



REAL PRICE EFFECTS AT PR24

Prepared for Affinity Water, Bristol Water, South East Water, Southern Water, Sutton & East Surrey Water, Thames Water and Yorkshire Water

Strictly private and confidential

June 2023

Contents

Executive summary	4
1. Introduction	6
1.1. Objectives of the report	6
1.2. Structure of the report	7
2. Context for estimation of RPEs during PR24	8
2.1. Economic landscape	8
2.2. Industry landscape	9
2.3. Regulatory landscape	9
2.4. Implications for the role of RPEs	10
3. The applicability of the PR19 approach to RPEs for PR24	15
3.1. The approach to RPEs at PR19	15
3.2. Is the PR19 approach fit for purpose for the PR24 price control?	16
3.3. Summary of suggested areas for improvement	20
4. Assessment of the emerging evidence for RPEs at PR24	21
4.1. Assessment of the need for an RPE for labour costs	21
4.2. Assessment of the requirement for an RPE for energy costs	24
4.3. Assessment of the requirement for an RPE for chemicals costs	27
4.4. Assessment of the requirement for an RPE for Materials, plant and equipment costs	28
4.5. Summary of results	30
5. Conclusions	32



Important notice

This Important notice should be read in conjunction with the transmittal letter provided to the companies.

This Report has been prepared by KPMG LLP (“we” or “KPMG”) for Thames Water Limited, Yorkshire Water Limited, Bristol Water Plc, Affinity Water, South East Water Limited, Sutton and East Surrey Water Plc and Southern Water Limited, (collectively “you” or “the Companies”, and individual “Company” where the context applies) in accordance with terms of engagement agreed by companies with KPMG under a private contract. This report should not be regarded as suitable to be used or relied on by any other person for any purpose.

The companies have commissioned KPMG to write a KPMG branded report on Real Price Effects (RPEs), to assist in their considerations regarding the PR24 price review.

Our report is for the benefit and information only of those parties who have accepted the terms and conditions of our Engagement Letter. Without prejudice to any rights that the companies may have, subject to and in accordance with the terms of engagement agreed between the companies and KPMG, no person is permitted to copy, reproduce, or disclose the whole or any part of this report unless required to do so by law or by a competent regulatory authority. In this instance, we consent to the companies disclosing the report to the Water Services Regulation Authority (“Ofwat”) in the context of the next price control (“PR24”).

To the fullest extent permitted by law, we will not accept responsibility or liability to any other party, including those parties’ legal and other professional advisers, in respect of our work or the report.

In preparing our Report, our primary source has been Ofwat PR19 documentation and various publicly available indices, as described in the report. Reference is made to ‘KPMG Analysis’; this indicates only that we have where specified undertaken certain analytical activities on the underlying data to arrive at the information presented, KPMG does not provide any assurance as to the appropriateness or accuracy of sources of information relied upon, has not sought to establish the reliability of the sources by reference to other evidence, and KPMG does not accept any responsibility for the underlying data used in this report.

Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. For the purposes of this report, the most recent regulatory period for which information was available was 2021-22.

For this Report the companies have not engaged KPMG to perform an assurance engagement conducted in accordance with any generally accepted assurance standards and consequently no assurance opinion is expressed.

KPMG has not assisted the companies in preparation of any aspect of their PR24 business plans which remain, at all times, the sole responsibility of the companies. KPMG has not made any decisions for the companies and has not assumed any responsibility in respect of any aspect of their Business Plans including what the companies decide, or have decided to, include in their business plans.



The opinions and conclusions expressed in this report are (subject to the foregoing) those of KPMG and do not necessarily align with those of the companies.

Executive summary

RPEs play an important role in the regulatory framework to ensure exogenous risks are appropriately allocated between companies and customers.

In PR19, Ofwat applied a RPE for labour costs, and introduced a true up based on manufacturing wage costs. In its PR24 Final methodology, Ofwat has noted that it will consider whether a labour RPE and accompanying true up remain appropriate for PR24 and whether an RPE is needed for other input cost areas.

In the period since the PR19 Price Control was determined, the global outbreak of coronavirus had the effect of closing down significant parts of the world economy. Subsequently, the war in Ukraine has resulted in an unprecedented increase in energy prices in the UK. The impact from these global events defines the PR24 economic landscape and macroeconomic conditions as subject to significant volatility and uncertainty.

These material changes in the economic and regulatory landscape in which water companies will operate during the next price control period, together with the need for major investment during PR24 means it is timely to reconsider the PR19 RPE framework.

The PR19 RPE assessment framework was developed by Europe Economics on behalf of Ofwat. This report has examined the extent to which Europe Economics' approach remains fit for purpose and should be adopted at PR24.

This report ("the Report") by KPMG assessing the appropriate approach to determining RPEs for PR24 was commissioned by a consortium of seven companies (Affinity Water, Bristol Water (now part of South West Water), South East Water, Southern Water, Sutton & East Surrey Water, Thames Water and Yorkshire Water).

Having assessed the Europe Economics approach adopted at PR19, the report identifies the following areas for potential improvement:

- **Consideration of whether a management controlability criterion is appropriate.** Given that the ex-ante RPE allowance is fixed and the true-up is based on indices beyond company control, it is not clear that either providing or not providing for an RPE allowance for a specific input will provide an incentive to management to control costs. This would suggest that this criterion does not serve a useful purpose as part of the assessment framework given that generally companies lack any significant control on input prices during the price control period..
- **Materiality does not represent an appropriate criterion (implicit or explicit).** If a cost category has a significant wedge or exhibits significant volatility then it should have an RPE/true-up mechanism associated with it regardless of overall materiality in the cost base. Outcome of a materiality test is sensitive to the choice of cost disaggregation. If RPEs are disallowed for cost categories with a small share in overall totex, then the RPE framework is limited to the two cost categories (labour, energy) that account only for 40-50% of totex and companies remain exposed to the input price risk for the remaining large proportion of totex.
- **Volatility should be carefully considered and should not be allowed to turn into a Materiality Criterion.** Europe Economics recognised the significance of volatility in

its approach to assessing RPEs at PR19 however by analysing volatility as a share of totex and applying a 1% threshold, this has the effect of turning the volatility assessment into a materiality test. When volatility makes forecasting future values difficult there should be a greater emphasis on the benefits to both companies and customers of applying a true up mechanism.

The underlying principles for an RPE framework at PR24 should include:

- An appropriate allocation of the risk from external price movements between companies and customers, based on factors within company control.
- A recognition of company preference for ex-ante allowances, where possible, to ensure cash-flow stability, which ultimately benefits customers through price stability.
- The use of true-up mechanisms as appropriate to minimise the risk to companies and customers of cost forecasts being incorrect.

The PR24 approach to RPEs should reflect both these underlying economic principles and the economic conditions faced by water companies.

The report has assessed the latest evidence for RPEs for all cost areas subject to the RPE framework. The findings of the assessment can be summarised as follows:

- **Energy costs:** There is strong evidence of a significant positive wedge above CPIH in the historical data and this is further exacerbated by volatility in very recent years. Further volatility in energy prices resulting from recent economic and geopolitical events has created immense uncertainty which will result in difficulties in predicting the evolution of prices with a reasonable degree of confidence.
- **Labour costs:** There is mixed evidence on the existence of a historical wedge and the assessment as to whether an RPE is merited is highly dependent on the timeframe and index considered. Looking forward, OBR forecasts for the next five years imply positive wage growth above general inflation, however the observed uncertainty over forecasts undermines the credibility of OBR projections.
- **Chemicals:** There is evidence of a statistically significant positive wedge in the recent historical period.
- **Materials, plant and equipment:** There is mixed evidence on the wedge when considering historical data. Results are influenced by the choice of index and the underlying period considered for analysis. The choice of indices used for the PR19 period should be re-examined ahead of the next price control period to mitigate the risks of mis-capturing input price risk for material, plant and equipment costs.

In addition, the following analysis should be carried out to enhance the quality of the assessment:

- The measurement of the wedge between input prices and general inflation should be updated with the latest outturn and forecast information, as data becomes available.
- The use of additional input indices should be considered where relevant and available.

1. Introduction

Ofwat's PR19 final determination decision on RPEs can be summarised as follows:

- Provision of an RPE allowance for labour costs, based on Office for Budget Responsibility's (OBR) real wage growth forecasts.
- True-up of the RPE allowance for labour costs based on ASHE hourly manufacturing wages index at the end of the price control period.
- No provision of an *ex-ante* RPE allowance or a true-up adjustment for any other input cost category.
- Provision of an RPE allowance for modelled base costs, metering enhancement costs and WINEP enhancement costs.
- No provision of an RPE allowance for any other cost category.

The CMA's final decision on RPEs at PR19 re-determination can be summarised as follows:

- To uphold Ofwat's PR19 RPE assessment framework and decision, except for extending the application of a labour RPE to all enhancement allowances.

Water companies are due to submit their final business plans for the next price control ("PR24") which will cover the five-year period to 31 March 2030. The final plans will include companies' estimates of the assumptions for Real Price Effects ("RPEs") for the upcoming price control.

Ofwat has not yet published its proposed approach to RPEs for PR24 noting only in a single sentence that it will consider a case for the application of RPEs to other cost areas besides labour, citing as examples, materials and energy.

