anticipated impact of national revaluations and legislative changes should be funded due to the materiality of the gap. Within the draft determination, Ofwat has allowed £253.8m, £63.8m less than the £317.6m submitted.

- In recognition of a level of uncertainty related to legislative change, we request the proposed uncertainty mechanism applied as soon as possible after costs are incurred to protect both the company and its customers. Insufficient funding within the AMP pushes costs into future AMPs. Ofwat should either provide a central forecast with a true up next AMP or a faster true up at the end of each year.

- We have introduced two areas of additional cost in our plan that we believe should be considered under the 'unmodelled costs' criteria:

    - Lane rentals – we describe in our section on changes to the plan the need for us to include costs for lane rentals that were not included in our original plan and have not been historically charged. Since our October submission three highway authorities (North Yorkshire County Council, Kirklees and Leeds) have confirmed their intention to start charging us for lane rentals in 2024-25. Given the uncertainty of the scale of the lane rental charges and the potential of other authorities notifying us of charges we request the costs associated with lane rentals to be subject to a 10:10 cost sharing mechanism to protect the company and its customers against this uncertainty. This is discussed further within the uncertainty mechanisms section of our cross-cutting issues chapter (YKY-PR24-DDR-05).

    - Increased Environment Agency charges for water quality permits – the existing costs form part of the wholesale base cost models however the new charges are not in the historic dataset. We therefore think it is most appropriate for these charges to be excluded from the modelled costs and treated as an unmodelled cost at final determination.

Table 10-1 Summary of unmodelled cost allowance changes

Summary of unmodelled cost allowance changes		
	Waste EA permit charges	**Lane rentals**
October 2023 business plan submission	31.05	00.00
January 2024 business plan resubmission	31.05	00.00
Ofwat's draft determination	31.05	00.00
YKY draft determination representation	56.74	05.30

These additional costs have been included in CW2 and CWW2 data tables.

10.2 Yorkshire Water's response to Ofwat

10.2.1 Business rates

This section of our response focuses on the first area: business rates. It sets out further evidence on why our business rates forecast is the reasonable central estimate and why Ofwat should apply the cost sharing around this rather than on the exit run rate from AMP7.

The draft determination requires companies to accept cost liability increases from the 2026 and 2029 rates revaluations for the entire AMP, with a true up (with 10% cost sharing mechanism) as part of PR29 from an earlier April 2023 baseline. However, we consider that this leads to an imbalance in the risk borne by companies and provides no incentive to minimise the rates liability over the AMP as our forecasting expects the cost liability to very likely increase by more than 10% from the draft determination proposed baseline.

Throughout previous AMPs we have sought to mitigate business rates costs wherever possible through proactive actions with a dedicated expert team in-house, including influencing in the government's fundamental review, involvement with Valuation Officer Agency Check Challenge Appeal Working Groups on business rates administration changes/developments, direct engagement with national Valuation Officer Agency leads on both the 2017 and the 2023 revaluation and have taken as 'business as usual' a proactive approach to appeals on rating assessments.

Over the last two AMPs, Yorkshire Water has been one of the most proactive industry companies in negotiating to reduce costs. However, business rates have – and continue to – change in scope, regulations, and administration; they are currently in the midst of change that brings significant uncertainty to future costs during AMP8. Since PR19 business rates has gone through the Government's promised 'Fundamental Review', with the biggest change affecting our industry and liabilities being the move to three-yearly revaluation reviews (resulting in two revaluation events in AMP8) and introduction of a new 'declaration' duty that shifts the responsibility of liability from the local Charging Authority and or Valuation Office Agency onto the ratepayer – i.e. the company.

Previously, the duty was on the local Charging Authority and or the Valuation Office Agency. The new duty is contained in the Non-Domestic Rating Act 2023 (clause 13 (3)), but at present there are no details of an implementation date except 'by April 2026', nor if any 'de minimus level' of change or value will apply. Previously, the Charging Authority and or Valuation Office exercised discretion on what asset or property changes warranted a change to the rating assessment – going forward, it will be a new obligation on the company. We have forecasted and modelled 'new' extra cost liability for physical changes on rateable properties taking a 'likely case' scenario, assuming that the cost effect will be from April 2026 (2026-27). It is equally possible that the new duty, and therefore cost, could be implemented earlier than 2026, and/or have a retrospective commencement date back to asset completion. With the lack of detail in the legislation it is not clear how this will or could apply to the Clean Water rating assessment.

Further, an extra uncertainty has arisen since our submission, with a change to government where the Labour party manifesto promises new change to business rates with bias, more cost help to small-businesses and high-street operators that seems likely to penalise other businesses. Additionally, in July the Chancellor confirmed tax rises (but not personal taxes) in autumn to address the economic financial challenges making increases above inflation in business rates taxation more likely.

We are pleased that Ofwat recognises the uncertainties, and cost risk. And we support the move to a 10:10 sharing mechanism, which we proposed at business plan submission. However, taking the cost baseline for the risk sharing mechanism as the rating assessment and liability at 1 April 2023 is unrealistic and unreasonable, plus excluding change in liability for existing asset stock (required by regulation, not discretionary) not yet in assessment, is unfair.

