Thames Water Utilities Limited

PR24 CMA Re-determination

Third Party Submission in Response to CMA PR24 Provisional Determinations

Submitted 11 November 2025

1 Introduction

(1) This submission sets out the response of Thames Water Utilities Limited ("**Thames Water**") to the CMA's provisional determinations ("**PD**") dated 9 October 2025 in relation to the PR24 price controls for the five companies (the "**Disputing Companies**"). We welcome the opportunity to comment on the PD.

(2) On 14 February 2025, Thames Water announced that it had asked Ofwat to refer its final determination ("**FD**") to the Competition and Markets Authority ("**CMA**") for a redetermination, after Thames Water's Board of Directors concluded that the FD does not appropriately support the investment and improvement that is required for Thames Water to deliver for its customers, communities and the environment. Following constructive discussions, Thames Water and Ofwat agreed on 18 March 2025 to defer making Thames Water's reference to the CMA for up to 18 weeks.[1] This deferral was subsequently extended on 18 July 2025[2] and on 21 October 2025.[3]

(3) Thames Water remains of the view that the FD is not in the interests of our customers or the environment. However, we believe that discussions together with Ofwat, other regulators and our senior creditors (the London and Valley Water Consortium) hold out the prospect of unlocking a market-led solution for the recapitalisation of the company to support the company's turnaround. This would be in the interests of all relevant stakeholders, including our customers, communities and the environment. Unless and until our FD is referred to the CMA by Ofwat, Thames Water remains a third party in relation to the redetermination process.

(4) We are grateful to Ofwat for accepting our request to defer our reference and to the CMA for its patience. We also recognise the robust and open process that the CMA has followed throughout the PR24 process and the opportunity that all stakeholders have had to contribute to the CMA's evidence base. We welcome the consideration that the CMA has given to Thames Water's submissions.

(5) This submission is intended to assist the CMA by providing Thames Water's perspective on matters which are relevant to the sector, and Thames Water specifically, in the PD. It is without prejudice to future submissions that Thames Water would make in a statement of case or thereafter should a reference to the CMA be made. For the avoidance of doubt, this submission does not purport to set out the issues, arguments and evidence that Thames Water would make in its statement of case if a referral of our FD is made.

(6) Thames Water welcomes the recognition by the CMA that the FD requires recalibration in fundamental respects. As highlighted in further detail in this submission, we believe that the CMA takes important steps in the right direction in several key areas of the redetermination – notably in relation to the level of frontier shift efficiency, the cost of equity and enhancement cost allowances.

(7) We have also identified where Thames Water has concerns with the PD – most acutely in relation to the PD's approach to base cost modelling. As explained further in Section 2 (and the independent expert reports provided by NERA and Professor Melvyn Weeks at Annexes 1 and 2 respectively), we consider that the application of the Least Absolute Shrinkage and

[1] Thames Water, CMA and Equity Raise Update (18 March 2025): https://www.thameswater.co.uk/news/2025/mar/equity-raise-update.

[2] Thames Water, CMA Reference Deferral Update (18 July 2025): https://www.thameswater.co.uk/news/2025/jul/cma-reference-deferral-update.

[3] Thames Water, CMA Reference Deferral Update (21 October 2025): https://www.thameswater.co.uk/news/2025/oct/thames-water-cma-deferral-october.

Selection Operator ("**LASSO**") technique in isolation is not fit for purpose, that the resulting base cost models lack robustness, and that the outcome of the base cost assessment is flawed and unsound. Indeed, it is striking that, in circumstances where the Independent Water Commission (the "**IWC**") has highlighted that an overemphasis on economic benchmarking without due consideration of company-specific factors has "*led to sub-optimal outcomes for the sector*",[4] the PD applies a more data-driven approach than Ofwat, reducing the level of economic and engineering judgement applied in the determination of base cost allowances.

(8) The remainder of this submission provides Thames Water's more detailed views on the CMA's PD, highlighting areas of disagreement with the PD. This submission is structured as follows:

(i) **Section 2** explains that Thames Water considers that the approach taken to base cost modelling in the PD is not fit for purpose. In addition, this Section sets out Thames Water's view on the PD's treatment of Real Price Effects ("**RPEs**"), frontier shift efficiency and mains renewal methodology. It also explains that we broadly welcome the approach taken by the CMA in assessing requests for increased enhancement allowances.

(ii) **Section 3** explains that whilst Thames Water welcomes the positive movement in relation to certain aspects of the outcomes framework, the CMA must reconsider its provisional view in relation to the Measures of Experience ("**MeXes**", each a "**MeX**"), where the level of revenue at risk is disproportionate and creates asymmetric downside risk.

(iii) **Section 4** on Price Control Deliverables ("**PCDs**") explains that we are in broad agreement with the CMA's concerns regarding PCDs and the provisional decision to await the outcome of Ofwat's recently concluded consultation on the PCD regime. However, we consider that the CMA should carefully consider the outcome of this consultation and should intervene to the extent that Ofwat's changes do not alleviate the concerns that have been raised by the CMA and the Disputing Companies.

(iv) **Section 5** on risk and return explains that, whilst Thames Water welcomes the CMA's upward adjustment to the allowed return on equity, further uplift is required to bring the cost of equity closer to market evidence on the returns investors require to invest significant amounts into the water sector. Thames Water disagrees with the PD's use of a forward-looking 2.4% Consumer Price Index Including Owner Occupiers' Housing Costs ("**CPIH**") inflation assumption for deflating the nominal cost of debt. Finally, we note that, should Thames Water's determination be referred to the CMA, the CMA would need to consider more fundamental recalibration of the balance of risk (including a consideration of the Aggregate Sharing Mechanism and Outturn Adjustment Mechanism) to reflect Thames Water's specific circumstances.

(v) **Annex 1** contains an independent review of LASSO Techniques for Econometric Benchmarking, prepared by NERA. **Annex 2** contains an independent response to the CMA's Provisional Determinations for Base Costs, prepared by Professor Melvyn Weeks of the University of Cambridge. **Annex 3** contains a spreadsheet model that calculates What Base Buys using the weighted average approach, including a validation of that approach.

[4] Independent Water Commission, Final Report (21 July 2025) ("**IWC Final Report**"), paragraph 417: https://assets.publishing.service.gov.uk/media/687dfcc4312ee8a5f0806be6/Independent_Water_Commission_-_Final_Report_-_21_July.pdf.

(9) Finally, as the CMA will be aware, Thames Water is experiencing well-publicised operational and financial challenges, and we are in the process of turning our business around. In this context, it is imperative that the CMA's consideration of the issues for the Disputing Companies does not prejudice or predetermine any redetermination by the CMA in relation to Thames Water. For example, the CMA's approach to the cost assessment in any future reference would necessarily need to account for Thames Water's specific circumstances and arguments. As has been explained in prior submissions, Thames Water is subject to region-specific challenges and costs by virtue of operating in London as recognised by the IWC,[5] which are not reflected in Ofwat's current approach.

(10) More generally, given the exceptional position of Thames Water, if our FD is referred, the CMA will also need to consider, consistent with its legal duties, whether more fundamental changes in regulatory approach are needed when regulating a company in financial and operational turnaround. We note that the PD refers to the "*confines of the existing regulatory framework*"[6] and refrains from making more fundamental changes in key aspects of the price control. For Thames Water, however, we believe that a more material step-change would be warranted, consistent with the evidence from the IWC Final Report which recommended a changed regulatory approach for water companies in turnaround.[7]

(11) We would be happy to provide more detailed observations on the issues set out in this submission, or to discuss these with the CMA, should this be of assistance to the CMA's process. In particular, as highlighted in our Third Party Submission in Response to Disputing Companies' Statements of Case dated 22 April 2025 ("**April 2025 Third Party Submission**"), we would be happy to provide our detailed observations on the approach to base cost modelling.[8]

2 Thames Water's submissions on the PD in relation to total expenditure

2.1 The base cost modelling approach is flawed

2.1.1 Approach in the PD

(12) The CMA has provisionally decided to assess these matters by reference to the LASSO algorithm, a machine-learning technique for the selection of explanatory variables in an econometric model based on their contribution to model prediction. In addition, the CMA has provisionally decided to select models based on a single criterion – the lowest root mean square error ("**RMSE**") – and in doing so, removed any model triangulation from the process of determining efficient base costs. To the best of our knowledge, the LASSO has not been used before in any regulatory setting or a similar real-life context.

(13) We set out our concerns with the use of LASSO in our response of 11 June 2025 to the CMA's PR24 Approach and Prioritisation document dated 28 May 2025 ("**June 2025 Third Party Submission**").[9] We note that both Ofwat and other Disputing Companies urged that

[5] Ibid, page 200, box 25.

[6] CMA, Water PR24 References, Provisional Determinations Volume 1: Introduction, Background, Approach and prioritisation, Base costs – Chapters 1–4 (9 October 2025) ("**CMA PD, Volume 1**"),paragraph 2.6: https://assets.publishing.service.gov.uk/media/68e7c0d8cf65bd04bad766ef/PR24_PD_vol_1.pdf.

[7] IWC Final Report, paragraphs 788 – 792.

[8] April 2025 Third Party Submission, paragraph 20: https://assets.publishing.service.gov.uk/media/68131d2f0a8696a367e727df/Thames_Water.pdf.

[9] June 2025 Third Party Submission, paragraphs 18 – 27: https://assets.publishing.service.gov.uk/media/684ff3399d538361ad2da716/Thames_Water_Response_to_Approach_and_prioritisation.pdf.

the LASSO approach should be used with caution to ensure that the resulting models uphold economic and engineering rationale and have statistical validity.

2.1.2 Thames Water's response to the PD

(14) Thames Water has significant concerns regarding the PD's approach to econometric modelling for base cost expenditure. We do not consider that the LASSO approach or the proposed models are fit for purpose in the present price control context. This Section will demonstrate that:

(i) The econometric models produced using the LASSO technique exhibit numerous and material failings, including:

(a) Model specifications and parameterisation which are unintuitive, uninterpretable, and which fail model specification tests. For example, different measures of density are included within the same econometric model with different signs applied.

(b) Sensitivity of the variables selected to assumptions regarding the penalty parameter, the number of 'folds' and even to the random seed required for the cross-validation procedure. This sensitivity is driven by the small sample size and presence of highly correlated variables. Further, the proposed models are sensitive to slight perturbations of input data, where small changes in the input data can result in coefficients becoming counter-intuitive, with a potentially material impact on allowances. Having econometric models which are highly dependent on assumptions and inputs which are intended to be random cannot be acceptable.

(ii) These failings are the result of having applied a specific, data-driven approach in a small-sample setting without having then applied economic/engineering evaluation of the outputs. The model variables should have been subject to *pre-selection*, and the models should have been subject to an *ex-post* evaluation.

(iii) The impact of these failings is exacerbated by the lack of triangulation, due to the strict reliance on a single statistic to select the models. All models have errors - model triangulation mitigates the risk of a large error for any given company, which is particularly important in price controls, where allowances have to be appropriate for all companies, not just 'on average'.

(iv) The PD's application of the LASSO technique diverges radically from the CMA's previous determinations at PR14 and PR19, where reasoned economic judgement and engineering rationale was applied, and due weight was given to company-specific adjustments.[10]

(15) Our conclusions in this regard are supported by independent expert reports provided by NERA and Professor Melvyn Weeks at **Annex 1** and **Annex 2** respectively. Specifically,

(i) NERA concludes that:

[10] CMA, Bristol Water plc - A reference under section 12(3)(a) of the Water Industry Act 1991, Report (6 October 2015), paragraph 4.52: "*We decided that we should not treat the complexity of Ofwat's models as a problem in itself. It is good practice to guard against unnecessary complexity in price control reviews, but there will be circumstances in which relatively complex models and methods are appropriate*" and Summary section, paragraph 26: "*we recognised that these alternative econometric benchmarking models were not perfect and there remained a need to consider potential company-specific adjustments for factors that may not be adequately captured in the models*": https://assets.publishing.service.gov.uk/media/56279924ed915d194b000001/Bristol_Water_plc_final_determination.pdf.

(a) The CMA's approach is inconsistent with regulatory precedent, as it relies very heavily on individual cost models rather than accounting for the limitations of individual models by relying on several models.

(b) The LASSO approach achieves "*false precision*".[11] The CMA's modelling implicitly assumes that all variation in the residuals is reflective of companies' relative efficiency. However, the approach is designed to restrict the number of explanatory variables retained in the cost models; the exclusion of variables does not prove that they do not explain companies' costs to some degree.

(c) The selection of the 'penalty' parameter is very important in the LASSO approach, but this is a subjective exercise. The CMA's choices in this regard are not justified based on an assessment of the data structure at hand.

(d) The CMA's cost models include some features which are inconsistent with economic intuition, including several features which we discuss in this submission.

(e) The CMA did not acknowledge the limitations of the LASSO approach and make sufficient provision for model checks and tests accordingly.