1.1. Objectives of the report

This report ("the Report") by KPMG was commissioned by a consortium of seven companies (Affinity Water, Bristol Water (now part of South West Water), South East Water, Southern Water, Sutton & East Surrey Water, Thames Water and Yorkshire Water) to assess the appropriate approach to determining RPEs for PR24, taking due note of Ofwat's approach at PR19.

The Report considers the appropriateness of the current Ofwat RPE framework in the context of PR24 in two steps:

- Firstly, it undertakes a relative assessment between PR19 and PR24 to understand whether any changes from expected macroeconomic conditions, industry landscape and regulatory design could impact upon the approach to RPEs at PR24.
- Secondly, it examines whether Ofwat's PR19 approach can appropriately account for any regulatory and market developments identified in step 1 and identifies potential areas for improvement to the methodology.

The Report considers the implications of the findings in step 1 and 2 for the RPE estimates for PR24 price control period.



The scope of the work does not include any company-specific analysis. All the analysis and commentary set out in this report is reflective of dynamics expected to apply for the entire sector during the PR24 period.

1.2. Structure of the report

The Report is structured as follows:

- **Section 2** sets out the key economic, industry and regulatory factors which could impact on the RPE approach going forward.
- **Section 3** establishes a framework for the consideration and application of RPEs at PR24, building on the PR19 approach and the considerations identified in section 2.
- **Section 4** assesses the evidence for RPEs for all cost areas subject to the proposed RPE framework.
- **Section 5** sets out the report's conclusions.

2. Context for estimation of RPEs during PR24

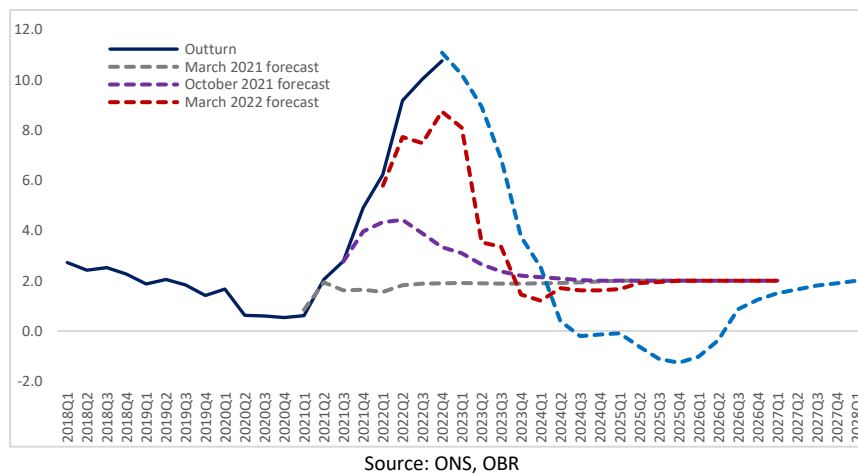
2.1. Economic landscape

The war in Ukraine has resulted in an increase in global energy prices. The unprecedented growth in energy prices in the UK, reaching approximately 35% above CPIH in 2022¹, has affected a wide range of sectors. Although energy prices are expected to fall from their peaks in 2023, they are likely to remain significantly higher than observed historically.

In addition, the coronavirus pandemic had the effect of closing down significant parts of the world economy. Although supply chain pressures have eased in 2022, they remain elevated by historical standards and the economy continues to experience disruption due to supply chain issues.

The path of inflation is uncertain and, as shown in Figure 1, the OBR has made significant revisions to even short-term forecasts in recent releases. The extent of the CPI inflation overshoot in 2021-22 is the largest difference between forecast and outturn since the OBR began forecasting in 2010. Around one-third of the difference is due to rising energy costs, with the remainder reflecting a tighter than expected domestic labour market, persistent supply and logistic bottlenecks and an unexpectedly strong recovery in demand in advanced economies².

Figure 1: Successive OBR inflation forecasts



There is a risk to the outlook for inflation, both to the upside and downside, due to the unpredictability of further supply shocks and price pressures. The rapidly changing inflation environment defines the PR24 economic landscape and macroeconomic conditions as volatile and uncertain.

Like most companies, water companies are exposed to external economic shocks. Due to the nature of the regulatory framework, water companies are particularly vulnerable to any mismatch between the headline consumer inflation rate and rising input prices. Likewise, water companies may not have the same flexibility as unregulated businesses, for example, to raise

¹ Average over three quarters of 2022 based on BEIS electricity price index

² Forecast evaluation report, OBR, January 2023

prices, albeit being regulated does provide certain protections, such as better visibility of revenues and with revenues being linked to inflation.

Energy costs account for around 11% of total base expenditure for water companies, and the unexpected rise in energy prices, during the PR19 period, has presented a significant challenge to the sector. In addition, supply chain difficulties in relation to chemicals and building materials have resulted in further upward pressure on costs.

2.2. Industry landscape

Against this economic backdrop the water sector will require an unprecedented level of capital investment to meet environmental demands. In 2022, UK Government's Department for Environment, Food and Rural Affairs (DEFRA) issued 'Storm overflow discharge reduction plan', requiring wastewater companies to invest £56 billion over the next 25 years to reduce discharge. The UK government has also set additional environmental targets, for example, to reduce the nutrient and phosphorous loads in wastewater effluent- in itself, this will require a step change in investment.

In addition, it is anticipated that the sector will face increased demand during the PR24 period due to population growth and the impact of climate change, which will require higher investment, in areas such as drought resilience, reservoir capacity and leak reduction. Furthermore, the transition to Net Zero will change how water companies operate with additional costs through the need to upskill employees and invest in technology.

In parallel with this, the ratings agency Moody's has lowered its credit outlook for the water sector from stable to negative for the first time since it was first published in 2004 "*primarily reflecting increasing cost pressures in the current macroeconomic environment*³". This has clear implications for the PR24 Price Control given the expectations of an increased requirement for capital investment, much of which will need to be funded through the raising of debt.

2.3. Regulatory landscape

In December 2022, Ofwat published its Final Methodology for the PR24 price reviews. Although there are still significant aspects of the PR24 framework that are not known at this stage, the document sets out some proposed methodological changes and signals the direction for others. PR24 will be an evolution of the PR19 framework, but with notable additional challenges for water companies.

The Final Methodology does not explain the detailed mechanisms through which the regulator will assess proposed enhancement programmes. Ofwat is yet to publish its PR24 efficiency targets, but it provides an early indication that PR24 will set challenging efficiency requirements to ensure that the impact on customer bills of additional expenditure is minimised.

Ofwat has indicated that it intends to make greater use of historical data in setting the efficient enhancement expenditure and may consider business plan forecasts to set the catch-up efficiency challenge in base cost assessment. In residential retail, Ofwat will retain no automatic indexation to allowed revenue despite the current high rate of inflation.

³ Regulated Water Utilities – United Kingdom: 2023 Outlook - Turns negative amid macroeconomic pressures, Moody's, January 2023

PR24 will require further improvements in performance⁴. The overall package on delivering outcomes for customers will represent a challenge to many companies, given that a number of common performance targets are proving extremely demanding in the current period.

The Final Methodology implies a greater level of risk for the sector⁵, whilst the proposed methodological changes⁶ imply a material downward pressure on allowed returns during PR24. There is the potential for a disconnect between risks and return due to, among other factors, the use of backward-looking data in the context of increasing future risk exposure from a step change in operational and macroeconomic risks.

2.4. Implications for the role of RPEs

Cost indexation is an important element of regulatory practice, and it is generally accepted that costs should be indexed for general measures of inflation, such as CPIH.

However, a water company's cost base is different from a consumer's typical "shopping basket", and as a result the actual inflation faced by the water sector is not necessarily captured accurately by general price inflation measures.

It is therefore appropriate to consider what are known as Real Price Effects (RPEs) where the rate of change of input prices deviates from headline inflation. If input costs grow faster than general inflation then companies will face a shortfall between costs and revenues, while if input prices rise more slowly or reduce, the sector will earn higher revenue than is required to recover efficient costs. Appropriately specified RPEs therefore provide a protection for both companies and customers.

In competitive markets, input price increases are to some degree reflected in the price of goods produced and services provided for customers. Similarly, if input prices fall, the price of a product is expected to reduce, and customers will benefit. The role of the RPEs in regulated industries is to ensure exogenous risks are appropriately allocated between companies and customers with these risks then reflected in the level of allowed returns.

There is the potential for significant adverse consequences of not applying RPEs when their use is justified including efficient costs being disallowed or not recoverable and pressures on financeability driven by factors outside of company control. Not providing for RPEs may result in crystallisation of risks which affect projected cashflows and returns and could result in reduced financial flexibility for companies to invest, which will ultimately affect service quality for customers. All of the above is likely to be exacerbated when the economic environment is highly uncertain as is implied by current macroeconomic volatility and uncertainty ahead of PR24.

The requirement for major capital investments during AMP8 has coincided with significant macroeconomic uncertainty and a national cost of living crisis. Water companies' actual spending compared to total cost allowances has been strongly affected by the pandemic and more extreme weather events. Going forward it will also reflect the energy crisis and wider inflationary pressures.

⁴ PR24 Final Methodology, Appendix 7, performance commitments

⁵ Relative risk analysis and beta estimation for PR24, KPMG, September 2022

⁶ Changes in Beta estimation, removal of the RPI back series when estimating TMR, partial adoption of Mason & Wright's proposal on Beta, dismissal of AAA yields to estimate the RfR, reduction in Cost of Deb, removal of aiming up and et.