The April 2023 baseline also penalises companies like Yorkshire Water that have proactively reduced rates liability in previous rating lists, as those successes are already benefitting the customer – as included in the April 2023 baseline value. This is in contrast to less proactive companies that have prior appeals yet to be settled, which will automatically reduce the 2023 baseline at a future date.

Our cost forecasts as submitted in CW10 and CWW10 are a central forecast, with best case and worst case scenarios falling either side of this. The key assumptions we made in determining the cost increases in AMP8 are as follows:

- the expected Duty to Declare will come into effect from April 2026, however this could be earlier;
- the expected Duty to Declare will not impact on the clean water assessment, however there could be an impact from new AMP investment assets;
- we continue to be successful in minimising cost increases through appeals and proactive engagement with the HMRC Valuation Office;
- our assumptions for the 2026 revaluation impact are considered to remain realistic but conservative, with no significant known change to each variable. Confirmed by independent consultant advice. We preferred to forecast a central estimate sharing risk rather than either a worst case or cost pass through mechanism.
- We have reflected a reduction in the asset stock (and therefore rates charge) in relation to the rationalisation of office premises post pandemic, with an assumption that the properties would have been disposed of by 2026-27.

The central forecast of the increase in rates costs in AMP8 is considered material at an additional £63.8m. We feel this is realistic and conservative.

For information: since submission and after the April 2023 baseline date, we have seen our wastewater rating assessments increase for AMP7 and earlier new asset stock by £0.51m. We have not reflected these increases in the data tables and maintain our forecast as these were forecasted in our submission.

Following draft determination, we have taken independent expert advice from the industry's leading surveyors consultancy to 'test' and check our forecast assumptions. Lambert Smith Hampton's (LSH) advice supports our assumptions but does further confirm that increases more than our forecast are possible which could be more significant for clean water. A copy of the advice is enclosed in the unmodelled cost report appendix (YKY-PR24-DDR-12).

Need for investment:

With the cost sharing mechanism proposed in the draft determination from the AMP7 exit run rate – i.e. excluding everything from AMP8 revaluations and legislation change – the company will always have to fund the first 10% of the impact of the changes, which we forecast to be £6.4m. Whereas if a true up is applied to a central estimate, the company would only have to fund 10% of the variance to forecast, not 10% of the full increase. A true up from a central estimate therefore represents a fairer balance of risk between the company and customers.

Additionally, with an uncertainty mechanism applied to the exit run rate (rather than a central forecast) the company is required to fund 100% of the uplift until the PR29 true-up occurs. This leads to additional debt, increased pressure on interest cover ratios and additional interest within the AMP until the adjustment takes place.

Change requested:

A central scenario for the impact of revaluations and legislative changes announced should be funded with the cost-sharing mechanism applied throughout the AMP. We propose this to be as soon as possible after the costs are incurred.

We would also support an alternative option to remove the cost uncertainty that we are aware some other companies favour. This would be to adopt the 2023 rating assessments (RV) as at 1 April 2025 (i.e. the opening day of AMP8) x the 2022-23 Uniform Business Rates (UBR) multiplier to give the 2025-26 opex baseline. The approach would then introduce a review during the annual reconciliation process, updating the revenues required for the following year's rates to align with the outputs of revaluations that have been confirmed ahead of that year. This approach would remove much of the uncertainty and negate most the need for enhanced cost sharing.

10.2.2 EA Charge

The Environment Agency (EA) recovers its costs incurred in regulating England's water environment through environmental permitting charges. These charges have remained unchanged for the last six years. In recent times, the EA has come under increased scrutiny about water quality deterioration, and in January 2024 consulted on increases in its charges to fund a step up in monitoring and evaluations. On 4 June 2024 it concluded that it will progress with the proposals set out for all elements of the consultation relevant to water companies.[3]

This proposal has been assessed to impact on Yorkshire Water's base operating costs to the value of £26m over the AMP8 period, however as the costs currently form part of Ofwat's econometric cost models which are backwards looking, the impact of the increase will not be captured in final determination allowances without an adjustment.

We welcome that Ofwat has recognised this risk in its draft determination and is considering an adjustment. We believe that the most appropriate way to do this is for it to consider wastewater EA charges as an unmodelled cost in a similar way to how it currently deals with abstraction charges in water resources.

Need for investment:

As described above, the EA consultation on 'Charge Proposals for Water Discharges' opened on 29 January 2024 and closed on 11 March 2024. On 2 June 2024 it confirmed its proposals to increase charges for water discharges.

The uplifts in charges impact on sewage effluent discharges, combined and emergency sewer overflows in the sewerage network and at sewage treatment works as well as a small increase in other WQ charges.

The increases are expected to increase Yorkshire Water's charges from £6.2m per annum to £11.3m per annum, an increase of £5.1m per year in 2022-23 prices.

The increase in these charges is outside of water company control as it is effectively an additional environmental tax that the company incurs. However, as the costs currently form part of Ofwat's econometric cost models which are backwards-looking, the impact of the increase will not be captured in final determination allowances without an adjustment.