(ii) Professor Melvyn Weeks reviews the application of LASSO in the CMA's provisional determinations. He challenges, as we do, the lack of model evaluation, robustness checks, and the misalignment of the proposed models with economic and engineering rationale. In addition, he emphasises that the LASSO does not remove the need for subjective judgement but instead relocates it to the judgement-based decisions regarding the calibration of hyper-sensitive parameters, such as the penalty parameter, lambda. He further notes that the use of automated methods "*fundamentally alters the nature of regulatory engagement*"[12] and that it "*fundamentally undermines the democratic engagement that effective regulation requires, replacing economic reasoning with algorithmic artifacts that resist contestation through the kinds of evidence that stakeholders can meaningfully evaluate*."[13] Professor Weeks concludes: "*While regularisation methods like Lasso, Ridge and Elastic Net represent potentially valuable tools, considerable effort is required to understand their properties within the broader regulatory framework, particularly given the small sample size. Considering the limited timescale of this redetermination, there is merit to remain with a multiple model approach based on explicit criteria, combined with diagnostic testing, as opposed to the use of a single-model framework with greater vulnerability to specification error*."[14]

(16) Significantly, data presented in the PD[15] indicates that the proposed models, were they applied to all companies, would make aggregate modelled base cost allowances across the industry 3.8%[16] less than Ofwat determined in the FD and that, were the models applied to

[11] Annex 1, page 1.

[12] Annex 2, page 15.

[13] Ibid.

[14] Ibid.

[15] CMA, Water PR24 References, Provisional Determinations Volume 5: Appendices A–F and Glossary (9 October 2025) ("**CMA PD, Volume 5**"), Table D.5: https://assets.publishing.service.gov.uk/media/68e7c17cb6ae95e3c76907c6/PR24_PD_vol_5_-_appendices_and_glossary.pdf.

[16] We note that we understand Table D.5 to be in error, and that the true industry-wide reduction in modelled base cost is 4.8%.

some companies individually, the results would be even more extreme. For Thames Water, for example, the PD indicates that the models would make allowances of £750 million[17] (8.5%) less than Ofwat's models and for some companies the reduction is greater still (South Staffordshire at 20.8%). These results are also counterintuitive when considering the widespread recognition that industry-wide investment is needed.

(17) Further to the above, our analysis shows that if the proposed LASSO approach were used to set the cost allowances at PR19, the sector would have received 17% and 15% less than outturn costs in water and wastewater during 2020-25, respectively. This is lower than the PR19 allowance, which itself significantly underestimated the required funding in the asset management plan period ("**AMP**") between 2020 and 2025 ("**AMP7**"). This provides further evidence that the LASSO approach can yield a non-credible outcome for the sector.

(18) The PD's approach to cost modelling also stands in stark contrast to the findings of the IWC that: "*Ofwat has relied too heavily on a data-driven, econometric approach, and has not taken sufficient account of company-specific conditions and challenges*" and *"econometric benchmarked outputs [should be] balanced with company-specific and expert supervisory judgement*."[18] The PD acknowledges the IWC's critique, but concludes that it is: "*not feasible for us to develop such a supervisory approach in the context of these redeterminations*" and states that it has simplified Ofwat's models.[19] However, the approach applied by the CMA is more data-driven than Ofwat's existing approach, placing almost complete reliance on the outputs of an algorithm to determine companies' allowances and reducing the scope for company-specific evidence and engineering insight. While the CMA notes that it cannot develop a more supervisory approach in the time available, we do not agree that adopting an approach which moves in the opposite direction from the IWC's recommendations is an appropriate and sound strategy.

(19) Predictability and regulatory consistency are of pivotal importance for investor confidence in a sector requiring substantial long-term investment. The use of LASSO represents a fundamental departure from Ofwat's FD which was not advocated for by any party to the redeterminations. To the best of our knowledge, this is not an approach that has been used in cost benchmarking by any UK regulator in the utilities space.

(20) In undertaking its redetermination, the CMA must have regard to principles of best regulatory practice, including the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed.[20] The Better Regulation Framework Guidance further emphasises the importance of proportionality and "*recognising what works*",[21] while the National Audit Office's Principles of Effective Regulation recommend transparent public consultation on major initiatives or proposed regulatory changes.[22]

(21) Thames Water does not consider that such a radical change to the approach to base cost modelling is credible, warranted or commensurate with principles of proportionality and best regulatory practice. Such radical change should at least have been the subject of more

[17] We understand this to be an error, with the actual reduction being £860 million, or 9.6%.

[18] IWC Final Report, paragraph 417 and 422 respectively.

[19] CMA PD, Volume 1, paragraph 4.42.

[20] Water Industry Act 1991, Part I, section 2(4).

[21] Department for Business & Trade, Better Regulation Framework Guidance (September 2023), paragraph 1.2: https://assets.publishing.service.gov.uk/media/67587ba55a2e4d4b993bfa83/better-regulation-framework-guidance-2023.pdf.

[22] National Audit Office, Good practice guidance: Principles of effective regulation (May 2021), page 22: https://www.nao.org.uk/wp-content/uploads/2021/05/Principles-of-effective-regulation-SOff-interactive-accessible.pdf.

thorough consultation prior to the PD, and it is notable that such a substantially altered approach was not to our knowledge accompanied by any working papers prior to the PD.

(22) Thames Water supports the application of econometric modelling in determining base cost allowances, though we consider that models should be used alongside sensible regulatory judgement to weigh up other evidence in the round (including company-specific evidence). As such, we consider that the CMA should revisit the PD's approach to determining base cost allowances. We do not believe that the PD adequately articulates why such a fundamental redesign of the base cost models is required or proportionate in the circumstances. Ofwat's basic approach to base cost modelling has been subject to detailed industry-wide consultation and is well understood by stakeholders. Conversely, the revisions to the base cost models proposed in the PD have not been subject to industry consultation or options analysis, and the modelling decisions are not adequately explained.

(23) Given the serious concerns identified in relation to the PD's base cost models, we recommend that:

(i) The CMA should return to a more conventional regulatory approach, amending the specification of Ofwat's models according to the CMA's consideration of the merits of the arguments presented by the Disputing Companies and third parties; and

(ii) For any base cost modelling framework the CMA chooses to implement, it should ensure a robust process of model selection and validation. This should include thorough pre-selection assessment of potential explanatory factors, a robust *ex-post* evaluation of the models, including diagnostic and sensitivity testing, and ensuring that the selected models exhibit robust economic and engineering rationale; and

(iii) The CMA should apply more thorough consideration of cost adjustments which should be applied to companies' base cost allowances, to account for company-specific factors. This would be consistent with the recommendations of the IWC, even if the CMA is unable to develop a full supervisory approach in the time available.

(24) We strongly recommend that in any case the CMA undertakes further consultation on the base cost modelling approach prior to its final determination.

(25) The remainder of this Section discusses specific shortcomings of the PD's base cost models and the changes that we consider necessary in further detail. We believe that, as a minimum, there should be another opportunity for third parties to comment on the updated base models (such as in response to working papers) prior to the CMA's final determination.

2.1.3 The exclusive use of LASSO to select models and set base allowances is inappropriate and disregards the role of expert judgement and assurance

(26) Rather than considering the merits of the arguments made by Disputing Companies regarding base cost modelling (as per the CMA's approach at PR14 and PR19), the PD has applied the LASSO algorithm with minimal oversight to provisionally determine modelled base cost allowances. This approach, in effect, delegates the modelled base cost determination to the LASSO algorithm in full without the application of expert judgement or intervention and without sufficient quality assurance of its outcome.

(27) The LASSO algorithm, if retained in the final determinations, must form part of a broader process. This process should include, at a minimum, a pre-selection stage and a post-selection evaluation on both sides of the application of the LASSO algorithm. It does not appear that there was a process of pre-selection nor any meaningful post-selection evaluation as part of the PD.

(28) The CMA must also give due consideration and a proper assessment of cost adjustment claims. In a small sample, not everything can be captured by the model. There may be cost factors that are not sufficiently material at the sector level to be picked up by the model, but which are material for some companies. These cost factors, often reflecting company specific circumstances, should be assessed carefully outside of the model.

(29) In addition, there was no consideration of the appropriate estimation approach given the panel structure of the data. There was no application of a panel data method, such as the random effects, either as part of the LASSO algorithm, or in the estimation of models post the LASSO selection process (this is notable given the Breusch-Pagan test favours a random effects estimation over Ordinary Least Squares for the two water models). The CMA also did not recognise that there is a case for using clustered standard error given the clustered data.

(30) At PR14 and PR19, the CMA scrutinised Ofwat's models and its own proposed models in a way that is not replicated in the PD's approach. It made reasoned economic arguments for its decisions on base cost models. These were generally held in high regard by the sector and made an impact on future price controls.

(31) For example, at the PR14 redetermination, the CMA emphasised the lack of economic rationale in Ofwat's 'complex' models. In the CMA's final report, it stated:

"*However, we considered that Ofwat's approach was deficient in the following way. Having decided to use complex models that it had recognised were difficult to interpret, Ofwat did not then undertake a further step to present the results and implications of its models in a more understandable and intuitive way. Doing so seems important for two reasons:*

(i) It might reveal aspects of the models that do not make sense (or at least require further investigation or explanation) which would otherwise be obscured by the complexity of the models.

(ii) It would make it easier for water companies and other stakeholders to understand the models and to see the extent to which the estimated expenditure for a particular company reflects adjustments for various explanatory factors and cost drivers. This is important in a context where econometric models are to be used as a starting point for cost assessment, and therefore have a major bearing on the determinations of wholesale price controls. It is also important where special cost factor adjustments are to be used to allow for factors that may not be captured sufficiently by these models."[23]

(32) The case for post-selection assessment is particularly pertinent where there are significant deviations between new models (in this case, as proposed by the CMA, using LASSO) and existing models (in this case, used by Ofwat), where the existing models – although imperfect – had the virtue of being developed through extensive and successive consultations, and drawing on expertise in the sector. In such a case, consistent with principles of regulatory best practice, the PD should have provided a robust economic rationale to justify its proposed significant deviations from the previous models.

(33) As part of post-selection assessment, the CMA should consider the following factors:

[23] CMA, Bristol Water plc - A reference under section 12(3)(a) of the Water Industry Act 1991, Report (6 October 2015), paragraph 4.53: https://assets.publishing.service.gov.uk/media/56279924ed915d194b000001/Bristol_Water_plc_final_determination.pdf.

(i) Using a suite of models in triangulation to reduce the likelihood of a large error for any one company

(34) Regulators such as Ofwat and Ofgem use model averaging (i.e., triangulation). Model averaging is a regularisation technique used where there is uncertainty over model specification, or to avoid overfitting in small samples (as exhibited in this circumstance). It is a widely used technique and there is substantial evidence that model averaging can improve predictive performance compared to selecting a single 'best' model.

(35) While Thames Water does not agree with all the models triangulated by Ofwat in the FD (we think that some variables should have been rejected as part of a pre-selection, which would have resulted in fewer models triangulated) we generally support the principle of a balanced triangulation.

(36) It is important to recognise that all models have errors. Therefore, relying on a single model is a risk, particularly in price controls, where the models must work well for all companies (in contrast to traditional econometric applications focused on causal inference or prediction). Triangulation reduces the likelihood of material harm to any single company, which could result from relying on a single erroneous result.

(37) We note that the CMA considered Ofwat's triangulation to involve random weighting of models. While there is an element of randomness in assigning weights, they are based on judgement. The regulator tends to start with an assumption of equal weights across various competing models (which is the common assumption for model averaging elsewhere) and deviates from equal weighting upon convincing evidence.[24] In this context, we consider that the CMA has made stronger 'arbitrary' assumptions regarding model weights: it assigned 100% weight to the model with the lowest RMSE and 0% weight to competing models.

(ii) Considering a range of statistics as part of model selection, including goodness of fit, specification tests, multicollinearity indicators, and sensitivity assessment

(38) To evaluate model performance, Ofwat's model selection guidance lists several statistical tests and diagnostics to be considered.[25]

(39) The CMA did not subject its models to statistical tests. A useful test is the RESET test for model functional form misspecification. Two out of the PD's three models fail this test, suggesting a misspecification. This would have been apparent if there was an *ex-post* model evaluation process.

(40) The fact that the CMA did not subject its models to the RESET test is inconsistent with other areas of the PD. For example, the CMA correctly considered this test to be informative in rejecting Ofwat's phosphorous removal models, which fail the RESET test.

(41) Ofwat also subjects its models to multicollinearity and sensitivity assessments. A multicollinearity assessment reveals extreme multicollinearity concerns in the PD models (discussed further below). The Ofwat sensitivity assessment assesses the impact of various data perturbations on the models, rating each response as green, amber or red. None of the PR24 FD models has a rating of red, yet the two water models at the PD have a red rating, suggesting an unstable coefficient that swaps sign when the data is being perturbed. Specifically, removing the least efficient company from the water resources plus model leads to a sign swap of the property density variable, and removing the most efficient company

[24] For example, at PR19 Ofwat decided to put 75% on the top-down retail model and 25% on the bottom-up models due to considerations regarding the strength of their diagnostics.

[25] CMA PD, Volume 1, paragraphs 4.50-4.55.

from the treated water distribution model leads to a sign swap of the squared term of property density.