Expected changes in the economic, industry and regulatory environment may require a reconsideration of the RPE framework applied as part of PR19. This will include how costs are indexed, to respond promptly to the risks and challenges the sector will face during PR24. Higher uncertainty increases the importance of assessing the need for RPEs as part of the regulatory framework to ensure ongoing efficiency and an appropriate risk allocation between company and consumers.

Table 1 summarises key changes expected in the PR24 price control period and sets out the potential implications of each for the approach to RPEs:

Table 1: Summary of key expected changes at PR24 and implications for the RPE framework

Economic factors	<p>Increased economic uncertainty and volatility of input prices</p> <p>The PR19 price control has been marked by a series of significant economic shocks, the impact of which is persistent but unpredictable. Greater economic uncertainty is directly linked with the increased need for an appropriate RPE mechanism to mitigate/reduce the risks faced by the water sector. To reflect higher economic uncertainty appropriately, the PR24 RPE framework may need to take account of the considerations set out below.</p> <p>A greater weighting on volatility in the RPE assessment criteria</p> <p>In the presence of material uncertainty, it is harder to estimate future movements in input costs and general inflation accurately, and consequently the wedge between the two. Greater volatility of input costs in the PR19 period potentially implies a higher exposure to external economic shocks going forward, which increases the probability the index will move differently from CPIH.</p> <p>A greater use of true up mechanisms</p> <p>Forecasts and historical relationships are unlikely to underpin robust RPE allowances over a price control period, given significant volatility in input costs and drivers. Less stable wedges, low confidence in forecasts or increased volatility do not remove the need for RPEs but can support the need for the inclusion of an <i>ex post</i> true-up mechanism alongside the <i>ex-ante</i> allowance. The use of an <i>ex post</i> true-up is a way of controlling against volatility and uncertainty. The True-up mechanisms may automatically take into account the impact from external economic shocks on key inputs.</p> <p><u>Example: use of a true-up for Labour costs</u></p> <p>At PR19 Ofwat allowed a labour RPE based on an OBR forecast of real wage growth with a true-up mechanism based on the ASHE manufacturing hourly wages index. After updating the PR19 reconciliation model with actual information on CPIH and the ASHE index (both published by ONS), the real wage growth was 2.01% (2020/21 and 2021/22 average), higher than the OBR forecast of 1.1%. Consequently, a c.1.0% real increase in wage allowance would need to be made at PR24 to account for the impact of this higher growth. The</p>
------------------	--

cumulative impact over PR19 of the increases will need to be calculated as the price control period progresses.

Example: Absence of an RPE for Energy costs

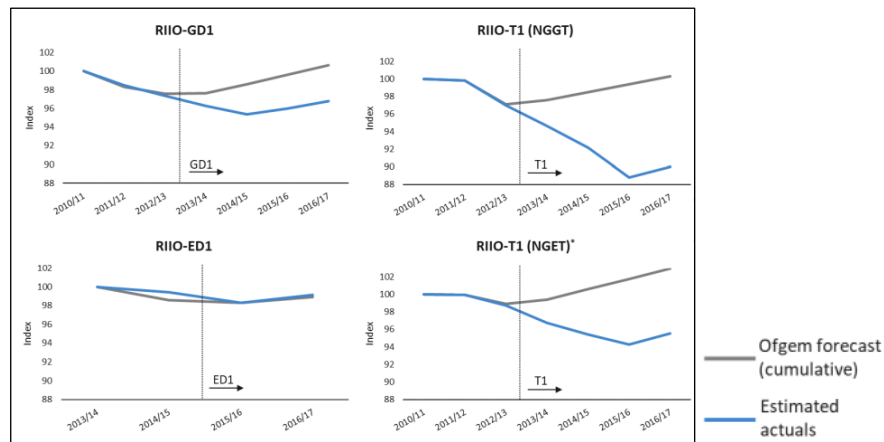
Ofat recognised evidence for a significant wedge, although this was dependent on the period of analysis chosen. Ofwat considered that energy costs were at least in part within management control and asserted that increases in energy costs would in part be captured through increases in CPIH, Ofwat concluded that the evidence was insufficient to warrant an RPE for Energy costs.

In the first two and half years of PR19 the wedge between electricity prices (BEIS index) and CPIH has been on average 16%, (reaching c.46% in Q2, 2022), which presents a material risk relative to the chosen index (CPIH).

Example: RIIO-GD1 approach

Ofgem significantly mis-forecasted outturn input price inflation for the GD1 and T1 price controls. This was driven by the aftermath of the global financial crisis, where labour costs stagnated in real terms over the early part of the GD1 and T1 controls compared to the above inflation increases seen historically which had been built into Ofgem’s forecasts. Ofgem’s review of RIIO-1 estimated that this issue created 70bps of additional RoRE for the GDNs at RIIO-GD1.

Figure 2: The problem of RPEs at RIIO-1 for Ofgem



Source: CEPA Review of the RIIO Framework (2018)

The apparent volatility and deviation of the ASHE index from OBR forecasts and the high energy price wedge with CPIH suggests that an ex-ante RPE with a true-up would have provided a more appropriate solution protecting both companies and customers.

Changes in CPIH input weights

The “shopping basket” of items used in compiling CPIH are reviewed each year and reflect developments in wider economy. When uncertainty is higher, changes in specific CPIH inputs may be more pronounced and the RPE assessment criteria as to whether CPIH adequately captures the input price for certain costs revised.

	<p>Impact of economic shocks on cost indices</p> <p>It will be important to select indices that are robust to known economic shocks. Historically, labour cost indices may have closely matched network company cost pressures, but this might no longer hold true in the medium term due to the effects of economic shocks such as coronavirus e.g. the impact of furlough and shutting down of some sectors. For example, the manufacturing sector furloughed around 30% of its staff at the height of the pandemic which had a significant impact on the indices for that sector.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Industry factors</p>	<p>Meeting increased demand, Net Zero and environmental targets</p> <p>As the role and mix of work undertaken by water companies changes in response to Net Zero, environmental and social expectations, then historical trends and the importance of certain inputs may change, and past volatility may not be a good basis for estimation of future volatility.</p> <p>Many of the enhancement proposals that the water sector is taking forward at PR24 have uncertainty attached. They represent new challenges for the sector, and in many cases represent innovative areas of expenditure. The unpredictability of the scale and the cost of programmes increases the risk of a mismatch between PR24 cost allowances and actual needs. The PR24 RPE approach should take into account the level of uncertainty associated with the large investment schemes and provide an appropriate true-up mechanism, to reduce the risk exposure from over/underspend for companies and customers.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Regulatory factors</p>	<p>Large scale of PR24 enhancement programs</p> <p>At PR19 Ofwat did not provide an explicit RPE allowance for all enhancement areas. This decision was amended by the CMA, extending the RPE framework to all enhancement costs – this helped to ensure that all companies have sufficient allowances to deliver the required level of service. In addition, it was also accompanied by an efficiency challenge to ensure that customers did not overpay.</p> <p>Given the likely scale of programmes to be undertaken during PR24, enhancement costs are becoming a more material proportion of water companies overall totex. If Ofwat departs from the CMA approach at PR19 and does not apply RPEs on all types of enhancement costs, companies will be exposed to larger risk and may face significant cost pressure at PR24 period.</p> <p>Anticipated increases in cost challenges in base and enhancement areas</p> <p>The intention to apply a tighter catch-up and frontier shift challenge may result in risks being overly and inefficiently allocated to water companies as against customers which could add to an imbalanced price control package. Any stretching efficiency challenges should be considered with corresponding adequate treatment of input prices, for example, if frontier shift implies enhanced labour productivity, then equally enhanced labour productivity would be expected to result in an expectation of higher levels of real wages.</p>

The methodology for frontier shift and RPEs should be consistent. If Ofwat acknowledges that CPIH indexation picks up part of the input price inflation and subtracts it from estimated input cost pressures, then it should also recognise that indexation to general inflation may also capture part of industry productivity growth and make a corresponding adjustment to its frontier shift estimate.

No indexation and cost sharing in residential retail for PR19

At PR19 the retail price controls were not indexed to a measure of general inflation. Ofwat set cost allowances in nominal terms based on 2017/18 values (and therefore prices) and these then became the nominal allowances for 2020-21 to 2024-25.

The efficiency challenge in retail was based on business plan costs rather than historical cost performance. Furthermore, Ofwat assumed companies to have incorporated RPE assumptions in their business plans but did not provide upfront clarity in relation to this assumption. This resulted potentially in inconsistent reporting of RPE assumptions across the sector. Additionally, Ofwat did not provide a cost-sharing mechanism for retail, thus any over or underspend was fully to the account of the companies.

At its initial assessment of business plans (IAP), Ofwat stated that inflation risk in retail is lower than in wholesale and so companies would be expected to manage input costs as part of ex-ante allowances. However, in reality, most retail costs are in fact labour-related and, at Final Determination, whilst Ofwat applied an ex-ante labour RPE with a true up on base costs in wholesale, it did not extend this to retail expenditure.

This apparent inconsistency in treatment of costs between price controls should be reconsidered at PR24. It is important that Ofwat is seen to consider input costs openly and justify its decisions, particularly where they appear to be inconsistent with other decisions in the price control package.

