WSX08 - Base cost assessment commentary and analysis

Business plan
2025-2030

Wessex Water
YTL GROUP

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WSX08 - Base cost assessment commentary and analysis

CONTENTS

For annexes, see Supporting Document WSX09 – Annexes – Base cost adjustment claims

This supporting document is part of Wessex Water's business plan for 2025-2030.

Please see 'WSX00 – Navigation document' for where this document sits within our business plan submission.

More information can be found at wessexwater.co.uk.

1. Base cost assessment commentary and analysis

1.1. Econometric Assessment of Base Costs

Although we recognise the importance of econometric models in understanding relative efficiency, we still have reservations around the full reliance on them to set forward looking ex-ante cost allowances. As we outline in our cost adjustment claims, there are clear pressures on costs over time that these backward-looking models cannot fully account for. Therefore, we have not based our submission on the outcome of econometric models but instead taken a bottom-up view of our requirements.

Our critique of the cost assessment models was submitted in response to the April cost model consultation and remains still entirely valid.

We have however continued to update the econometric models to give an ex-post view of current level of efficiency and find that when you account for service we remain at or around the upper quartile.

1.1.1. Current level of efficiency

We have as a starting point used the models consulted on in April 2023, these indicate the following results:

Table 1: WSX efficiency score and rank

Area	WSX cost efficiency score (and rank)
Water resource plus models	1.50 (15)
Treated water distribution	1.09 (10)
Wholesale water	1.28 (16)
Sewage collection models	0.87 (1)
Sewage treatment models	0.96 (4)
Wastewater network plus models	0.95 (2)
Bio resource models	1.13 (7)
Bad debt models	1.37 (14)
Other retail costs models	0.82 (1)
Total retail costs	0.94 (7)

Wholesale Water

Although on the face of it our costs are not the most efficient across wholesale water, when you look at the models, the impact of small companies and performance, it creates a very different picture.

Across the models the efficient frontier is dominated by Portsmouth and South Staffs Water – two of the smallest companies. The range of efficiency scores across the industry is also cause for concern, being around three times (0.89 vs 0.26) the range of the wastewater models, and in some cases suggesting the least efficient company is four times as expensive as the most efficient company.

This results in us having less confidence in these models. There is something else underlying, not captured within these models, that drives the difference in cost efficiency.

Amongst our WaSC peers, our performance is clearly leading.

- For the last two years our CRI score has been a fraction of the next best performing WaSC, beating the next best company by over two points in 2022 and over one point in 2023 (on performance of 0.37 and 1.04 respectively),
- For the last two years our supply interruptions performance has been around twice as good as our nearest competitor (around four minutes compared to eight),
- We have earned an annual return for exceeding our leakage target for the last three years and are maintaining one of the largest reductions amongst our peers.

The lack of confidence in the cost efficiency modelling, and clearly leading performance leads us to conclude that overall, when accounting for performance and considering the cost efficiency of other business areas, we are delivering efficiently for customers.

Within this plan we are clearly outlining where expenditure will improve service, a distinction, that at previous price controls was obfuscated with what was implicit within base. Fully accounting for this in cost assessment will help focus true base models and result in improvements to cost assessment over time.

Wholesale Wastewater

We remain one of the most cost-efficient companies when looking at recent wastewater expenditure. Alongside this we remain a strong performer across the key wastewater performance commitments. We have:

- received rewards for internal sewer flooding annually since 2020 with performance within the top three companies each year,
- maintained treatment work compliance at over 99% since 2020, and have been the only company to achieve 100% (in 2022),
- performed above the industry average for total number of pollutions since 2020, receiving a green classification in the EPA for this in two of the three years,
- been in the top three performers for sewer collapses each year since 2020.

Our leading cost and service performance concludes that we currently delivering at the efficient frontier for wastewater.

Retail

There is a clear distinction between models that include bad debt, and those that don’t. We provide more information in WSX20 – Residential retail strategy and analysis. Where models look at the pure retail operating expenditure, we are the clear frontier company. At the same time, we remain firmly towards to the top of C-MeX, with the fewest CCW complaints.

Our plan is based on our existing efficient costs, with further dynamic efficiency challenges of c1% pa from our move to a data driven understanding of customers and a challenging frontier shift of 0.5% pa.

When bad debt is modelled, we look less efficient. This is due to distortions in the bad debt from provisions around Covid, and the current cost of living crisis. We currently see successful collections of 97%, suggesting a bad debt level c25% below those reported at the start of this price control.

We believe that bad debt models are a prime example where backward-looking models will struggle to capture future bad debt costs. We are currently in unprecedented economic conditions, inflation is high, interest rates are rising, and disposable income is falling. Although we are yet to see a reduction in collections our partner organisations working with financially vulnerable customers expect to see a substantial impact. Coupled with the proposed increase in bills, we believe that allowances for bad debt costs need to be carefully considered.

However, through the delivery of our new billing system and our move to a data led view of customers we expect to be able to offset this and potentially improve collections (c10%) to 97.2%. We have modelled future bad debts as 2.8% of household retail revenue to account for this.

1.1.2. Our cost adjustment claims

No models are perfect, any model will struggle to fully account for the true level of efficient costs needed to deliver our outcomes. To this end, we have submitted a suite of cost adjustment claims to address shortfalls in the econometric modelling.

At a high level, we find that the backward-looking models do not fully account for the increases of costs over time, and this sits at the heart of a number of these claims. They each look at efficient costs we are incurring that are not fully included in the panel data used to inform the econometrics.

As we expect the approach to cost assessment to continue to evolve, we welcome continued dialogue around the costs implicit in your modelling. This may result in additional claims being made if there are material differences between our submitted and your modelled costs.

Notwithstanding the above, the scope of our final cost adjustment claims are the same as those prepared for early submission in June. As foreseen at early submission we have made reasoned updates to our claims to reflect the finalisation of our proposed plan and regulatory setting.

Our claims are set out in detail in WSX09 – Annex A1-A6 Cost adjustment claims and summarised below.

Table 2: Summary of cost adjustment claims

		Water Resources	Water Network +	Wastewater Network +	Bioresources	Total
CAC1	Increases to efficient costs over time		£44.0	£183.6		£227.5
CAC2	Mains replacement costs		£35.0			£35.0
CAC3	Growth at Water Recycling Centres (WRCs)			£126.4		£126.4
CAC4	Catchment and nature-based solutions	£11.7		£23.3		£35.0
CAC5	Industrial Emissions Directive (IED) and Environmental Permitting Regulations (EPR) costs				£200.8	£200.8
CAC6	Energy Costs		£57.1	£147.6		£204.7
Total		£11.7	£136.0	£480.9	£200.8	£829.4

In all of this, there is a need to recognise that by the time of the final determination, 2022/23 and 2023/24 data will be available for inclusion in the econometric models and as such any claim valuation in net terms will be subject to change, at minimum due to changing valuation of the implicit allowance, all else being equal.