(42) While the tests and diagnostics above are not determinative, they provide a reasonable, stable and well understood framework for model selection. In contrast, putting all weight on a single statistic (the RMSE) and relying on a single benchmarking model does not do that, and it diverges further from the recommendations of the IWC to reduce reliance on benchmarking.[26]

2.1.4 The proposal lacks pre-selection and therefore does not include consideration of evidence that has been provided in relation to variables

(43) In the PD base cost modelling, the CMA does not carry out a pre-selection process (except for the regional wage index, where it assesses which index it considers to be most appropriate for the water sector). Instead, it makes the high-level assertion that "*All the potential variables have economic and engineering rationale*".[27] To justify the use of LASSO to resolve the disputes amongst cost drivers, it further argues that "*the disputes revolve around the magnitude of their effect and whether adding or subtracting given variables improve the models' predictions*".[28]

(44) A pre-selection process guards against variables entering models based on spurious correlations rather than genuine causal relationships.

(45) While at a high level all potential variables have some economic or engineering rationale, there are other attributes that must be considered. For example, a variable that is sufficiently under management control would generally be rejected. A variable of low reporting quality may also be rejected. These attributes should properly be considered as part of a pre-selection process. *Prima facie*, it does not appear that the PD approach considered factors such as these when determining the set of variables which the LASSO algorithm could select from.

(46) Further, the pre-selection process should include consideration of evidence provided by the Disputing Companies (and third parties), which may lead to the rejection of a variable at the outset. For example, some companies (such as Anglian Water)[29] provided qualitative and quantitative evidence to suggest that the "*simple average*" measure of density is clearly inferior to the weighted measures (e.g., as the "*simple average*" measure does not reflect 'pockets' of highly dense areas) and should be excluded from the models. This dispute is not, as the PD states, about the magnitude of the effect of the variables, or about their predictive qualities. It is more fundamental - concerning the quality and characteristics of the different measures.

(47) There is no evidence of a pre-selection process in the PD's approach to base cost models. All variables in Ofwat's models and those proposed by the Disputing Companies were added to the set of possible cost drivers, and the LASSO proceeded to make a selection based on algorithmic criteria over engineering fundamentals.

2.1.5 The proposed cost models are unintuitive and lack *ex-post* evaluation

[26] IWC Final Report, paragraphs 387 – 389.

[27] CMA PD, Volume 1, paragraph 4.37.

[28] Ibid.

[29] CMA Water PR24 References, Provisional Determinations Volume 3: Outcomes – Chapter 6 (9 October 2025) ("**CMA PD, Volume 3**"), paragraph 6.181: https://assets.publishing.service.gov.uk/media/68e7c1121c8b2a3b506907db/PR24_PD_vol_3_-_chapter_6.pdf.

(48) The PD's cost models exhibit many peculiarities, and they are unintuitive on many levels, which undermines the assertion that they are transparent. There is a notable lack of explanation regarding the rationale of the proposed models, including the selected variables, functional form and estimated coefficients.[30]

(49) This approach yields proposed models that lack transparency, reliability and interpretability, and provide a poor baseline for the determination of base allowances for water companies.

(50) In particular, the proposed models contain:

(i) Unintuitive interaction terms

(51) The three models proposed by the CMA include an energy index interacted with the length of mains (in water) or with pumping capacity (in wastewater). One of the water models also includes a wage index interacted with the length of mains.

(52) It is unclear why the PD included the energy and wage indices as interaction terms and why a standalone index is not included in the model (it is unclear if the CMA asked LASSO to test the stand-alone indices).

(53) The PD provides a short explanation for the interaction terms in paragraph 4.52: "*the effect of changes in wages or energy prices on companies' expenditure depends on the size of their businesses and their requirements for labour and energy*".[31]

(54) It is true that *if* the effect of changes in wages or energy prices on companies' expenditure depends on the size of their businesses, an interaction term with scale would be appropriate (in addition to a stand-alone term for wages and energy, as in standard functional forms). However, the explanation in the PD (above) is insufficient – it is, in fact, just a statement. More depth in explaining why the interaction term is appropriate is required, including a description of the evidence or intuition this is based on.

(55) The interpretation of the positive interaction term in this case is that a given % increase in wages (or energy prices) would have a higher percentage impact on large businesses than on small businesses. However, the PD does not demonstrate that the CMA has considered evidence or insight which leads it to believe that this is the case (e.g., the PD has not presented data which would indicate that large companies are more labour intensive than small companies).

(ii) Multiplicity of population density variables in a single model, with counter-intuitive signs, and the inclusion of quadratic density terms without their corresponding linear terms

Multicollinearity

(56) The proposed models include multiple highly correlated measures of density in the same model. For example, the water resources plus model includes two measures of density (one with a negative coefficient and one with a positive coefficient), and the wastewater model includes all three measures (also with alternating signs).

(57) The presence of highly correlated variables in a model creates high multicollinearity. As a result, coefficients become unstable, and their variance is inflated. This can cause several issues that affect the reliability and interpretability of the model.

[30] In this section we refer to the post-LASSO models as presented in the PDs. We are aware that there may have been an error in the R-code (specifically, in the calculation of lambda.1se) which could lead to revised models once corrected. The challenges we raise in this section would extend to any revised models to the extent that they exh bit similar issues.

[31] CMA PD, Volume 1, paragraph 4.52.

(58) The presence of multiple measures of density in the same model, and of the two energy variables in the same model (that is, average pumping head and booster pumping stations per length) also means that the LASSO did not achieve the PD's intended aim of settling the disputes brought in front of it. Rather than settling the dispute by selecting the 'appropriate' variable, the LASSO kept all of them.

(59) A pre-selection stage of removing unsuitable measures could have avoided the problem of multicollinearity, and/or different measures could have been used individually and model triangulation applied.

(60) *Ex-post* model evaluation could have detected these issues, for example, through an examination of the variance inflation factor ("**VIF**"), a metric included in Ofwat's model evaluation guidance. The VIF for the proposed models is far above the acceptable range.

Presence of quadratic terms without their corresponding linear terms

(61) The water models include squared density terms without their corresponding linear terms. For example, the Middle-layer Super Output Area ("**MSOA**") weighted density appears in both models only as a quadratic variable.

(62) Including the quadratic terms without the linear term is not best practice.[32] It requires strong theoretical or empirical justification, which the PD did not provide.

(63) Table 1 summarises the inclusion of density measures in the CMA's proposed models.

Table 1: The density variables in the CMA's three PD models

	WRP	TWD	Wastewater NP
Property density	+	Dropped	+
LAD density	-	-	+
MSOA density	Dropped	Dropped	-
Property density ^2	-	+	Squared terms not considered
LAD density ^2	Dropped	+	
MSOA density ^2	+	+	

(64) The PD argues that this result is "*consistent with the view that the impact of density on costs is unclear*".[33]

(65) We disagree that the impact of density on cost is unclear. This explanation is indicative of over-reliance on the output of LASSO. It is important to weigh up the economic evidence.

(66) We generally expect density to have a non-linear, U-shaped relationship with costs: there are usually large economies of density in areas where density is low, such that additional density reduces costs. As density increases, economies of density become less material, and the 'clutter effect' (i.e., the high cost of working in highly dense areas due to road, noise, traffic and other restrictions and impediments) becomes more material, such that additional density increases costs. This relationship is evident in Ofwat's models. It is also discussed

[32] Wooldridge (2013), Introductory Econometrics: A Modern Approach, 5th ed., page 227: "*If we include x2 in the model, we almost always include x, even if it turns out to be statistically significant, because omitting it imposes the restriction that the marginal effect of x is zero at x=0*"; Fox (2016), Applied Regression Analysis and Generalized Linear Models, 3rd ed., page 144: "*Polynomial terms should generally be included hierarchically; if a quadratic term is in the model, the linear term should also be retained, regardless of significance*".

[33] CMA PD, Volume 5, Appendix D, paragraph D.17.

in the Thames Water Investor Group's[34] response to Disputing Companies' statements of case dated April 2025, where the annexed George Yarrow report explains this in the following manner: "*If, say, densities are generally increasing, the implications of a U-shaped relationship are that lower-density areas will enjoy decreasing average costs whilst, at the same time, very high density areas are experiencing increasing average costs*".[35]

(iii) Counter-intuitive signs

(67) The CMA's proposed models include the 'Average volume per WTW' variable. The variable was put forward by Disputing Companies as a measure to capture economies of scale in water treatment – the more volume treated by each WTW (on average), the lower the unit cost of treatment. Given that the model already controls for companies' scale, we expect the coefficient of this variable to be negative, consistent with the economic rationale of economies of scale.

(68) However, the coefficient of the variable is positive in the PD models. This is counterintuitive. A model should not have variables with counterintuitive coefficients, particularly a price control model based on a small sample, where allowances must be correct for all companies.

(69) We note that a similar variable is included in the wastewater model (Weighted average treatment size) with a negative coefficient, in line with *a priori* expectations.

(70) We do not suggest that removing the variable from the set of variables assessed by LASSO and re-running the LASSO without it would be an acceptable solution. In our regulatory context, where the sample is small and allowances must be appropriate for all companies (not just on average), the models cannot be the only indicator of whether a specific variable should or should not have a role in setting cost allowances.

2.1.6 As a result, the models lack transparency

(71) The PD states that "*the models that result from this approach are considerably simpler (and therefore more transparent) than the suite of models used by Ofwat in its PR24 FD*".[36]

(72) This statement implies that the only criterion for simplicity considered is the number of models. The PD concludes that the models are simpler and more transparent because they have just one model for wastewater and one for each sub-service in water, rather than multiple models.

(73) However, we consider that fewer models cannot be equated with simplicity or transparency.

(74) The PD's base cost models are not transparent. As discussed above, their functional form is unintuitive, with variables and coefficients that are difficult to explain or interpret.

(75) While we do not agree with the precise specifications of Ofwat's FD24 models, they are based on intuitive, well-understood assumptions about the relationship between explanatory factors and base costs. This makes them more transparent, and easy to interpret and evaluate. The fact that there are multiple models, each with a different measure of certain cost drivers (such as different measures of density), does not make it less simple or transparent.

[34] The Investor Group is an ad-hoc group of over 100 financial institutions that are creditors of Thames Water.

[35] Annex 3 to the Submissions of the Thames Water Investor Group on the issues raised in the five Ofwat references (April 2025), which is a report by Professor George Yarrow, Regulatory Policy Institute, paragraph 73: https://assets.publishing.service.gov.uk/media/68131a2296fbee80400085f5/Investors_in_Thames_Water.pdf.

[36] CMA PD, Volume 1, paragraph 4.57.

2.1.7 The LASSO model selection is sensitive to assumptions

(76) The LASSO results are sensitive to arbitrary/non-trivial assumptions used as part of running the algorithm. They are also sensitive to slight perturbations of input data.

(77) Replicating the PD's LASSO results has proved challenging. After repeated attempts at replicating the outputs of PD models using the LASSO, we consider that there may be an error in the CMA's R-code.[37] The analysis below, on the sensitivity of LASSO to internal parameters and input data, is based on a STATA code where lambda.1se is correctly calculated.

(78) At any rate, to replicate LASSO models, one must use specific parameter choices in order for the LASSO algorithm to reproduce the same results in every run. Principally, one must use the same approach as the CMA for selecting the penalty parameter. We also found that changes in less prominent parameters, such as the number of 'folds', and even the random seed, can lead to different models.

(79) For example, to select the penalty parameter using the cross-validation approach, LASSO splits the data into k-folds to train and test the data and then select models. There is no single best approach to selecting k (the number of folds). Often, k=10 is the default, although a smaller number of folds is commonly used. For the wastewater network plus model, the CMA chose k=10. Our analysis shows that when using k=4 instead, a new variable is selected, namely sewer length.

(80) To split the data into folds, statistical modelling packages generate a 'seed' (a random number). Different seeds will result in different data content in each fold. In order to fully reproduce a set of results, a fixed seed is used: by specifying a fixed seed, we can ensure that we get exactly the same folds and therefore exactly the same results in every run. Typically, however, we should not expect the choice of seed to have a significant impact on the selected model, but with a small sample and highly correlated variables the choice of this parameter can have an impact.

(81) In the wastewater network plus model, the CMA fixed the seed at 123. Our analysis shows that, when the seed is changed to 12345, one of the density variables is deselected and the average volume of water per site is selected again. This example is not an exception. In the testing we have done, most times when we changed the random seed, we obtained different models via the LASSO.

(82) For each of these choices, there is no trivial 'best practice' approach. In the case of the seed parameter, the choice is intended to be entirely random.

(83) In addition to being sensitive to algorithmic choices, we found LASSO to be sensitive to slight perturbations of the data, such as the removal of the first or last year of the data, the removal of the least efficient or most efficient company, or expanding the initial set of predictors with those that had been proposed by other companies at PR24.

(84) The above shows very clearly that, in this application, the LASSO algorithm is sensitive to somewhat arbitrary choices of internal parameters and to small perturbations of the data. The fact that it is difficult to reproduce the LASSO results underlines the fact that it is not suitable for application in this regulatory context, where decisions should be subject to a consultation process and stakeholder engagement. The sensitivity of results to arbitrary choices is an even greater concern given the importance of these models in determining the

[37] Specifically, in the calculation of lambda.1se, which is the choice for the penalty parameter.

efficient and appropriate base allowance for water companies and in ensuring appropriate bill levels for customers.

