Appendix
YKY23_Real Price Effects
[Redacted]

YorkshireWater

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1. Real Price Effects

1.1 Executive Summary

Companies have an opportunity to propose and evidence Real Price Effects (RPEs) alongside their PR24 submissions. RPEs are a request for an adjustment to Totex allowances to reflect future differences between input prices (energy, labour, chemicals) and the general inflation allowed in the plan. Ofwat will ultimately decide on its approach to RPEs and is likely to make an industry-level decision on whether any are appropriate.

Ofwat allowed only a labour RPE at PR19 and we set out below the impact of the PR19 approach and demonstrate that it did not sufficiently protect companies against the volatility of the other input prices seen in the early years of AMP7.

We recommend that Ofwat provides a greater element of protection at PR24 by applying an uncertainty mechanism to true-up a greater proportion of input prices than simply labour. We suggest that this true-up should cover, as a minimum, energy prices and potentially chemicals and materials also. We also note that this mechanism is proposed on the basis that the botex cost models are adjusted to fully reflect the impact of the exceptional costs seen in recent years.

We do not request a specific RPE for any element of wholesale costs. The AMP7 period has demonstrated the difficulty in forecasting these going forward. We believe the best way to protect customers and companies is to expand the existing true-up mechanism.

In the Household Retail price control we believe it is appropriate to apply an RPE adjustment on labour costs (c. 30% of our costs). Retail costs are not indexed to inflation and as such one element of the uncertainty is removed. Labour is the least volatile of the input prices and we have a greater confidence that costs in this area will continue to increase above zero. We attach a report from Economic Insight which provides more detailed evidence to support this claim.

1.2 Introduction

Real Price Effects are where an adjustment to companies' Totex allowances is made to reflect a 'wedge' between any forecast input price pressures and the general inflation allowed in the plan (For Wholesale this is CPIH, for Retail there is no indexation of costs to inflation).

At PR19 Ofwat created a decision framework assessing which input prices should be subject to an RPE adjustment - with only labour costs passing its defined criteria.

Companies were subsequently given an uplift of c. 1.1% p.a. on the labour element of costs (assumed to be 38.6% of totex) based on the evidence provided. This was accompanied by a true-up mechanism based on the ASHE wage index where revenues would be subject to an ex-post adjustment to reflect the actual difference between the indices.

Despite company proposals and evidenced forecasts of above inflation rises of the other main areas (energy, chemicals & materials), they were not found to meet the criteria, and no additional allowance or true-up was allowed for these.

At PR24 we are once again asked to evidence RPEs if applicable and Ofwat will consider this evidence in setting final allowances for companies.

1.3 Impact of PR19 Decisions

The impact of Ofwat's decision to allow only a labour RPE (and a true-up mechanism) at PR19 has had a material impact on companies at PR24. As it stands, the decision will result in a true-down of the industry's costs at the end of the period when the overall input price inflation would indicate a true-up should be required. Some companies may have some short-term protection to this full impact because of energy hedging.

The below narrative is a summary of the analysis completed by First Economics for the industry at the start of 2023 and explains the impact that the PR19 decisions have had. The full report is contained in Section 2 of this appendix.

Table 1.1 below shows the impact of the ASHE index mechanism which reflects the lagging nature of wage growth against CPIH and at the time of analysis was creating a true-down of the

22/23 allowance by (1.77%). This adjustment may of course correct itself before the end of the period.

Year	Actual Nominal Manufacturing Wage Growth (A)	Actual CPIH inflation (B)	Real Wage Growth (C) = (A) – (B)	Percentage weight for labour costs (D)	Allowance for Real Price Inflation (E) = (C) * (D)
19/20	1.9%	1.7%	0.2%	38.6%	0.09%
20/21	1.4%	0.8%	0.6%	38.6%	0.24%
21/22	2.8%	3.7%	(0.9%)	38.6%	(0.33%)
22/23 (to date)	4.5%	9.1%	(4.6%)	38.6%	(1.77%)*

Table 1.1 Ofwat's out-turn real input price inflation allowance

Source: First Economics Report February 2023

Table 1.1Table 1.2 shows an assessment of the other input prices and how the preferred indices have moved since the PR19 determinations. As can be seen, Electricity, Chemicals and Materials have risen significantly more rapidly than CPIH , particularly in 22/23.

Year	Labour	Energy	Chemicals	Construction Materials	Machinery & Equipment
19/20	3.0%	12.5%	(2.1%)	0.8%	1.7%
20/21	1.9%	3.5%	1.3%	0.6%	0.8%
21/22	3.2%	24.7%	14.4%	4.4%	3.7%
22/23 (to date)	4.1%	39.9%	26.9%	12.8%	9.1%

Table 1.2 Annual rate of input price inflation, 2019-20 to 2022-23

Source: First Economics Report February 2023: Source: ONS; BEIS; First Economics' calculations The table uses ONS' average weekly earnings index for the electricity, gas and water supply industry (K57Y); which we believe is a more targeted metric.

Table 3 calculates how a different true-up would have been calculated for companies had Ofwat allowed an indexation mechanism for an aggregate of the measures in Table 2 rather than solely labour costs.

In this scenario companies would have seen cost allowances trued-up by 2.7% in Yr2 and 2.9% in Yr3 rather than the -0.3% and -1.77% respective true-downs.

Year	Aggregate nominal input price changes (A)	Actual CPIH inflation (B)	Real Input Price Inflation (C) = (A) – (B)	Percentage weight identifiable inputs (D)	Allowance for Real Price Inflation (E) = (C) * (D)
19/20	3.7%	1.7%	2.0%	70%	1.4%
20/21	2.0%	0.8%	1.2%	70%	0.8%
21/22	7.5%	3.7%	3.8%	70%	2.7%
22/23 (to date)	13.3%	9.1%	4.2%	70%	2.9%

Table 1.3 Alternative out-turn real input price inflation allowance

Source: First Economics Report February 2023: Source: ONS; BEIS; First Economics' calculations

Instead companies have been asked to absorb this above CPIH increase (after cost sharing) whilst allowances are trued-down.

The analysis shows that there is no reason to think that CPIH is a good proxy for the input price changes experienced by water companies. It is also clear that the mechanism applied at PR19 has not provided adequate protection for companies against the volatility of input prices experienced over the last few years.

1.4 Wholesale Real Price Effects at PR24

We have worked with First Economics and KMPG to assess the historic RPE mechanism and to look at the evidence for Real Price Effects at PR24. These analyses are shown in full in Sections 2 and 3.

Where there is greater confidence in future indices, an up-front allowance is preferable to companies to ensure cash-flow stability, which ultimately has a benefit for customers who also benefit from greater price stability.

At PR19 however companies utilised a variety of sources and created complex econometric models to forecast future 'wedges' between inflation and input prices. Whilst most companies were correct in identifying that an overall wedge would occur, none were able to forecast the high volatility that we have seen in either CPIH or the input prices in the 2020-23 period.

Forecasting both CPIH and input prices going forward (particularly energy, chemicals and materials) is likely to be similarly challenging (see successive CPIH forecasts from ONS/OBR in Figure 1.1 below).

In addition to this, many sources that were used at PR19 for input prices are no longer providing forecasts of indices into the medium term (for example World bank projected oil costs 10-15 years into the future until 2022. It is currently forecasting until the end of 2025).

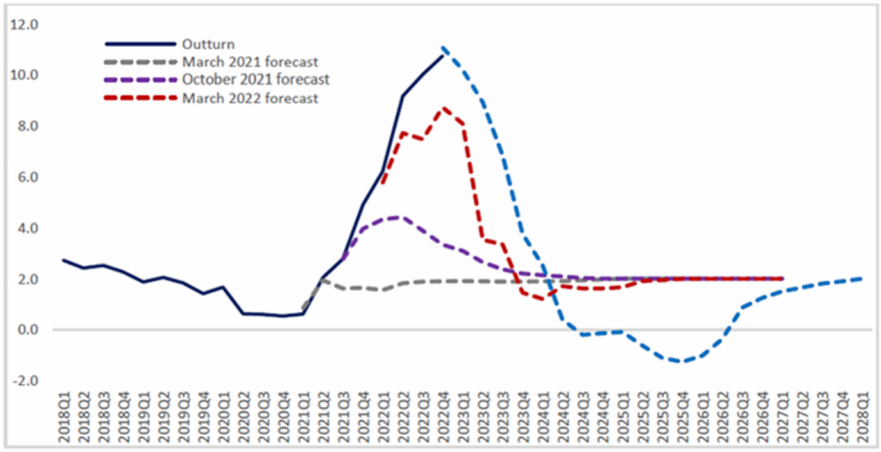


Figure 1.1 Successive CPIH forecasts

Source: KMPG, ONS,OBR

We are therefore not proposing any Wholesale Real Price Effects for PR24.

However, we believe a risk remains that this approach will not protect customers or companies against the volatility of future input prices which have been shown to be unpredictable with respect to CPIH. An obvious, fairer, solution is to introduce a true-up mechanism covering a greater proportion of input costs.

1.5 Wholesale Adjustment Mechanism

As set out in the First Economics report, the forward look for CPIH is so unusual that is highly improbable that the price for any input will follow it. Therefore, the obvious and fairest way to protect companies and customers is to provide a true-up mechanism based on indices that realistically reflect company input costs.

We worked with KPMG to review the short-, medium- and long-term wedges between CPIH and input prices. All areas have shown some evidence of volatility compared with CPIH particularly

in recent more uncertain times. Our preference is therefore linking all of these areas to appropriate indices but be believe that Labour and Electricity are the most important.

We believe the proposed mechanism from First Economics, a composite inflation index, set out in Table 1.4 below is a good starting point and would help reflect the true input prices and proportions that impact water industry costs.

Input Category	Weight (PR24 industry average TBC)	Proxy Indices
Labour	38%	ONS: Average Weekly earnings index, electricity, gas and water supply (K57Y)
Electricity	10%	BEIS: industrial electricity prices, including CCL
Chemicals	2%	ONS: chemical and chemical products PPI (G6VG)
Materials	20%	BEIS: construction materials price index, All work ONS: machinery and equipment n.e.c. PPI (G5SV)
Other	30%	ONS: CPIH

Table 1.4 A possible PR24 input price inflation true-up mechanism

Source: First Economics Report February 2023. Weights based on PR19 – and should be updated for the industry.

Such an uncertainty mechanism does not add undue complexity to the sector. It is something that is applied across other sectors (e.g. Ofgem's Real Price Effects Model) and once established is a simple, mechanistic approach using independent evidence removing both regulator and company judgment from the process. Application of the mechanism as an in-period adjustment to allowances would protect existing customers from paying too much for their bills, and companies from undue RoRE impacts.

We discuss each input category and our initial proposal for an appropriate index below but we would welcome engagement with Ofwat and the industry to ensure the most appropriate index is used.

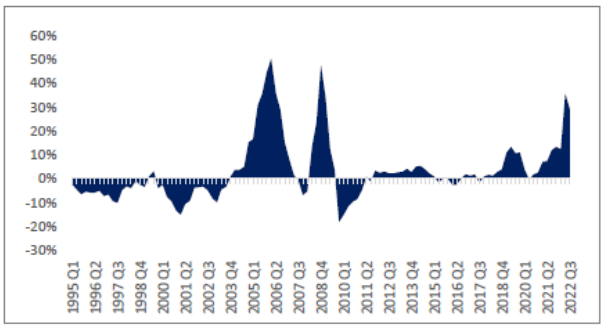
1.5.1 Labour

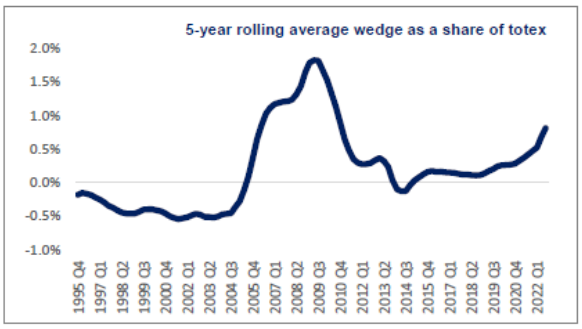
It is particularly important that a true-up is maintained for Labour, even if no RPE is applied in the final determination. This will ensure consistency with PR19 and whilst the KPMG report shows that the wedge is not clearly positive over the long-term, it is the most material element of company costs and can lag behind CPIH.