We note that companies operating in Wales may not have these increases set by the corresponding environment agency in Wales and the impact of the changes will vary between companies depending on the makeup of their sewage catchments.

Change requested:

Ofwat recognised this change in its draft determination:

"In January 2024, the Environment Agency consulted on proposed changes to water quality permits charges. The changes proposed in the consultation could see water quality permit costs increase for wastewater companies. We will consider the outcome of this consultation and whether we should make a cost adjustment at final determinations."

We consider it is most appropriate for Ofwat to consider EA permits as an unmodelled costs (similar to abstraction charges for water resources) and to build in an allowance for the increased cost levels expected in AMP8. For Yorkshire Water this would be an additional cost of £26m for the period. However, a post-modelling adjustment may be appropriate if the increased costs are fully reflected at PR29 when new econometric models are created.

An uplifted allowance to account for these increases is important to ensure a thriving Yorkshire, right for customers and right for the environment as it is part of ensuring the company is appropriately financed for costs outside its control.

10.2.3 Lane rental schemes

Since completing and assuring the original base opex submission three councils (Leeds, North Yorkshire and Kirklees) out of the 16 we work with have informed us that they will be instigating a lane rental scheme from 2025. At the time of completing the original submission we did not include any costs for this due to the uncertainty around scale across councils, timing of implementation and daily cost.

Yorkshire Water also expects further councils will also adopt similar schemes over the AMP8 period. These councils have not been included in the calculations below as there has been no formal notification from them as at the time of writing (July 2024).

Need for investment

This change is required as it is a new base opex cost which has not been incurred previously and is therefore not included within the base modelled costs.

Yorkshire Water has no choice but to incur the additional fees from the councils – they are outside of management's control. The notifications from the Leeds City Council and Kirklees Council are included in the Lane Rental appendix (YKY-PR24-DDR-13).

Other companies will be impacted to different extents by the new schemes, depending on their regional councils.

This is important to ensure a thriving Yorkshire, right for customers and right for the environment as it is part of ensuring the company is appropriately financed for costs outside its control.

Cost justification

The three councils' schemes are expected to have an impact of £5.3m over AMP8. This has been calculated on the following basis:

- Assuming the level of work in the highway for each council area continues at the same level as 2023-24 (last most recent full year of data available).
- As the councils are yet to provide details of which specific streets are covered by the lane rental schemes, the number of streets within each area has been taken from GeoPlace (for those maintainable at public expense only). National Lane rental guidance states that up to 10% of streets can be classified as lane rental status, however we have taken a more conservative estimate that on average councils will identify 5% of roads within the lane rental schemes. We have therefore calculated 5% of the jobs that were undertaken in each council area in the carriageway. This assumes an even spread of jobs across roads impacted by lane rental, and roads not impacted.
- The average duration of a job is based on 2023-24 data, taking account of the first 48-hour exemption for immediately urgent works and excluding weekends.
- The unit charges are as provided in the council documents – we have used £2,500 as the standard daily cost.

Change requested:

We ask Ofwat to fund lane rental costs included in our draft determination tables as an unmodelled cost, costs that were not included in our original plan due to recent confirmation from. Since our October submission, three highway authorities have confirmed their intention to start charging us with lane rentals in 2024-25.

We believe it is most appropriate for Ofwat to also consider an uncertainty mechanism for lane rental costs, with a true up as soon as possible after costs are incurred. Due to the new and emerging nature of these costs, and the expectation that additional councils will also start to deploy lane rental schemes during AMP8. The costs could materially increase over the AMP, with only three of the 16 councils currently declared and valued.

An uplifted allowance to account for these increases is important to ensure a thriving Yorkshire, right for customers and the environment as it is part of ensuring the company is appropriately financed for costs outside its control.

10.3 Concluding points

We are asking Ofwat to consider unmodelled costs differently to how it has at draft determination, as described above, to ensure the company has appropriate funds available within the AMP to cover these costs which are largely outside management's control.

Without funding to cover these costs within the AMP, the company will still incur the costs but would potentially overspend its allowance, impacting financeability and/or customers.

Alongside asking for a central forecast of costs to be funded in the final determination, we are also asking for associated uncertainty mechanisms for all unmodelled costs to protect customers and the company due to the level of uncertainty in future costs. We consider that these true-ups should be at the same dates as the ODI within the AMP timetable.

11. Other operating expenditure

11.1 Overview

Ofwat wants to strengthen its monitoring of delivery in AMP8 and is considering a range of measures to improve its monitoring regime. One of its suggestions is a more detailed breakdown of modelled 'other operating expenditure' in order to better understand what costs are reported in this cost category. Ofwat is consulting on companies' views and seeking feedback in draft determination responses.

11.2 Ofwat action reference

Ofwat has set out its intention to collect more granular data on base expenditure and outputs, in section 4.8.4 of PR24 draft determinations: Expenditure allowances. This is part of a wider review of monitoring the delivery of company plans.

Ofwat is considering collecting more granular data on base expenditure and associated outputs. This would allow it to better understand what companies are delivering for customers and the environment within base expenditure allowances. And will also allow more granular cost benchmarking at future price reviews.