2.1.8 Recommended Changes

(85) As set out in the preceding sections, Thames Water has significant concerns regarding the PD's approach to econometric modelling for base cost expenditure. We do not consider that the LASSO approach or the proposed models are fit for purpose in the present price control context.

(86) Given the serious concerns identified in relation to the PD's base cost models, we recommend that:

(i) The CMA should return to a more conventional regulatory approach, amending the specification of Ofwat's models according to the CMA's consideration of the merits of the arguments presented by the Disputing Companies and third parties; and

(ii) For any base cost modelling framework the CMA chooses to implement, it should ensure a robust process of model selection and validation. This should include thorough pre-selection assessment of potential explanatory factors, a robust *ex-post* evaluation of the models, including diagnostic and sensitivity testing, and ensuring that the selected models exhibit robust economic and engineering rationale; and

(iii) The CMA should apply more thorough consideration of cost adjustments which should be applied to companies' base cost allowances, to account for company-specific factors. This would be consistent with the recommendations of the IWC, even if the CMA is unable to develop a full supervisory approach in the time available.

(87) We strongly recommend that the CMA in any case undertakes further consultation on the base cost modelling approach prior to its final determination.

2.2 Mains renewal methodology

2.2.1 Approach in the PD

(88) The PD contains several notable determinations with regard to mains renewal. These are discussed in turn below.

(89) **What base buys** ("**WBB**"): the CMA has provisionally determined that base buys an annual renewal rate of 0.3% of a company's water mains. To reach this position, the CMA has determined that:

(i) It is appropriate to use the full historical dataset (2011/12 to 2024/25), not just the last five years.

(ii) It is not appropriate to consider the downward trend in mains renewals over time to project WBB in the AMP between 2025 and 2030 ("**AMP8**").

(iii) The statistical approach for calculating WBB is based on first calculating the 'within company mean' and then the 'between company median'.

(90) **Under-delivery adjustments**: the CMA has provisionally determined not to apply an 'under-delivery' adjustment in this circumstance.

(91) **Unit rates**: the CMA has allowed a slightly higher unit rate for South East Water and Southern Water due to evidence of higher wages in the South East of England.

(92) **PCDs**: in relation to the request that PCDs be applied to the 'base uplift' element of mains renewal only, the CMA has provisionally determined that PCDs should continue to be applied to all mains renewals.

(93) **Condition grade requirement**: in response to the request that the 'condition grade' requirement be removed from the asset health adjustment element of mains renewal PCDs, the CMA has provisionally determined that the 'condition grade' requirement should be maintained.

2.2.2 Thames Water's response to the PD

(94) We disagree with the PD's approach to estimating WBB for mains renewal:

(i) When estimating WBB using renewal rates, the appropriate statistical approach is the weighted average. We provide an example to demonstrate this below.

(ii) There is a clear case for putting more (if not all) weight on the last five years of data, as these years have significantly more influence on final allowances than older years in the sample period, through their role in determining the catch-up challenge.

(iii) The consistent fall in replacement rates over the years should be taken into account. It evidences what current levels of base allowance enable companies to buy. Disregarding it is inconsistent with the approach to setting certain performance commitment levels ("**PCLs**"), where targets are based on what appears to be possible given the trend and levels in recent years only.

The CMA's statistical approach

(95) Some Disputing Companies suggested using a weighted average approach when determining WBB, as Thames Water advocated in response to Ofwat's draft determinations.[38] In response, the CMA states that: "*using a weighted mean could allow the performance of one or two larger companies to distort the estimates if they are particularly good or particularly poor performers*"[39] and is therefore inappropriate in this case.

(96) We consider that using the median places too much weight on smaller companies (i.e., using this approach brings in a different distortion), whereas using a weighted average is the correct approach as explained below.

(97) Table 2 provides an illustrative example using five companies of varying network lengths, from the smallest, A, to the largest, E. The table shows the length of mains renewed by each company and its replacement rate. The (unweighted) average replacement rate is 13.3%, the median is 10%, and the weighted average is 5%. Each of these statistics is a candidate answer to the WBB question – how much renewal does the base allowance buy for each company?

(98) Table 3 shows WBB for each company, in terms of renewal length, if we were to assume that WBB is the average, median and weighted average, in turn.

Table 2: Calculation of WBB for three candidate statistics: the average, median and weighted average based on an example

Company	Renewed (kms)	Total length (kms)	Renewal rate
A	300	1,000	30.0%

[38] Thames Water, TMS-DD-037 Thames Water PR24 DD Response Cost Efficiency (August 2024), page 48: https://www.thameswater.co.uk/media-library/yrtpa3ui/tms-dd-037-thames-water-pr24-dd-response-cost-efficiency.pdf.

[39] CMA PD, Volume 1, paragraph 4.339(b).

Company	Renewed (kms)	Total length (kms)	Renewal rate
B	400	2,000	20.0%
C	500	5,000	10.0%
D	600	17,000	3.5%
E	700	25,000	2.8%
Total	**2,500**	**50,000**	
Average			**13.3%**
Median			**10.0%**
Weighted avg.		**5.0%**	

Table 3: The renewal length that base is assumed to buy per company for each candidate statistic

WBB (kms)			
Company	**Average**	**Median**	**Weighted**
A	133	100	50
B	265	200	100
C	663	500	250
D	2,255	1,700	850
E	3,316	2,500	1,250
	6,633	**5,000**	**2,500**

(99) Under the assumptions of the average or median, base allowances are assumed to buy a total of 6,633 km or 5,000 km for the sector. This is far above the total length replaced over the sample period (2,500 km), and so it is unreasonable. The weighted average provides the correct rate of WBB. With this rate, base allowances are assumed to buy 2,500 km, the same as the renewal length that fed the models.

(100) We have attached at Annex 3 a spreadsheet model that calculates WBB using the weighted average approach, including a validation of the approach. Determining WBB based on the weighted average suggests a rate of 0.23% instead of 0.30%.[40]

(101) The use of the median as a statistic to average between company variation in replacement rates may appear superficially attractive, as it removes the influence of companies with very small or large replacement rates, but it remains inaccurate. In this case, the use of the median appears to introduce a material inaccuracy. The companies with mains renewal rates above the median are systematically smaller than the companies with mains renewal rates below the median (the exception is Severn Trent).[41] This is shown in Figure 1. The six companies with the shortest network have replacement rates above the median, and of the

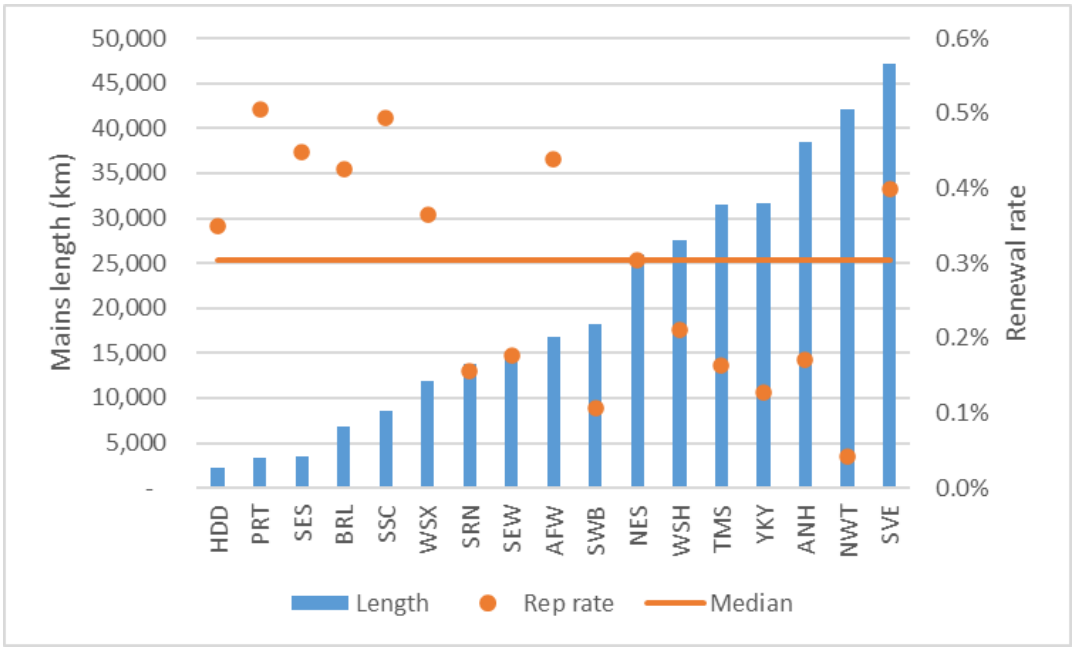
[40] For the avoidance of doubt, we think WBB should be lower given the consistent downward trend in renewal rates over time, and the significantly lower renewal rates over the last five years compared to earlier years in the sample. We discuss the issues further below in paragraphs 108 to 111. However, as a minimum, the appropriate statistical method should be used, which estimates a 0.23% renewal rate.

[41] The total length of mains of the eight companies below the median replacement rate is more than double the total length of mains of the eight companies above the median. Five of the six largest network companies are below the median.

six networks with the longest network, five have replacement rates below (often, well below) the median.

(102) The replacement rate of the relatively small companies above the median should receive a low weight in the calculation of WBB. This is on the basis that, although they have a relatively high replacement rate, the total length that they replace (and therefore the total cost) is not as high comparatively. The opposite is true for companies below the median: although their replacement rate is relatively low, their replacement length (and therefore cost) is comparatively higher. The use of a median disregards this vital information and uses one company to set the replacement rate for the sector. If the mix of companies above and below the median was more random (i.e., not exhibiting a systematic difference in mains length), such that the average length of mains between the groups was broadly similar, the inaccuracy introduced by the median may have been smaller. If one of the smaller companies were to be merged with one of the larger companies, for example, the median value would be materially lower.

Figure 1: Sectoral mains renewal rates and mains lengths



(103) At any rate, given the availability of a more appropriate approach – the weighted average – we consider that the PD errs in using the median.

(104) We note also that the PD states: "*Given that we aim to estimate what base buys for an efficient company there could be an argument for using a more stretching benchmark than the median (such as the upper quartile (UQ))*".[42] However, when we estimate WBB, we should estimate it without consideration of efficiency. The efficiency is introduced later through the catch-up challenge, the frontier shift and, where an additional base allowance is made, through setting an efficient unit cost to fund additional volumes of replacements. A company's replacement rate does not provide an indication of its efficiency and therefore the upper quartile of companies' replacement rates does not answer the question of what base buys for an efficient company.

(105) Without prejudice to our view that the weighted average is the most appropriate approach, the CMA could also consider a triangulation of approaches, such as a triangulation of its

[42] CMA PD, Volume 1, paragraph 4.339(b).

proposed approach with the weighted average approach, and, possibly, a company's own historical rate of mains renewal. This would mitigate any real or perceived drawbacks of using each approach individually and recognise that there are 'unexplained company specific factors' which may well have played a role in influencing a company's historical rate of mains renewal. Such an approach, which moderates the results of a benchmarking exercise by using company-specific information, is in line with the recommendations of the IWC.[43] In the context of Thames Water, were such an approach to be applied in a future redetermination, this would account for the fact that WBB in London is much less than WBB elsewhere, as recognised by the higher unit rate allowed by Ofwat for mains renewal in London.

The use of the full historical period rather than the last five years

(106) The Disputing Companies argued that weighting the whole historical period evenly "*was inconsistent with calculating catch-up efficiency over five years which 'helps to ensure the base expenditure allowances reflect more recent cost pressures'.*"[44] The CMA notes this challenge but does not explain why it does not accept it.

(107) We support the position of the Disputing Companies. The full historical period is used to estimate the parameters of the models as accurately as possible. Whatever the parameter of the models, the allowance (including WBB) is largely determined by the spend of two companies over the last five years: the company just above the upper quartile and the company just below the upper quartile (or a single company, if the upper quartile corresponds to a single company). As such, more weight should be given to replacement rates over the last five years than to replacements in earlier years.

The reflection of the downward trend in the rate of mains renewal across the water industry (demonstrated by Figure 4.9 of the CMA's PD)

(108) When setting certain PCLs, which represent the assumed performance levels that base buys, Ofwat readily takes into account the sector's trend of improving performance and extrapolates it to the next AMP to set 'stretching but achievable' targets.

(109) By the same token, steadily declining trends in asset replacement should be taken into consideration and extrapolated to AMP8.

(110) For example, the average supply interruptions performance across all companies during the sample period is c.16 minutes. Ofwat (and the CMA) could have concluded that this is the performance that base buys and set it as a PCL for this common performance commitment, in a similar way to its approach for mains renewal. However, the PCL on supply interruptions is five minutes, reflecting more recent performance and what is expected to be achieved in AMP8.

(111) We recognise that using a simple extrapolation of the mains renewal trend would result in replacement rates that appear too low to set as WBB. Nonetheless, we urge the CMA to have an internally consistent approach to WBB across costs and outcomes.

Unit rates

[43] The CMA recognises that it cannot account for all the factors that have driven historical rates of mains renewal, stating in CMA PD, Volume 1, paragraph 4.339(b) that: "*we cannot discount that these differences are driven by unexplained company specific factors rather than inefficiency*". However, the CMA does not act on this statement in making its determination and instead falls back on a purely benchmarked approach to determining WBB. Our proposed approach acknowledges company specific factors.