3. The applicability of the PR19 approach to RPEs for PR24

This section examines whether Ofwat’s PR19 framework for RPEs is fit for purpose for adoption and use of at PR24. Firstly, it reviews the approach used to assess the requirements for RPEs at PR19 and identifies areas for improvement considering the changes in the economic, industry and regulatory landscape. Secondly, it proposes changes which might be made to the framework going forward to address the areas for improvement.

3.1. The approach to RPEs at PR19

As part of the development of the PR19 price control framework, Ofwat commissioned Europe Economics to develop an approach to assess the case for RPEs. A two-stage framework was proposed which was implemented subsequently by Ofwat for the PR19 period and later accepted by the CMA at PR19 re-determination.

The framework was structured as follows:

Stage 1: An assessment of the case for RPEs is carried out for each of the major wholesale cost items, namely

- Labour costs
- Energy costs
- Chemical costs
- Material, plant and equipment costs

Stage 1 is itself broken down into two sub-stages:

- Stage 1A: Are there any material RPEs outside management control that are not captured by CPIH indexation?
- Stage 1B (if relevant): What, if anything, should be done about these RPEs in terms of regulatory treatment?

Table 2 sets out the approach for stage 1A which follows a gated assessment via three sub-criteria.

Table 2: Stage 1A assessment criteria

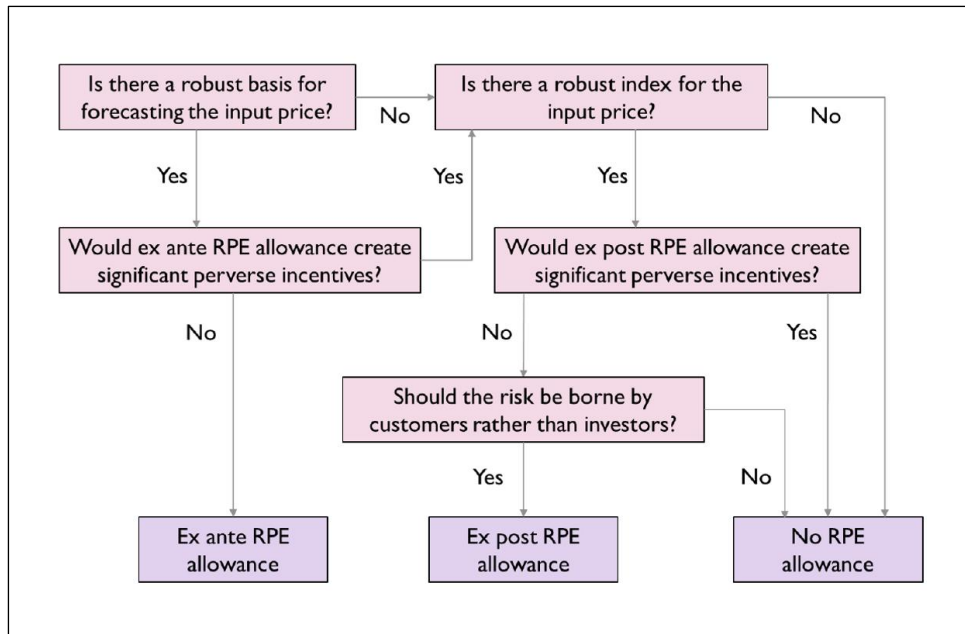
Stage 1A	<p>Criterion 1: Forecast wedge</p> <p>Is there a significant likelihood that the value of the wedge between the input price and CPIH will differ substantially from zero over the period of the price control? Both the expected value of the wedge and the volatility of the wedge are considered.</p>
	<p>Criterion 2: Representation of input in CPIH</p> <p>Are there sufficient and convincing reasons to think that CPIH does not adequately capture the input price?</p>

Criterion 3: Management control:

Is the input price and exposure to that input price outside management control for the duration of the price control?

Stage 1B identifies the appropriate regulatory treatment where a potential RPE has been identified during stage 1A. This is described through a decision tree which is shown at Figure 3.

Figure 3: Stage 1B assessment map



Source: Europe Economics

Stage 2: An appraisal of the overall RPEs ‘package’ implied once stage 1 has been completed.

3.2. Is the PR19 approach fit for purpose for the PR24 price control?

Good regulatory practice involves establishing a clear, realistic, flexible, and consistently applied set of tests to determine the need for RPEs.

This section comments on the PR19 framework on the basis of the application of these principles and identifies where there is scope for improvements to be made, given the particular circumstances that might be expected to arise going forward.

Stage 1A assessment

Use of ‘partial passes’ in stage 1A

In the PR19 framework, for a cost item to pass stage 1A, it should meet all three criteria, although for the second and third criteria there is the option for a ‘partial pass’. Moving from a binary grading system and adopting the concept of a partial pass is helpful as it allows the

framework to capture more detailed context and if necessary, employ additional analysis. The concept of partial pass should be extended to criterion 1.

At PR19, Europe Economics concluded that there may be a compelling case to allow for RPEs for labour and energy costs, depending on the reliance placed on OBR forecasts (on wages) and BEIS forecasts (on energy), stating “*Our final report accepts that an ex-post indexation mechanism could also be considered for energy*”⁷. However, Ofwat only allowed a labour RPE on the basis that the case for RPE adjustment for energy was less clear⁸. If energy costs had been graded as a partial pass, which would have been reasonable had the framework allowed it, then Ofwat may have felt more compelled to accept Europe Economics recommendation and hence provided an RPE for energy costs also. Failure to provide for efficient level of costs can result in underinvestment and consequentially increased costs to customers. Customers equally face the cost of compensating investors for the risk they bear in terms of uncertain and volatile input costs.

The use of unstated materiality criteria

In the final version of its approach, Europe Economics introduced some modifications to the assessment criteria⁹ including the removal of a materiality condition¹⁰ which had been challenged by the companies. However, implicit materiality criteria remain in effect in the assessment of sub-criterion 1 and in the actual application of stage 1A.

In criterion 1, the framework assesses the volatility of a 5-year rolling average wedge between input prices and general inflation (CPIH) as a share of totex with a 1% threshold. The application of the 1% threshold has the effect of re-introducing a materiality criterion into the framework. This 1% threshold band is arbitrary, not supported by regulatory precedent and is contrary to Europe Economics’ decisions elsewhere in the framework. The application of such a threshold has a particular impact on chemical costs which represent approximately a 2% share of overall totex but where the volatility is unlikely to clear the 1% threshold.

In its decision to disallow energy RPEs, as a result of applying stage 1A, Ofwat explained: “*The scale of cost (materiality) is lower in energy (9% compared to 35% for labour). Additionally, some energy costs are reflected in CPIH. Europe Economics presents evidence that CPIH partially captures the impact of changes in energy costs as the total share of energy (including other fuels which tend to move in line with energy prices) in CPIH is 5 per cent. Therefore, CPIH indexation will in part reflect increases in electricity prices*”¹¹. By rejecting energy RPEs, Ofwat has effectively without clear justification re-introduced the materiality threshold that was dropped from Europe Economics’ analysis.

Applying the appropriate weight to volatility of costs in criterion 1

Europe Economics recognised the significance of volatility in its RPE assessment at PR19 and considered the volatility of the wedge as a separate sub-test¹² as part of its criterion 1B. If this sub-test was passed, then criterion 1 was passed as a whole. However, as described

⁷ Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations, Europe Economics, 2019

⁸ PR19 Draft Determinations, securing cost efficiency technical appendix, Ofwat, 2019

⁹ Real Price Effects and Price Effects and Frontier Shift, Europe Economics, 2018

¹⁰ Criteria 1: Is the input cost item to which the RPE would be applied a material proportion of total company costs?

¹¹ PR19 Draft Determinations, securing cost efficiency technical appendix, Ofwat, 2019

¹² Criteria 1B: Does the wedge between the input price and CPIH exhibit high volatility over time?

previously, by analysing volatility as a share of totex and applying a 1% threshold, the framework has, in effect, turned the volatility assessment into a materiality test.

Given the current economic environment, greater importance should be placed on volatility going forward as a factor. Increased uncertainty in the wider economy is expected to have a prolonged impact on prices in the next price control period, however the direction and the magnitude of this impact is difficult to estimate.

The volatility of input prices observed in recent years could serve as a measure of how reactive certain input costs are, or can be, to external economic shocks. High volatility of input prices in the last few years implies a higher probability of them growing below/above general inflation in the future. As a result, the PR24 framework should redefine volatility assessment as an assessment of the risk of whether companies' input costs are likely to fluctuate relative to CPIH in the next price control period. This can be undertaken through a comparative assessment of the volatility of the wedge between input prices and general inflation in recent years (affected by economic shocks) compared to the volatility of the wedge observed over a longer historical timeframe.

Comparisons with the makeup of CPIH

Europe Economics' second criterion assesses the share of each cost item in totex with the share of the most comparable item in the CPIH basket. Europe Economics states: "*The logic is that if the share of a cost item in totex is similar to the share of that cost item in CPIH, then CPIH indexation should already be capturing well the evolution of that cost item in company costs*¹³". This implies that if a cost category has the same proportions in total costs as in CPIH, then criterion 2 is failed and an RPE does not need to be applied.