Whilst the ASHE index used currently is a broad assessment across all industries and occupations, we feel that the ONS data of Average Weekly earnings index, electricity, gas and water supply (K57Y) will be more reflective of the water industry and could be a more preferable metric to use.

1.5.2 Energy

There is strong evidence of a significant positive and volatile wedge above CPIH in the historical period for Electricity. Without a true-up mechanism companies will continue to absorb increased electricity costs within base allowances (see Figure 2 below).





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**

Figure 1.2 Energy costs relative to CPIH and Wedge Analysis

Source: KMPG, ONS, OBR

We recognise that short-term volatility against wholesale price changes can be mitigated in some companies by hedging. However, hedging is not available for non-commodity costs and there will be times where hedged prices are both above and below the market price depending on the timing of contract purchasing. Hedging occurs for companies to increase financial certainty rather than to try to outperform the market.

We believe the use of the BEIS index Industrial Electricity Prices, including CCL is an appropriate measure to index the industry against. It is based on a survey of electricity suppliers on what their industrial customers are paying for their electricity so hedging, insofar as this strategy is utilised across the wider industrial sector will be captured within this metric. We note that a smaller proportion of water company energy costs are related to the cost of gas. This could be separated and trued-up against a separate index, however for simplicity of application and because electricity and gas prices are highly correlated we propose that the electricity price index is applied to the full portion of energy costs.

Companies will still be incentivised to buy energy at the lowest price possible with this index as it does not insulate companies from wholesale price swings. Companies will still be incentivised to reduce their energy use through Ofwat's Totex sharing mechanism.

1.5.3 Chemicals

A proportion of chemical costs is highly correlated to energy prices given energy is a key input into creating chemicals. We propose that a simple option would be for indexation to a chemicals index such as ONS Chemicals and Chemical Products for Domestic Market.

However an alternative could be to identify the proportion of chemicals costs that closely align to energy prices and index these to the energy index discussed previously.

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1.5.4 Materials

An appropriate indexation of materials costs would involve a combination of indices to reflect the different activity that companies deliver. A triangulated index using the below indices

- BEIS: construction materials price index, All work [ref]

- ONS: machinery and equipment n.e.c. PPI (G5SV) [ref]

Alternatively, datasets are available specific to the water industry from some other independent sources. BCIS [ref] have produced a water and sewerage cost index which is used by YW in our capital delivery function.

1.6 Retail Real Price Effects

In the Retail price control we are proposing a Real Price Effect for Wage Inflation (Labour). This is on the basis that:

a) There is no indexation of retail costs to CPIH

b) Both forward-looking and historical wage inflation in the UK are generally positive and non-zero – we find that this historical trend also applies for Yorkshire specifically, once its geographical location and the different job roles in its retail workforce are accounted for.

We attach a detailed report in Section 4 of this document produced by Economic Insight to produce an independent view of an appropriate Real Price Effect adjustment for YW's Retail labour costs. The report demonstrates our relative efficiency in the retail price controls and the limited scope elsewhere for reductions in our labour costs.

We propose simply using the current OBR forecasts for average wage inflation to set the Real Price Effect cost allowance which can be trued-up using an appropriate index for the Water Industry. We believe the ONS: Average weekly earnings index, electricity, gas and water supply (K57Y) is a better, and more specific metric than the ASHE index previously used.

To calculate the Real price Effect Adjustment, we firstly needed to estimate wage growth to 2030. We then multiplied the forecast value by the % of our Retail costs attributable to Labour to calculate the final Real Price Effect adjustment.

	2025/26	2026/27	2027/28	2028/29	2029/30
% Average Earnings Growth	1.66%	2.06%	2.48%	3.49%	3.60%
% Labour Costs	33.27%	33.27%	33.27%	33.27%	33.27%
Retail Cost Adjustment	0.55%	0.69%	0.83%	1.16%	1.20%

Table 1.5 Calculation of the Retail Labour Real Price Effect

Source: YW calculations; OBR.

The calculation shown in Table 1.5 occurs within the SUP11 data table within our data table submission.

2. RPEs – First Economics – PR24 Real Price Effects

PR24: INPUT PRICE INFLATION

John Earwaker

February 2023

1. INTRODUCTION

England & Wales' water companies are currently compiling business plans for the period 2025/26 to 2029/30. One of the component parts of the cost projections that appear in these plans will be estimates of the input price inflation that will impact companies' operating and capital expenditures through to March 2030. Ofwat, as industry regulator, will then be required to review these projections and make adequate allowance for input costs in the PR24 price control determinations that it publishes at the end of 2024.

During the last review of price controls, PR19, there was some debate about how best to structure input price inflation allowances, both ex ante and as regards the use of ex post true-up adjustments. This new paper revisits these discussions in the light of companies' actual experience during the last 3-4 years. Drawing on the lessons learned, the paper goes on to set out four recommendations about the way in which input price inflation should be handled by companies and by Ofwat during the PR24 process.

The paper is structured into five main parts as follows:

- section 2 contains a brief recap of the position that Ofwat took in its PR19 decision;
- sections 3 and 4 looks at the input cost pressures that companies have faced since 2019 and shows, with the benefit of hindsight, that the price control framework has not accommodated these pressures in the way that Ofwat intended;
- section 5 identifies the root causes of the mismatch between costs and revenues, and sets out a possible way forward for PR24; and
- section 6 concludes.

2. A BRIEF RECAP OF PR19

Ofwat's stance throughout its PR19 review of price controls was that companies needed to make a "compelling case" in order for Ofwat to factor an allowance for real[1] input price inflation into its totex calculations. Ofwat's final PR19 determination explained the rationale for its position in the following terms:[2]

> This is because of information asymmetry (as water companies are more likely to tell us that costs will go up rather than down) and that water companies already benefit from a range of protections not provided to companies that operate in other parts of the economy. These include CPIH indexation of revenues, cost sharing with customers, five yearly price control reviews, interim determinations and substantial effects provisions.

Ofwat looked to its consultant, Europe Economics, to advise on the case for above- or below-CPI input price inflation allowances on an input-by-input basis.[3] Europe Economics first provided Ofwat with a four-step questionnaire and sought to filter for the regulator input types that merit a real input price inflation overlay from input types that do not. Europe Economics' four questions are set out in table 1.

Table 1: Europe Economics' Stage 1A questionnaire

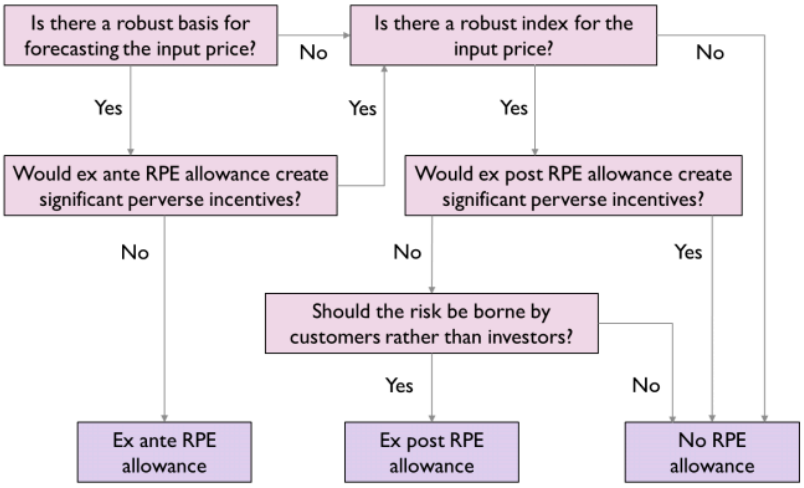
No.	Question
1	Is the expected value of the wedge between the input price and CPIH materially different from zero?
2	Does the wedge between the input price and CPIH exhibit high volatility over time?
3	Are there sufficient and convincing reasons to think that CPIH does not adequately capture the input price?
4	Is the input price and exposure to that input price outside management control for the duration of the price control?

Source: Europe Economics.

For input types that passed the above hurdles, Europe Economics then applied additional tests to determine whether Ofwat should, in practice, make allowance for real input price inflation and, if so, whether the 2020-25 allowance should be trued up at PR24 to pass through to consumers the difference between forecast and actual price increases. The consultant's decision tree is reproduced as figure 1.

[1] Real input price inflation in this context is the difference between nominal input price growth and CPIH inflation. The focus during a price review is on real input price inflation because price controls, and, hence, expenditure allowances, automatically index in line with CPIH under the terms of water companies' licences.
[2] Ofwat (2019), PR19 final determinations: securing cost efficiency technical appendix.
[3] Europe Economics (2019), Real price effects and frontier shift – final assessment and response to company representations.

Figure 1: Stage 1B assessment



Source: Europe Economics.

Europe Economics judged after applying the above criteria that two of the types of input that water companies use in their activities – labour and energy – might merit recognition in Ofwat's determinations. All other input types – notably chemicals and materials – fell at most of the hurdles in table 1 and were deemed not to warrant any kind of real input price inflation allowance.

In its December 2019 PR19 determinations, Ofwat concluded that it was necessary for it to make allowances for only labour input price inflation. For energy costs, and the remainder of companies' expenditures, Ofwat deemed that there was no reason to provide for an above-or below-CPIH cost trajectory. (Ofwat's reasoning specifically in the case of energy prices is reproduced in annex 1 to this paper.)

Ofwat's final PR19 determinations therefore provided for real input price inflation in the amounts shown in table 2 below. The figures in columns A and B of the table were based on the latest available Office for Budget Responsibility (OBR) forecasts and the percentage in column D was set as the average weight that companies cited for labour costs in their PR19 plans.

Table 2: Ofwat's PR19 real input price inflation allowance

Year	Forecast nominal wage growth (A)	Forecast CPI inflation (B)	Real wage growth (C) = (A) – (B)	Percentage weight for labour costs (D)	Allowance for real input price inflation (E) = (C) x (D)
2019-20	3.0%	2.0%	1.0%	38.6%	0.37%
2020-21	3.0%	1.9%	1.1%	38.6%	0.44%
2021-22	3.1%	2.0%	1.1%	38.6%	0.43%
2022-23	3.2%	2.0%	1.2%	38.6%	0.45%
2023-24	3.3%	2.0%	1.3%	38.6%	0.50%
2024-25	3.4%	2.0%	1.4%	38.6%	0.54%

Source: Ofwat.

Ofwat also put in place an ex post true-up mechanism, through which the figures in columns A and B of the above table will be replaced by out-turn wage growth, as recorded by (a) the ONS' Annual Survey of Hours and Earnings (ASHE) mean manufacturing all employees hourly wages including overtime series and (b) the ONS' out-turn CPIH inflation measure, respectively, as part of the PR24 process.

3. INPUT PRICE INFLATION 2019/20-2022/23

3.1 Overview

This report is written just over three years after Ofwat issued its PR19 determination. As regulator and companies start to think about the way in which Ofwat should approach input price inflation in PR24, it is natural to assess first of all how Ofwat's assumptions and allowances have held up in practice during the first half of AMP7.

In this section, I compare:

- the out-turn values of Ofwat's allowances for real input price inflation from 2019-20 to 2022-23, after applying the PR19 ex post true-up mechanism; and
- the apparent actual rate of aggregate real input inflation in the sector, based on the basket of indices that Europe Economics identified in its 2019 work can be used as proxies for water industry input costs.

3.2 Ofwat's out-turn allowance

In table 3 I update the first four rows of table 2 using actual out-turn data.

Table 3: Ofwat's out-turn real input price inflation allowance

Year	Actual nominal manufacturing wage growth (A)	Actual CPIH inflation (B)	Real wage growth (C) = (A) – (B)	Percentage weight for labour costs (D)	Allowance for real input price inflation (E) = (C) x (D)
2019-20	1.9%	1.7%	0.2%	38.6%	0.09%
2020-21	1.4%	0.8%	0.6%	38.6%	0.24%
2021-22	2.8%	3.7%	(0.9%)	38.6%	(0.33%)
2022-23 (to date)	4.5%	9.1% *	(4.6%) *	38.6%	(1.77%) *

Note: the * symbol in this table and in subsequent tables denotes a forecast based on data from the first nine months of 2022-23 only.

Where table 2 records that Ofwat expected wage growth and, hence, input price inflation to run ahead of CPIH inflation, table 3 shows that Ofwat's PR19 indexation mechanism is showing a net real reduction in input costs since April 2019.

The figures in the final column of the table are a cumulative 3.5 percentage points lower than Ofwat's PR19 forecasts, meaning that, as things currently stand, Ofwat will need to true down companies' totex allowances by several hundred million pounds as part of its PR24 review.