[44] CMA PD, Volume 1, paragraph 4.309(b).

(112) We agree that applying different unit rates to the renewal of mains in different areas of the country is appropriate, as issues such as regional variances in wages have a material impact on the cost of asset replacement. We note that, in some cases (notably in London), additional factors are important to consider beyond wages, as Ofwat has recognised in applying a higher unit rate for mains renewal in London than elsewhere. We do not agree with the PD that unit rates should only be adjusted to account for the variation in regional wages, and consider that other company-specific factors which drive cost variation should be given further consideration at final determination.

2.3 Frontier shift

(113) The CMA has provisionally decided to adopt a frontier shift estimate of 0.7% per year. This is lower than Ofwat's 1% estimate in its PR24 FD. The CMA's estimate is based on analysis of historical productivity performance in the water sector and the current forecasts of productivity growth for the UK economy from the Bank of England ("**BoE**") and the Office for Budget Responsibility ("**OBR**").

(114) We welcome the CMA's recognition that the water sector's productivity performance is in line with that of the wider UK economy, and the consequent decision to reduce the frontier shift estimate based on available evidence.

(115) We note that the BoE forecasts for UK Total Factor Productivity ("**TFP**") referenced by the CMA average is 0.27% per annum to 2027. While the OBR labour productivity forecasts increase gradually to 1.25% by 2029, the CMA correctly identifies that OBR has tended to systematically overestimate UK productivity growth in the past.[45] We also note that TFP is a more appropriate estimate of Frontier Shift than labour productivity, which could capture increases in capital inputs and capital productivity, so it will be higher than TFP.

(116) We consider that the available evidence – the recent historical productivity performance of the water sector, which the CMA estimates to be near zero,[46] and the BoE productivity forecasts of around 0.27% per year – suggests that UK productivity performance may well be below 0.7% per year during AMP8.

(117) We believe that, if the frontier shift was set on the basis of the evidence above, it should be set at c.0.45% per year.

2.4 RPEs

(118) In the PD, the CMA has: (i) removed labour and energy RPEs from modelled base costs due to the introduction of labour and energy input price indices in some of its proposed base models (noting that the CMA did not specify if a true-up mechanism remains, and if so, how it would be implemented); and (ii) not explicitly stated how RPEs will apply for costs other than modelled base costs. We consider that the omission of reference to several important facets of the RPE regime amounts to an error in the overall approach, which the CMA should address.

(119) RPEs are a vital element of price control frameworks, designed to address the uncertainty of forecasting input price movements beyond general inflation when setting *ex-ante* allowances.

[45] CMA) PD, Volume 1, paragraphs 4.161-4.162.

[46] Ibid, paragraph 4.158.

(120) Combined with a true-up mechanism to adjust for outturn values of input price indices, RPEs reduce the likelihood of windfall gains or losses for customers and companies, and remove uncontrollable risk from price controls to the benefit of all.

(121) RPEs are not exclusive to the water sector and commonly feature in *ex-ante* price control regimes. In the recent RIIO-ED3 methodology consultation, Ofgem reconfirmed their intention to use annual true-up mechanisms to adjust for actual price changes beyond general inflation.[47]

(i) Lack of clarity on the CMAs RPE position

(122) The CMA's approach to RPEs in the PD is unclear, leaving the sector with uncertainty over how input price risk has been addressed. This arises through:

(a) the introduction of significant change and complexity to the RPE approach as a result of including some RPE factors in modelled base costs;

(b) the absence of definitive statements on the role and implementation of true-ups; and

(c) the absence of statements on the implementation of RPEs for costs outside modelled base costs.

(123) The CMA should provide greater clarity regarding RPEs to allow stakeholders to understand the price risk that is being transferred to Disputing Companies under any revised approach. We consider that further consultation between the PD and final determination is likely to be required in this regard, as the omission of reference to important aspects of the RPE regime leaves too much uncertainty.

(ii) RPEs and base allowances

(124) The PD states that the inclusion of input price variables in their revised base cost models removes the need for pre-modelling RPE adjustments.[48] We accept in principle that the inclusion of such variables could replace the need to overlay RPEs on the modelling results. However, the way the input price indices feature in the PD's proposed base cost models raises several concerns:

(a) The price indices are interacted with scale variables. This makes their interpretation, and an assessment of their contribution to allowed costs, complex, non-transparent and difficult to validate.

(b) The indices do not appear in all models. The wage variable is not selected through the application of LASSO for either the water resources or wastewater network plus models. This means that there is no explicit allowance for labour cost inflation over and above the CPIH in wastewater. While one can posit explanations (e.g., perhaps wages are captured through high correlation with other variables), this omission reduces the confidence that the models adequately capture RPEs. The transparency of Ofwat's approach is one of its strengths, which we consider the CMA should give further consideration to.

[47] Ofgem, ED3 Sector specific methodology consultation: cost assessment annex (8 October 2025), paragraph 7.34: https://www.ofgem.gov.uk/sites/default/files/2025-10/ED3%20SSMC%20Cost%20assessment%20Annex%20FINAL2_clean_7_Oct.pdf.

[48] CMA PD, Volume 1, paragraph 4.52.

(c) The wage variable is based on a "*linear forecast for AMP8 based on the previous time series*".[49] It is unclear why historical information rather than forward looking forecasts, as Ofwat has used at FD24, have been applied.

(125) Additionally, the PD is not clear whether a true-up mechanism would be retained under its revised approach. Removing this mechanism will introduce uncontrollable input inflation risk to the price control, which will be borne, inefficiently, by companies and customers.

(126) Finally, by having one approach to RPEs for modelled base costs and (potentially) another approach for other costs, the PD's approach risks creating a complex and disproportionate true-up process at the end of AMP8 because of this intervention.

2.5 Enhancement expenditure

2.5.1 Approach in the PD

(127) The PD assessed 22 requests for additional enhancement funding. 20 of these were assessed through individual assessment, provisionally maintaining or reducing allowances for 10 requests and increasing allowances for the remaining 10. The scale of the adjustments ranged from -£14 million to +£19 million compared to Ofwat's FD. The other two cost areas were fully remodelled, namely supply interconnectors and phosphorus removal, resulting in changes from -£156 million to +£240 million.

(128) The CMA also assessed requests for expenditure to be added to either the Regulators' Alliance for Progressing Infrastructure Development gated process or the large schemes gated process, resulting in one and four schemes being added respectively.

2.5.2 Thames Water's response to the PD

(129) We broadly support the approach taken by the CMA for assessing requests for increased enhancement allowances.

(130) In particular, we appreciate that the CMA has reviewed cost models for suitability considering concerns raised and that revisions have been made guided by relevant econometric and engineering factors.

(131) We also recognise that cost modelling is not always possible and agree with the areas that have been reviewed through individual assessments. Again, we support the use of independent engineering advice to aid the CMA's decision making.

(132) The CMA's recognition of regional cost variation when considering allowances for companies in the South East is also welcome.

(133) We support the proposal to add the five schemes into the two gated processes, recognising that in cases where material uncertainty exists or additional scrutiny is warranted that this is a suitable route for schemes to be assessed.

(134) Further specific comments are provided below on the CMA's approach to determining phosphorus, industrial emissions directive ("**IED**") and sewage treatment works ("**STW**") growth costs below.

(i) Phosphorus removal

(135) We support the CMA's approach to reviewing and improving Ofwat's cost models, including the use of advice from the Water Research Centre Group ("**WRc**") on additional engineering

[49] CMA PD, Volume 1, paragraph 4.53.

cost factors. We agree with the rejection of Ofwat's models due to concerns about misspecification and weak explanatory powers[50] – these are concerns we share.

(136) We agree with WRc's advice provided to the CMA that Ofwat's models exclude some site-specific factors that influence costs and that there is more than Ofwat's single step change for cost rates as the permit level tightens.[51]

(137) With respect to the characteristics of the CMA's model, we strongly support the three new variables it introduced. Specifically, a dummy variable for new schemes to address cost inflation, a variable controlling for population density, and the inclusion of regional construction labour costs.[52]

(138) We welcome the resulting improvement in model performance. We expect that further model performance improvement could be achieved by including additional variables linked to permit tightness, in line with WRc's engineering advice.

(ii) IED

(139) We agree with the CMA's conclusion that Ofwat's IED econometric models are poor-performing and with their concerns over Ofwat's *ad hoc* approach to setting efficiency challenges for other IED schemes.[53] We support the use of individual assessments to determine allowances in this area, aided by independent engineering advice.

(140) With regard to Southern Water's case for additional impermeable surface costs for secondary containment, we recognise there is a wide range of unit rates across the industry and suspect there may be additional unaccounted variables that help explain the spread. Nevertheless, given the range of costs, we agree with the CMA's approach of reviewing costs against average costs rather than median to limit the impact of unaccounted cost drivers, as well as uplifting for regional costs for companies in the South East.[54]

(141) For covering costs and other IED, we support the use of independent engineering advice to determine both need and fairness of costs given the site-specific nature of these costs and the poor predictive performance of Ofwat's models.

(iii) STW growth

(142) Given the stated uncertainties with the Howdon wastewater treatment works growth costs, we agree that this scheme should be added to the large scheme gated process. [55]

(143) With respect to reduction of forward-looking costs for 'under delivery' and 'under spending' of the AMP between 2015 and 2020 and AMP7 growth allowances, we agree with the CMA's approach to reinstate Northumbrian's costs.[56] We share Northumbrian's view that there were no specific funded growth schemes and outputs, and that allowances were only assessed using a general model for these periods – meaning it is not reasonable to determine there was under spending or under delivery.[57]

[50] CMA Water PR24 References, Provisional Determinations Volume 2: Enhancement costs – Chapter 5 (9 October 2025), paragraph 5.37: https://assets.publishing.service.gov.uk/media/68e7c0f5e5f463a62cb985e3/PR24_PD_vol_2.pdf.

[51] Ibid, paragraph 5.42.

[52] Ibid, paragraph 5.69.

[53] Ibid, paragraphs 5.161 - 5.162.

[54] Ibid, paragraph 5.366.

[55] Ibid, paragraph 5.330.

[56] Ibid, paragraph 5.346.

[57] Ibid, paragraph 5.333.

(144) It follows that we agree with the CMA's view that there were only high-level total expenditure ("**totex**") allowances awarded at PR19 and there is no evidence of specific growth expenditure allowances.[58]

(145) For completeness, while none of the Disputing Companies raised this, we believe that there are material shortcomings with Ofwat's cost models for growth and this is an area that Thames Water would address in detail if a referral of our FD to the CMA is made.

2.6 National Insurance Contributions

(146) As part of the 2024 UK Budget, employers' national insurance contributions ("**NICs**") increased from 13.8% to 15%, and the threshold at which employers pay NICs decreased from £9,100 per annum to £5,000 per annum from April 2025.

(147) The CMA acknowledged company concerns about the increase in employer NICs, which is beyond their control. However, it provisionally decided not to address the issue as part of the PR24 redetermination because:

(i) The amounts involved fall below the *de minimis* threshold set out in its PR24 Approach and Prioritisation document dated 28 May 2025.

(ii) Updating allowances for the increase in NICs would not be a simple exercise due to the inability to isolate these costs within the existing data reporting and allowance structure.[59]

(148) Noting that companies can recover 50% of any overspend on base costs from customers, the CMA concluded that focusing on this matter would not be consistent with the overriding objective to dispose of redeterminations fairly, efficiently, and at proportionate cost within the time available.[60]

(149) We recognise the difficulty of the task that the CMA faces in disposing of the parallel redeterminations in a fair, efficient and proportionate manner. For the reasons explained in our June 2025 Third Party Submission, we maintain our view that it is inappropriate to use a threshold of 0.5% of totex (as a *de minimis* threshold) as a threshold or starting point to deprioritise issues.[61]

(150) Labour costs constitute a significant portion of costs for water companies. For instance, we estimate the impact of Thames Water's employment costs to be c. [**confidential**] over the period 2025-2030. This estimate is based on our current number of employees and total pay bill. Given the significant increase in investment in AMP8, we anticipate the actual impact to be greater. While this increase in cost may fall below the CMA's *de minimis* threshold, it nevertheless has a material impact on Thames Water.

(151) At any rate, we do not think materiality is a relevant consideration in this case. These costs are largely beyond management control, and there is no risk that customers will be paying twice as these costs have not been included in Thames Water's historical base costs (and therefore are not in the PR24 allowance, as acknowledged by Ofwat).[62] These costs are far from trivial – they lead to an appreciable rise in employment costs for labour intensive

[58] Ibid, paragraph 5.345.

[59] CMA PD, Volume 1, paragraphs 3.31 – 3.32.

[60] Ibid, paragraph 3.31.

[61] June 2025 Third Party Submission, paragraph 10.

[62] Ofwat, Ofwat's response to Disputing Companies' submissions on other companies' statements of case (14 May 2025), paragraph A1.4: https://www.ofwat.gov.uk/wp-content/uploads/2025/05/Response-to-disputing-companies-submissions-on-other-disputing-companies-statements-of-case-redacted-2.pdf.

companies. The impact on Thames Water is larger than that of other companies due to its high-wage area of operation.