11.3 Key messages

We support the provision of more granular cost benchmarking in order to help us identify how we can continue to drive cost efficiency across the industry. Cost comparisons are most effective and reliable when data sets are consistent and objective.

We do not support providing operating costs by performance driver/activity, where operating costs and performance do not have a 1:1 relationship. This would involve a high degree of subjectivity, making comparisons difficult and less meaningful. In addition, this would also likely lead to the need to invest in additional people or systems to administer, which again we do not support as the overall benefit would be limited.

We feel strongly that disaggregating charges between price controls (including the principal use recharge and liquor recharge) and disaggregating support and overhead costs from 'other operating costs' would allow a better understanding of what companies are spending their money on. (All support and overhead costs are currently included within 'other operating costs').

11.4 Yorkshire Water's response to Ofwat

In general, we support the provision of more granular cost benchmarking in order to help us identify how we can continue to drive cost efficiency. In particular, we support splitting out costs that can be objectively assessed.

We do not support splitting out operating costs by activity in the APR e.g. pressure management because there is not always 1:1 relationship between £1 of opex and 1 output. For example, 1 FTE may be working in a multi-skilled team, across several activities, or £1 spent on network maintenance benefits multiple customer outputs. Additionally, apportioning the cost of one contract or 1 team between activities does not represent the real cost of any of the activities. High levels of apportionment also introduce higher levels of subjectivity which makes comparisons between companies less meaningful.

Currently all the company business support and overhead costs are included within other operating costs. We believe it would be helpful to show business support and overhead costs grouped together in a separate line from other operating costs. This will allow assessment of costs split between operational costs and non-operational costs.

We also strongly believe that the principal use (PU) recharge, as well as other recharges between price controls, should be identified on a separate row.

When looking at operating costs in isolation in AMP8, the PU recharge is a material movement of costs between price controls significantly relating to capex incurred in AMP7. The price control of principal use is determined by individual companies as most relevant to them which makes comparisons between companies on individual price controls difficult when the recharge is embedded within ‘other operating costs’.

While the PU recharge on a totex basis, over time, shows a fair allocation of costs across the price controls, examining opex or capex alone over a limited time period, does not represent a true reflection of expenditure by price control.

Based on our feedback above, we suggest replacing the current ‘other operating cost’ line in the APR tables with the following rows:

- Chemicals
- Asset maintenance
- Other operational operating costs
- Cost of regulation
- Insurance
- Support functions and overheads
- Recharges between price controls

12. Opex / Capex Model

12.1 Overview

Our plan contained operating and capital expenditure costs that allowed us to operate as a business and deliver our PC targets. The balance of opex and capex costs reflected how we expected the money to be invested and was planned to ensure an affordable level of borrowing and acceptable financeability metrics (interest cover ratios) in line with our covenants.

Ofwat assesses cost allowances across base and enhancement on a totex basis. Some costs are assessed through base cost models and other elements are assessed separately through specific post-modelling adjustments, reviews of CACs or enhancement. It must make assumptions on the breakdown of these costs between opex and capex in order to feed the financial modelling and set company revenue allowances.

We set out in this section how the assumptions that Ofwat makes on assessing the opex/capex split of its view of efficient opex will cause a significant impact on the revenues we are allowed to recover. This split will not align with the cost modelling decisions that have been made.

12.2 Ofwat action reference

Not applicable

12.3 Key messages

Ofwat's approach to assessing the opex/capex split in its draft determination is not appropriate as it does not reflect where the challenges have been made. For example, if a capex cost adjustment claim is rejected, it results in a reduction to opex in the final allowances.

This impacts on the revenues that companies can collect, compared to their expected ongoing operating cost allowances.

Ofwat should adjust the final opex/capex split to reflect where the disallowances have taken place.

12.4 Change requested

As described in more detail below, a simple intervention could be made to identify the key components that make up the cost assessment and the proportions of opex/capex within them (particularly in base). The model should then be adjusted to account for where the efficiency reductions have been applied and adjust the split on the remaining allowance accordingly.

12.5 Yorkshire Water's response to Ofwat

Our plan contained operating and capital expenditure costs that allowed us to operate as a business and deliver the PC targets set out in our plan. The balance of opex and capex costs reflected how we expected the money to be invested and was planned to ensure an affordable level of borrowing and acceptable financeability metrics (interest cover ratios) in line with our covenants.

Ofwat assesses cost allowances across base and enhancement on a totex basis. Some costs are assessed through base cost models and other elements are assessed separately through specific post-modelling adjustments, reviews of CACs or enhancement. It must make assumptions on the breakdown of these costs between opex and capex in order to feed the financial modelling and set company revenue allowances.

The file *PR24-DD-Opex-capex-split.xlsx* sets out how these assumptions are applied, but put simply, the Ofwat model calculates the spilt of opex and capex within company plans and then

applies the same split to its view of efficient allowances (this happens separately for both base and enhancement).

This approach causes issues to companies because it does not recognise either:

a) Proportional efficiency – the method applied does not consider how the company would need to respond to an overall reduction in costs to optimise its service output – it assumes efficiencies can be made to opex and capex in the same ratios of the base plan and is too simplistic.
b) Efficiency allocation – specific elements of the efficiency factors applied relate directly to either opex or capex and should be accordingly weighted in the allocation across opex and capex. For example, where efficiency relates to capex cost adjustment claims, these should be applied to capex only whereas the current method applies this across capex and opex.