3.3 Actual industry input price inflation

In table 4 overleaf, I give an estimate of actual industry input price inflation over the same 2019-20 to 2022-23 period. The inputs into this calculation are:

- labour costs – the ONS' average weekly earning index for the electricity, gas and water supply industry (K57Y);
- electricity costs – BEIS' electricity price index for the industrial sector, including climate change levy;
- chemicals costs – the ONS's chemicals and chemical products producer prices index (G6SV);
- materials costs – (i) BEIS' all work construction materials price index and (ii) the ONS' machinery and equipment n.e.c. producer prices index (G6VG); and
- weights – labour = 38%, electricity = 10%, chemicals = 2%, materials = , 20%, other = 30%.

In each case, the proxy indices and weights align with the proxy indices and weights that Europe Economics used in its 2019 work.

Table 4: Annual rate of input price inflation, 2019-20 to 2022-23

Year	Labour	Electricity	Chemicals	Construction materials	Machinery and equipment
2019-20	3.0%	12.5%	(2.1%)	0.8%	1.7%
2020-21	1.9%	3.5%	1.3%	0.6%	0.8%
2021-22	3.2%	14.7%	14.4%	4.4%	3.7%
2022-23 (to date)	4.1% *	39.9% *	26.9% *	12.8% *	9.1% *

Source: ONS; BEIS; First Economics' calculations.

Table 5 combines the data in table 4 into estimates of annual aggregate nominal and real input price inflation.

Table 5: Ofwat's out-turn real input price inflation allowance

Year	Aggregate nominal input price changes (A)	CPIH inflation (B)	Real input price inflation (C) = (A) – (B)	Percentage weight for identifiable inputs (D)	Allowance for real input price inflation (E) = (C) x (D)
2019-20	3.7%	1.7%	2.0%	70%	1.4%
2020-21	2.0%	0.8%	1.2%	70%	0.8%
2021-22	7.5%	3.7%	3.8%	70%	2.7%
2022-23 (to date)	13.3% *	9.1% *	4.2% *	70%	2.9% *

Source: First Economics' calculations.

This table shows a markedly different picture from table 3. Where Ofwat's indexation mechanism shows a net reduction in real input costs, table 5 shows a sizeable net real increase.

In cumulative terms, input price inflation as measured by the basket of proxy indices that Europe Economics identified in its work is around 10 percentage points higher than shown in table 3.

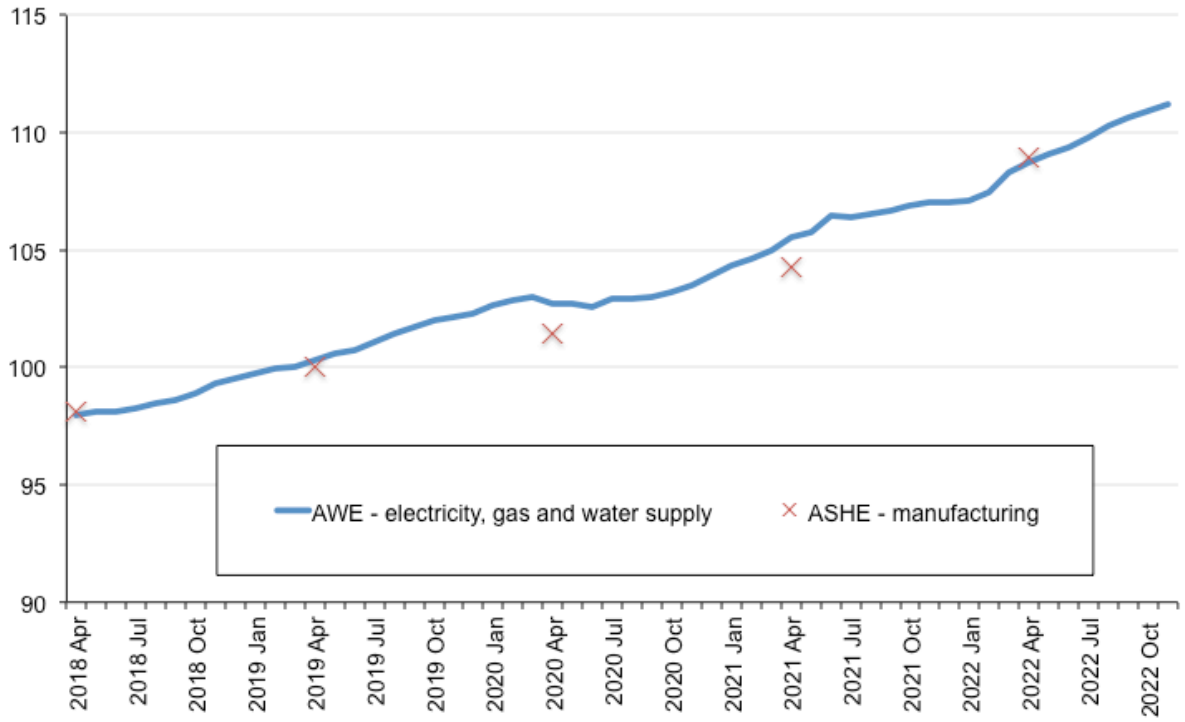
4. AN ANALYSIS OF INPUT PRICE INFLATION BY COST CATEGORY

Before I consider why the mismatch between Ofwat's allowances and actual input prices has arisen, I provide some further background detail for each category of input.

4.1 Labour

Figure 2 plots annual growth in the ONS' average weekly earnings index for the electricity, gas and water supply industry[4] and Ofwat's PR19 ASHE manufacturing wage index.

Figure 2: ONS wage indices, April 2019 = 100



Source: ONS.

Table 6 shows that the industry-specific wage index has increased faster than Ofwat's chosen proxy index since 2019.

Table 6: Electricity, gas and water supply vs manufacturing annual wage growth

Year	Average weekly earnings Electricity, gas and water supply	ASHE Manufacturing
2019-20	3.0%	1.9%
2020-21	1.9%	1.4%
2021-22	3.2%	2.8%
2022-23 (to date)	4.1% *	4.5%

Source: ONS.

[4] In its PR19 report Europe Economics also considered the ONS' index of labour cost per hour. This index appears to have been discontinued in 2020.

There look to be two main reasons for the differential shown in the above table:

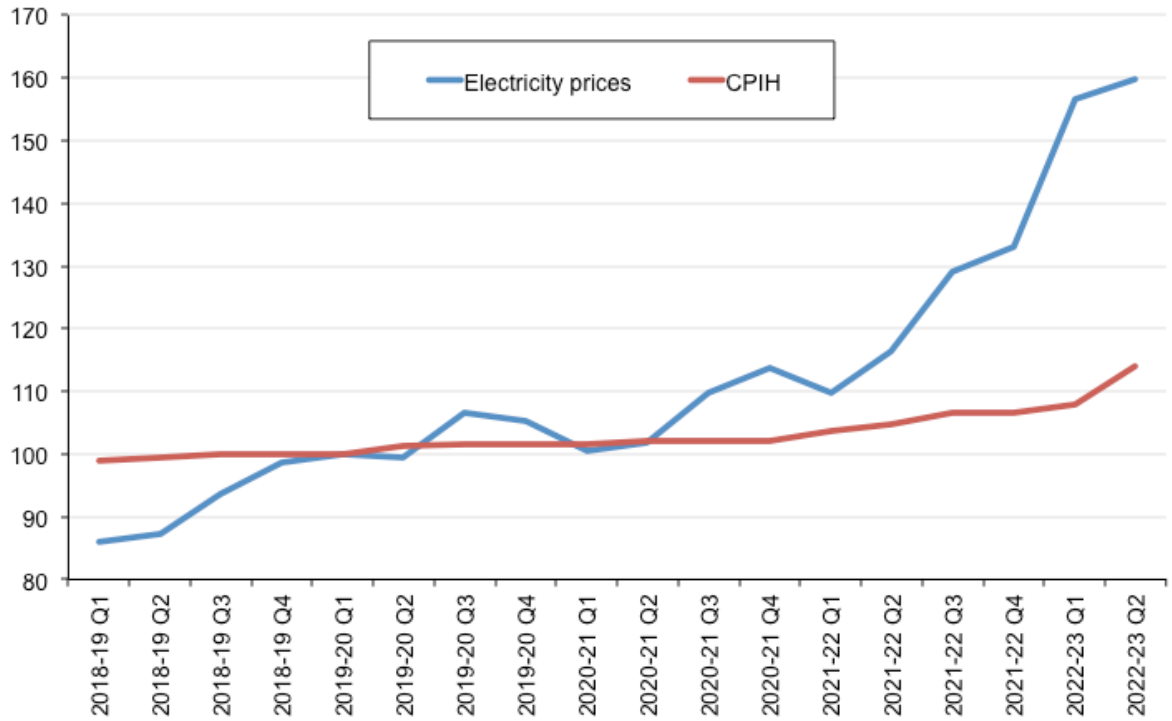
- first, there will be inevitable differences between rates of wage growth in two distinct industries – i.e. an index of manufacturing wages is, at best, only ever going to give a rough guide to labour cost pressures in the water and wastewater sector; and
- second, Ofwat's chosen index takes the form of a snapshot of wage at a particular point at the start of the financial year (e.g. in 2022/23, the ONS's survey collected data for the employee's pay period that included 27 April 2022). This means that the ASHE index can sometimes give a misleading impression of wage growth on a 12-month vs 12-month basis.

The differences between the figures in the two columns of the table are not as big as the differentials that I identify under the next three headings. The cumulative 1.6 percentage point shortfall between Ofwat's proxy index vs the ONS sector index contributes a cumulative 0.6 percentage points to the overall under-allowance for input price increases since 2019.

4.2 Electricity

Figure 3 plots BEIS' industrial electricity price index next to the ONS' CPIH consumer price index.

Figure 3: Electricity prices and CPIH, 2019/20 Q1 = 100



Source: BEIS and ONS.

Table 7 overleaf compares the annual rates of growth for the two indices since 2019.

Table 7: Electricity prices vs CPIH annual inflation

Year	Electricity	CPIH
2019-20	12.5%	1.7%
2020-21	3.5%	0.8%
2021-22	14.7%	3.7%
2022-23 (to date)	39.9% *	9.1% *

Source: BEIS; ONS.

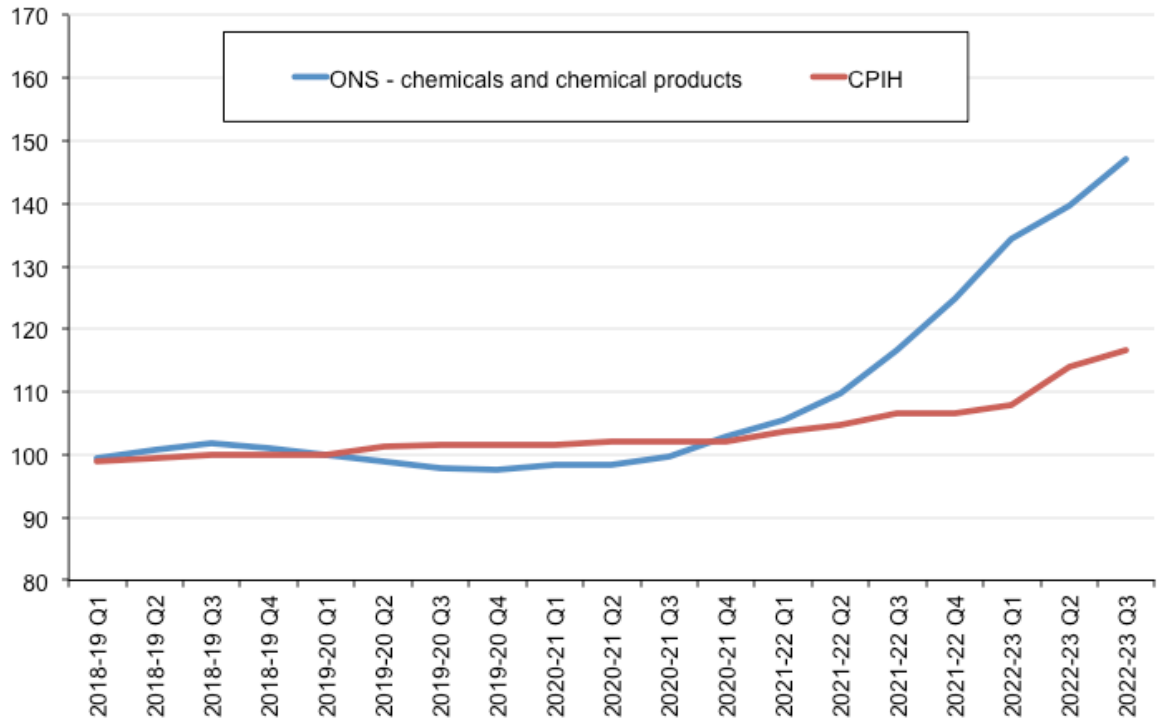
The BEIS index puts cumulative industrial electricity price inflation at approximately 75% since 2018/19. (Note that the BEIS index tracks the price that customers actually pay for their electricity, after forward purchasing arrangements, and so may not (yet) capture the increase that there has been in prevailing market prices over this period.) The reasons for this rapid price growth are well known – i.e. the recovery from COVID caused dislocation in global oil and gas markets, which was then exacerbated by the war in Ukraine and western sanctions on Russia, giving rise to significantly higher electricity prices for all UK and European consumers.