(152) We do not agree that the cost sharing mechanism is an appropriate reason to deprioritise the issue. Cost sharing is a mechanism for dealing with symmetric risk. It is not a funding mechanism, as it is not intended to mitigate a known increase in costs. The proper approach to the increase in employers' NICs is to provide *ex-ante* funding at the expected impact, leaving the cost sharing to deal with the residual symmetric risk.

(153) The increase in employer NICs is an additional tax that companies must pay, and not allowing companies to recover these extra costs is equivalent to adding unwarranted stretch to the efficiency challenge. We consider that the failure to account for the increase in NIC costs is a material flaw of FD24. We believe it would be consistent with its overriding objective for the CMA to remedy this by introducing a regulatory mechanism to recover these costs. An appropriate mechanism might be to provide an uplift to base allowance at the expected rate of growth in employer's NIC costs and, given the uncertainty around their precise impact, a true-up with the actual increase in NIC costs at the end of the AMP. This mechanism is fit for purpose, proportionate and sufficiently targeted.

3 Thames Water's submissions on the PD in relation to outcomes

(154) Thames Water welcomes some of the changes proposed by the CMA to the outcomes regime, which are consistent with the recommendations of the IWC. The IWC recommended substantial changes to the outcomes regime, stating it *"needs to provide a narrower corridor for returns at risk*"[63] and that the "*ODI framework needs recalibration to be a 'fair bet'*".[64] However, the CMA has chosen not to make substantial changes to the framework and we believe that the CMA should go further, particularly in relation to the MeXes, which would be consistent with the IWC recommendations.

(155) In any case, given the disproportionate and punitive impact of the MeXes for Thames Water, if our FD is referred then the CMA would need to look at this area afresh in light of the particular issues and evidence raised in our Statement of Case.

3.1 Evidence of PCL miscalibration and excessive revenue at risk warrant changes to Customer MeX

(156) There are three overarching options available to the CMA in respect of the Customer MeX ("**C-MeX**"). It could opt for fundamental reform, alter the PCL, and/or alter the outcome delivery incentives ("**ODI**") rate. Thames Water notes that the IWC recommended fundamental changes to C-MeX.[65]

(157) We accept that the CMA is unlikely to be able to fundamentally reform the MeXes for the Disputing Companies in the time it has available. Instead, we consider that the CMA should make specific changes to C-MeX which mitigate the worst of the negative incentive and financial risks it creates.

3.1.1 C-MeX PCL

[63] IWC Final Report, paragraph 472.

[64] Ibid, paragraph 473.

[65] For example, the IWC Final Report in chapter 5, paragraph 655 concluded that: "*The regulator should ensure the measure is focussed on actual customer service delivered by a company rather than more general measures which will tend to pick up broader concerns about industry as a whole and which may to be susceptible to media coverage of other companies' performance*".

(158) We consider that the CMA should give greater consideration to the arguments and evidence in our April 2025 Third Party Submission (which addressed C-MeX). We have demonstrated in our submissions that companies have minimal practical ability to change their absolute or relative scores, and that external factors such as media reports are more impactful on scores than actual company activity – a point the IWC accepted.[66] We have not repeated these arguments here, but note that the PD does not appear to engage with this evidence and we believe that the CMA should give this due consideration in determining its final position regarding C-MeX PCLs. We therefore ask that the CMA reconsider the PCL and ODI rate for C-MeX in line with this evidence and our submissions below.

(159) New data further demonstrates that Ofwat's PCL is not well-calibrated. [**confidential**].[67] This is an industry-wide issue, not only relevant for Thames Water.

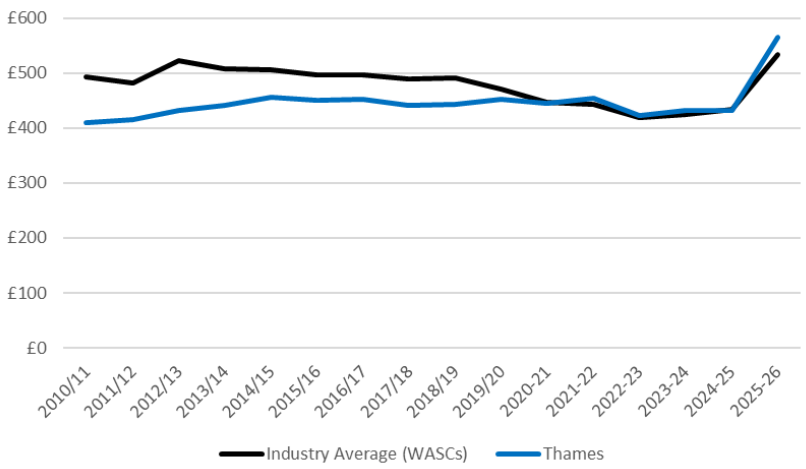
[**confidential**]

(160) In the absence of substantial and sector-wide changes in actual operational performance, we contend that [**confidential**] is driven by two factors, both of which are outside of company control:

(i) **Survey methodological changes for AMP8:** At PR19, Ofwat acknowledged that digital surveys receive a lower satisfaction rating from customers than telephone or face-to-face surveys and provided a correction factor.[68] For PR24, this has been removed.

(ii) **April 2025 price increases:** The increase in customer bills in April 2025 from the PR24 FD regulatory settlement, driven by new major capital programmes to meet environmental requirements, represented the first major real price increases since privatisation. Across the sector, average bills went up by 23%, with Thames Water's bills increasing by 31%.

Figure 3: Real average bills since (2005-2010) for water and sewerage companies and Thames Water (2022-23 prices)



[66] Ibid; for further information, please see Thames Water's April 2025 Third Party Submission, paragraphs 15 to 26.

[67] Please note that [**confidential**].

[68] Ofwat, PR19 final determinations – Customer measure of experience (C-Mex) and developer services measure of experience (D-Mex) policy appendix (December 2019), page 35: https://www.ofwat.gov.uk/wp-content/uploads/2019/12/PR19-final-determinations-Customer-measure-of-experience-C-MeX-and-developer-services-measure-of-experience-D-MeX-policy-appendix.pdf.

3.1.2 C-MeX ODI rate

(161) The CMA set out in the PD that the share of relevant C-MeX revenue at risk was "*not significantly higher than the average proportion Ofwat targeted*".[69] It used this as justification for its determination that Ofwat's allocation of revenue was not inappropriately high. We do not agree with the CMA's position, as we contend that the level of revenue at risk that Ofwat targeted (however it is stated) was too high.

(162) Thames Water's April 2025 Third Party Submission provided evidence that the revenue at risk for C-MeX – as well as the other two measure of experience – is disproportionately high.[70] The CMA noted that Thames Water submitted a response but did not provide any appraisal of the evidence we put forward.[71] Our April 2025 submission set out evidence which demonstrated that the revenue at risk is disproportionately high, relative to the scale of three main comparators:

(i) **Other performance commitments in PR24:** The C-MeX expected financial exposure of £189 million is larger than for any other performance commitment ("**PC**") in Ofwat's PR24 FD. Ofwat set the expected maximum exposure at 0.4% of *total* appointee return on regulated equity ("**RoRE**"). For water and sewerage companies, this equates to a penalty exposure around 60% greater than other key PCs, which are typically set at 0.5% of *either* water or waste RoRE – around £120 million over AMP8 for Thames Water. Neither Ofwat's FD nor the CMA's PD justify the disproportionate strength of the penalty when compared to other aspects of the outcomes package. We are concerned the CMA has not appreciated the distinct approach used to set the MeXes' financial exposure compared to other PCs.

(ii) **Other customer priorities:** Ofwat's own research places "*provide good customer service*" as only eighth out of ten in customer priorities.[72] The PCs associated with "*provide clean, safe drinking water*" and "*prevent sewage entering people's homes*", which are ranked first and second in the ten customer priorities, have lower revenue at risk. This indicates that C-MeX is overpowered relative to other ODIs when assessed using the yardstick of customer priorities.

(iii) **Other regulated industries:** In RIIO-GD2, Ofgem set a cap and collar on the 'customer satisfaction survey' measure – which encompasses both customer interactions and developer services – of 0.5% of revenue.[73] Revenue is generally much smaller than Regulatory Capital Value ("**RCV**") and, taking Thames Water as an example, 0.5% of revenue would equate to around 0.1% of RoRE. This compares to a total of 0.6% RoRE Ofwat set in the FD.[74] Thames Water's C-MeX incentive penalty exposure in AMP8 (£189 million) is greater than the customer satisfaction related ODIs in the entire electricity and gas transmission and distribution sector,

[69] CMA PD, Volume 3, paragraph 6.435.

[70] April 2025 Third Party Submission, paragraph 49.

[71] CMA PD, Volume 3, paragraph 6.432.

[72] Savanta, Customer Spotlight: People's views and experiences of water – Wave two – Report for Ofwat and CCW (April 2024), pages 23-24: https://www.ofwat.gov.uk/wp-content/uploads/2024/04/Customer_spotlight_Peoples_views_and_experiences_of_water_wave_two_Savanta_report.pdf.

[73] Ofgem, RIIO-2 Final Determinations – GD Sector Annex (3 February 2021), pages 22-23: https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_gd_annex_revised.pdf.

[74] Thames Water is not aware of any equivalent metric to BR-MeX in other sectors, which takes Ofwat's FD MeXes exposure to 0.8%.

which are forecast to be £165 million for RIIO-2 across 14 companies. This is clearly disproportionate.

(163) For more information, please refer to paragraphs (10) to (14) of the Annex of our April 2025 Third Party Submission.

3.2 D-MeX and BR-MeX are excessively financially incentivised

(164) The CMA rejected requests for reduced financial incentives on the Developer Services MeX ("**D-MeX**") and the Business Customers and Retailer MeX ("**BR-MeX**"). The CMA dismissed Southern Water's arguments regarding the relevant price control revenue at risk as not relevant, stating: "*The objective of the calibration exercise is to incentivise companies' management to allocate scarce attention and resources across areas of performance in a way that aligns with customers' priorities (subject to financeability constraints)*".[75]

(165) However, given the evidence set out above and in our April 2025 Third Party Submission, the CMA must consider decreasing the ODI rates for both D-MeX and BR-MeX. These PCLs are excessively financially incentivised and clearly go far beyond what is required for a proportionate and targeted regulatory incentive framework.

3.2.1 D-MeX ODI rate

(166) In relation to D-MeX, the CMA set out that Ofwat's 0.20% total RoRE risk allocation translated into "*33% of Southern's relevant price control revenue put at risk*"[76] and that this is "*closely comparable*"[77] to the RoRE allocation in PR19.

(167) 0.2% of RoRE across waste and water *together* is equivalent to around 0.4% RoRE for *either* water or waste – this makes D-MeX and BR-MeX incentivised to a similar degree as very high customer priorities like supply interruptions and sewer flooding. This is the same issue that we have identified for C-MeX. Customer research, as set out in our April 2025 Third Party Submission,[78] does not support this prioritisation.

(168) Using Thames Water as an example helps to illustrate the disproportionality of the incentives on D-MeX. As a poor performer, we expect to incur penalties of £94 million for D-MeX over AMP8. By contrast, our developer services price-controlled revenue is forecast to be £316 million. This therefore means that 30% of Thames Water's relevant price control revenue is at risk. The maximum D-MeX penalty in PR19 was 12% of developer services revenue.[79] This penalty rate would equate to £37 million if applied in AMP8. The risk exposure in PR24 is therefore 2.5x more than it was for PR19. We therefore contend that the relevant price control revenue at risk is not "*closely comparable*" to the allocation at PR19,[80] as the CMA stated. This problem is particularly acute by 2030, as the forecasted impact of the competitive market for new connections reduces our developer services price-controlled revenue to £50 million with an associated expected penalty of £19 million, representing 35% of total price-controlled revenue.

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[75] CMA PD, Volume 3, paragraph 6.434.

[76] Ibid, paragraph 6.435(b).

[77] Ibid.

[78] April 2025 Third Party Submission, Figure 2, page 18.

[79] Ofwat, PR19 final determinations – Customer measure of experience (C-Mex) and developer services measure of experience (D-Mex) policy appendix (December 2019), page 63: https://www.ofwat.gov.uk/wp-content/uploads/2019/12/PR19-final-determinations-Customer-measure-of-experience-C-MeX-and-developer-services-measure-of-experience-D-MeX-policy-appendix.pdf.

[80] CMA PD, Volume 3, paragraph 6.435(b).