The method applied by Ofwat therefore affects the split of opex/capex feeding financial models in a disproportionate way (i.e. the effect of the efficiency applied is not linked to the cause). The first point raised in the list above may be difficult to address without companies pre-empting Ofwat's final determinations, but it should be possible to ensure that the second is not extremely detrimental to companies operating cost allowances by allocating efficiencies to opex and capex in direct relationship to the driver of change – for example rejected capex cost adjustment claims being applied to capex allowances and not spread across opex and capex.

Impact on Yorkshire Water

We are particularly impacted by this issue in Ofwat's application of opex/capex to our water base costs. The majority of our cost challenges are in relation to our cost adjustment claims, which are capex-based, however this results in a significant reduction to our base opex requirements despite a smaller challenge to our base costs (excluding the CACs).

The below tables set this out:

Wholesale Water Base Plan Submitted				DD Allowance
	Opex (£m)	Capex (£m)	Totex (£m)	Totex (£m)
Base Costs/ Unmodelled Costs / Energy Adjustment / NZ	1461	649	2110	1987
CAC/P-MA Metering	0	110.1	110.1	164
CAC/P-MA - Infra mains replacement	0	251	251	106
CAC Targeted allowance – non-infra	0	186.8	186.8	0
Total	**1461**	**1196.9**	**2658**	**2257**
Plan Opex/Capex Split	55%	45%		

	Gap	Gap based on modelled decisions	Gap applied by Opex Capex Model

	Totex (£m)	Opex (£m)	Capex (£m)	Opex (£m)	Capex (£m)
Base Costs/ Unmodelled Costs / Energy Adjustment / NZ	-122.8	-85	-37.8	-67.54	-55.26
CAC/P-MA Metering	+53.6	-	53.6	29.48	24.12
CAC/P-MA - Infra mains replacement	-144.8	-	-144.8	-79.64	-65.16
CAC Targeted allowance – non-infra	-186.8	-	-186.8	-102.74	-84.06
Total	**-400.8**	**-85**	**-315.9**	**-220.44**	**-180.36**

The table above shows where the challenges have been made which is approximately one quarter opex (£85m) and three quarters capex (£316m).

However, Ofwat's approach applying the same proportions to the remaining allowance leads to an opex reduction of £220m and capex reduction of £181m. This a £135m swing of cost challenge from capex to opex compared to what is implied in the totex assessment.

The split of opex and capex is critically important for a number of reasons, not least customer bills and the company's ability to achieve service outcomes within affordability. By applying efficiency changes by driver as we propose, the balance of opex and capex are more representative and realistic. Wider implications of Ofwat's draft determination opex and capex ratio being unreflective include ICR levels, where there is an increased risk of breaching banking covenants as there is not a way to balance capex and opex within overall totex. By not adjusting the split of efficiency to driver, there is an increased risk of suboptimal prioritisation of spend in order to not breach covenants.

The solution to this issue is to adjust the final opex/capex split to reflect where the disallowances have taken place. This approach should be relatively simple to apply by identifying the elements that make up the cost assessment. We set out below across the base allowances the key elements making up the assessment and a simple view of where any efficiency assumptions would be removed from across our wholesale base plans.

Base Allowance	Capex / Opex
Base Modelled Costs	Splits per plan (exc. other areas)
Post Modelling Adjustment - Mains	Capex
Post Modelling Adjustment – Metering	Capex
Post Modelling Adjustment – Energy	Opex
Post Modelling Adjustment – NZ	Capex
Post Modelling Adjustment – P removal	Opex
YW CAC – Combined Sewers	n/a (proposed adjustment to base models - splits as per base modelled costs)
YW CAC – Non-Infra	Capex

Unmodelled Costs	Opex

12.6 Concluding points

Ofwat's approach to assessing the opex/capex split of its determination does not account for where efficiencies have been applied. This leads to different balance of opex and capex costs to those needed to efficiently run the business.

The misbalance between opex and capex changes the timing of when the funding for the expenditure will be received from customers. If the opex funding is not received in line with when the opex is spent, then there is a risk of suboptimal prioritisation of spend in order to avoid breaching banking covenants.

Annex 1 – Supporting Data for Water Infrastructure Cost Adjustment Claim

Table showing build-up of £390.5 per meter of mains renewal from AMP6 and AMP7 schemes actual out turn costs.