We acknowledge data requests in the interim period since the June early submission with regards both energy and IED costs and recognise these as important next steps to ensure that the cost assessment methods in totality for PR24 provide sufficient efficient allowances to recognise the increasing costs over time.

CAC1 - Increases to efficient costs over time

Our increasing costs over time claim concerns the efficient levels of base costs that Wessex Water faces which are not captured by the allowances derived from Ofwat's base cost econometric models (once these allowances are adjusted for RPEs and ongoing productivity growth and growth-related enhancements).

This claim presents a method and quantification of the level of efficient base costs faced by Wessex Water affected by upwards pressures from a combination of factors which are overlooked or under-estimated in Ofwat's established approach to setting allowances for base costs. These factors primarily relate to:

- increases in base-plus costs over time to support improvements in performance captured by PCs and subject to financial incentives via ODIs;
- increases in base-plus costs over time as a result of the ongoing operational and capital maintenance associated with past enhancement expenditure; and
- increases in base-plus costs over time from broader sets of increasing regulatory requirements.

CAC2 - Mains replacement costs

We have prepared a claim which relates to the additional costs that we expect to incur in AMP8 in order to deliver efficient increases in the level of potable water mains replacement activity, over and above the levels that we consider are implicitly funded through Ofwat's draft econometric models published in April 2023.

CAC3 - Growth at Water Recycling Centres (WRCs)

It is not clear how Ofwat will assess growth at Water Recycling Centres (WRCs) and, in particular, Dry Weather Flow (DWF) related costs, and therefore this high-level introductory claim has been prepared in the context of this uncertainty.

Prior to AMP6, expenditure to increase capacity at WRCs driven by DWF and pro-rata tightening was funded under the Environment Agency's National Environment Programme (NEP) and allowances set against quality drivers. The growth models for PR19 and currently proposed for PR24 did/do not take into account this additional DWF quality expenditure in the historic data.

At time of submission of this claim there remains significant uncertainty regarding both the scope and scale of the Water Industry National Environmental Programme (WINEP) for AMP8. A number of sites we have identified for capacity provision have also been identified as requiring enhancements under the WINEP, particularly regarding nutrient requirements at our WRCs. Many of the currently developed options and proposed improvements to WRC discharges have been superseded through the emergence of new legislation and/or changes to regulatory guidance. Costs will be purpose split as appropriate and in line with Ofwat's regulatory reporting guidelines.

Given the uncertainty regarding how Ofwat will assess growth at WRCs, as well as the WINEP still being in development, we reserve the right to amend/re-submit this claim. We plan to provide further supporting evidence to Ofwat's cost adjustment claim assessment criteria as part of our business plan submission for any partially or not addressed through this early submission.

Refer to document WSX09, CAC3, for further detail of the claim, section 1.1.3 of this document for commentary on other companies' growth claims and document WSX16 for further detail on the investment case for WRC Growth.

CAC4 - Catchment and nature-based solutions

Our fourth claim relates to funding for efficient operating expenditure relating to the continuation of pre-AMP8 catchment- and nature-based solutions (C&NBS).

In relation to the water resources price control, the claim is for efficient operating expenditure for the continuation of pre-AMP8 C&NBS to improve raw water quality in a context where Ofwat's cost models are specified in a way that remunerates the costs of addressing raw water quality deterioration via increases to water treatment works complexity rather than solutions that apply before water reaches the treatment works.

In relation to the wastewater network plus price control, it relates to the efficient operating expenditure for the continuation of AMP7 C&NBS to reduce nitrates and phosphorus in catchments.

While we have included a cost adjustment claim for the ongoing operating expenditure of pre-AMP8 C&NBS, we do not consider that Ofwat's standard cost adjustment process is well-suited in this case and we would favour a separate remuneration process for these costs. Indeed, Ofwat has recently proposed an alternative funding arrangement for the ongoing operating expenditure for phosphorus removal (which is relevant to part of this claim), but this has yet to be confirmed.

Our view is that Ofwat's standard cost adjustment process poses unnecessary risks of disincentivising C&NBS and innovative alternatives to conventional capex-intensive enhancement solutions because it does not provide the certainty that companies should be able to expect when choosing the most efficient solution. We have discussed this with Ofwat on several occasions and proposed alternative approaches to Ofwat that we do not repeat here for the sake of brevity.

CAC5 - Industrial Emissions Directive (IED) and Environmental Permitting Regulations (EPR) costs

We have prepared a cost adjustment claim relating to the costs associated with IED and EPR, given the scope and timing uncertainties of EA requirements and permits and linked to this the uncertainties of how Ofwat will assess the level of efficient costs in this area for PR24. To this effect we have included total forecast costs at the timing of preparing our plan in the cost adjustment claim. We recognise there may be more appropriate methods within the developing and yet-to-developed aspects of the PR24 cost assessment framework, than a cost adjustment, and acknowledge the letter and additional data request to companies, since early submission with this regard.

Refer to document WSX09, CAC5, for further detail of the claim and document WSX18 for further detail on the investment case for Bioresources.