(169) This is an excessive level of penalty, far beyond a level necessary for management to focus on customer satisfaction. As the Annex to our April 2025 Third Party Submission sets out, industry scores in D-MeX increased materially over PR19 (from 81.5 median in 2019/20 to 89.6 in 2024/25), indicating that existing PR19 incentives (in conjunction with competitive forces) were already strong enough.[81]

3.2.2 BR-MeX ODI rate

(170) In relation to BR-MeX, the CMA set out that "*0.2% total RoRE risk allocation translated into a small proportion (3%) of Southern's relevant revenue being put at risk*" and that this was "*not a significant proportion*".[82] Thames Water notes that Ofwat moved from incentives equivalent to 0.05% to -0.10% RoRE in its PR24 Final Methodology[83] to 0.2% in its draft determination with only a brief explanation that this would "*sufficiently incentivise*" companies and that this was "*based on the relative size of incentives for the other measure of experience incentives*".[84]

(171) Unlike C-MeX and D-MeX, BR-MeX lacks a direct revenue stream that penalties can be measured against.[85] Business customer revenue forms part of overall wholesale water and wastewater price control revenue. As a result, business customers are protected through the 10 water and 10 waste PCs, with any penalties spread across both household and business customers. Further BR-MeX penalties therefore represent a 'double jeopardy' for companies. The only return that companies earn is the RCV increase of these assets being added to the RCV – i.e., there is no allowed return beyond the cost of capital, which remains very low. Expected penalties would exceed allowed returns by many times over.

3.3 Total Pollutions PCL

(172) The CMA did not make any changes to the FD24 PCL for total pollution incidents on the basis that "*Ofwat's change control process provides an appropriate process for assessing and determining what implications relevant EA/Natural Resources Wales decisions should have on the total pollution incidents PCL*".[86]

(173) Following the recent Environment Agency decisions on pollution incident reporting, Ofwat is currently consulting on changes to the PCL and ODI rate.[87] We are currently reviewing this consultation in detail and will respond to Ofwat directly. The CMA should consider the outcome of the Ofwat consultation, and revisit its provisional decision accordingly. We note that the proposed changes following Ofwat's consultation would only come into effect in 2026, and so rewards/penalties for 2025-26 would still be based on the FD.

3.4 Thames Water supports the specific changes proposed by the CMA

[81] The April 2025 Third Party Submission included evidence for 2019/20 to 2023/24. The 2024/25 data is only more recently available and adds additional weight to the point.

[82] CMA PD, Volume 3, paragraph 6.435.

[83] Ofwat, Creating tomorrow, together: Our final methodology for PR24 - Appendix 8 Outcome delivery incentives (December 2022), page 54: https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_8_Outcome_delivery_incentives.pdf.

[84] Ofwat, PR24 Draft Determinations, Outcomes – Measure of experience performance commitments appendix (July 2024), page 32: https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-draft-determinations-Outcomes-Measure-of-experience-performance-commitments-appendix.pdf.

[85] Such as Retail price control revenue for C-MeX, Developer Services price control revenue for D-MeX, wholesale water price control revenue for water PCs or wholesale wastewater price control revenue for waste PCs.

[86] CMA PD, Volume 3, paragraph 6.199.

[87] Ofwat, Consultation on changes to three PR24 environmental performance commitments (29 October 2025): https://www.ofwat.gov.uk/consultation/consultation-on-changes-to-three-pr24-environmental-performance-commitments/.

(174) The CMA's PD adjusted Ofwat's FD24 PCLs for supply interruptions and the ODI rate for total pollution incidents.[88] The CMA also amended a small number of other PCLs for a subset of Disputing Companies.

(175) Thames Water supports the CMA's changes to the calculation of the baseline and subsequent 'glide path' for water supply interruptions. In particular, we agree with the CMA's provisional view that Ofwat's approach did "*not take sufficient account of available evidence on the levels of performance that companies have shown themselves able to achieve in recent years while subject to the financial reward and penalty arrangements*".[89] Thames Water notes that the CMA did not alter Ofwat's target of 5 minutes in 2029/30: we maintain that it is highly unlikely that many companies, especially those with older and more complex networks, will be able to hit this target. Nevertheless, adjusting the baseline results in a more appropriate PCL. It is therefore a pragmatic change which we support.

(176) Regarding total pollutions, the PD changed the calculation of performance ranges, increasing the estimated performance variability and so reducing the total pollution incidents ODI rate. Thames Water supports this approach as it is a better reflection of the actual range of performance risk faced by companies.

4 Thames Water's submissions on the PD in relation to PCDs

(177) Thames Water supports the principle of PCDs. We agree that companies should return funding to customers when funding has been allocated and outputs are not delivered. In addition, we recognise that the expenditure allowances in AMP8 provide for an unprecedented level of investment and agree that customers deserve assurance that their money will be invested as intended.

(178) We retain reservations regarding some aspects of the PCD regime as currently designed and ask that the CMA reconsider the position in the PD with respect to the issues set out below.

4.1 Non-delivery PCD clawbacks and within-AMP changes

(179) We agree with the CMA's decision to await the outcome of Ofwat's September 2025 consultation[90] on its approach to applying non-delivery PCD clawbacks and within-AMP changes before finalising its determinations in these areas. We consider that the CMA should review Ofwat's decisions following this consultation and, if Ofwat has not addressed the CMA's concerns, these issues should be revisited in the CMA's final determination.

(180) We broadly support the changes proposed by Ofwat in its recent consultation, but have suggested a small number of amendments which we ask the CMA to consider in its final determination:

(i) Non-delivery clawback

(181) Ofwat proposes that, where projects are not delivered by the end of the AMP and a PCD exists, a threshold of 70% of the allowed expenditure would be used and, if a company has spent more than that, then no money would be clawed back. Conversely, if a company has spent less than that, then all funding would be clawed back and reallocated in the next AMP.

[88] It also introduced a company specific collar for supply interruptions for South East Water.

[89] CMA PD, Volume 3, paragraph 6.222.

[90] Ofwat, Consultation on changes to PR24 price control deliverables (September 2025): https://www.ofwat.gov.uk/wp-content/uploads/2025/09/Consultation-on-changes-to-price-control-deliverables.pdfhttps://www.ofwat.gov.uk/wp-content/uploads/2025/09/Consultation-on-changes-to-price-control-deliverables.pdf.

This threshold is proposed as the level at which Ofwat calculates that a company would not be incentivised to delay projects on the basis of accruing a 'finance benefit'.

(182) We consider that the approach of clawing back and re-allocating all expenditure would be excessively complicated, and instead propose that only the unspent portion of the allowance be clawed back if a project is still planned for delivery, rather than the whole allowance. The 'finance benefit' that the company would incur from late delivery could be determined (in line with the draft 'financing benefit analysis' spreadsheet produced by Ofwat alongside this consultation)[91] and applied as an adjustment to the re-allocated costs to avoid the perverse incentive. This approach reduces risks for companies who would not be penalised for money already spent, and it is more transparent, since the calculations are simpler.

(183) Additionally, Ofwat proposes that clawed-back totex allowances associated with still-required outputs will be re-awarded at the next price review at the same level of funding. If costs are clawed back and re-awarded, we recommend that there is an option for cost allowances to be reassessed as part of that following the price review process, as market conditions may have changed since the PR24 review.

(ii) Within-AMP changes

(184) Ofwat's proposed inclusion of a materiality threshold is sensible, although it is not clear if this test applies by totalling changes at the water/wastewater price control level, or if it would be assessed per PCD output, or per PCD category. If the threshold is intended to apply to individual projects, the threshold (0.5% totex) is too high. If the threshold is intended to apply across the price control, then a disproportionate process is likely to be the result, with all changes being assessed once the aggregate exceeds the 0.5% threshold. We recommend that changes are considered at the project level, and that a 'minor changes' threshold is introduced for projects with allowances of >0.1% totex where the impact of change is >10% of the allowance.

(185) The consultation is not clear on what adjustments would be eligible for consideration, but where the evidence thresholds for change have been met, we consider that both non-delivery and time-incentive penalties would be adjusted to align with revised forecast completion dates. We propose that unmitigable external supply chain constraints would be one factor that should be eligible.

4.2 Application of PCDs to base expenditure

(186) Thames Water believes that PCDs should not be applied to base expenditure, because this removes the flexibility, granted in previous price controls, for companies to deliver outcomes in the most efficient way, which is the intention of the outcomes-based regulatory regime.

(187) Therefore, we disagree with the PD's position in relation to Southern Water's argument that removing PCDs applied to base expenditure would not hold companies accountable for delivering mains renewals.[92] Companies are rightly held accountable for the standards of service they provide through extensive outcomes regulation, and if the mains renewals result in lower service standards, they will be penalised in that way. As such, there is no need for PCDs on base expenditure.

4.3 Time incentives PCDs

[91] Ofwat, Financing Benefit Analysis, supporting document to the consultation on changes to PR24 price control deliverables (September 2025): https://www.ofwat.gov.uk/wp-content/uploads/2025/09/Financing-benefit-analysis.xlsx.

[92] CMA PD, Volume 3, paragraphs 6.53-6.54.

(188) Thames Water does not agree that the PR24 FD approach "*provides significant scope to manage penalty risks, while at the same time providing material opportunities for rewards*".[93]

(189) Given the five-year duration of the price control period, there could be significant outperformance in two years of the control, most of which cannot be offset against underperformance in two other years. This is due to the asymmetry in under-performance and outperformance payments, with under-performance payments set at three or more times the outperformance rate, and with under-performance payments accruing over time, but out-performance payments not.

(190) We consider that customers are as likely to value early as to dislike late delivery of investments. To penalise a delay several times as much as an early delivery is rewarded seems arbitrary, unless clear justification for such treatment can be demonstrated through customer preferences. If not, the time-incentive payment framework should be amended such that it is symmetrical, with rewards for outperformance of similar magnitude to penalties for under-performance, and either both accruing over time, or neither.

5 Thames Water's submissions on the PD in relation to risk and return

5.1 Risk

(191) It is widely acknowledged by all stakeholders that PR24 requires a step change in delivery and investment across the sector to enable the infrastructure upgrades and performance improvements expected by customers.[94] This will only be possible with a regulatory package that provides an appropriate balance of risk and return that can attract investment into the sector.

(192) Ofwat's FD does not provide this in its current form – there is no 'fair bet.' Thames Water welcomes the interventions made by the CMA across individual building blocks of the price control framework to address downside skew at source. This includes the revision of frontier shift assumptions to reflect recent productivity trends and targeted interventions on specific ODI proposals that created excessive penalty exposure. We also note the expectations made clear by the CMA regarding Ofwat's future guidance on the application of clawback mechanisms for PCDs to address concerns of downside risk in this area.

(193) We note the PD's position that intervention in relation to the aggregate sharing mechanism ("**ASM**") and Outturn Adjustment Mechanisms ("**OAM**") is not required for the Disputing Companies. However, even if interventions made 'at source' address concerns over the balance of risk and return for the Disputing Companies, this does not, in our view, imply that no changes should be made to the ASM and OAM.

(194) This reflects our concern that the principle-based assumption that the notional company should be able to spend in line with allowances and deliver against Ofwat's PCLs appears increasingly weak in the water sector. We disagree with the CMA's dismissal of modelling approaches presented by KPMG on the basis that any assumption that the notional company

[93] CMA PD, Volume 3, paragraph 6.88.

[94] IWC Final Report, paragraph 16: "*To deliver positive long-term water outcomes for the environment, citizens and economic growth, it is essential there is a step change in government's strategic approach to water. At present, the issues facing the sector are resolved by the unplanned – and often unintended – interplay between siloed guidance and policy, as well as over-lapping and under lapping legislative requirements*"; CMA Water PR24 References, Provisional Determinations Volume 4: Allowed Return, Risk & Return, Provisional Determinations, Next steps - Chapters 7–10 (9 October 2025) ("**CMA PD, Volume 4**"), paragraph 8.279: "*Each Disputing Company submitted that there were increasing requirements for debt and equity investment in the water sector in AMP8 due to the large capital programme. The Disputing Companies noted that it was important to ensure that the allowed return was sufficient and there was an appropriate balance of risk and reward so that the sector was able to attract the required investment*": https://assets.publishing.service.gov.uk/media/68e7c1621c8b2a3b506907dc/PR24_PD_vol_4_-_chapter_7_to_10.pdf.

may underperform is invalid. This argument fails to fully assess the level of cost disallowance made by Ofwat at FD in PR24, and the challenging assumption that the notional company will perform in line with Ofwat's PCLs.

(195) By way of example, as noted in this response in relation to outcomes, companies have minimal practical ability to shift their absolute or relative scores under C-MeX quickly, as these scores exhibit strong inertia and influence from factors outside of companies' control. So those companies in the sector performing at a level worse than the collar can only expect to receive the full penalty. PCLs for C-MeX do not represent a 'fair bet' for a significant portion of the sector. This downside skew is compounded by the significant financial exposure expected from C-MeX being higher than for any other PC in Ofwat's PR24 FD, as well as compounded detrimental financial impacts from other correlated incentives.

(196) This explains why we suggest further changes are required to the ASM and OAM to limit downside risk. This includes an enhanced ASM which should apply to those water companies in turnaround arrangements. This is consistent with the findings of the IWC:

> "*To support the attractiveness of the sector as a whole to long-term, low-risk, low-return investors it has to present a lower risk profile than has been the case in recent years*".[95]

(197) Finally, as noted above, should Thames Water's FD be referred to the CMA, it is of paramount importance that the CMA consider the overall balance of risk and return afresh in light of the exceptional nature of Thames Water's position. The PR24 FD features a significant downside skew in expected returns for Thames Water, predominantly driven by insufficient cost allowances to deliver required work and an excessively punitive outcomes regime. The incremental methodological changes in the PD for the Disputing Companies would not deliver the fair balance of risk and return when applied to Thames Water that is needed to ensure that investors can continue to invest in Thames Water.