This logic only holds if the CPIH basket is identical to companies' cost proportions, which is not a realistic assumption. In all other scenarios, the wedge between input cost and the CPIH should be considered if an accurate assessment is to be undertaken. Assessing the proportion of a cost item is simply not a sufficient test to disallow RPEs.

Moreover, to achieve an accurate estimate of the input price inflation faced by companies, if an RPE is applied to at least one cost category, then RPEs need to be applied to all other input cost categories irrespective of whether they pass criterion 1 or not.

This is an approach taken by Utility Regulator ("UR") to estimate RPEs for Northern Ireland Water¹⁴. UR first calculates weighted input price (using input prices and the cost proportion of all cost items) and then subtracts retail price inflation ("RPI") and frontier shift. The approach taken by UR is less discretionary and more accurate than the one applied by Ofwat at PR19.

The relevance of management control in assessing the need for RPEs

Ofwat considers that management control of costs is an important consideration as companies may have some ability to protect both customers and themselves against input price volatility. The CMA accepted the management control criterion and agreed that it helps preserve management's incentive to control costs.

¹³ Real Price Effects and Price Effects and Frontier Shift, Europe Economics, 2018

¹⁴ Water & Sewerage Services Price Control 2021-27, Final determination – Annex K, Opex and Capex Frontier shift, Utility Regulator, 2021

The purpose of RPEs is to adjust for external input cost pressures that are outside the control of management. However, this should not be interpreted as RPEs only being applicable where there is no management control over costs. In general, management has *some* control in relation to the majority of the cost stack. What is more, if management had no control over costs, then setting assumptions of frontier shift would be completely unreasonable. However, there are external factors which are outside of the control of management, such as, input price movements driven by macroeconomic developments, which imply risks for the sector in the absence of regulatory mitigation. The presence of RPEs ensures these risks and factors outside of management control can be appropriately allocated between companies and customers.

Incentive properties for RPE mechanisms can be supported by:

- (1) an *ex-ante* RPE allowance provided upfront which is *independent* of companies' actual spending.
- (2) an *ex-post* true-up mechanism which is based on external indices which are not under management control; and
- (3) an *ex-ante* assessment of the proportion of costs to which the true-up is applied.

As a result, it is unclear how providing an RPE allowance, *where appropriate*, acts as a disincentive for companies to control costs, e.g., by hedging energy prices effectively or controlling labour costs through long-term contracts. Moreover, keeping costs in CPIH real terms lower than anticipated, through hedging or other managerial actions, should be recognised as efficient underspend and the benefits should be appropriately shared with customers through the cost-sharing mechanism.

Where an RPE allowance is not provided but is required to protect companies from increasing uncontrollable costs to which they are exposed, the regulatory framework transforms external pressures into a requirement for additional efficiency improvement, allocating all risk entirely to companies.

Stage 1B assessment

A greater use of true-up mechanisms

The greater economic uncertainty and increased volatility in historical and forecast indices being observed currently imply that there may be a strong case for the use of ex-post true-up mechanisms for PR24. Given the high volatility in indices, use of forecasts and historical relationships may not provide credible estimates. This reinforces the case for RPEs. An appropriate response in this case would be to allow an ex-ante RPE allowance and to incorporate an ex-post true-up based on an independent external price index which could correct for the volatility.

3.3. Summary of suggested areas for improvement

This section outlines proposed improvements in Ofwat's PR19 approach to appropriately reflect the challenges inherent to the PR24 period.

Stage 1: Assessment of the likely presence of a wedge between the input price and CPIH during the coming PR24 period

- Any condition based on materiality should be removed from the assessment.
- Greater weight should be given to the volatility in costs when assessing the need for an RPE or ex-post true-up. Where volatility of an index for a specific cost category has clearly increased in recent periods, RPEs should be considered.
- The need for an RPE should not be rejected purely because of a difference in the composition of the basket underlying CPIH as against the cost category under examination.
- If management control is to be retained as a criterion, then more clarification needs to be provided how allowing/disallowing an *ex-ante* RPE with a true-up based on an exogenous index weakens/strengthens the efficiency incentives.

Stage 2: Implementation of an RPE

- Where high volatility of input prices is identified, a true-up mechanisms needs to be considered to allocate risk across companies and customers

4. Assessment of the emerging evidence for RPEs at PR24

This section focuses primarily on the assessment of the wedge between input prices of individual cost items and general inflation (CPIH) based on historical data. Third-party forecasts are considered for energy and labour costs only. This is in line with Ofwat's approach, considering OBR forecasts for labour costs and BEIS energy price projections when assessing the case for RPEs at PR19.

This section is structured as follows:

- Firstly, the evidence is assessed for the presence of a historical wedge for each of labour costs, energy costs, chemical costs and material, plant and equipment costs. These were the cost areas considered by Ofwat at PR19.
- Secondly, the results are summarised, and suggestions are provided for additional analysis that should be carried out to inform the RPE assumptions for PR24.

4.1. Assessment of the need for an RPE for labour costs

Labour costs represent the largest component of water companies' totex, approximately 39% across the sector.

In the long run, one might expect real wage growth to exceed inflation resulting in a gradual rise in living standards. However, supply shocks, such as the coronavirus pandemic and the impact of the war in Ukraine can significantly disturb the typically positive correlation between inflation and wage growth. Although, wages have increased in nominal terms until relatively recently, inflation has now increased above real wage growth due to higher prices for energy, food and other goods. According to the Office of National Statistics, in 2022 growth in total pay fell in real terms by 3.1% in October compared to the previous December.

To assess the historical wedge between CPIH and labour input prices faced by the water sector we have considered two different wage indices:

- Average Weekly Earnings (AWE)¹⁵ for the electricity, gas and water supply sector published by ONS¹⁶.
- Labour and Supervision in Civil Engineering (PAFI) index published by BCIS¹⁷.

Both indices were considered by Europe Economics and Ofwat at PR19.

The wedge over the 17 years, since 2003, has shown an average of positive growth of 1.30%, as shown in table 3. Following the 2008 recession, wage indices fell in real terms until 2014. From 2014 to 2021 (Q3) wages were on average growing above inflation. Since 2021, as a result of Brexit, coronavirus and the War in Ukraine, the position has reversed again with general inflation higher than wage growth. Table 4 summarises the results of the assessment as to whether the historical wedge is significantly different from zero in statistical terms across

¹⁵ For Electricity, Gas & Water Supply

¹⁶ We do not assess the Labour Costs per Hour (ILCH) index published by ONS as the series is last published in 2020 and can not reflect recent market developments.

¹⁷ Building Cost Information Service

different timeframes. The results show that the evidence on the statistical significance of the wedge is mixed and dependent on which time period and index is used.

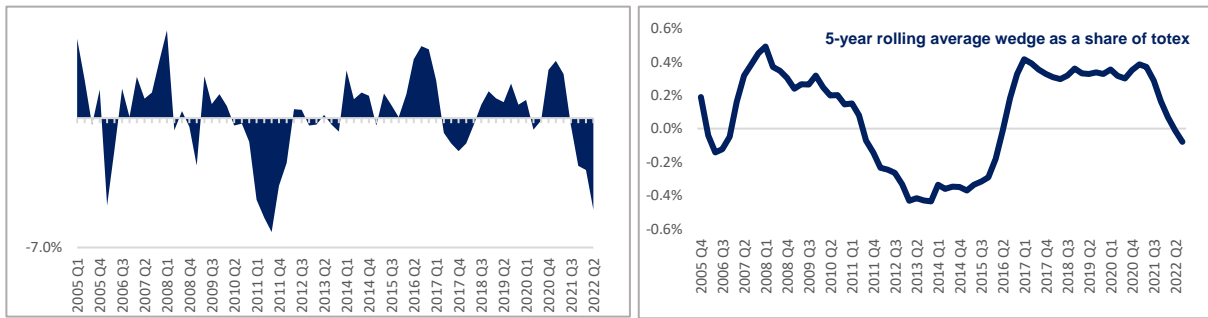
Table 3: Size of the historical wedge between and CPIH inflation.

Source: ONS and BCIS data, KPMG analysis

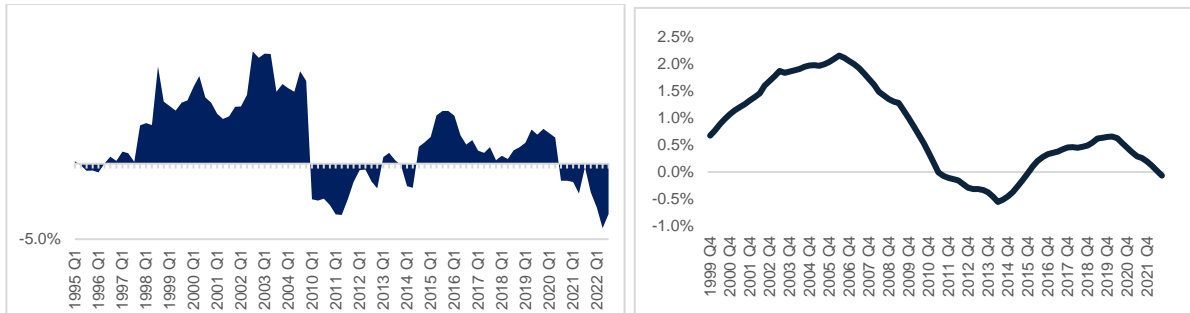
Time period	Wedge	5-year rolling average wedge
Average Weekly Earnings (AWE)		
Last 17 years (2006-2022)	0.30%	0.2%
Last 10 year (2013-2022)	0.40%	0.2%
Last 5 years (2018-2022)	-0.10%	-0.7%
Last 2 years (2020-2022)	-0.90%	0.6%
Supervision in Civil Engineering (PAFI) index		
Last 20 years (2003-2022)	1.30%	2%
Last 10 year (2013-2022)	0.50%	0.4%
Last 5 years (2018-2022)	-0.20%	1.1%
Last 2 years (2020-2022)	-2.10%	0.8%

Figure 4: The trend of the historical wedge between labour price indices and CPIH

Average Weekly Earnings (AWE) index published by ONS



Labour and Supervision in Civil Engineering (PAFI) index published BCIS



Source: ONS and BCIS data, KPMG analysis

Table 4: Is the wedge positive and statistically different from zero?