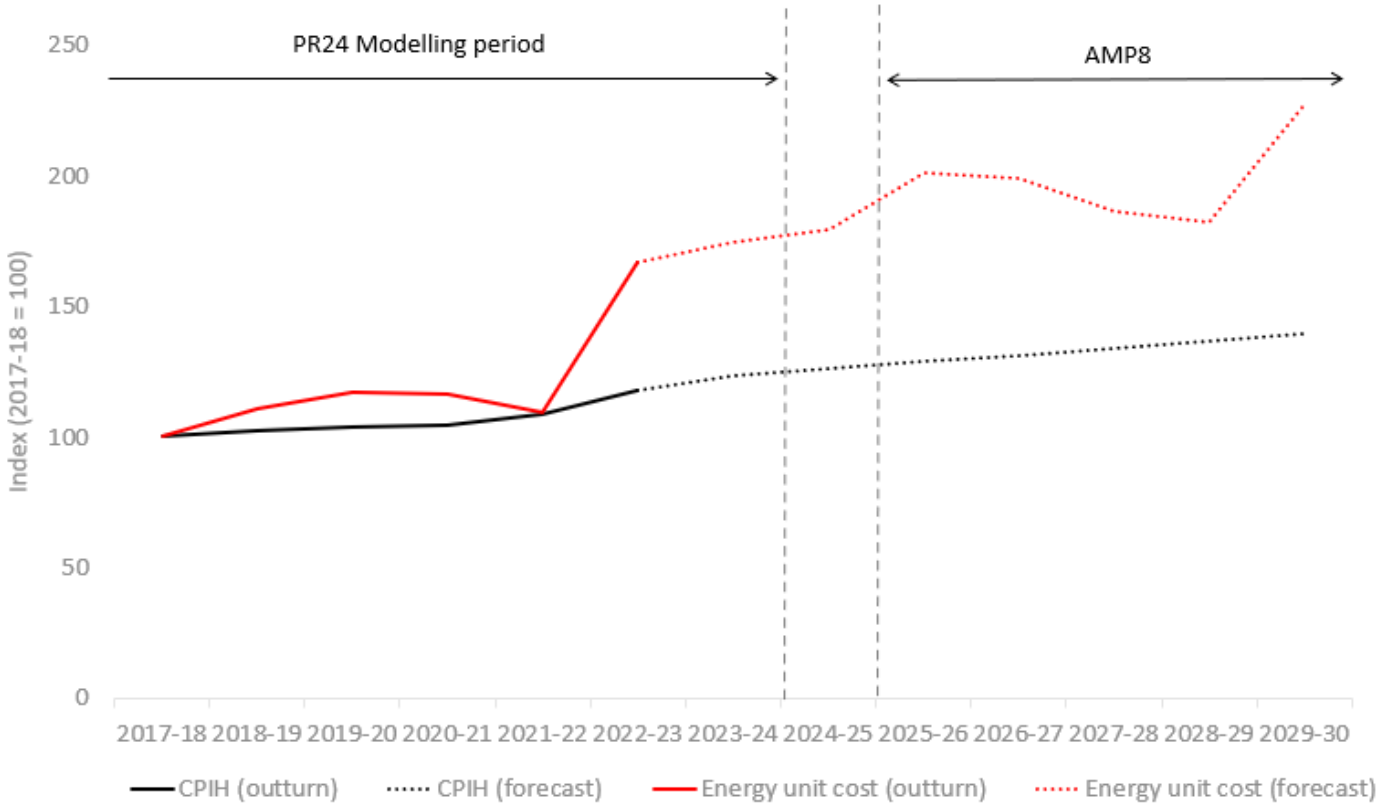
CAC6 - Energy Costs

Our energy claim relates to the additional costs that we expect to incur in AMP8 in order to deliver our services given the increase in energy costs over and above the levels that we consider will be implicitly funded through Ofwat's PR24 econometric models and a reliance on backward looking models.

The graph below compares our energy unit costs with CPIH. This figure shows that, from 2021-22, energy costs have risen materially compared to general inflation, due to the higher energy prices. In addition, we forecast that this 'wedge' between energy costs and inflation will continue to persist towards the start of, and during, AMP8.

In the short term we can and do hedge energy prices to secure the future unit cost of energy. The primary purpose of this is to provide price stability, not necessarily to out-perform the market. In the current climate of energy price hikes, market hedging cannot provide indefinite protection to the sharp rise in prices. Whilst we have used hedging to achieve a relatively good unit price for 22/23, this cannot be sustained and we are expected to experience the full impact and exposure in achieved prices in 23/24 and PR24 based on current information.

Figure 1: Comparison of energy unit costs and CPIH over time



Ofwat's base cost allowances are set based on its benchmarking models. These models use historical data to predict costs for AMP8. Using this starting point for allowances will significantly under-provide efficiently allowances for energy because there is a disconnect between the energy price to CPIH wedge, across the historical modelling time period and the forecast period (AMP8). That is, energy prices will be materially higher relative to CPIH at AMP8, compared to the PR24 modelling period. Absent a variable to capture this wedge in Ofwat's benchmarking models, predicted costs at AMP8 will not reflect the higher energy prices. Therefore, we propose that Ofwat applies an off-model adjustment to correct allowances accordingly.

Within the consulted on PR24 regulatory framework we consider this take the form of a cost adjustment claim to 're-set' what is considered to be a baseline level of efficient expenditure for PR24; and given energy market forecasts suggest no return to the pre-2021/22 prices (see graph above), that this be in conjunction to an ex-ante energy RPE allowance (see below). We recognise there may be more appropriate methods within the developing and yet-to-developed aspects of the PR24 cost assessment framework and acknowledge the letter and additional data request to companies, since early submission of cost adjustment claims with this regard.

We add, that whilst our claim method is only material in the water network and wastewater network price controls, energy is a fundamental input across all price controls and we consider that an adjustment is needed across all areas of our business, with disregard to materiality thresholds, as fundamentally we procure a single wholesale price for energy regardless of whether it abstracts water resources, pumps waste from customer homes or keeps the lights on at our billing company. Consistent with this, our Energy RPE is applicable to all areas of our business.

Finally, we also note that this issue is not peculiar to PR24 or to a particular input cost. That is, in future price controls, Ofwat should establish a methodology to take into account the possibility of future real input price inflation mismatches between the modelling period, and the forecast period. We focus on energy prices as it is the most material at PR24.

1.1.3. Responding to other companies claims

The cost adjustment claim process should provide opportunity to make reasonable adjustments to allowances where it is expected that the cost assessment process will model a level of allowances that differs to that an efficient company should expect to receive. Simply put, cost adjustments need to be more inclusive to types of claims beyond simply unique circumstances that seek to redistribute insufficient industry allowances in a zero-sum game.

In this section we provide a response to some of the early cost adjustment claims submitted to Ofwat by other water companies, which Ofwat published in June 2023. These were claims which Ofwat considered to involve symmetrical or potentially symmetrical adjustments.

We discuss the following issues in turn:

- Drainage and combined sewers.
- Economies of scale at water treatment works.
- Cross-industry adjustments for growth-related expenditure.
- Average pumping head and booster pumping stations.

We have given particular attention to the first claim which raises a number of methodological issues and has a potentially high impact on our base cost allowances. Our comments on the other claims covered are more targeted and selective at this stage. We have needed to take a proportionate and prioritised approach in terms of the comments that we provide in response to other companies' early cost adjustment claims.

Drainage and combined sewers

In this section we take together two early cost adjustment claims which are closely related and which involve claims of increased costs arising from a relatively high proportion of combined sewers. These claims are:

- Yorkshire Water's early cost adjustment on combined sewers.
- United Utilities' claim on drainage (UUW_CAC_002).