Batch	Batch Title	Included Length	Included Cost
YW.202396	AMP6 Y5 Growth (F890) Park Avenue Driffi	378	£234,917.5
YW.202395	AMP6 Y4 DOMS (G196) Bramham - Windmill	748	£294,948.1
YW.202150	AMP6 Y4 Structural (E010) Whixley Res -	408	£269,004.0
YW.201862	AMP6 Y5 Structural (L136) South Ossett -	110	£114,442.9
YW.201586	AMP6 Y4 Structural (H103) Harland Moor-	529	£155,674.6
YW.202093	AMP6 Y5 Structural (C201) Cornholme - H	201	£96,944.4
YW.200875	AMP6 Y5 Structural (C211) Cragg Vale - B	637	£142,958.8
YW.202056	AMP6 Y4 Structural (K702) Riddlesden- St	228	£23,383.7
YW.202713	AMP6 Y5 (A251) Brierley - Hillside Mount	439	£73,158.5
YW.204590	AMP6 Y5 Structural UQ (K708) Oakworth -	179	£58,946.5
YW.204373	AMP6 Year 4 DOMS (H517 Whitby Esk/Sleigh	362	£183,337.7
YW.203807	AMP6 Year 2 - Cudworth STW - Refurbishme	310	£70,834.7
YW.203762	AMP6 Y3 Structural Wroot High Street	403	£542,664.7
YW.203761	AMP6 Y4 Structual-Upper Accom. Rd.	449	£189,469.6
YW.203611	AMP6 Y4 DOMS Brockholme Ln,Water Quality	1457	£162,432.6
YW.203610	AMP6 Y4 Carlton Miniott,Skipton-on-Swale	458	£57,120.8
YW.203453	AMP6 Y3 Structural Cragg Road C470	736	£311,757.4
YW.203380	AMP6 Y4 Dalton Green,Tandem Way IND EST	711	£199,127.4
YW.203260	AMP6 Structual Bagart Hill,Monkswood Av	1027	£363,737.3
YW.203142	DG3/H&S Risk Jeater Houses WPS	1969	£680,788.0
YW.203025	AMP6 Year4 Water Quality issues at Colne	434	£101,305.8
YW.202966	AMP6 Y4 DG2 (E076) Ethelburgers Penny P	457	£247,196.8
YW.202962	AMP6 Year 4 DOMS (E217 Valley Road) The	451	£101,824.7
YW.202960	AMP6 Harrogate Growth- Studley to Birkby	2246	£1,017,782.9
YW.202483	AMP6 Y4 DG2 (E131) Northallerton 2 - Mow	410	£144,831.0
YW.201956	AMP6 Y5 Growth (E016) Low Level 16in Eas	5592	£1,197,221.9
YW.201855	AMP6 Y4 Structural (E096) Cowthorpe - 3"	1133	£129,209.5
YW.201836	Lee Lane Royston- Water main failure- UQ	207	£206,450.0
YW.201622	Barnes Road- Structual Mains Failure- UQ	634	£368,289.5
YW.201494	L384 New Fryston DMA - Lo	131	£99,643.8
YW.201492	NMCN SM1-Staincross HP-Sackup Lane	578	£218,703.4
YW.200407	OConnors-SM-Crimicar Lane-Whiteley Lane	92	£31,810.9
YW.200067	NMCN Yr1 SM1-Thorne Moorends-Moorends Rd	1621	£313,744.0
YW.202591	OConnors-SM-Fishpond-Sycamore Close	93	£38,466.9
YW.202492	NMCN SM1-Oxspring-Copster Lane	670	£142,398.7
YW.202323	AMP7 Willerby & Kirkella DG2 Growth	547	£411,673.7
YW.202177	AMP7 Yr1 SM2-Stanley Gravity-Mt Batten	884	£319,758.2
YW.202172	AMP7 F639 FLAMBOROUGH - Water Mains Fail	377	£154,656.2