Average Weekly Earnings (AWE) index published by ONS

Sample period	Sample period	Wedge different from zero	Wedge positive
22 years	2001 - 2022	No	No
15 years	2008 - 2022	No	No
10 years	2013 - 2022	No	No
5 years	2018 - 2022	No	No
5 years (pre-2021)	2015 - 2020	Yes	Yes
10 years (pre-2021)	2010 - 2020	No	No

Labour and Supervision in Civil Engineering (PAFI) index published BCIS

Sample period		Is the wedge significantly different from zero	Is the wedge positive?
27 years	1995 - 2022	Yes	Yes
20 years	2002 - 2022	Yes	Yes
10 years	2013 - 2022	No	No
5 years	2018- 2022	No	No
5 years (pre-2021)	2015 - 2020	Yes	Yes
10 years (pre-2021)	2010 - 2020	No	No

Note: colours indicate 1% significance level, 5% significance level, 10% significance level, lower than 10% significance

Source: ONS and BCIS data, KPMG analysis

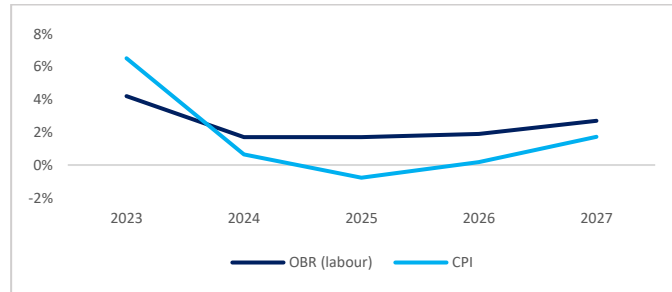
The analysis demonstrates the difficulty in forecasting the future relationship between inflation and wage growth. During PR24, the wedge between wage growth and general inflation may increase if energy and other commodity prices keep increasing or due to a “wage-price spiral” effect. Equally, wage growth may catch up with inflation if these increased costs either fall out of the measure of inflation or price pressures subside.

The OBR produces economy-wide forecasts for average earnings growth (calculated as wages and salaries divided by number of employees) and CPI. OBR does not provide forecasts for CPIH, although for this purpose we take CPI forecasts as a proxy for CPIH as they move relatively closely in line.

At PR19, Ofwat allowed a labour RPE based on OBR forecasts. Figure 5 shows that OBR forecasts for the next 5 years support a positive labour wedge. We consider that the OBR projections may again be the best available source for forecasting labour cost movements over PR24, but due to increased economic uncertainty and its potential effects on the labour market, the wedge estimates based on these forecasts may be less reliable when compared to the PR19 period. Therefore, a true-up mechanism remains appropriate at PR24.

Due to the increased uncertainty in forecast data, the application of it (whether the true-up is applied at the end of the period or annually) becomes more important compared to PR19 price review.

Figure 5: The future trend of CPI and average earnings growth, OBR projections



Source: OBR, KPMG analysis

4.2. Assessment of the requirement for an RPE for energy costs

Energy costs represent a material component of water and sewage companies' total expenditure, equivalent to approximately 9% of totex. At PR19, to assess evidence of the wedge between energy input prices and CPIH, Ofwat focused on the evolution of the electricity price index for industrial customers published by the Department for Business, Energy and Industrial Strategy (BEIS)¹⁸. The rationale for relying on the BEIS electricity price index was that electricity is the most important energy cost for water companies.

Figure 6 shows the evolution of the wedge between BEIS electricity price index and CPIH inflation. Energy prices have grown significantly higher than CPIH since 2020. The Ukraine war led to large increases in the price of gas, which has directly affected the price of electricity as gas is used for much of the electricity generation in the UK. The average growth of electricity prices above CPIH was 35% in the second quarter of 2022 (Q2).

Figure 6 shows the high volatility of energy prices over the last 25 years and a large positive wedge prior to 2010 and since 2020. The high volatility of the historical wedge is also observed when the wedge is considered based on the 5-year rolling average wedge as a share of totex. Historical high volatility of energy prices indicates that energy prices are highly sensitive to external events, e.g., economic, and political developments. The instability of energy prices implies the increased need for an RPE mechanism to protect the industry from risks arising from future energy price uncertainties.

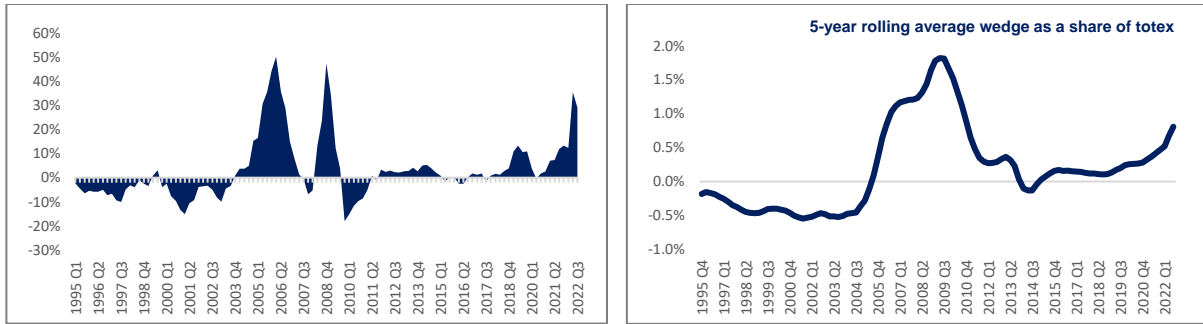
Table 5 summarises the size of the wedge between electricity prices and CPIH (and the 5-year rolling average wedge) over a range of timeframes. The wedge is positive and statistically significantly different from zero over the long and/or short-term periods. The size of the wedge depends which period the analysis is done over. The size of the wedge increases as the timeframe of analyses becomes shorter and more recent.

While the recent period may provide the best proxy for energy price movements during PR24, relative to inflation, the choice of the time period for analysis should be carefully considered, in line with expectations for macroeconomic developments. High inflation in energy prices was not anticipated at PR19; it is not included in the cost allowances nor is there an RPE indexation

¹⁸ <https://www.gov.uk/government/statistical-data-sets/industrial-energy-price-indices>

mechanism to recover it. At PR19, one of the reasons why Ofwat did not allow energy RPE is that the wedge showed mixed results, depending on which period was being used for the analysis, for example, it was statistically significant in one period but was not in another). Hence, Ofwat’s decision at PR19 exposed water companies to the risk of an unexpected rise in energy costs.

Figure 6: The trend of the historical wedge electricity prices and CPIH inflation.



Source: BEIS, ONS

Table 5: Is the historical wedge statistically different from zero?

Time period	Wedge	5-year rolling average wedge	Is the wedge significantly different from zero	
Last 28 years (1995-2022)	3.00%	2.2%	Yes	Yes
Last 20 years (2003-2022)	6.70%	4.9%	Yes	Yes
Last 10 year (2013-2022)	5.20%	2.2%	Yes	Yes
Last 5 years (2018-2022)	9.80%	3.4%	Yes	Yes
Last 2 years (2020-2022)	14.80%	4.7%	Yes	Yes
Last 2 quarters (2022, Q2 & Q3)	32.20%	8.2%	Yes	Yes
Last quarter (2022, Q3)	29.00%	9.0%	Yes	Yes

Note: colours indicate 1% significance level, 5% significance level, 10% significance level, lower than 10% significance

Source: BEIS, ONS, KPMG analysis

Independent third-party forecasts can play an important role in estimating the RPE assumptions at PR24. For energy prices, the most commonly used measure is the Energy and Emissions Projections bulletin published by BEIS. This includes forecasts of industrial retail electricity prices out to 2035 for a reference scenario, as well as for high and low-price scenarios. Another, commonly used source for energy price forecasts is the Cornwall Insight projections. We focus on Cornwall Insight forecasts as these provide the most up to date projections available. For inflation projections, we consider the OBR CPI quarterly forecasts, as CPI is a good proxy for CPIH inflation.

Figure 7 presents the forecast quarterly movements in electricity prices and CPI. Although there is an expectation that energy prices will start to decrease from the second half of 2023, the wedge forecasts exhibit high volatility over next 5 years. We find evidence of a statistically significant and negative wedge for the future period, as shown in table 6.