Overall, we consider that both claims should be rejected and that no adjustments should be made. We summarise our reasoning for this in the subsections that follow. These take the following topics in turn:

- Endogeneity and the lack of a link to an underlying exogenous cost driver.
- The argument that the combined sewer variable is exogenous.
- Differences across companies in the extent of combined sewers installed recently.
- The proposal to adjust for legacy assets inherited at privatisation.
- The linking of the urban rainfall variable with the proportion of combined sewers.
- The statistical performance of the models proposed in the claims.
- Symmetrical adjustments calculated for Wessex Water.

We also note that the cost adjustment claims are primarily submissions from the two companies for the proportion of combined sewers to be incorporated into Ofwat's econometric benchmarking models of base costs. The claims do not really explain why, if the premise of the claims is accepted, a cost adjustment is more suitable than a change to the explanatory variables in Ofwat's base cost models. Our response is applicable both to the specific cost adjustment claims submitted and to questions on base cost model specification.

Endogeneity and the lack of a link to an underlying exogenous cost driver

In its April 2023 cost model consultation, Ofwat reviewed proposals for inclusion of the combined sewer variable and said the following:

"Severn Trent Water and United Utilities also suggested including the percentage of combined sewers in sewage collection models. We consider this variable is endogenous and including in the models might perversely incentivise companies not to separate sewers into surface water and foul. We also consider urban rainfall captures a similar impact and is more exogenous."

As a preliminary point, we consider that Ofwat's stated position on "endogenous" variables could benefit from some further elaboration and articulation.

At face value, it might be argued that Ofwat is not applying a consistent approach, because the majority of the explanatory variables in Ofwat's own preferred models are endogenous, in the sense that they are not completely exogenous to management decisions and company efficiency. These include, for example, variables based on: the length of water mains and sewers; the size of sewage treatment works; the complexity of water treatment works; the number of water booster pumping stations; and wastewater pumping capacity of wastewater.

A closer review of Ofwat's approach to the base cost models suggests that Ofwat does not require all *explanatory variables* to be exogenous (in the strict sense). Instead, Ofwat's approach seems to be to accept a role for explanatory variables that may be under some degree of management control where these provide a practical way to help *capture underlying cost drivers*. We illustrate this in the table below which shows explanatory variables that Ofwat has accepted in its models, which are not entirely endogenous, but which are related to – and might be seen to proxy for – underlying exogenous cost drivers.

Table 3: Examples of non-exogenous explanatory variables used in Ofwat's April 2023 base cost models.

Explanatory variable	Underlying exogenous cost drivers related to the variable
• Length of water mains and sewers	• Number of customers • Density/dispersion of customers within area of appointment
• Weighted average treatment complexity • Water treated at complexity levels 3 to 6	• The nature and quality of raw water available for abstraction within each company's area of appointment
• Average pumping head TWD	• Topography
• Booster pumping stations per length of mains	• Topography • Density/dispersion of customers within area of appointment
• Weighted average treatment size • Load treated in size bands 1 to 3 • Load treated in STWs ≥ 100,000 people	• Number of customers and density/dispersion of customers within area of appointment (which in turn affect opportunities for economies of scale)

Our point here is not about whether these variables used by Ofwat are the best way to capture the underlying exogenous cost drivers, but simply that the variable can play a role (perhaps imperfectly) in enabling an underlying exogenous cost driver to be captured.

In contrast to the variables listed above, in its April 2023 consultation Ofwat seemed to be particularly concerned about endogeneity or management control in the case of the following variables which had been suggested to it:

- measures of the volumes of water used or distribution input;
- the age of water mains;
- the proportion of mains renewed each year;
- the percentage of sewer assets constructed after 2001;
- the volume of sludge disposed; and
- the proportion of combined sewers.

We consider that a key feature of these variables that Ofwat rejected is that they are not directly related to an underlying cost driver or do not seem to offer a good proxy for an underlying cost driver.

From this perspective, Ofwat's decision to exclude the proportion of combined sewers from the models it consulted on in April 2023 (and from models it has used at PR19) can be seen as part of a broader practice of being wary of including explanatory variables that are not linked to underlying cost drivers, especially where these pose risks of perverse incentives.

The concern with the combined sewers variables is not so much that the variable itself is endogenous, but that it is endogenous and that it is not linked to an underlying exogenous cost driver.

Yorkshire Water's submission puts forward some arguments as to why it is unrealistic to consider that companies might be incentivised to invest in combined sewers to receive higher cost allowances (if the variable were to be included in the model). These arguments seem largely besides the point. Yorkshire Water's submission does not seem to address the fundamental concern that, if the models did allow companies more money the higher is their proportion of combined sewer, this may might adversely affect the efficiency of the decisions that are open to them.

The argument that the combined sewer variable is exogenous

We now consider the endogeneity of the combined sewer variable in the context of the specific claims made by Yorkshire Water and United Utilities. We found that neither of these claims presented reliable arguments or evidence that the proportion of combined sewers reflects an underlying exogenous cost driver.

Yorkshire Water's claim does not seem to provide much evidence or discussion as to why is has a higher proportion of combined sewers than other companies. There is some reference to these being installed in "older towns and cities" but this is not developed any further or supported by cross company comparisons of exogenous factors. The lack of any attempt to link the proportion of combined sewers to an exogenous cost driver (or some other factor that the benchmarking models should control for) is a major weakness of the Yorkshire Water claim.

United Utilities' claim proposes that the proportion of combined sewers is treated as an exogenous factor. United Utilities describes combined sewers as "legacy assets inherited at privatisation" that are "largely outside of management control", and says that whilst it is looking to increase surface water separation it is an expensive and complex process to conduct at scale.

We consider that it is important for Ofwat to reject outright the proposition that the proportion of combined sewers is treated as an exogenous factor.

There is no sense in which the proportion of combined sewers is truly exogenous. Even United Utilities implicitly accepts that it is under some degree of management control when it says that it is "largely" outside management control, conceding that there is some management influence on the variable.

We consider that the Yorkshire Water and United Utilities claims risk understating the extent to which combined sewers is under management control. The proportion of combined sewers in 2021/22 is influenced not simply by decisions made in the distant past (e.g. pre-privatisation) but also by decisions made since privatisation and in recent years.

Differences across companies in the extent of combined sewers installed recently

Yorkshire Water's claim includes a chart that shows that across the industry the overall proportion of combined sewers for each company has not changed much in recent years. This is intended to support the idea that the proportion of combined sewers is exogenous or largely outside of management control.