Batch	Batch Title	Included Length	Included Cost
YW.202052	AMP7 H550 SWAINSEA LANE - Wate	839	£181,531.6
YW.201954	AMP7 SWAINSEA LANE SREs - Main	1009	£318,400.2
YW.201909	AMP7 H297-SCALING-Scaling Dam	631	£80,755.8
YW.201866	AMP7 E154-Osmotherley High Level	844	£204,035.7
YW.201864	AMP7 H114 Reighton Sands-Reighton SRE	1512	£388,357.9
YW.201863	AMP7 E114 High Shaw- Charcoals Way Mains	211	£67,354.3
YW.201853	AMP7 E114 High Shaw - 4"uPVC Mains Failu	1248	£232,315.9
YW.201852	AMP7 H535 PICKERING WEST - Wat	454	£119,267.9
YW.201849	AMP7 H531 PICKERING URBAN - Wa	115	£70,383.2
YW.201828	AMP7 E114 HIGH SHAW - Water Ma	470	£125,985.9
YW.201827	AMP7 L173 SNYDALE RD - Commonside Lane	370	£37,215.8
YW.201826	AMP7 D522Wheatley Hall Road - Mains Rein	400	£270,864.5
YW.201814	AMP7 E010DMA The Crescent, Greenhammerto	140	£54,325.5
YW.201657	AMP7 G502 THE STANKS - Stanks Way - Wate	82	£46,333.1
YW.201594	Bilton Grange Close - WQ Failure	85	£65,161.8
YW.201371	AMP7 H560 BURYTHORPE - Water Mains Failu	1930	£304,238.8
YW.200948	AMP7 Yr1 SM5-Padside Thruscross-Darley P	579	£142,442.3
YW.200922	AMP7 E200-Ripon-Dishforth Road 8" PVC	1036	£290,899.7
YW.200713	AMP7 Yr1 SM2-Briggate-George Street	194	£102,904.3
YW.200712	AMP7 Hainworth SRE New Main - WQ Failure	441	£473,051.4
YW.200296	AMP7 Yr1 SM3-Hubberton-Upper Field House	317	£112,883.9
YW.201860	AMP7 Yr1 SM3-Midgley-Hullet Drive	440	£202,124.3
YW.201830	1MP7 Yr1 SM5-Ouseburns-Thorpe Green Lane	1736	£204,610.5
YW.201375	AMP7 Yr1 SM5-Ouseburns-New Rd-Tancred Lo	1211	£183,323.3
YW.201372	AMP7 Yr1 SM3-Soyland Pumped-Roachdale Rd	853	£346,948.6
YW.200383	AMP7 Yr1 SM1-Brook Square-Station Rd	148	£110,176.1
YW.200106	AMP7 A077 Hawshaw Lane - Chapel Hill - M	55	£32,856.8
YW.202091	AMP7 K785 Ghyll-Eastwood Street	97	£75,622.0
YW.202090	AMP7 Yr1 SM3-Ingleton-New Road-Halsteads	722	£277,410.4
YW.202053	AMP7 (E022) HL East Knaresborough Growth	1756	£838,440.9
YW.201958	AMP7 Harlow Tower Grwth- Hydraulic Ntwrk	1272	£1,409,523.0
YW.201910	AMP7 G194-Whitecote Hill-Rodley Lane	200	£216,332.7
YW.201861	AMP7 Yr1 SM2-Stanningley-Swinnow Lane	206	£144,409.4
YW.201783	KT18 Hebden Ghyll Cracoe and Rylestone	3434	£1,947,759.4
YW.200878	AMP7 HT21 NESS TO TERRINGTON - DG3 Mains	4526	£2,405,647.9
YW.200873	AMP7 Yr1 SM3-Edge Lane-Walker Green	52	£22,143.1
YW.200695	Hough Lane, Wombwell	58	£85,193.3
YW.200391	Lane Head - Mains Failure - 4" AC DG7	249.1	£57,855.8
YW.200371	Rails Road - 3" AC main - Mains Renewal	760	£128,919.6
YW.200190	NMCN Yr1 SM1-Thorpe-Moss Lane	1570	£297,372.7
YW.200183	AMP7 C4 A19 Mount Grace Priory	143	£53,745.1
YW.200401	AMP7 E114-HIGH SHAW-6" Simonstone-Hawes	745	£174,017.7
YW.201309	AMP7 E128-Agra DMA-Fearby-3" mains fail	1050	£143,147.3
YW.201225	AMP7 C016 Flockton – DG3 – Manor Drive –	428	£124,934.8
YW.200408	AMP7 B557 Woodside- Water Mains Failure-	108	£45,831.0
YW.200943	AMP7 G169 ABERFORD - Beckside Farm WQ	156	£36,460.8
YW.200403	AMP7 L382 SOUTH MILFORD - South Milford	303	£134,998.7