Importantly for the discussion that follows in section 5, higher electricity costs have had a discernable contemporaneous impact on CPIH. ONS data indicates that the electricity/gas price component of the CPIH calculation has directly contributed around 3-4 percentage points to elevated inflation in 2021/22 and 2022/23, with a further indirect contribution coming through multiple other items in the CPIH basket.

4.3 Chemicals

Figure 4 shows the ONS' chemical and chemical products producer prices index and CPIH.

Figure 4: Chemical prices and CPIH, 2019/20 Q1 = 100



The annual growth rates are shown in table 8.

Table 8: Chemicals prices vs CPIH annual inflation

Year	Chemicals	CPIH
2019-20	(2.1%)	1.7%
2020-21	1.3%	0.8%
2021-22	14.4%	3.7%
2022-23 (to date)	26.9% *	9.1% *

Source: ONS.

The story here is partly about energy prices (chemical production is an energy-intensive industry), but also about the prices of raw materials used in the manufacture of chemical products and COVID. During 2021 and 2021, producers cut back on production and stocks of chemicals shrank. As economies started lifting restrictions, mismatches between demand and supply began to emerge, pushing prices sharply higher. These price increases have yet to abate, at least in part because sterling has depreciated against the US dollar and other major currencies over the last year, pushing up import prices.

(Note that companies have indicated to me that there has been considerable variation within the chemicals cost category, with prices of phosphoric acid and caustic soda increasing significantly faster than the blue line in figure 4, but other prices increasing more slowly.)

4.4 Materials

Figures 5 and 6 compare the growth in two materials price indices with CPIH.

Figure 5: Construction materials prices and CPIH, 2019/20 Q1 = 100

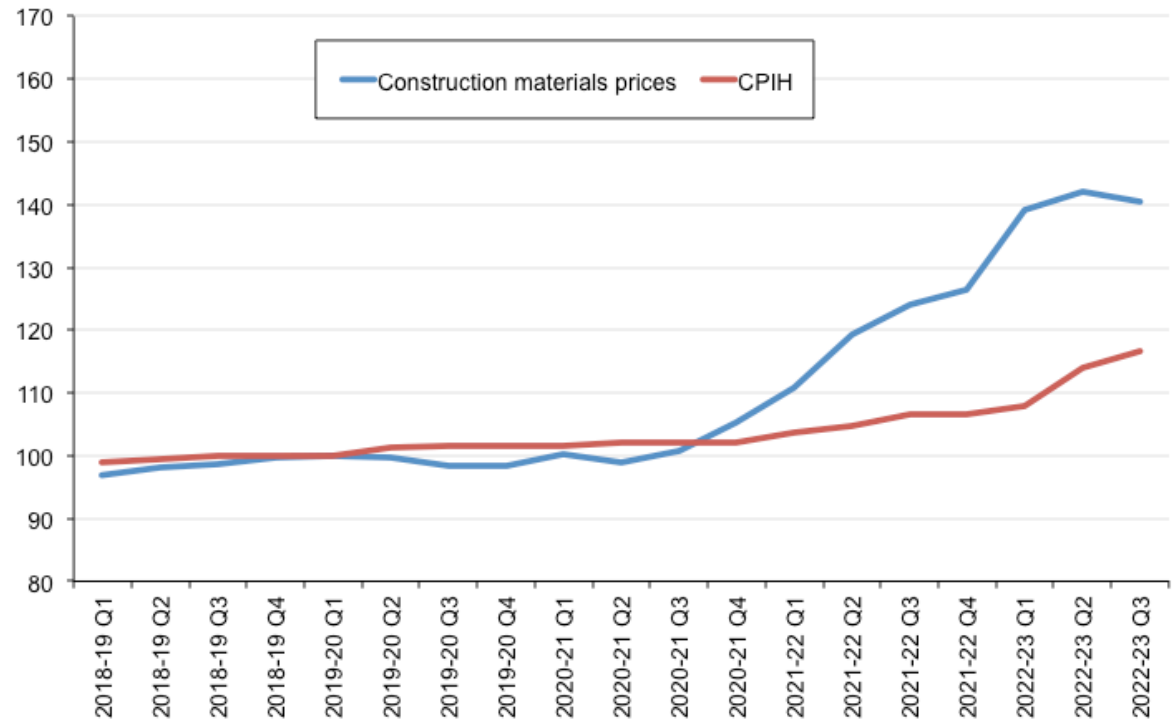
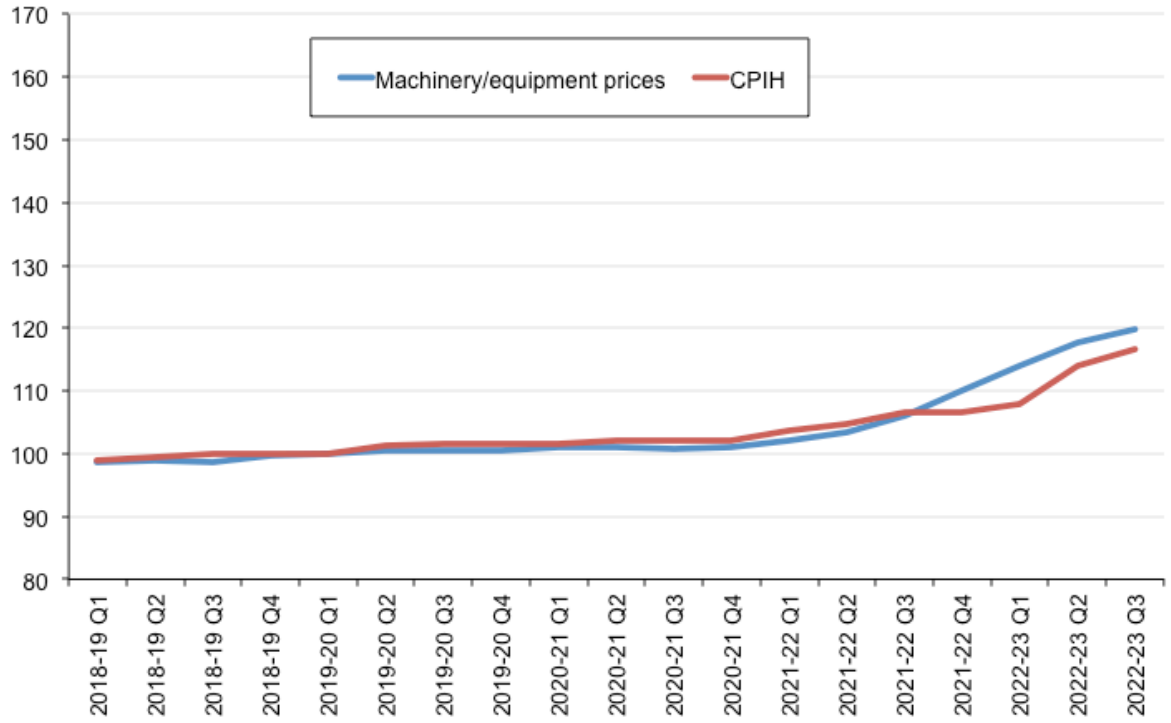


Figure 6: Machinery/equipment prices and CPIH, 2019/20 Q1 = 100



Source: ONS.

Tables 9 and 10 record the annual growth rates.

Table 9: Construction materials prices vs CPIH annual inflation

Year	Construction materials	CPIH
2019-20	0.8%	1.7%
2020-21	2.2%	0.8%
2021-22	18.6%	3.7%
2022-23 (to date)	19.1% *	9.1% *

Source: BEIS and ONS.

Table 10: Machinery/equipment prices vs CPIH annual inflation

Year	Machinery/equipment	CPIH
2019-20	1.4%	1.7%
2020-21	0.6%	0.8%
2021-22	4.4%	3.7%
2022-23 (to date)	12.8% *	9.1% *

Source: ONS.

The two sets of charts and tables tell slightly different stories, albeit with price increases running ahead of CPIH inflation in both cases. The wider gap between the blue line and red line in figure 5 compared to figure 6 is again a function of global commodity prices, with the prices

of construction materials like steelwork, plastic and cement being more heavily affected by increases in the prices of oil, metals and other commodity costs.

4.5 Other

'Other' costs were assumed at PR19, by default, to move in line with CPIH inflation. I have not carried out a detailed investigation of the cost items in this category, but I note that:

- business rates ought to have increased in line with CPI inflation, which has been running slightly ahead of CPIH inflation;
- I have been informed by companies that Environment Agency abstraction charges have moved broadly in line with CPIH;
- consent fees have been stable in nominal terms.

Overall, therefore, the assumption that 'other' costs move in line with CPIH inflation does not appear to have been unreasonable.

5. CONSEQUENCES FOR PR24

The picture that sections 3 and 4 present is clear. While the precise numbers could potentially be refined in various ways,[5] it is apparent that:

- ex ante PR19 totex allowances, with the benefit of hindsight, have been insufficient to cover the actual input price inflation that companies have had to manage since the start of 2019/20; and
- Ofwat's ex post input price true-up mechanism, as things currently stand, is likely to exacerbate rather than correct this under-funding.[6]

Given the magnitude of the input price overshoot, I think it is self-evident that now is a good time to ask if there are ways of ensuring that the regulatory framework for PR24 more accurately aligns revenues to the costs that companies incur when delivering services to customers.

5.1 The root cause of the mismatch

In my opinion, it is imperative that the work that companies and Ofwat do in PR24 starts by recognising what CPIH and CPIH indexation represent.

In table 11 I set out the component parts of the CPIH basket as it stood at the start of Ofwat's PR19 forecasting period.

Table 11: The CPIH basket, 2019

Item	Weight	Item	Weight
Food and non-alcoholic beverages	82	Transport	123
Alcoholic beverages and tobacco	32	Communication	20
Clothing and footwear	54	Recreation and culture	127
Housing, water, electricity, gas and other fuels	298	Education	18
		Restaurants and hotels	97
Furniture, household equipment and maintenance	53	Miscellaneous goods and services	74
Health	22		

Source: ONS.

It should be obvious straight away that this basket of goods and services is not a like-for-like match for the goods and services that water companies buy in the course of their activities. When consumers are out buying food and shelter and clothes and holidays, water companies are purchasing concrete and pumps and engineers and surveyors. Moreover, even when there are similarities in household and water company purchases – e.g. in the case of electricity bills – households and companies inevitably spend different proportions of their income on these

[5] For example, it may be possible to break labour and/or material costs into sub-categories and find additional indices that better match specific input types. The 'other' category that covers 30% of expenditure is also quite large and could potentially be subjected to further analysis with a view to either allocating additional cost to labour and materials or identifying further top-line cost categories (e.g. accommodation costs, EA charges).

[6] I note that there will separately be a sharing of over-spending vs allowances via the PR19 cost sharing rates.

expenses. These different patterns of expenditure mean that there are literally dozens of reasons why CPIH inflation might move at a different rate to water industry input price inflation.

Over the last 3-4 years, an inspection of the ONS data[7] shows that there are four principal reasons why water industry input price inflation happens to have run ahead of CPIH inflation:

- water companies have had a materially higher direct exposure to rising electricity/gas bills (~10% of total expenditure vs ~3% for a typical household);
- the sharp increases in chemicals and construction materials costs have outstripped even the historically high price increases that consumers have had to pay for commodity-heavy items like food and furniture;[8]
- housing costs, which make up about a quarter of the CPIH basket, have increased only very modestly[9], helping to hold down the rate of CPIH inflation; and
- the prices of products in the alcohol and tobacco, clothing, healthcare, communication and education purchase categories, constituting around 15% of the CPIH basket, have similarly shown only modest increases, thus also moderating the headline CPIH inflation rate.