However, we consider that this type of chart is at risk of being misleading when it comes to the extent of management control. The stability in the overall proportion of combined sewers is largely reflective of the very large

installed base of sewers and actions in relation to new or replacement sewers in any one year will have a small overall impact. But that does not mean that there is no scope for management control.

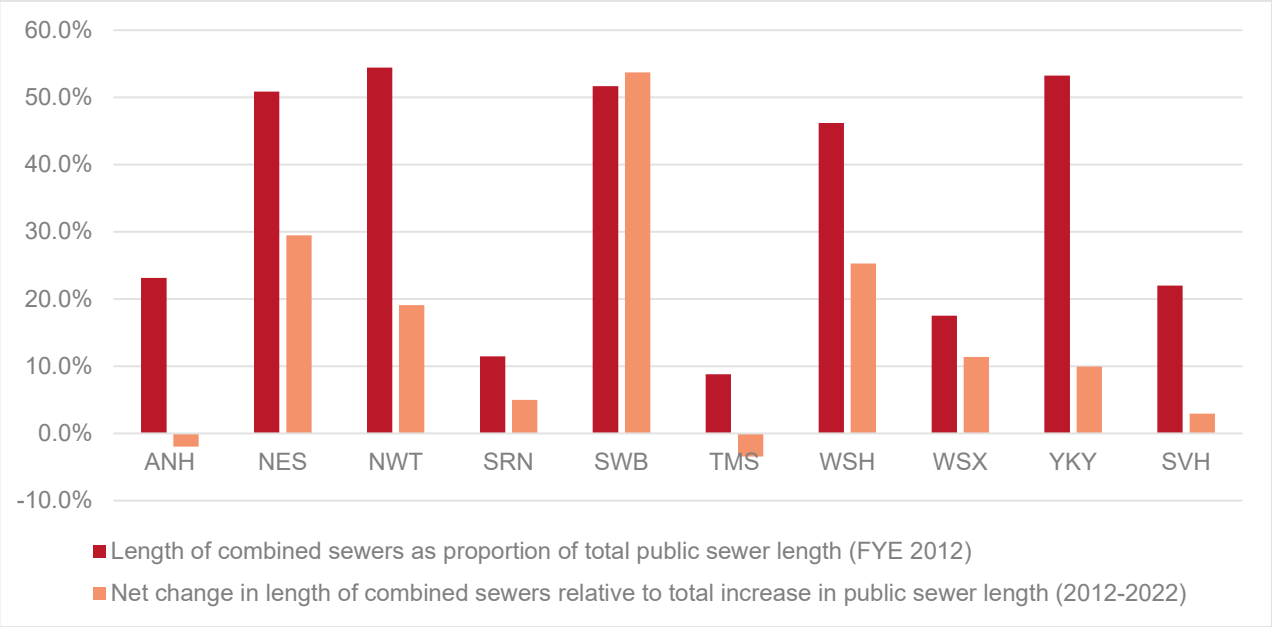
We consider it illuminating to look at the changes in recent years in the length of combined sewers relative to the changes in overall public sewer length. The chart below shows, for each company: (a) the net change in the length of combined sewers over the period 2011/12 to 2021/22 (the period covered by Ofwat's cost assessment dataset), expressed as a proportion of the total increase in the company's total public sewer length; and contrasts this with (b) each company's proportion of combined sewers at the start of this period (2011/12).

We draw attention to the following:

- Some companies (Anglian Water and Thames Water) report a net reduction in the proportion of combined sewers since 2011/12.
- Most companies have experienced a net increase in the length of combined sewers. The proportion of additional sewer length that is combined sewers since 2011/12 is nearly 20% for United Utilities.
- Looking across a set of companies which had relatively high proportion of combined sewers in 2011/12 (i.e. Northumbrian Water, United Utilities, South West Water, Welsh Water and Yorkshire Water) we see substantial variation in the extent to which the increase in total sewer length since 2011/12 has involved net increases in the length of combined sewers. For instance, for South West Water 50% of the increase in total sewer length is attributable to net increases in combined sewer length whereas for Yorkshire Water it is only 10%.

While not in any way conclusive on its own, this evidence calls into question the idea that the proportion of combined sewers is not under management control or that it this is simply an issue of legacy or inherited assets.

Figure 2: Comparison of the net changes since 2011/12 in length of combined sewers



The proposal to adjust for legacy assets inherited at privatisation

Leaving the terminology of exogenous versus endogenous factors aside, we do not consider that it is appropriate for Ofwat's econometric benchmarking models – or its cost adjustment process – to adjust for the proportion of combined sewers on the grounds that these are inherited assets. This is for several reasons.

First, this is not the established practice for the purposes of base cost benchmarking. Ofwat's base cost models include explanatory variables that are: (a) either exogenous (e.g. the population density variables); or (b) which relate to underlying exogenous cost drivers (see table above). Ofwat has not sought to include explanatory variables that reflect historical system configuration or historical decisions.

Second, seeking to adjust for historical differences between water companies in the extent of combined sewers would open up the model design process and cost adjustment process to a much broader scope which may be unmanageable. There may be numerous other differences between water companies, in terms of the investment decisions made in the distant past, that may affect costs today. There are also concerns about cherry picking if the models or cost adjustment process allows adjustments for one aspect of system design (e.g. combined sewers) that work against certain companies but do not take account of other aspects of historical system design that may work in favour of these companies.

Third, we do not see why customers, rather than investors, should face the financial consequences of relatively higher costs – compared to other companies – that result from a water company's legacy system and decisions made in the past.

Fourth, we do not see how it is possible to make adjustments for legacy assets or historical decisions without some adverse impact on the incentives arising from – and communicated by – the price control framework. An approach of making adjustments – via the model design or cost adjustment process – for legacy decisions raises the prospect that companies may be bailed out down the line for management decisions that prove relatively inefficient (compared to other companies), and limits the perceived scope for financial gains by companies who take decisions that prove to be efficient over the long term.

The linking of the urban rainfall variable with the proportion of combined sewers

We disagree with the way that United Utilities has incorporated information on each companies' proportion of combined sewers into the econometric models. This does not seem appropriate and can give a misleading impression of the statistical performance of models that control for the proportion of combined sewers.

Rather than having the proportion of combined sewers as a separate explanatory variable, as Yorkshire Water has done, United Utilities' approach involves the creation of a single explanatory variable that is calculated as the product of (a) the log of the urban rainfall variable (from Ofwat's April 2023 model consultation) and (b) the proportion of combined sewers. This is a form of interaction variable.

United Utilities explains in its claim that it used an interaction variable in its models because, in contrast to a model where terms for each factor were included as separate variables, it allows for an 'inter-relationship' between the two variables rather than imposing a constant marginal effect of either one.