Batch	Batch Title	Included Length	Included Cost
YW.200439	AMP7 D581 Crowle Village– Mains Replacem	774	£159,021.8
YW.200400	AMP7 "E104DMA - Breckenbrough Lane - 5""	1155	£149,254.2
YW.200802	AMP7 G483DMA - Harewood Saw Mill - 3" CI	250	£79,813.2
YW.201374	49623 G114 - Farnley, DG2 (Growth), Whit	2721	£1,261,043.9
YW.200389	AMP7 Yr1 SM4-Whitby North-East Way	462	£186,331.7
YW.200397	AMP7 Windy End SRE Inlet – Mains Failure	640	£615,869.7
YW.200409	AMP7 Catterick Growth Scheme - significa	564	£199,863.5
YW.200382	AMP7 - Handsworth Grange/Flockton Cres	743	£280,135.2
YW.200398	AMP7 JT07 Rivelin WTW to Ringinglow SRE	500	£118,359.3
YW.200420	AMP7-M371 Snaith DMA-Growth DG2	2197	£808,842.2
YW.200406	AMP7-G016 Braemar Drive-Stocks Blocks	547	£433,649.4
YW.200921	AMP7 E114 High Shaw - 3" Penn Ln, Hawes	879	£212,615.4
YW.200644	AMP7 E114 HIGH SHAW - Water Main Failure	777	£347,608.5
YW.200787	AMP7 B562 Menston Growth- Network Reinfo	1088	£469,624.9
YW.200438	AMP7 E132 Boroughbridge Rd - DG3 risk -	946	£369,526.2
YW.201654	AMP7 DG3 Risk Mitigation - Bradford High	1141	£513,684.7
YW.201593	AMP7 H525 THORNTON LE DALE - Mains Failu	1289	£231,874.6
YW.201227	AMP7 C217 Midgley – Mains Failure – Work	601	£249,043.1
YW.201204	AMP7 J422 Monteney- Mains Failure Monten	126	£70,701.5
YW.200947	AMP7 J564 Brookhouse Main St 4" AC	824	£350,267.0
YW.200946	AMP7 (HT36 Hildenely to Huttons Ambo) H	570	£139,290.9
YW.200945	AMP7 C472 Longcroft- Mains Replacement-F	543	£165,682.7
YW.200923	AMP7 D520 Epworth Mains Replacement Turb	2912	£465,579.8
YW.200897	AMP7 D452 Crowle - Mains Replacement - B	267	£104,298.6
YW.200896	AMP7 Village Street Norwood Green. C467	1063	£301,365.3
YW.200880	AMP7 M513 Riccall Tower Zone - Mains Rep	2770	£491,355.8
YW.200879	AMP7 G148 NEWMARKET LANE - New Market	1281.79	£990,966.7
YW.200789	AMP7 F655 Sigglesthorne - Mains Replacem	718	£188,839.7
YW.200788	AMP7 Year 1 A251 Brierley-Poor Pressure	206	£136,313.4
YW.200786	AMP7 G005 HUNSLET ROAD - Chadwick Street	200	£176,900.9
YW.200581	AMP7 G148 NEW MARKET LANE - Ne	7598	£4,609,007.0
YW.200421	AMP7 Flaxby Growth mains reinforcement	3535	£1,598,548.1
YW.200405	AMP7 E115DMA Thornton Lodge,DL8 - WQ fai	122	£35,607.0
YW.200394	AMP7 Y008 ELVINGTON- Derwent Close - WQ	153	£54,347.6
YW.200392	Water Lane & G125 Spingwell Road	1078	£1,533,909.7
YW.200390	AMP7 Yr1 SM3-Northgate Road	1139	£331,954.2
YW.200384	AMP7 E140DMA Piper Hill - Mains Failure	5364	£2,854,260.3
YW.200212	AMP7 K716 Colne Road- 12" CI Water Mains	1050	£977,670.6
YW.200111	AMP7 Catterick Growth - phase 3A - TS WT	6435	£1,917,384.2
YW.200168	AMP7 Slee Gill, Richmond	339	£189,575.4
YW.004433	AMP7 A316 Ryhill - Mains Failure – Ryhil	1330	£269,703.1
YW.004476	AMP7 E020DMA - North Deighton Village -	300	£98,490.6
YW.004455	AMP7 F606 SWANLAND- West End- Network Re	153	£134,762.4
YW.004449	AMP7 J858 Rudd Hill Mains Renewal Sheeph	412	£173,830.0
YW.004441	AMP7 F622 F622 - HEDON- Cherry Tree Lane	265	£97,957.0
YW.004434	AMP7 G108 QUEENSWOOD DRIVE Foxcroft Way	56	£33,202.9
YW.004395	AMP7 C242 Outlane – Mains Failure – Clay	301	£129,841.0

Batch	Batch Title	Included Length	Included Cost
YW.004393	AMP7 Y009 Hull Road/Tang Hall	978	£550,931.7
YW.004344	AMP7 DRIFFIELD GROWTH Phase 2 - F735 Dri	498.4	£230,514.1
YW.004307	AMP7 E001 North Stainley Growth Scheme	4171	£852,119.7
YW.004305	AMP7 G118 - Boggart Hill Drive - WQ - 3"	72	£45,033.8
YW.004303	AMP7 C489 Crosland Moor South – Beaumont	260	£91,633.0
YW.004293	AMP7 F712 Market Weighton South - North	87	£39,376.3
YW.004292	AMP7 F814 Howdale Pumped	390	£200,933.1
YW.004167	AMP7 E127DMA- Masham Growth scheme	700.3	£346,460.3
YW.004072	AMP7 F710 CLAYFIELD POCKLINGTON - Main l	91	£91,099.0
YW.003962	AMP7 H197 PEASY HILLS - Mains Replacemen	426	£143,462.9
YW.003928	AMP7 H191 Castle Howard LP Market Place	152	£134,407.6
YW.003927	AMP7 F617 North Ferriby The Ridings	253	£120,545.2
YW.003760	AMP7 F612 Gilberdyke – Hutch Lane, Yokef	438	£136,899.0
YW.001092	AMP7 K878 Low Bentham – Mewith Lane	508	£115,093.0
YW.001076	AMP7 K754 SKIPTON WEST - Otley Road - WQ	182	£137,102.2
YW.001061	AMP7 Stumps Cross, Boroughbridge	694	£520,827.9
YW.001059	AMP7 E174DMA- Richmond LL network - DG2	1494	£519,828.5
YW.001058	AMP7 H206 Setttrington Beacon	1097	£170,617.5
YW.001056	AMP7 H151 AMOTHERBY - Poor Pressure - Gr	930	£177,946.3
YW.001053	AMP7 G075 OAKWOODS - North Lane DG2	747	£322,350.4
YW.001052	AMP7 C016 Flockton - Mains Replacement -	696	£187,480.3
YW.001051	AMP7 C212 Long Top - Mains Failure - Smi	368	£204,448.0
YW.001049	AMP7 H222 RANDYMERE TO POKEHAM BROW	128	£77,430.2
YW.001048	AMP7 H081 SALTON - Mains Replacement - G	452	£176,080.0
		Average Unit Cost	**£390.5**
		CAC Unit Cost	**£336.0**
		Implied Efficiency	**14.0%**