Note that this is just a headline summary. The nature of the comparison here – i.e. between water industry costs, on the one hand, and CPIH inflation on the other – means that a full accounting of the ~10 percentage point wedge that we saw in section 3 would take many more pages of analysis, requiring a detailed discussion of what has happened to each and every item in the CPIH basket.

5.2 Implications

In my view, the takeaway from the last few years should not, in any case, be the stories of price increases that have affected this item or that item. It should be a realisation that there is no reason, a priori, to expect CPIH inflation to be a good proxy for water industry input price inflation. Or to put the same point another way, while the period covered by PR19 has been impacted particularly by energy markets, commodity prices and housing costs, in a future price control period it could just as easily be wage growth or private transport costs or restaurant prices or any one of a very long list of factors that cause the rate of water industry input price inflation to diverge materially from CPIH inflation.

This is important because companies and regulators have a choice in any price review. They can either strive to make the best possible forecasts of and allowances for input-specific price increases through to the end of the next price control period. Or they can assume input prices will just track in line with the average of the prices of the items listed in table 11. The first approach entails greater complexity, and I do not under-estimate the challenges that there are in analysing market data, current and expected market conditions, cost drivers, and so on, in order to come to a point estimate forecast of input price inflation. But, in spite of the inevitable uncertainties that there will be at the end of such analysis, I think it is clear that recent experience makes it plain that the alternative of defaulting to a measure of household price inflation is not the nice simple short-cut that it might first appear to be.

[7] ONS (2023), Consumer price inflation detailed reference tables.
[8] Food and furniture price increases in the year to December 2022 were 17% and 12% respectively.
[9] Rents, owner-occupied housing costs and council tax increased by 5%, 4% and 3% respectively in year to December 2022.

This is particularly the case when the regulator has available to it the option of truing up any differences between actual and expected input price inflation at the end of a regulatory period once it has been able to see how in reality input prices moved over time. Where good, reliable information on actual input prices exists, the insertion of an ex post adjustment mechanism, built from a basket of third-party reference price indices, would seem to be an obvious way of overcoming understandable nervousness about forecasting error and of ensuring that allowed revenues do not move too far out of line from companies' costs.

5.3 Recommendations

This diagnosis causes me to make the following recommendations.

Recommendation 1: Companies need to factor item-by-item forecasts of input price inflation into their business plan projections of 2025-30 expenditure

The onus in PR24 falls initially on companies to produce the best available estimates of future operating and capital expenditures. This unavoidably requires that each company accounts for what it considers are the likely future rates of increase or decrease in labour costs, electricity costs, chemicals costs, materials costs and any other separately identifiable items of expenditure.

Companies can find external benchmarks for the forecasts they need to make in:

- the OBR's twice-yearly economic forecasts;
- other forecasters' macroeconomic and sector-specific publications;
- privately commissioned forecasts; and
- historical experience.

They can then layer on their industry- and company-specific knowledge to come up with projections that align with their individual starting cost positions and their local circumstances.[10]

Recommendation 2: Ofwat should drop its "compelling case" test

The notion that there is information asymmetry and that companies have a clear advantage over the regulator when forecasting input prices was, to my mind, always misconceived. There is no reason that I can think of why a water company is better placed than Ofwat to forecast economy-wide wage growth or GB-wide electricity prices or global commodity prices. Indeed, my past discussions with companies in a number of regulated sectors suggest that this is an area that companies find just as taxing as the professional economists working in regulators' offices.

A key point to note here is that a decision by a company or by Ofwat not to make a stand-alone allowance for a particular type of input price inflation is <u>not</u> a zero allowance for input price inflation. It is instead a decision to positively assume that the cost of that particular input will move in line with the prices of the particular basket of goods and services identified in table 11.

[10] I note that companies could conceivably be in different positions in 2022/23 and 2023/24 – i.e. the base years for PR24 business plans and Ofwat's PR24 final determinations respectively – depending on the way in which contracting arrangements have shielded/exposed individual companies from/to the input price increases identified in section 4.

Looked at in this way, I would say that it is very hard to conclude that the best way of compiling an expenditure forecast or expenditure allowance is to presume, unless proven otherwise, that simple CPIH indexation is sufficient and to choose consciously not to think about what is likely to happen specifically to labour, electricity, chemicals, materials, etc. costs.

Recommendation 3: Three of the four tests used by Europe Economics should also be omitted in PR24

Europe Economics set up four hurdles before they were willing to recommend that Ofwat should factor a given category input price inflation into its PR19 allowances. They were:

1. Is the expected value of the wedge between the input price and CPIH materially different from zero?
2. Does the wedge between the input price and CPIH exhibit high volatility over time?
3. Are there sufficient and convincing reasons to think that CPIH does not adequately capture the input price?
4. Is the input price and exposure to that input price outside management control for the duration of the price control?

In my opinion, as I made clear during PR19, questions 2, 3 and 4 are unhelpful and have the potential to lead Ofwat to the wrong policy decisions.

In the case of question 2, whether changes in input prices are or are not volatile ought to be irrelevant once it has been established that input prices are expected to escalate more quickly or more slowly than CPIH. That is to say that companies and regulator would still need to make allowance for input price inflation even if input prices have in the past moved in a straight line and/or if future price increases are completely predictable.

In the case of question 3, Europe Economics' position was that if water companies and households are spending a comparable percentage, y%, of their budgets on a particular input type (e.g. electricity), there is no need for Ofwat to make allowance for any anticipated wedge between input price inflation and CPIH inflation. The thinking was that if that particular price moves up unexpectedly by z%, company costs and CPIH will simultaneously both move up by y% multiplied by z%, and the company will be compensated in full for their unexpectedly higher expenditures via the CPIH indexation of price controls. However, the problem with this logic is that a zero ex ante allowance will likely mean zero upfront recognition for any expected or knowable gap between input price inflation and CPIH inflation. To see this, suppose, for example, that the forecast at the time of a price review was for the price of input A to increase or reduce by 10% per annum. Ofwat would need to ensure that companies' expenditure allowances are sized to cover the projected cost increase or cost reduction, but this cannot happen unless Ofwat factors a 10% roll forward into its price review determination. [11]

Finally, in the case of question 4, it is impossible to envisage how identifiable external input price increases or input price reductions for the specific categories of input that water companies buy could <u>not</u> impact a water company's expenditure over the kind of five-year

[11] The only scenario that I can envisage in which a company is remunerated in full for the higher price it pays is if projected input price increases across the remainder of the firm's expenditure happen to exactly match projected inflation in the rest of the CPIH basket. It would be an extraordinary coincidence if this were the case, given the very different compositions of company and household expenditures.

horizon that applies during a price review. The recent experience with electricity prices proves this point. In PR19, Europe Economics and Ofwat both scored companies' ability to lock into fixed-price contracts as a reason for not making an explicit allowance for energy price inflation. In practice, while such contracts have shielded companies from some of the recent rise in market prices, they have not afforded complete protection in the short term and will offer little or no protection to most companies by 2025.

What this means is that the only question on Europe Economics' list that really matters is question 1. And that question unavoidably requires the regulator to produce an analysis of the forecast amount of real input price inflation by input type.

I have not been asked to make such forecasts as part of this assignment. However, I can record the OBR's most recent forecasts of CPI inflation.

Table 12: The OBR's November 2022 CPI inflation forecast

Year	2023	2024	2025	2026	2027
CPI	7.4%	0.6%	(0.8%)	0.2%	1.7%

Source: OBR.

The very unusual profile shown in table 12, when put alongside the recent paths of wages, electricity prices, chemicals costs and materials prices highlighted in section 3, makes for a highly atypical forecasting exercise. It would only be as a result of extraordinary coincidence if the price of any particular product were to follow exactly the trajectory shown in the table. This means that it will almost certainly be possible to answer question 1 in the affirmative for at least the foreseeable future.

Recommendation 4: There should be a comprehensive ex post true-up mechanism for differences between forecast and actual input price inflation

Unless the macroeconomic and geopolitical backdrop changes markedly in the next six months, any forecasts that companies make of input price inflation are going to come with sizeable margins of error.

My view, based not just on the experience in the water sector in the last few years, but also in other sectors in previous price control periods (notably Ofgem's RIIO-1 energy network price controls), is that in-period indexation / ex post true-up mechanisms are a low-cost, 'no-regrets' way for a regulator to guard against the windfall losses and windfall gains that an erroneous input price inflation can produce. I also think that a comprehensive indexation mechanism can head off an increase in the cost of capital that could otherwise emerge from investors' new-found appreciation of the systematic risks that they have been / would be exposed to under the partial PR19 input price indexation formula.

I have already, in effect, sketched out an initial blueprint for this type of mechanism in section 3 of this paper, building on work that Europe Economics did in 2019. The building blocks in a possible water industry input price inflation index are summarised again in table 13 overleaf.

Table 13: A possible PR24 input price inflation true-up mechanism

Input category	Weight	Proxy indices
Labour	38%	ONS: Average weekly earnings index, electricity, gas and water supply (K57Y)
Electricity	10%	BEIS: industrial electricity prices, including CCL
Chemicals	2%	ONS: chemical and chemical products PPI (G6VG)
Materials	20%	BEIS: construction materials price index, all work ONS: machinery and equipment n.e.c. PPI (G5SV)
Other	30%	ONS: CPIH

The structure of this calculation is very similar to the structure of Ofgem's RIIO-2 input price indexation formula (see annex 2), but with indices that are suitable to the mix of inputs used by water companies. I envisage that Ofwat can build from this starting point by:

- updating the weights in the second column of the table to reflect companies' actual cost proportions as at 2023/24;
- seeking to downsize the 'other' category to no more than 10-20% of unidentifiable cost (NB: one of the main learning points that I took from PR19 is that there is more that companies can do in PR24 to understand the mix of costs that they are ultimately using and so keep this 'other' category to the absolute minimum);[12]
- further exploring what suitable proxy indices might be for each cost category, drawing as appropriate from the indices published by the ONS, BEIS and the Building Cost and Information Service (BCIS). Ideally, the proxy indices would –
  - act as a very close match to water industry cost types;
  - be published on a monthly or quarterly basis;
  - have proven statistical accuracy; and
  - be outside the direct control of any individual company.
- taking the necessary steps to ensure that the aggregate measure of input price inflation is a proper price index based on sound statistical foundations (e.g. as regards the updating of weights on an annual basis in line with changes in the relative sizes of different cost items).

NB: I would recommend that the index used for electricity prices merits particular attention in any follow-on work. My understanding is that the BEIS index that I have focused on in this paper is based on a survey of the bills paid by around 600 large industrial customers.[13] I take from this that the index tracks the p/kWh that would be paid by a hypothetical industrial user whose contracting strategy matches the average firm in the sample. This feels, in principle, like it ought to be a suitable benchmark to use when setting water companies' revenues, but I acknowledge that I have not carried out an investigation into whether water companies make more or less use of fixed-price contracts and forward-purchasing arrangements than other industrial users.

[12] In their PR19 business plans, some companies managed to allocate 85% of their expenditure to specific cost categories, but four companies had an 'other' category worth more than 40% of expenditure and one company had an 'other' category worth more than 70% of expenditure. This indicates to me that the companies concerned did not account properly for the composition of their third-party contractor costs.
[13] See BEIS (2017), Industrial price statistics: data sources and methodologies.

(I should also note that I am unclear at the time of writing how Ofwat intends to ensure that its modelled PR24 totex allowances take proper account of the level of input prices that are coming into costs as at 2023/24. For the avoidance of doubt, an expanded input price inflation indexation mechanism must fit hand in glove with Ofwat's modelled base year totex allowances, so that appropriate percentage adjustments are applied in a coherent way to costs and regulatory allowances as they stood at the start of the forecast period.)

6. CONCLUSIONS

The last four years have seen unprecedented movements in the prices paid by users for many different types of goods and services. While it would wrong to criticise anyone for failing to predict the out-turn path of water industry input costs since 2019, it would also be wrong not to revisit some of the assumptions that were made in PR19 in light of recent experience. I have set out in section 5 my arguments for:

- moving away from default CPIH-based allowances for most categories of input costs;
- use of direct forecasts of at least future labour prices, electricity prices, chemicals prices and materials prices in companies' plans and in Ofwat's determinations; and
- an ex post true-up mechanism, based on published indices, to correct for differences in forecast and out-turn costs.