However, the more standard approach, when exploring interactions between two variables, is to include the variables on their own as well as including an interaction term, and then to assess the statistical results to see if there is support for the more complex model with the interaction term rather than the simpler model without the interaction term. This does not seem to be the case under the United Utilities' approach.

By only allowing for the impact of urban rainfall via the interaction term, the United Utilities' approach has the effect of implying that urban rainfall only affects costs via its interaction with the proportion of combined sewers. To take a simple example, assume that there is a company with no combined sewers. The interaction term will be zero which means that the level of costs predicted by the model under the United Utilities' approach will be the same irrespective of the level of urban rainfall experienced by that company. We do not understand the logic for this.

In our response to Ofwat's April 2023 base cost consultation, we said that on current evidence we agreed with Ofwat's inclusion of the urban rainfall variable in the sewage collection and wastewater network plus models.[1] We said that the rationale we saw for the new urban rainfall variable is that it provides a measure of the scale of the surface water collection part of the wastewater service, which is particularly relevant to the sewage collection part of the value chain.

We consider that even for companies with low or zero combined sewers, the extent of urban rainfall is a relevant exogenous cost driver. But the United Utilities approach does not allow for this, as it imposes an assumption that urban rainfall only affects costs via the impact of combined sewers. This does not make sense and seems to be at odds with our understanding of the rationale for the urban rainfall variable.

Furthermore, by bundling the urban rainfall and combined sewers variables together into a single explanatory variable, the United Utilities approach risks overstating the statistical support for the combined sewers variable. This is particularly relevant as, as we discuss below, when combined sewers and urban rainfall are included separately in the model specification there is weaker statistical support for the combined sewers variable.

The statistical performance of the models proposed in the claims

Our primary concerns with the claims from Yorkshire Water and United Utilities concern the principle of including the endogenous combined sewer variable in the benchmarking models, and in the case of the United Utilities claim, the specific way that the proportion of combined sewers is incorporated into model specifications.

Nonetheless, there are also some limitations in the statistical support for the combined sewer variable, which we would expect to be apparent to Ofwat.

For instance, Ofwat's April 2023 model consultation made the case for introducing the urban rainfall variable to some of the wastewater models (we supported this in our consultation response). Under Yorkshire Water's modelling, when the combined sewer variable is included in the models that already include the urban rainfall variable the statistical performance of the combined sewer variable is weaker than when the urban rainfall variable is omitted (e.g. for sewage collection models, the proportion of combined sewers is found to be significant only at the 10% level when used alongside the rainfall variable and significant at 1% in the absence of that variable).

The combined sewer variable used in the United Utilities' claim seems to perform better statistically but, as discussed above, we do not consider that this has been incorporated into the models in a valid way.

Symmetrical adjustments calculated for Wessex Water

The early cost adjustment claims from Yorkshire Water and United Utilities report negative adjustments to AMP8 cost allowances for Wessex Water of around £64m and £72m respectively.

For the reasons set out above, we do not consider that either claim should be accepted (whether in full or partially) and so we consider the appropriate adjustment for Wessex Water is zero.

[1] We also suggested that whether this new variable is used in all relevant models, or a subset of relevant models, for the final PR24 model suite is something that is decided in light of the evidence on model performance for the updated dataset and given other aspects of model specification.

Economies of scale at water treatment works

We make some brief comment on the early cost adjustment claim from South East Water concerning “economies of scale at water treatment works”.

The submission from South East Water argues that it operates the second-smallest water treatment works (WTWs) in the industry (defined as WTWs per property) on average and that it cannot benefit from the same WTW-level economies of scale as other companies. It argues that Ofwat’s PR24 base cost models do not account for explicit measures of WTW-level economies of scale and that while WTW size is correlated with some of the PR24 cost drivers such that WTW-level economies of scale are partially captured in the PR24 models, South East Water’s operating environment is such that the PR24 cost drivers significantly overestimate the size of SEW’s WTWs and exaggerates SEW’s ability to benefit from WTW-level economies of scale.

We share the concern raised by South East Water that the opportunities to benefit from economies of scale at water treatment works (which in turn are driven by exogenous factors such as customer numbers and population density/dispersion within the area of appointment) are not properly captured under the base cost models that Ofwat consulted on in April 2023.

This is a particular issue for Wessex Water. South East Water says that it operates the second-smallest WTWs on average and on its analysis Wessex Water has the smallest size of water treatment works on average. Furthermore, Wessex Water is similar to South East Water in terms of the “Average discrepancy between actual WTW size and that predicted by the PR24 WRP models” (see Figure 4.9 from the South East Water early cost adjustment submission).

In this context, we were highly surprised that the early cost adjustment submission from South East Water indicated a negative adjustment for Wessex Water. Other companies who seem similar to Wessex Water on key metrics reported in the claim (e.g. Southern Water and Affinity Water) are shown with positive adjustments.

From the information available from the published South East Water submission, we could not tell whether this issue reflected a typographical error (e.g. reporting the wrong figure for Wessex Water) or a problem with the methodology applied.

Overall, we consider that there may be a good case in principle for cost adjustments for economies of scale at water treatment works, but that any methodology for this should imply an upward adjustment for Wessex Water.

As a related point, we highlight that on Ofwat’s base cost models from April 2023 Wessex Water has much worse efficiency ratios under all six of the water resources plus models than in for any of the models in covering treated water distribution, sewage collection, sewage treatment, wastewater network plus, bioresources and the aggregated retail models. Our view is that this is reflective of significant limitations in Ofwat’s water resources plus rather than relative inefficiency in the single area of water resources plus, and this in turn suggests a role for cost adjustments (or modelling refinement) that would reduce the perceived gap between our modelled and actual costs.

Cross-industry adjustments for growth-related expenditure

We have highlighted in previous consultation responses the need for growth-related expenditure to take into account available headroom at sites and for site-specific methods of assessment. We consider a unit cost method of assessment might be sub-optimal, however if a unit cost benchmarking approach is pursued, we have provided the below comments in the context of Southern Water’s cost adjustment claim. We are mindful the approach has not been consulted on and we would support further engagement on this topic.

Southern Water submitted an early cost adjustment claim which relates to wastewater growth. Southern Water’s claim is in two main parts. The first part of the claim involves the type of off-model adjustment for growth which Ofwat applied at PR19 FD and which was refined by the CMA. In Southern Water’s claim this covers sewer network

reinforcement and growth at sewage treatment works. The second part of Southern Water's claim relates to "atypical investment in treatment works at growth hotspots" and is intended to be applied on top of the adjustment for sewage treatment work growth costs calculated under the first part of the claim.