5.2 Allowed Rate of Return

5.2.1 Cost of equity

(198) Thames Water welcomes the CMA's upward adjustment to Ofwat's allowed return on equity. This brings it closer to market evidence on the returns investors require to invest significant amounts into the water sector in the next regulatory period and beyond.

(199) Thames Water agrees that the allowed return must be positioned logically relative to the prevailing cost of debt. As of October 2025, Anglian Water's, Northumbrian Water's, and Wessex Water's Baa1 rated bonds, maturing in 2044, 2042 and 2043 respectively, were offering yields to debt investors of 4.22%, 4.04%, and 3.92%[96] respectively (CPIH-deflated using a CPIH inflation assumption of 2.1%). The CMA's 5.9% real return on equity sits very tight against these yields (1.7% to 2.0% premium), meaning that there is very little additional return for bearing equity risks in relation to operational performance, costs inflation above CPIH which is not (perfectly) protected by RPEs, capital project cost and schedule risk, fines and penalties, the outcomes performance regime, inflation risk, and financing parameters. The CMA may need to provide further upward adjustment in the cost of equity in the final determination to provide sufficient attractiveness to equity investors.

[95] IWC Final Report, paragraph 753.

[96] Data taken from FactSet; the relevant ISINs used are: XS2898771774, XS2718044824 and XS0733486848.

(200) At the very least, the CMA cannot be said to have precautionarily 'aimed up' in the way that it describes in paragraph 7.820 and paragraph 8.10 of the PD.[97]

(201) Thames Water notes that the key reasons why the mid-point of the Capital Asset Pricing Model range is coming out at a cost of equity that objectively looks too low are the following:

(i) the CMA has departed from its PR19 approach to setting the risk-free rate. This was based upon a thorough review of the academic literature at the time and concluded that other models and estimation methods were better suited to providing the risk-free rate. This methodological finding was not dependent upon the low interest rates at the time of PR19, so it is both surprising and inconsistent that the PR24 CMA panel has followed a different approach. Thames Water urges the CMA to reconsider this change of position;

(ii) the bottom end of the Total Market Return is lower than other experts' historical *ex-ante* estimates (see Kairos Economics estimate of 6.85% to 6.92%[98] and Oxera's updated estimate of 6.84%),[99] and the top-end of the range is afflicted by a major pick 'n' mix error by calculating its *ex-post* long-run equity risk premium using nominal data series and combining with an index-linked yield for the risk-free rate. It should instead combine the nominally-derived equity risk premium with a nominal risk-free rate and then deflate using its forward-looking CPIH assumption; and

(iii) the low end of the CMA's unlevered beta range, drawing on data from more than 10 years ago, is out of date and not a credible indicator of current investor perceptions of riskiness in the water sector. The approach of the CMA effectively places equal weight on the 10-year estimates and the 3-year estimates. Thames Water considers the 3-year estimate to be a far superior estimate – not only reflecting recent risk conditions in the industry, but also benefitting from three acceptable comparators rather than two.

5.2.2 Inflation

(202) Thames Water does not agree with the CMA's use of a forward looking 2.4% CPIH inflation assumption, used for deflating the nominal cost of debt. This is a major departure from regulatory precedent which has typically used the same figure for the Consumer Price Index ("**CPI**") and CPIH with a difference between the two of zero.

(203) Thames Water agrees that the additional housing-related elements in CPIH means that CPIH inflation is likely to run marginally ahead of CPI inflation over the long term, but this is highly uncertain as there are many potential positive and negative drivers of council tax rates, which are subject to national and local Government fiscal decisions.

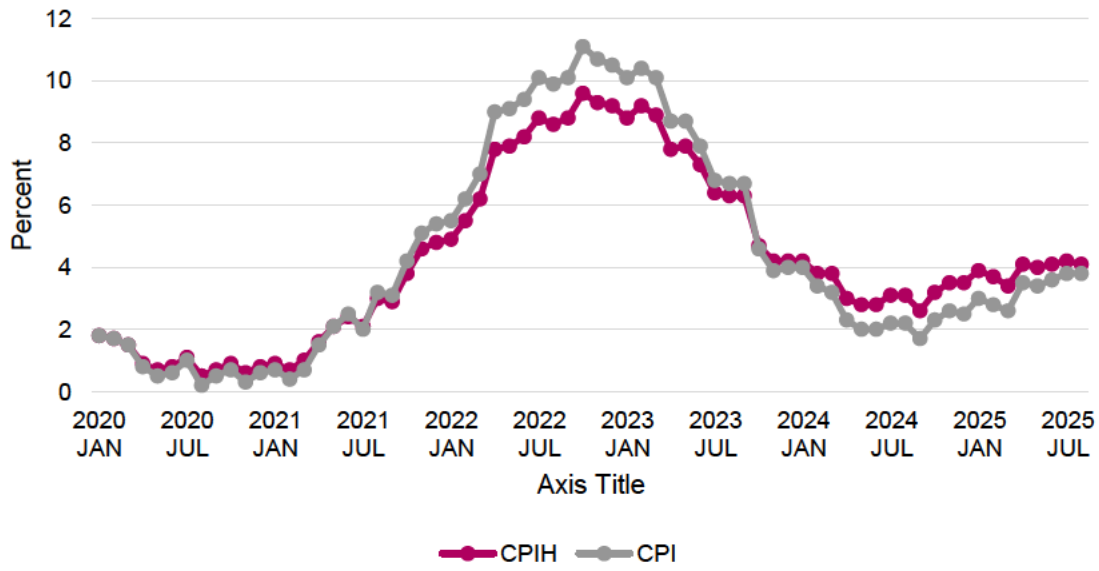
(204) The historical profile of CPI and CPIH is instructive and set out in Figure 4 below. This shows periods where CPI has run ahead of CPIH and the reverse.

[97] CMA PD, Volume 4.

[98] Kairos Economics, Setting the Allowed Return on Equity for PR24 (19 March 2025), page 35: https://assets.publishing.service.gov.uk/media/68e7c66cb6ae95e3c76907d1/Kairos_PR24_Allowed_Return_2025.pdf.

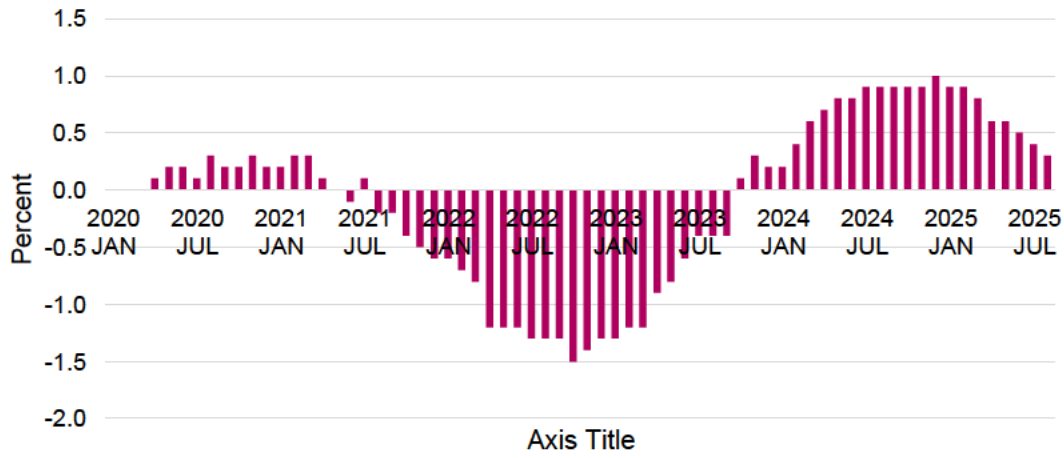
[99] Oxera, RIIO-3 draft determinations – CAPM parameters and debt-based cross-checks (22 August 2025), page 40: https://www.spenergynetworks.co.uk/userfiles/file/Annex%202.2%20-%20Oxera%20-%20RIIO-3%20DD%20CAPM%20parameters%20and%20debt-based%20cross-checks.pdf.

Figure 4: Historical profile of CPI and CPIH (2020–2025)



Source: ONS

Figure 5: Difference (Annual CPIH – Annual CPI) (2020–2025)



Source: ONS

(205) During the period of this chart, since 2020, the average difference between CPI and CPIH has been -0.1%. Since 2015 the average difference has been 0.0% and since 2000 the average difference has been 0.0%. This shows how out of place the CMA's +0.4 assumption is with respect to historical experience.

(206) Forward-looking projections also support a much smaller difference. The OBR's latest five-year forecast shows a difference of up to 0.1% in 2027/28, 2028/29 and 2029/30 - the final three years of PR24.[100]

(207) The OBR analysis of long-term CPIH inflation then jumps up to 0.4% increase above CPI. It makes hugely optimistic assumptions about earnings growth and productivity growth –

[100] The next OBR forecast is due to be published on 26 November 2025 and will need to be taken into account by the CMA in its final determination (https://obr.uk/publications/).

assumptions that the CMA has deliberately aimed down from in its totex work. This assumption is far less certain than both the historical data and its near-term forecast.

(208) The key question here is: what do investors currently expect from CPIH inflation? When the long-term historical experience is very close to 2% and the OBR's forecast to 2030 is also around 2.1%, then an assumption of 2.4% is a clear outlier. The OBR 2.4% long-term assumption isn't a central case, nor a consensus forecast. Investors will give more weight to recent/current experience. The appropriate CPIH inflation assumption is ~2.1%.

6 Conclusion

(209) Thames Water welcomes the recognition that changes are required to key aspects of Ofwat's FD. In particular, we support the proposals made in relation to frontier shift efficiency, the allowed rate of return, and certain expenditure allowances. That said, we have identified concerns with certain aspects of the PD and (where relevant) provided alternatives that we consider to be better aligned with regulatory best practice, the relevant statutory duties, and the evidence presented by the IWC. In particular:

(210) **We disagree with the CMA's application of LASSO in the present regulatory context.** The exclusive use of LASSO to set modelled base cost allowances is inappropriate, disregards the role of expert judgement, and does not sufficiently consider relevant evidence points in relation to variables that have been put forward by the Disputing Companies and third parties. We do not contend that Ofwat's existing modelling framework is without flaws, and therefore, that the choice between the existing framework and the LASSO framework is a choice between right and wrong in principle. However, we consider that LASSO has significant flaws in *practice* in our regulatory context – in its transparency, reproducibility, lack of expert judgement, and plausibility of selected models – such that it is clearly inferior and, at least currently, unsuitable to be applied in substitution for Ofwat's framework in the CMA's final determination.

(211) **We disagree with the CMA's approach to estimating WBB for mains renewal**. In particular, we have demonstrated that, in estimating WBB using renewal rates, the appropriate statistical approach is the weighted average. We also set out why there is a clear case for putting more weight on the last five years of data, as these years have more influence on final allowances through their role in determining the catch-up challenge. Finally, we set out why the consistent fall in replacement rates over the years should be taken into account, not least because a failure to do so would be inconsistent with the approach to setting PCLs.

(212) **We consider that the CMA should make significant changes to the MeXes to ensure that the ODI framework continues to represent a 'fair bet'**. For C-MeX in particular, we have set out why there is evidence of PCL miscalibration and excessive revenue at risk that warrants changes to the PCL and/or the ODI rate which is applied. This is aligned with the recommendations of the IWC. In addition, we explain why D-MeX and BR-MeX are also excessively financially incentivised and should be decreased to create a proportionate and targeted regulatory incentive framework.

(213) **We disagree with certain aspects of the CMA's treatment of PCDs.** While we support the CMA's decision to delay consideration of non-delivery PCD clawbacks and within AMP PCD changes until the publication of Ofwat's consultation on the same, we consider that the CMA should now revisit these issues in its final determination. For example, we consider Ofwat's approach to non-delivery clawback to be excessively complicated and propose that

only the unspent portion of the funds are clawed back (with safeguards to protect against perverse incentives).

(214) **We do not agree with the CMA's use of a forward looking 2.4% CPIH inflation assumption.** We have explained that this is a major departure from regulatory precedent and makes optimistic assumptions about earnings and productivity growth that are not aligned with the approach taken by the CMA in relation to totex. We suggest that a more appropriate CPIH inflation assumption (of c.2.1%) is used.

(215) **In all instances, the approach that the CMA adopts for the Disputing Companies should not prejudge the CMA's assessment of a future redetermination for Thames Water**. Thames Water is in an exceptional position and is in the process of undertaking a significant operational and financial turnaround. If a reference of our FD is made, the CMA's redetermination would be critical for Thames Water's operational and financial viability. While the PD would deliver important incremental changes to the PR24 FD, the CMA exercises restraint in several key areas citing the "*confines of the existing regulatory framework*".[101] Given the unique circumstances of Thames Water, if our FD is referred we consider that the CMA would need to take a fresh look at fundamental aspects of our price control arrangements and the regulatory architecture that underpins it to deliver a redetermination that is realistic, deliverable and financeable, as well as affordable for our customers.

(216) We would be happy to provide more detailed observations on the issues set out in this submission, or to discuss these with the CMA, should this be of assistance to the CMA's process.

[101] CMA PD, Volume 1, para 2.6.