For the avoidance of doubt, this should not be read as a call for companies to receive higher PR24 expenditure allowances. After a period of pronounced real input price inflation, it is not at all obvious to me whether the next few years will see water industry input prices race even further ahead of CPIH or whether there will be a period of correction. It follows that future divergences from CPIH inflation could be in either direction and that the use of the best available forecasts of input costs, paired with an ex post true-up mechanism, is as much about protecting customers interests as it is about protecting shareholders from what is currently a major source of uncertainty impacting companies' future plans.

Annex 1

Ofwat's reasons for not including an ex ante energy input price allowance or an ex post energy input price true-up

In the table below I reproduce text from Ofwat's PR19 final determination document and respond to each point that Ofwat makes.

Table A1

Ofwat, December 2019	Observations, February 2023
There is some evidence to suggest that we should allow a real price effect for energy. For example: - There is evidence of wedge of up to 10% in the last year (2018-19) – see figure A3.1, although there is mixed evidence of a wedge since 2010. - The latest BEIS electricity forecast a wedge of 0.7% per year between 2020 and 2024 – see Table A3.8.	When companies compile their PR24 business plans, they will observe that electricity prices have diverged significantly from CPIH in four out of the last five years. Moreover, there is a near certainty that the forecasts for prices in at least the first few years covered by business plans will be materially different from CPIH inflation.
However, there is also evidence to suggest we should continue to not to allow a real price effect adjustment for energy, which includes the following: - There is mixed evidence of a historical wedge which depends on the period of analysis.	Data from the period from 2018 onwards will show clear evidence of a recent historical wedge.
- Energy costs are partially within management control, particularly the option to sign up to fixed energy tariffs to minimise exposure to price fluctuations, although these contracts are usually only for 1-2 years. Other mechanisms such as payment arrangements, increased energy generation by the companies themselves, timing of energy use and improved energy efficiency can assist companies to reduce costs through reduced consumption and minimising exposure to price fluctuations.	While forward purchasing arrangements have protected companies from some of the increase in energy prices in the short term, the experience of the last few years makes it clear that they will not and cannot shield companies from a shift in energy market fundamentals for more than a temporary period.
- There is significant uncertainty about forecasts of energy price, particularly as BEIS forecasts have repeatedly failed to provide accurate forecasts of energy costs in the past. This reflects the volatility of energy prices and interactions with global markets.	The uncertainty in PR24 will be markedly higher than PR19 after the dislocations of the last few years. However, this does not justify assuming that electricity prices will track in line with CPIH inflation. Rather, the uncertainty reinforces the case for a realistic ex ante price forecast and an accompanying ex post true-up mechanism.
- 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.	Europe Economics' 5% figure included the ~2 percentage point share for diesel and petrol prices. However, electricity/gas and diesel/petrol prices have diverged significantly over the last two years, meaning that the co-movement is much less pronounced than Europe Economics believed. CPIH will in any case be affected by many other factors that have little relevance to water companies, making it highly unlikely that CPIH will act as a good proxy for electricity price inflation or aggregate input price inflation over any horizon.

- Water companies produce as well as consume energy, reducing the net impact of energy prices. They also produce biofuels whose value will be linked to energy prices.	Even after allowing for this production activity, water companies are net consumers of electricity and the resulting net exposure to energy prices ought to be reflected in business plans and regulatory allowances.
- Unlike labour costs, there is no clear theoretical link between energy costs and productivity growth.	It is not clear why this is a relevant consideration. Input price inflation and productivity growth are separate line items in companies' and Ofwat's calculations. The allowance for input price inflation can be sized in line with expected/out-turn input price inflation, and the allowance for productivity growth can be sized separately in line with expected productivity growth.
- Some water companies do not assume a real price effect adjustment or assume that any adjustment would be very small.	It is highly unlikely that this will be the position in PR24. In any case, recent experience shows that even if the forecast for future energy price increases just so happens to be broadly in line with forecasts of future consumer price inflation, there is potential for material divergences in period. This uncertainty warrants an ex post true-up mechanism.
- There are a number of protections within the price control such as cost sharing which provide additional protections to water companies.	This is correct. But the scale of the uncertainties around future energy prices means that companies are exposed to risk associated with input prices worth >100 bps of RORE even after the application of cost sharing rules.
- Unlike labour costs, the potential wedge is much smaller, equivalent to less than 0.1% of costs over the period based on BEIS forecasts, not taking account of the impact of cost sharing.	Again, this is not how matters currently stand. And recent experience shows that even if the forecast for future energy price increases were to be broadly in line with forecasts of future consumer price inflation, there is potential for material divergences in period. This uncertainty warrants an ex post true-up mechanism.
- Companies are moving towards their target of net zero carbon emissions during the 2020 to 2025 period, for example, Yorkshire Water will increase the amount of renewable energy it generates from biogas by 15%, and South East Water will reduce its carbon emissions by 68%. To do this water companies are using a range of measures including greater water efficiency, buying green energy, generating renewable energy, planting trees and working with their supply chain. These measures could have a substantial impact on energy usage in the sector and therefore mitigate real price effects.	The opportunities that companies have to improve inefficiency are important and should be accounted for in PR24, but the numbers involved are relatively small in comparison to the potential swings in prices.

Annex 2

Ofgem's RIIO-GD2 input price indexation mechanism

Table A2 details the indices that Ofgem's uses in its RIIO-GD2 indexation mechanism.

Table A2

Input category	Weight	Indices
Labour	70%	ONS: Average weekly earnings index, private sector (K54V) ONS: Average weekly earnings index, construction sector (K553) BCIS: PAFI civil engineering (4/CE/01)
Materials	14%	BCIS: Plastic products (including pipes) (4/CE/24) BCIS: Structural steelwork materials – civil engineering work (3/S3) BCIS: FOCOS resource cost of infrastructure materials (7467)
Other	16%	ONS: CPIH

Table A3 shows the value of Ofgem's aggregate input price inflation index for financial year 2021-22

Table A3

Input category	Weight	Indices	2021-22 out-turn
Labour	70%	ONS: Average weekly earnings index, private sector (K54V) ONS: Average weekly earnings index, construction sector (K553) BCIS: PAFI civil engineering (4/CE/01)	6.4% 6.0% 2.4%
Materials	14%	BCIS: Plastic products (including pipes) (4/CE/24) BCIS: Structural steelwork materials – civil engineering work (3/S3) BCIS: FOCOS resource cost of infrastructure materials (7467)	16.0% 43.4% 20.0%
Other	16%	ONS: CPIH	5.5%
		Aggregate nominal input price inflation	8.0%
		CPIH inflation	(5.5%)
		Total real input price inflation allowance	2.5%

The 2.5% figure in the final row of this table will feed directly into the GB gas distribution networks' expenditure allowances – i.e. Ofgem's RIIO-GD2 expenditure allowances for 2021-22 and all subsequent years will index by CPIH + 2.5% in respect of input price inflation in 2021-22.

3. KPMG – Real Price Effects at PR24

This content has been removed due to it containing commercially sensitive material

4. Economic Insight – Retail RPE

Economic Insight

10 August 2023

Economic Insight Ltd

RETAIL LABOUR IPP AT PR24

A report for Yorkshire Water

CONTENTS

As part of the development of its PR24 business plan, Yorkshire Water has asked us to consider the case for an input price pressure adjustment in relation to its retail labour costs. In order to do this, we have developed a high-level framework, against which we have tested the available evidence both from Yorkshire and independent third parties. Overall, our assessment suggests that there is significant evidence for an adjustment at PR24.

1 Introduction and summary

In its PR24 final methodology, Ofwat said that:

- It does not intend to index retail costs to CPIH.[1]
- It will consider making an adjustment for input price pressure, if there is *"convincing evidence of significant projected increases"*.[2]

In this context, Yorkshire Water has asked us to assess the case for an input price pressure (IPP) adjustment for its retail labour costs at PR24, based on the available evidence from both Yorkshire and third parties.

In order to test this, we have sought to collect evidence against a high-level framework of three overarching criteria. Within each, we set out categories of relevant information that would be helpful to collect in order to assess the overarching criterion in question. Taken together, these three criteria go over and above what we would consider to be the minimum evidence base to support the case for an IPP adjustment – but they represent conditions that a regulator would (understandably) want to be met in order to grant an IPP adjustment.

Nonetheless, with robust supporting evidence, collectively they can be used to make a strong case for an IPP adjustment. The criteria we consider are:

- The **materiality** of: (i) retail labour costs, as a proportion of retail totex; and (ii) labour IPP, both on a forward-looking and historical basis. This is beneficial to consider as unaccounted-for IPP will increase the risk of significant overspend in instances when: (i) the cost category makes up a significant proportion of totex; and (ii) and evidence suggests that IPP rates for that cost category are likely to be high.

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1 *'Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances.' Ofwat (December 2022); p. 38.*

2 *'Creating tomorrow, together Our final methodology for PR24.' Ofwat (December 2022); p. 40.*

- Whether retail labour costs are within **management control** for Yorkshire, based on: (i) the extent to which any potential efficiency gains from cost savings have already been made; and (ii) the ability of Yorkshire to influence its retail labour cost base. In relation to (ii), we consider the extent to which Yorkshire is able to influence the wage rates and salaries it pays (either via the agreed price, or through protections against exogenous shocks during PR24), or through the volume of labour. We consider it helpful to test this as, if labour costs are shown to be within management control, then Yorkshire would be able to reduce its exposure to (at least some of) the PR24 labour IPP – which would lessen the case for an IPP adjustment. We note that we test the ability of Yorkshire to shield itself from volatility in wage rates and salaries because, were it able to do this (e.g. by setting long-term contracts), then this would mean that it is less susceptible to the full extent of potential labour IPP over the PR24 period.

- The extent to which input price pressure is **considered elsewhere in the price control**, specifically: (i) taking into account IPP in all areas of its retail cost assessment approach; (ii) ensuring internal consistency with the approach to frontier shift; and (iii) the extent to which companies are at risk of significant additional costs in the case of overspend, even with Ofwat's cost sharing mechanism. As there are many different elements to a price control, it is important that the price control is considered as a whole to ensure that contradictions are minimised, and potential interdependencies are understood.

Overall, our assessment against this framework suggests that there is significant evidence for there to be an adjustment for retail labour costs within the price control.

In relation to materiality, evidence suggests that:

- Retail labour costs make up a significant proportion of retail totex for Yorkshire at PR24, which was also the case for the industry more generally at PR19.

- Both forward-looking and historical wage inflation in the UK are generally positive and non-zero – we find that this historical trend also applies for Yorkshire specifically, once its geographical location and the different job roles in its retail workforce are accounted for.

In relation to management control, evidence suggests that:

- Yorkshire is highly efficient in retail, both based on Ofwat's PR19 cost benchmarking models, and our estimates using its PR24 consultation models.[3]

- There is limited scope for Yorkshire to be able to influence its retail labour costs, through reductions in: (i) wage rates and salaries (either via prices paid or mitigations against volatility); and/or (ii) volumes of labour.

[3] *This is based on replicating its PR19 triangulation method, using Ofwat's PR24 consultation models. Please see here for further details: https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/econometric-base-cost-models-for-pr24/.*

In relation to whether retail costs are considered elsewhere in the price control, we consider that:

- At PR24, Ofwat should ensure that its approach to retail cost assessment ensures that efficient cost allowances are provided, which includes fully taking into account IPP. Under Ofwat's current approach, inflationary pressures affect the cost assessment through both historical and forward-looking costs in the cost benchmarking assessment, but they are not reflected in allowed costs over the price control period (because no IPP allowance is provided). Although Ofwat has not fully specified its approach to retail cost assessment at PR24, based on Ofwat's PR19 approach we have no reason to believe that IPP would be accounted for elsewhere, and therefore there is a need for an IPP allowance.
- It is important that there is internal consistency between the approach to retail frontier shift and IPP at PR24.
- IPP that has not been accounted for is likely to result in companies incurring significant costs in the case of overspend, even with Ofwat's cost sharing mechanism.

Based on the evidence that we have reviewed, the OBR forecasts provided in the table below form a strong basis for an IPP labour allowance. Specifically, the table below sets out the OBR March 2023 forecasts of UK wage inflation in each year of PR24.