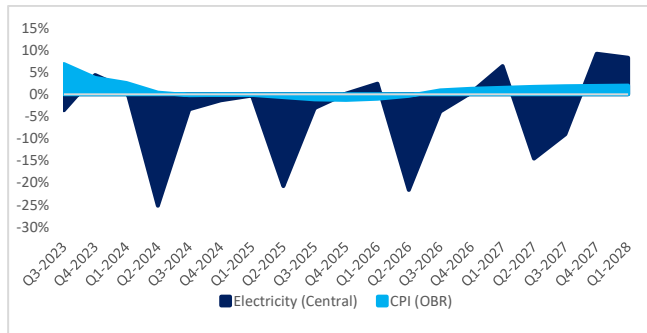
The future price of electricity currently largely depends on the price of gas as the cost of gas tends to set the market price of electricity in UK. Due to global political and economic events such as the coronavirus pandemic and war in Ukraine, the future price of gas is volatile and

uncertain. Figure 8 demonstrates the difficulty in forecasting gas prices as the OBR has made significant revisions to even short-term forecasts in recent releases.

The pressures on European energy prices started to emerge in 2021 when Russia began reducing gas deliveries to Europe. By the end of 2022, gas prices were five times higher than those which the OBR had anticipated in 2020. OBR bases its forecasts for oil and gas prices on market expectations, which have been *more volatile* as a result of the Ukraine war.

Uncertainty around the progress of the war in Ukraine and unpredictability of its economic consequences, is likely to continue to undermine the reliability of energy price forecasts.

Figure 7: The future trend of CPI and electricity price growth



Note: Electricity price projections are based on a central scenario.

Source: OBR forecasts, KPMG analysis

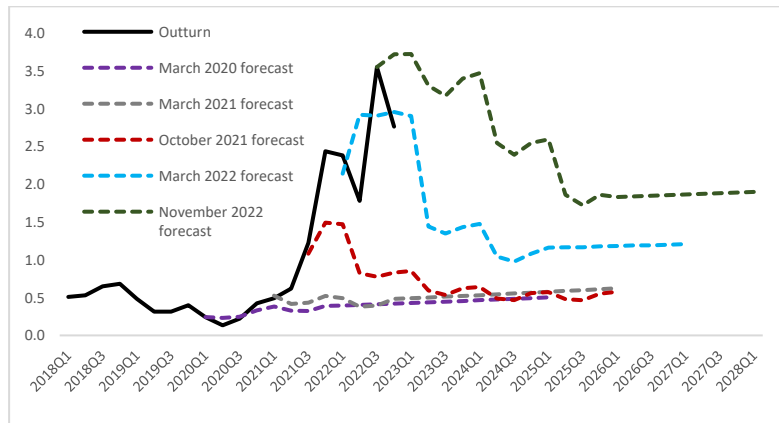
Table 6: Size of the future wedge between electricity prices and CPI inflation.

	2023	2024	2025	2026	2027	Is the wedge different from zero	Is the wedge positive?	Is the wedge negative
Wedge	-3.51%	-7.53%	-4.34%	-5.54%	-3.31%	Yes	No	Yes

Note: colours indicate 1% significance level, 5% significance level, 10% significance level, lower than 10% significance

Source: OBR forecasts, KPMG analysis

Figure 8: Successive OBR gas price forecasts



Source: OBR

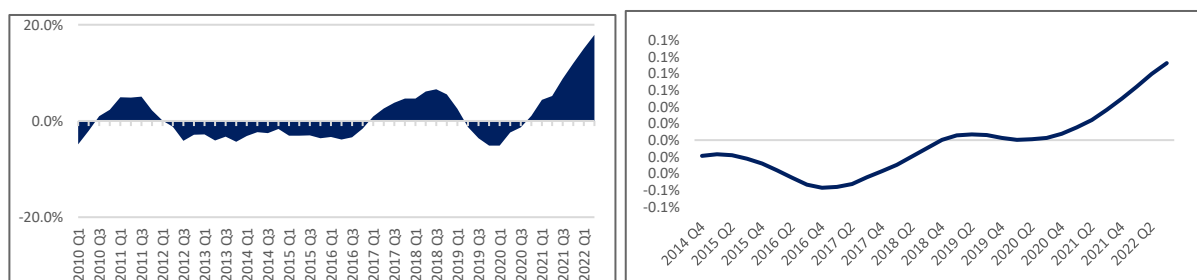
4.3. Assessment of the requirement for an RPE for chemicals costs

To assess the historical wedge between chemical input prices and CPIH a commonly adopted approach at PR19 was to consider the Chemicals & Chemical Products' PPI published by ONS. Our analyses of the historical wedge for chemical costs will also use of this approach.

Figure 9 summarises the size of the historical wedge between the index and CPIH (and the 5-year rolling average wedge) over a range of timeframes. The wedge has significantly increased during the PR19 price control period. This is potentially an impact arising from persistent supply and logistics bottlenecks, particularly in emerging economies in Asia, which struggled to respond to the increasing growth in demand. We also find evidence of a statistically significant and positive wedge over the recent period from 2018 to the present).

At PR19, both Ofwat and the water companies acknowledged the lack of independent third-party forecasts for chemicals costs. This remains an issue at PR24. Therefore, to assess the need for an RPE for chemical costs, the historical wedge observed in the recent period may be the most reliable source of information. Evidence over the last 3 years suggests that there is a reasonable justification for an RPE for chemicals costs.

Figure 9: The trend of the historical wedge between Chemicals & Chemical Products' PPI and CPIH inflation.



Source: ONS, KPMG analysis

Table 7: Is the wedge positive and statistically different from zero?

Sample period	Wedge	5 year rolling average wedge	Is the wedge significantly different from zero	Is the wedge positive?
Last 13 years	-0.2%	1.2%	No	No
Last 5 years	0.9%	4.6%	Yes	Yes
Last 2 years	1.9%	10.2%	Yes	Yes
Last 2 quarters	4.3%	17.4%	Yes	Yes
Last quarter	4.6%	16.9%	Yes	Yes

Note: colours indicate 1% significance level, 5% significance level, 10% significance level, lower than 10% significance

Source: KPMG analysis

4.4. Assessment of the requirement for an RPE for Materials, Plant and Equipment costs

There is no suitable single index that captures well the changes in input prices for materials, plant and equipment. This was acknowledged by both Europe Economics and Ofwat at PR19 and as a result, the assessment of the wedge for this cost category considered a range of indices which could capture the price movement of individual cost components. Overall, Ofwat has considered six different indices to assess the historical wedge for materials, plant and equipment input prices and CPIH. In this report, we have analysed three of the six indices which were considered at PR19, as follows:

- Materials cost index published by BCIS.
- Inputs for Water Collection, Treat/Supply index published by ONS.
- Machinery and Equipment Products' PPI published by ONS

These indices were chosen because the other indices considered by Ofwat at PR19 have either not been updated yet or are no longer available.

At PR19, Ofwat decided not to allow RPEs for materials, plant and equipment, because the supporting evidence was mixed, and the cost category failed the first criterion of the assessment framework¹⁹. i.e., whether there was “a significant likelihood” of a material wedge given the evidence considered.

Three of the indices that Ofwat considered showed a real price effect, but the other three did not. Ofwat determined that there was insufficient evidence that there will be a significant wedge between materials plant and equipment and the CPIH over the price control period. Some companies argued that there should be an RPE for this input because of its materiality and that three of the available indices show a statistically significant wedge. The input has passed the other two assessment criteria – Ofwat accepted that it may not be sufficiently represented in the CPIH and that there is a limited management control over the input.