We provide some comments below which are focused on the first part of the claim. Our comments are applicable both to Southern Water's claim and to Ofwat's wider work to ensure that its PR24 cost assessment takes an appropriate approach to the growth-related expenditure (and other enhancement expenditure) that Ofwat chooses to include within the scope of modelled base costs.

We support the principle behind the first part of the Southern Water claim which is that, *if Ofwat does include growth-related expenditure in the scope of modelled costs*, a set of company-specific adjustments, based on a common industry-wide methodology, will be needed to take appropriate account of the drivers of growth-related expenditure. We mentioned this is on our own early cost adjustment claims (*CAC1 – Increases to efficient costs over time*, page 4):

"As at PR19, if Ofwat retains its approach of including growth-related and drainage-/flooding-related enhancement expenditure in its base cost models, Ofwat will need to make off-model adjustments to capture differences over time and between companies in the drivers of such expenditure. The principle of making such off-model adjustments is now an established part of Ofwat's approach to cost assessment and we have not sought to cover it within cost adjustment claims. We are keen to have opportunity to engage with Ofwat on the industry-wide methodology for these adjustments, to ensure improvements are made compared to the initial iteration at PR19."

The first part of Southern Water's claim concerns this type of adjustment, and we support the need for an adjustment of this nature.

As we said in June, we are keen to engage with Ofwat on the appropriate methodology for the adjustments, but we make a number of specific points at this stage which are relevant both to the adjustments calculated by Southern Water and any similar off-model adjustments that Ofwat develops for draft determinations.

First, this type of adjustment seems appropriate for all areas where Ofwat includes growth-related expenditure within the scope of modelled base costs. This will depend on Ofwat's approach to growth-related expenditure relating to sewage treatment works but is likely to apply to wholesale water, wastewater network plus as well as bioresources.

Second, while Southern Water seems to have followed Ofwat's approach from PR19 in relation to the calculation of the adjustments, we consider that this needs modification. One key issue is the way that the unit costs are calculated. In Southern Water's submission, the "historical growth unit cost" for wholesale wastewater is reported to lie in the range, across companies, between £178 per new connection (sic) to £1,585 per new connection (see step 3 on page 9). From this Southern Water took the upper quartile figure of £717 per new connection to calculate the adjustment (though Southern Water also noted the wide range and said that it would consider for its business plan submission whether to deviate from the upper quartile).

The range of unit costs reported by Southern Water, under its application of the PR19 approach, implies an implausible range of efficiency differences between companies (in the terminology of efficiency ratios used elsewhere by Ofwat the range would be 25% to 220%). This is a strong indication that the measure of unit costs used for the adjustment does not compare costs between companies on a like-for-like basis and/or does not properly account for the relationship between the timing of new connections and the timing of when costs are incurred to accommodate those new connections.

There is an alternative approach to the calculation of the unit cost for the purposes of the adjustment which seems an improvement on that used in Southern Water's early cost adjustment claim (while recognising that any such unit cost metric will be an approximation that has limitations). This approach draws on logic similar to that from one of the methods for calculation of implicit allowances that Ofwat suggested in its PR24 final methodology, and can be broadly summarised as follows:

- Taking each company in turn, calculate (a) the modelled costs for that company over the last five years using Ofwat's triangulated suite of base cost models; and (b) a modelled cost figure for that company over the last five years based on the same set of econometric models but with growth-related and capital enhancement expenditure excluded from the scope of the dependent variable.
- For each company, calculate a unit cost as the value from (b) minus the value from (a), divided by the total number of new connections that the company would have had if it had experienced the industry average growth rate.

This approach produces a *modelled* unit cost per connection which is tailored to each company (e.g. reflecting the modelled impact of cost drivers such as density). If an upper quartile or other catch-up adjustment is needed this could be taken from that applied to base costs overall (or the adjustment for growth made before applying the catch-up adjustment).

This might be seen as a somewhat simplified approach to the unit cost calculation, which assumes that all "growth-related costs" are driven by the number of new connections. There may be scope to improve it by allowing for multiple drivers of the growth-related costs (e.g. some wastewater costs that Ofwat treats as growth-related may actually be climate driven).

Finally, there are also important interactions between this adjustment and the approach to uncertainty mechanisms and true-ups for growth. At PR19 both Ofwat and the CMA decided to apply two types of adjustment for growth-related costs as part of the price control framework for AMP7: (a) an ex ante adjustment based on forecast growth rates (which is the topic discussed above); and (b) an ex post adjustment based on outturn customer growth (the DSRA mechanism, which was refined in scope by the CMA). We consider that there should be coherence across these two types of adjustments for growth. For instance, we see no reason why the *unit cost* assumptions used for the ex ante adjustment should differ from those used for the ex post adjustment mechanism.

Average pumping head and booster pumping stations

Anglian Water, SES Water. and Severn Trent submitted early cost adjustment claims that concern the potential use of the average pumping head (for treated water distribution) and booster pumping station variables in Ofwat's base cost models.

We wanted to comment on one specific issue raised by these claims which concerns the role played by the booster pumping stations variable. Anglian Water and SES Water seem to treat the average pumping head variable as a superior replacement to the booster variable and seek an adjustment to give full effect to results from APH models (which would have the effect of nullifying the models with the booster pumping station variable). In contrast, Severn Trent seems to argue that the average pumping head and booster pumping stations play different roles and seeks an adjustment to allow for the effects of both.

Our view on this issue, which is more consistent with the position taken by Severn Trent, is that the booster pumping station variable may play two roles in the benchmarking models: it can reflect the impacts of topography (and vertical pumping requirements or lift), and it can reflect the impacts of density (over and above the density impacts that are captured by the more explicit density variables in the models).

1.2. Real Price Effects

Given the current volatility in the market, with unprecedented shocks to power, oil and hence chemical prices understanding how we expect these costs to evolve out to 2030 is key to understanding the true level of efficient costs.

At PR19, Ofwat provided an RPE allowance for labour costs only. However, we believe that Ofwat should take a different approach to RPEs at PR24 for two reasons.

1. **First, the recent rise in energy, chemical and material prices (relative to general inflation) caused by global events** – higher demand from the post-COVID era, and a restriction of supply linked to the war in Ukraine – mean that water companies currently experience materially higher energy costs (relative to general inflation) and as a result, also materially higher chemical and material costs. We have submitted a CAC to adjust our cost allowances accordingly (see CAC6). We forecast that the deviation between input costs and CPIH will continue persist over 2025-30, with input costs rising faster than CPIH in some cases, and CPIH rising faster than input costs in other cases (see below).