Table 1: IPP forecasts at PR24

	2025-26	2026-27	2027-28	2028-29	2029-30
IPP forecast (%)	1.66%	2.06%	2.48%	3.49%	3.60%

Source: OBR March 2023 forecasts

The remainder of this report is structured as follows:

- Chapter 2 sets out our assessment against the high-level framework of three criteria described above.
- Chapter 3 presents: (i) our findings of potential labour IPP at PR24 – with this taken from the OBR's March 2023 forecasts; and (ii) potential updates that can be made to these forecasts between now and final determinations.

2 Assessment of the case for an IPP allowance

2A. Materiality

In this section, we consider, in turn: (i) whether retail labour costs make-up a significant proportion of retail totex (i.e. are material); and (ii) whether evidence suggests that retail IPP at PR24 is likely to be positive and non-zero (i.e. material), based on both forecast and historical data.

Materiality of retail labour costs

There is a degree of uncertainty that is inherent in any assessment of IPP, because no forecast will ever be perfect – meaning any allowance made for an IPP is subject to this uncertainty. For costs that make up an immaterial proportion of a company's cost base, there is an argument that the company should bear the risk in relation to these costs, and that this uncertainty should not be brought into the cost allowances. However, for costs that are indeed significant, it is important that an IPP is accounted for, in order to prevent the company from not being able to cover its costs.

We find that **labour costs are a highly material part of retail totex**, with this the case at PR24 for Yorkshire, and at PR19 for the industry overall. As was set out in chapter 1, we consider that our framework of three criteria goes beyond what we would consider to be the minimum threshold to grant an IPP adjustment. Nonetheless, we recognise that a regulator would understandably want retail labour costs to make up a significant proportion of retail totex, in order to accordingly grant an IPP adjustment. The table below shows the proportion of Yorkshire's retail totex that is labour costs. These are the business plan numbers for its SUP11 table.[4]

Table 2: Materiality of retail labour costs for Yorkshire at PR24

	2025-26	2026-27	2027-28	2028-29	2029-30
Materiality (%)	33.3%	33.3%	33.3%	33.3%	33.3%
Materiality (£m)[5]	£25.8m	£25.8m	£25.8m	£25.8m	£25.8m

Source: Yorkshire Water

[4] *These are draft numbers that Yorkshire shared with us in July 2023.*
[5] *This is shown in 2022/23 prices.*

Furthermore, the table below shows (at PR19) the average across all companies for which data was available;[6] and the median across all companies for which data was available. We note that PR19 figures are used in this table as the initial plans have not yet been submitted for PR24, so industry data is unavailable at the time that this report was drafted.

Table 3: Materiality of retail labour costs at PR19[7]

	2020-21	2021-22	2022-23	2023-24	2024-25
Industry mean (%)	37.9%	37.8%	37.9%	37.8%	38.2%
Industry median (%)	38.0%	37.1%	37.5%	38.5%	39.0%

Sources: (i) Yorkshire Water; and (ii) PR19 Business Plan data tables sourced from companies' websites

We further note that, the two smallest reported average company proportions across the entirety of PR19 were 7.2% and 12.5%, but that both these companies outsourced much of their labour costs. The next smallest was 18.2% - further indicating the significance of labour costs for retail.

We note that the figures presented in the tables above exceed both of the following thresholds considered at PR19 and the RIIO-2 energy price controls:

- **PR19**. In its initial assessment of potential RPEs[8] on behalf of Ofwat, Europe Economics considered a materiality condition of at least **10% of retail totex**.[9] This condition was ultimately removed.

- **RIIO-2**. For both RIIO-GD2 and RIIO-ED2, Ofgem used a materiality threshold based on CEPA's assessment, based on a notional cost structure. This stated that the category must be **at least 10% of notional totex** for an RPE to be granted; or it **could be 5% of notional totex** but a further condition would be applied for the RPE to be granted.[10,11]

Materiality of IPP

We now consider the extent to which evidence suggests that:

- **Forecasts of future IPP are non-zero**. For an IPP for retail to be taken into account, there needs to be evidence that it will indeed be non-zero across the PR24 period.

6 *Data for the following companies was not publicly available: (i) Bristol Water; and (ii) SES Water.*
7 *Data is taken from the latest available PR19 business plan data tables.*
8 *This was prior to Ofwat confirming that retail costs would not be indexed to inflation.*
9 *'Real Price Effects and Frontier Shift.' Europe Economics (2 January 2018); p. 18.*
10 *'RIIO-2 Final Determinations – Core Document.' Ofgem (8 December 2020); p. 67.*
11 *'RIIO-ED2: Cost Assessment – Frontier Shift methodology paper.' CEPA (17 June 2022); p. 44.*

- **Historical labour IPP is non-zero**. Given that forecasts of IPP are inherently uncertain, considering historical IPP for labour allows us to test the robustness of these forecasts. If forecasts were to suggest high IPP going forward, contrasting historical data with very low rates of IPP may call into question the validity of these forecasts. However, we note the presence of extremely high inflation in the UK economy currently - as such, general macroeconomic conditions are significantly different to the PR19 period. Therefore, at PR24, placing weight on historical data to assess the future is likely to be less informative than at previous price controls.

We consider these two conditions to be by far the most important when considering whether an IPP allowance should be granted – given that (as we have detailed in chapter 1), we consider the question to be a quantitative one.

We find evidence to suggest the presence of non-zero IPP, both on a forward-looking and a historical basis. We discuss each of these in turn below.

Forward-looking

As detailed above, we consider that the evidence suggests that forward-looking labour IPP is non-zero. This is because:

- Agencies that forecast wage inflation consistently estimate it to be greater than 1.0% in each year.
- Evidence does not suggest that forecasts that are available throughout PR24 systematically over / underestimate wage inflation.

We have assessed forecasts provided by the following agencies:

- **OBR**. The Office for Budget Responsibility (OBR) produces biannual forecasts of average earnings inflation for the whole UK economy[12] using macroeconomic modelling and expert judgments.[13] The most recent forecast was produced in March 2023.[14]
- **NIESR**. The National Institute of Economic and Social Research (NIESR) produces quarterly[15] forecasts of average earnings inflation for the whole UK economy, with their most recent forecast published in May 2023.[16]
- **BCC**. The British Chamber of Commerce (BCC) produces quarterly forecasts of average earnings inflation for the whole UK economy, with their most recent forecast published in June 2023.[17]

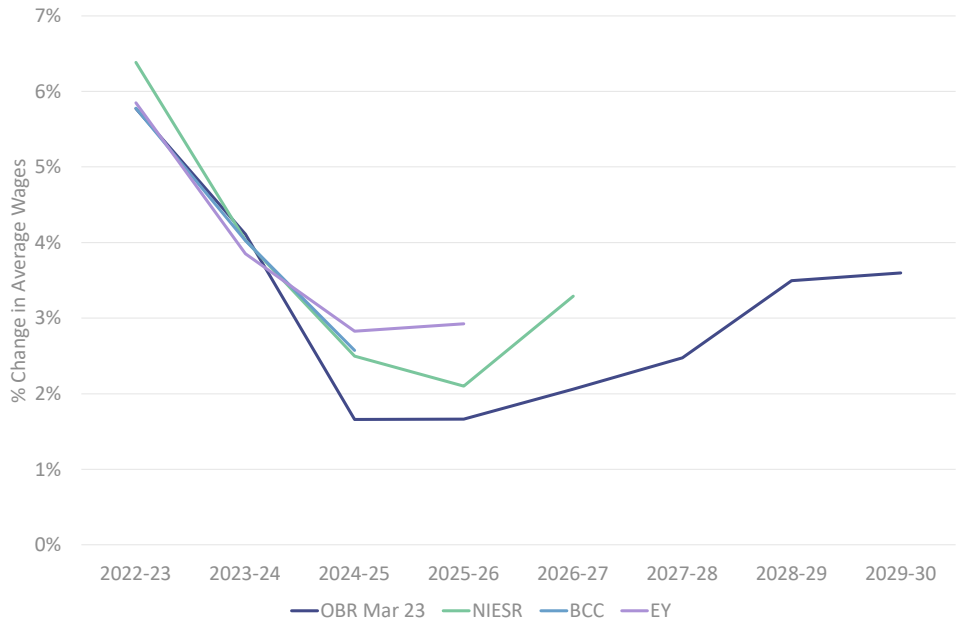
[12] *Please see: https://obr.uk/forecasts-in-depth/the-economy-forecast/labour-market/#averageearnings*
[13] *Please see: https://obr.uk/forecasts-in-depth/obr-macroeconomic-model/*
[14] *Please see: https://obr.uk/efo/economic-and-fiscal-outlook-march-2023/*
[15] *Please see: https://www.niesr.ac.uk/publication-type/uk-economic-outlook*
[16] *Please see: https://www.niesr.ac.uk/publications/uk-economy-sluggish-growth-high-inflation?type=uk-economic-outlook*
[17] *'Quarterly Economic Forecast.' British Chambers of Commerce (9 June 2023); p. 2.*

- **EY**. The Ernst and Young (EY) ITEM Club produces quarterly forecasts of average earnings inflation for the whole UK economy, with their most recent forecast published in April 2023.[18]

However, out of these agencies, only the OBR predicts wage inflation beyond 2026-27, i.e. for the entirety of the PR24 period.

The figure below shows forecasted annual wage inflation estimated by each of these agencies. As can be seen, they all display **expected wage inflation greater than 1.0%** in each year. As such, this suggests that IPP for retail labour is likely to be non-zero across PR24.

Figure 1: Independent forecasts of wage inflation at PR24



Source: Economic Insight analysis of publicly available data

We note that, at PR19, Ofwat relied on OBR forecasts for its labour RPE,[19] with the CMA also maintaining this approach.[20] However, Europe Economics considered that the OBR systematically overestimated wage growth[21] – with Ofwat then also citing this in its final determination decision.[22]

We have sought to test this, by comparing: (i) predicted wage growth from OBR forecasts; and (ii) outturn wage growth released as part of more recent OBR forecasts. The figure below shows the difference between (i) and (ii), for each forecast in each year. The figure shows that there does not appear to be any systematic over / underestimation of wage growth by the OBR.

18 *'EY ITEM Club Spring Forecast.' EY ITEM Club (April 2023); p. 13.*
19 *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 211.*
20 *'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations.' CMA (17 March 2021); paragraph 4.740.*
21 *'Real Price Effects and Frontier Shift.' Europe Economics (2 January 2018); p. 29.*
22 *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 196.*

Figure 2: Percentage point difference between OBR forecasts and outturn data

Source: Economic Insight analysis of OBR forecasts

Historical

We consider that historical IPP for Yorkshire is positive and non-zero. This is on the basis that:

- Realised UK wage inflation data almost always shows rates of non-zero (and often greater than 1.0%), on both a UK-wide basis and a more granular basis.
- This pattern appears to be consistent with Yorkshire's workforce in terms of its (i) geographical location; and (ii) breakdown of job roles.

We use data on annual wage growth from the following sources to test the extent to which historical growth is non-zero:

- **National Accounts**. The national accounts published by the Office for National Statistics (ONS) provide total wages and salaries for the UK as a whole. We derive average earnings from this by dividing the total wages and salaries by the number of employees (based on the Labour Force Survey). The advantage of this is that it is the same approach taken by the OBR to produce their forecasts[23] and is therefore directly comparable. However, it is an implied measure rather than directly calculated from individual employee earnings.