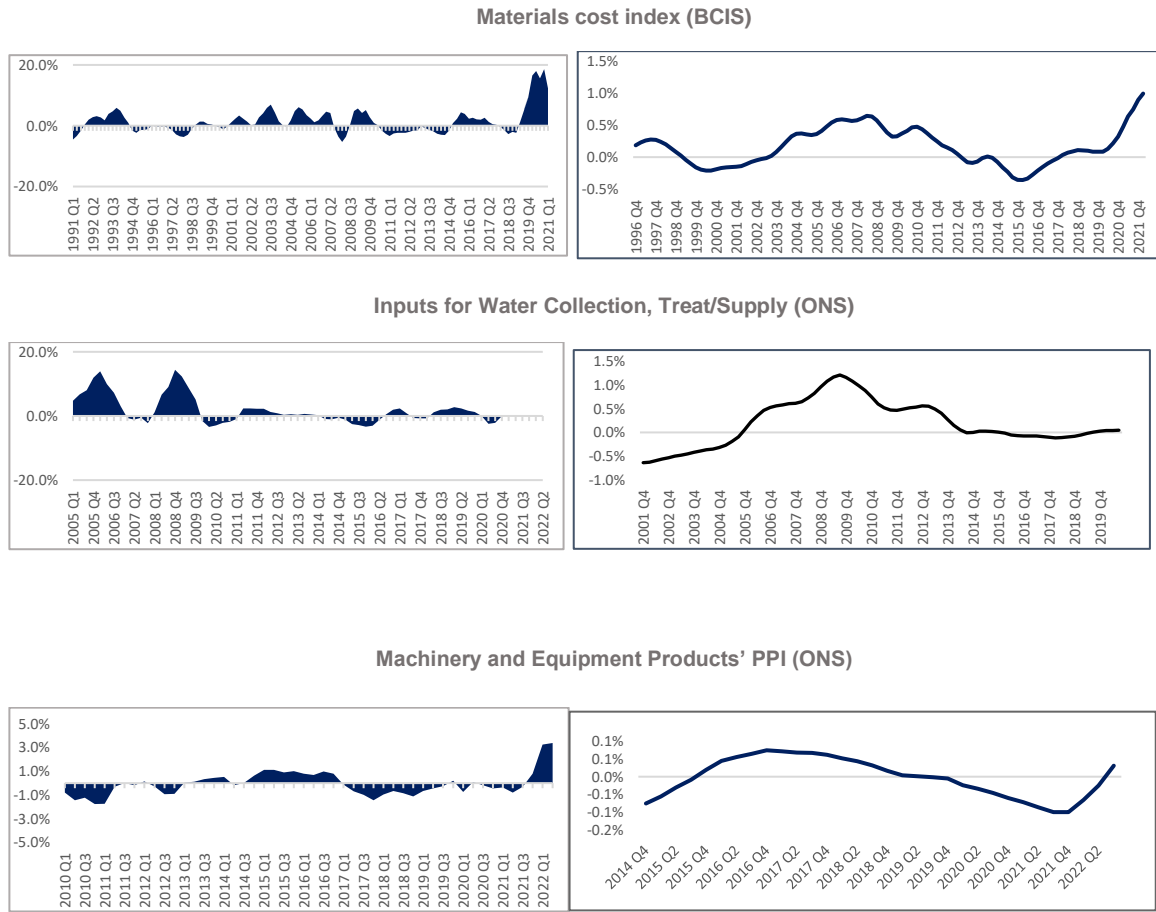
The results of our analysis are similar to the findings at PR19. Figure 10 shows the volatility of the wedge that can be observed over the last 30 years for each index considered in this report. We also present the 5-year rolling average wedge as a share of totex. Table 8 summarises the results of the assessment and whether the wedge is significantly different from zero in statistical terms, including the size of the wedge (and the 5-year rolling average wedge) over a range of timeframes for each index.

We find mixed evidence depending on which index is used. The materials cost index published by BCIS shows a positive and significant wedge over the historical period, whilst the other two indices do not show a statistically significant wedge. The evidence on the wedge can be quite different depending on the specific index and the time period considered.

Notwithstanding this, materials, plant and equipment costs represent a material part of water companies' overall totex. At PR19, this cost category accounted c.20% of industry's totex. These costs may become even more material during PR24 due to the increased investment expected in the sector over next price control period. In light of this, Ofwat should consider how to evolve the approach to move away from the situation where it is regulatory discretion being used to decide whether an RPE should be provided.

¹⁹ Criterion 1 of EE's framework: whether there a significant likelihood that the value of the wedge between the input price and CPIH will differ substantially from zero over the period of the price control.

Figure 10: The trend of the historical wedge



Source: ONS, BCIS, KPMG analysis

Table 8: Is the wedge positive and statistically different from zero?

Time period	Wedge	5 year rolling average wedge	Is the wedge significantly different from zero	Is the wedge positive?
Materials cost index (BCIS)				
20 years (2001-2020)	2.00%	0.9%	Yes	Yes
10 years (2011-2020)	2.10%	0.5%	Yes	Yes
5 years (2016-2020)	5.00%	0.7%	Yes	Yes
2 years (2018-2020)	12.10%	1.5%	Yes	Yes
Inputs for Water Collection, Treat/Supply index (ONS)				
Last 15 years (2006-2020)	1.4%	1.8%	No	No
Last 7 year (2013-2020)	-0.1%	0.2%	No	No
Last 2 years (2018-2020)	0.7%	-0.1%	No	No
Machinery and Equipment Products' PPI (ONS)				
Last 9 year (2014-2022)	0.3%	0.0%	No	No
Last 2 years (2014-2022)	1.0%	-0.3%	No	No
Last 2 quarters (2022, Q2 and Q3)	4.0%	0.0%	No	No

Note: colours indicate 1% significance level, 5% significance level, 10% significance level, lower than 10% significance

Source: ONS, BCIS, KPMG analysis

4.5. Summary of results

The evidence for a wedge by cost category is summarised in Table 9.

Table 9: Summary of results

Cost category	Results
Energy	<ul style="list-style-type: none"> • Strong evidence of a significant positive and volatile wedge above CPIH in historical period. • Further volatility resulting from recent economic and geopolitical events has created immense uncertainty in future energy prices and further difficulties to predict the evolution of prices with a reasonable degree of confidence.
Labour	<ul style="list-style-type: none"> • Mixed evidence on the historical wedge. Depends on the timeframe and index considered. • OBR forecasts for the next five years imply a positive wage growth above the general inflation. Due to increased economic uncertainty and unpredictability of its potential effect on labour market, the wedge estimates based on forecast information may be less reliable compared to PR19 period.
Chemicals	<ul style="list-style-type: none"> • Evidence of a significant positive wedge in the recent historical period.
Materials, plant, and equipment	<ul style="list-style-type: none"> • Mixed evidence from the historical wedge.

To support the conclusions of this report, there are additional analysis that should be carried out to support the assessment including:

Updating the measurement of the wedge between input prices and general inflation with the latest outturn and forecast information when data becomes available.

The estimates for RPE assumptions for all cost items are highly sensitive to the underlying period considered for the estimation. Evidence considered in this report (i.e., OBR successive forecasts of labour prices and inflation) shows that there are significant revisions to even short-term price forecasts in recent releases. The RPE assumptions for PR24 should be based on the most recent outturn and forecast information available to reflect conditions of the period that is the closest to the next price control and which provides the most up to date view of how input price movements may evolve over PR24.

Use of additional input indices where relevant and available.

The use of an external independent index ensures that there are incentives for cost minimisation and indices are not influenced by water companies. However, external indices are not a precise measure of input price changes that companies face but represent a proxy for the price changes. While some indices may be reflective of historical price movements in water sector, they may not be relevant over PR24 due to a change in ways companies may operate in the next price control period. Additionally, some indices may be relevant for part of



the industry, but they may show less representation for price changes that specific companies face.

- The choice of index should be based on a clear and transparent assessment criterion. This may include availability of data, transparency, volatility, history and robustness of underlying data and the uniqueness of water companies cost categories, the extent to which they are captured by a specific price index. The rationale of using each potential index should be carefully considered and if the index fulfils the selection criteria, it should be included in the RPE assessment process.

5. Conclusions

RPEs play an important role in the regulatory regime and, provided that the starting level of the ex ante allowance has been set appropriately, should protect consumers and companies against the risk of external cost shocks. RPEs build on the existing inflationary protection offered by the indexation to out-turn CPIH and play an important risk mitigation role that has been further strengthened through the appropriate use of true-up mechanisms.

Ofwat has recognised the role that RPEs can play and established a framework at PR19 for determining whether RPEs were necessary and if an ex post mechanism was also required.

Any framework is likely to be both a reflection of underlying principles as well as the economic conditions faced at the time. Consequently any review of the PR19 framework needs to start from those underlying principles and then consider whether the macro-economic environment has changed significantly since the last time the framework was established.

Core elements that should underpin the RPE framework have been identified in this report. The underlying principles for an RPE framework at PR24 should include:

- An appropriate allocation of the risk from external price movements between companies and customers.
- Consideration of consumer value, including the incentivisation of the appropriate spend and investment, through an efficient price setting framework
- Companies' preference for ex-ante allowance to ensure cash-flow stability, which ultimately has a benefit for customers.
- Consumers' preference for price stability.

While the last principle is one that has been enshrined in UK regulation since the publication of the Littlechild report in the early 1980s it should not be blindly followed. As seen with other regulators, such as Ofgem, a fair trade-off between price certainty and cash-flow can be achieved without delaying all true-ups to the end of the AMP/price control period.

Within the PR19 framework are some aspects that do not meet these principles. Specifically:

- The consideration of whether a cost is under management control is inappropriate. Management will always have an incentive to be cost efficient if they are seeking to beat a target that they do not have any control over. By ensuring that any RPE and/or true-up mechanism uses an external independent index ensures that there are incentives for cost minimisation.
- Materiality, whether as an explicit or implicit criteria is not appropriate. If a cost category has a significant wedge or exhibits significant volatility then it should have an RPE/true-up mechanism associated with it.
- Volatility should be carefully considered and should not be allowed to turn into a Materiality Criterion. By analysing volatility as a share of totex and applying a 1% threshold, this has the effect of turning the volatility assessment into a materiality test. When volatility makes forecasting future values difficult there should be a greater emphasis on the benefits to both companies and customers of applying a true up mechanism.



- Volatility is, under the current macro-economic conditions, a key concern and should be given due consideration. This also places greater emphasis on the use of true-up mechanisms when volatility makes forecasting future values difficult.

It is also important to consider where the use of regulatory discretion is appropriate with respect to RPEs. An entirely mechanistic approach might be possible but would require levels of detail and transparency that could be difficult to achieve. Consequently the regulator is likely to play a role in interpreting and implementing the framework. Limiting where discretion exists and placing limitations on the discretion is most likely to create an environment that will encourage investment.



www.kpmg.com

© 2023 KPMG LLP, a UK limited liability partnership and a member firm of the KPMG global organisation of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee. All rights reserved.

The KPMG name and logo are registered trademarks or trademarks of KPMG International Cooperative.