2. **Second, there is greater evidence of a possible future wedge between input prices and general inflation**, as set out in the table below. We have commissioned industry experts across multiple fields to consider what the likely level of input price increases we should expect over 2025-30. We engaged Cornwall Insight for power, Economic Insight for chemicals, and ChandlerKBS for plant and materials. These are all experts in their respective fields, and we attach the individual reports produced as annexes to this plan.

Table 4: Real Price Effects, Real change in input price

Input category	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Labour	-2.0%	-1.6%	-0.5%	0.0%	0.5%	0.0%	0.0%
Energy	-0.1%	-0.6%	10.3%	-2.8%	-8.4%	-4.4%	22.2%
Chemicals	-6.6%	-4.7%	1.9%	1.8%	1.7%	1.7%	1.7%
Materials, plant and equipment	-1.1%	1.4%	1.5%	1.5%	0.5%	0.2%	0.3%
Business Rates	-0.3%	4.1%	5.7%	35.7%	10.1%	8.1%	14.2%

We are not in support of true-up mechanisms for RPEs during PR24. Whilst the price hikes observed are largely beyond our control, we do not consider our customers should bear the uncertainties of this. Neither do we support the increased regulatory burden and complexity that true-up mechanisms provide. Analysis of the PR19 labour RPE reconciliation has demonstrated that in the short-to-medium term of PR19 and our forecasts of PR24 included in the table above, that movements relative to CPIH broadly net out. Instead, we consider the setting of ex-ante allowances to be a more appropriate way to set efficient and sufficient allowances for PR24.

In summary, customers are protected against variance in expenditure through the existing totex reconciliation and can further be protected by the appropriate use of forward looking RPEs. This strikes the correct balance of risk, still giving customers protection against price changes that are different to those expected whilst still retaining incentives for companies to manage their consumption and power and input purchasing strategies efficiently.

Labour

For wholesale and retail labour we have considered the analysis undertaken at PR19 and concluded that this does not create a material need for adjustment. For completeness and consistency our labour RPE assumptions in our business plan data tables are based on extrapolation of the PR19 labour RPE reconciliation.

Energy

As set out in the CAC Energy section, we consider a cost adjustment claim is needed to ‘re-set’ the baseline level of efficient expenditure for energy PR24; and given energy market forecasts suggest no return to the pre-2021/22 prices, that this be in conjunction to an ex-ante energy RPE allowance. We recognise there may be more appropriate methods within the developing and yet-to-developed aspects of the PR24 cost assessment framework and acknowledge the letter and additional data request to companies, since early submission of cost adjustment claims with this regard.

Forecast energy prices have been informed by a Water UK industry study with Cornwall Insight (June 2023) and Wessex specific management costs. We note the 22.2% RPE in 29-30 is consistent with the Cornwall Insight and is primarily driven by a forecast increase in wholesale energy prices.

In the short term we can and do hedge energy prices to secure the future unit cost of energy. The primary purpose of this is to provide price stability, not necessarily to out-perform the market. In the current climate of energy price hikes, market hedging cannot provide indefinite protection to the sharp rise in prices. Whilst we have used hedging to achieve a relatively good unit price for 22/23, this cannot be sustained and we are expected to experience the full impact and exposure in achieved prices in 23/24 and PR24 based on current information.

Chemicals and Materials, Plant and Equipment

Chemicals are a key input to our treatment processes and we rely on any array of materials, plant and equipment to maintain, invest and expand our network and assets. We have been experiencing above inflationary prices increases, linked in part to the essential utilisation of energy in chemical and material production processes, but also due to resource constraints linked to the production and transportation of chemicals and materials. War in Ukraine, raw material supply chain issues, plant shutdowns, COVID restrictions, weaker exchange rates and international sanctions are also contributing factors to the increasing market prices. Many chemical markets are seeing declining production coupled with increased demand, pushing prices up.

Our procurement practices are designed to mitigate to the extent possible our exposure to the price increases, but as with energy prices there is only so much that is within management control. To spread procurement risk, where possible we use more than one supplier (where more than one exists), we routinely explore alternative products / production methods (again where they exist), we seek to optimise treatment processes to minimise chemical inputs required, we invest in storage to help mitigate again supply shortage, and we engage early with suppliers on requirements.

Our forecast chemical prices have been informed by econometric analysis of key drivers of chemical cost movements, related to the mix of chemicals we use. This analysis has been undertaken by Economic Insight (August 2023) and their reported is an annex to our plan. Our forecast materials, plant and equipment prices have been informed by a review of relevant material, plant and equipment cost indices provided by ChandlerKBS (August 2023) and their reported is an annex to our plan.

Business rates

Business rates is another area where we are experiencing above inflationary pressures due to factors largely beyond our control.

Supply business rates are calculated using a tenants share approach and depend heavily on the expected RCV and WACC, both of which are increasing significantly from current levels.

Waste business rates are set with reference to the contractor’s test, and again will increase as more assets are created. In relation to existing assets, the Valuation Office Agency will be updating its cost guide prices in 2026 and 2029 as part of its triennial valuation cycle. We have already seen large increases at 2023 and further substantial increases are expected at each of these dates for all waste water assets.

We also expect further costs increases as a result of the Non-Domestic Rating Bill currently going through Parliament. Over 2025-30 this will increase our expected rates bill significantly over inflation.

Table 5: Real price effect - Wholesale business rates

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Real change in input price - business rates, water	-32.7%	0.0%	0.0%	36.5%	0.0%	0.0%	19.3%
Real change in input price - business rates, wastewater	22.6%	6.9%	9.7%	35.2%	17.7%	14.2%	10.2%

The Uniform Business Rate (UBR) revaluation on the supply side in 2026-27 and 2029-30, gives rise to the peaks in the profile observed.

1.3. Efficiency Challenges

With the unprecedented increases in costs we are seeing it is important that we continue to challenge our efficiencies over and above the dynamic efficiencies already embedded in our plan.

To this end we have included a 0.5% annual frontier shift efficiency challenge to all our costs. This is supported by expert analysis undertaken by Economic Insight; the full report is appended to this plan. We have taken the middle of the PR24 range recommended by Economic Insight.

When considering the frontier shift assumed it is important to understand its interaction with the service delivered. Historically, with the improvements seen from base expenditure we believe this has been obfuscated. We have been very clear in our plan where we are submitted expenditure required to improve service, separating this has enabled us to include this stretching efficiency target that is beyond what is being delivered in similar sectors across the UK.