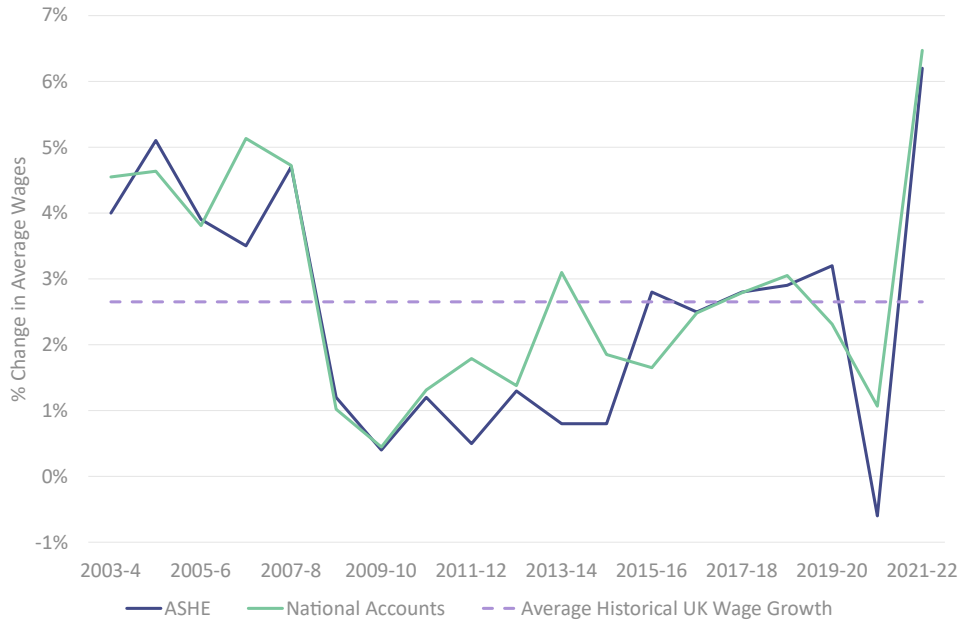
[23] *Please see: https://obr.uk/forecasts-in-depth/the-economy-forecast/labour-market/#averageearnings*

- **ASHE**. The annual survey of hours and earnings is published by the ONS based on a 1% sample of employee jobs (around 300,000) from HM Revenue and Customs' (HMRC's) Pay As You Earn (PAYE) records. This survey is carried out in April each year and the most recent data available is from 2022.[24] The advantages of ASHE are that it is a direct measure of employee earnings and will not be affected by changes in hours worked.[25] However, it does not distinguish between private and public sector wages,[26] and earnings estimates were impacted by the furlough schemes during COVID-19.[27] We note that, at PR19, Ofwat used ASHE wage inflation data for its true-up mechanism for wholesale labour.[28]

In the figure below, we show historical data from both National Accounts and ASHE, covering all industries in the UK. In addition the average historical UK wage inflation across all years is also shown in the figure below.

As can be seen, wage inflation is **almost always above 0%**, with the one exception to this in 2020-21, i.e. during the COVID-19 pandemic. The other significant drop shown in the chart between 2007-08, and 2008-09 was at the time of the Global Financial Crisis.

Figure 3: Historical wage inflation data



Source: Economic Insight analysis of publicly available data

[24] *Please see: https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/annualsurveyofhoursandearningsashe*

[25] *'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations.' CMA (17 March 2021); paragraph 4.698.*

[26] *'RIIO-ED2: Cost Assessment – Frontier Shift methodology paper.' CEPA (17 June 2022); p. 74.*

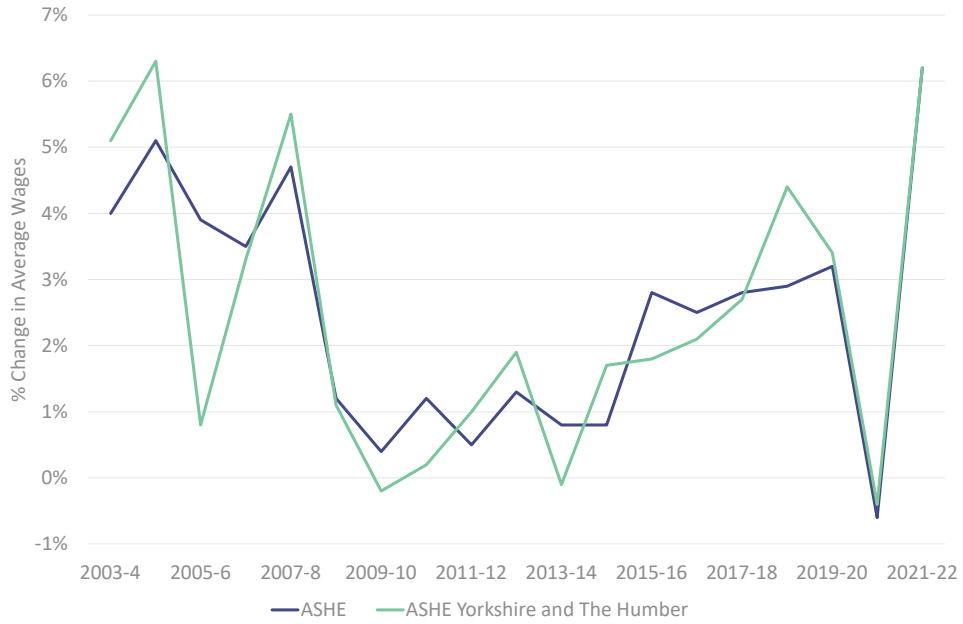
[27] *Please see: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2022*

[28] *'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations.' CMA (17 March 2021); paragraph 4.683.*

We also test the applicability of our data with respect to Yorkshire's retail workforce, in respect of: (i) geographical location; and (ii) the breakdown of roles.

Yorkshire's retail workforce is mainly based in West Yorkshire (with some remote workers based elsewhere), which corresponds to the region of "Yorkshire and the Humber". As such, we have compared historical wage inflation in this region, to national wage inflation in the figure below. As can be seen, the two series on average move together, but with larger differences at certain points in time. However, in recent years (i.e. since 2019-20), the two indices have moved very closely together. Furthermore, wage inflation in Yorkshire does drop just below zero in 2009-10 (during the Global Financial Crisis), and then only marginally below zero in 2013-14. It drops further below zero during in 2020-21, but this was likely due to the COVID-19 pandemic.

Figure 4: ASHE and Yorkshire and The Humber wage inflation data



Source: Economic Insight analysis of ASHE wage inflation data

In order to test the comparability of wage inflation based specifically on Yorkshire's retail workforce to UK wage inflation across all job roles, we have sought to match Yorkshire Water's wage inflation data across to that of the UK. We have done this in the following way:

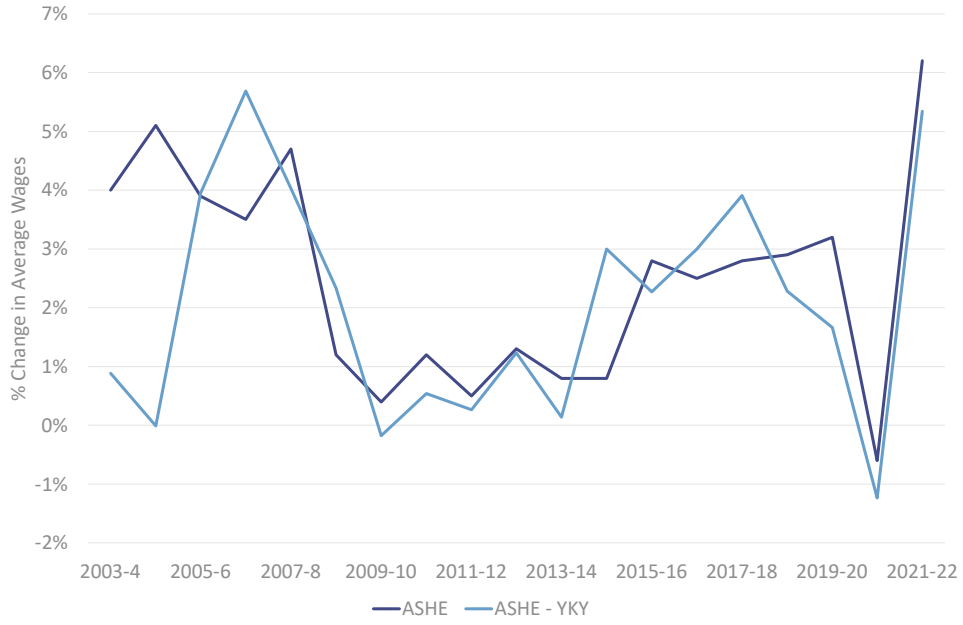
- Matched job roles provided by Yorkshire to 2-digit SOC codes.[29] We show the results of this matching process in Annex 1.

[29] *'SOC2020 Volume2 the coding index (excel) 18-05-23.' ONS (18 May 2023); SOC 2020 Structure*

- Calculated weights for each of the 2-digits SOC codes in Yorkshire's retail labour force weighted by total cost – for each SOC code the total cost was calculated by multiplying: (i) the total FTE (full time equivalent) provided by Yorkshire for that SOC code in 2021-22; and (ii) the mean 2021-22 salary in the ASHE data for that SOC code.
- Generating a "Yorkshire-specific" ASHE wage inflation index, by multiplying the weights from the previous step by annual wage inflation in the ASHE database for each of the 2-digit SOC codes.

The figure below shows the annual wage inflation for each of: (i) ASHE; and (ii) the Yorkshire-specific ASHE index ("ASHE-YKY"). As can be seen, the Yorkshire-specific ASHE index matches the ASHE index closely from 2005-06 onwards. In addition, it is also above zero except for: (i) in 2020-21 (i.e. during COVID-19); and (ii) in 2009-10 (i.e. during the Global Financial Crisis) where it fell slightly below zero.

Figure 5: ASHE and Yorkshire Water-specific ASHE wage inflation



Source: Economic Insight analysis of Yorkshire Water and publicly available data

2B. Management control

We now consider the extent to which retail labour costs at PR24 are within management control for Yorkshire. Specifically, we test: (i) how efficient Yorkshire is in retail, which affects the scope for further inefficiencies to be removed at PR24; and (ii) whether it is able to affect its retail labour costs – on the basis of wage rates and salaries, or volume of labour.

Yorkshire Water's retail efficiency

We firstly consider the extent to which Yorkshire is efficient in terms of retail. We do this by looking at:

- Ofwat's cost benchmarking models at PR19.
- Ofwat's PR24 cost consultation models.[30]

Overall, the evidence using Ofwat's models / proposed models suggests that Yorkshire is **highly efficient in retail**. This suggests that the scope for efficiency gains to be made at PR24 in relation to retail labour costs is limited – given that an efficient company would have already made these gains.

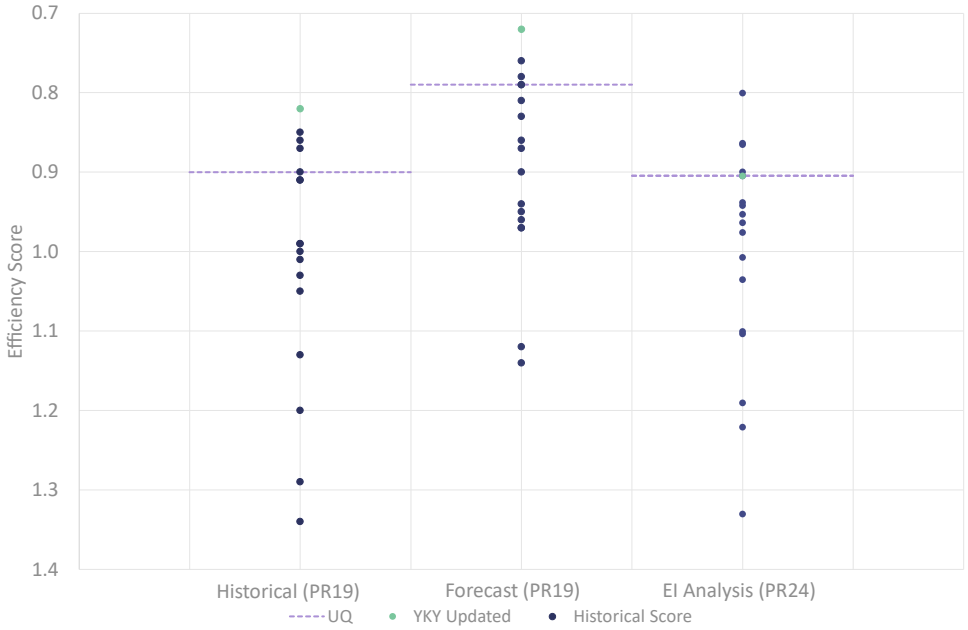
In the figure below, we show the following sets of efficiency scores for each company (with Yorkshire shown in green and the upper quartile with a purple line):

- Ofwat's triangulated PR19 historical efficiency score – "Historical (PR19)".
- Ofwat's forward-looking efficiency score – "Forecast (PR19)".
- The likely PR24 cost efficiency scores, based on our assessment using Ofwat's PR24 consultation models.

As can be seen, in both the PR19 scores, Yorkshire was the most efficient company, and in the PR24 estimation it is the upper quartile firm.

[30] *This is based on replicating its PR19 triangulation method, using Ofwat's PR24 consultation models. Please see here for further details: https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/econometric-base-cost-models-for-pr24/.*

Figure 6: Historical and forecast PR19 efficiency scores; and estimated historical PR24 retail efficiency scores



Source: Economic Insight analysis of Ofwat data

Furthermore, Yorkshire Water was at least as efficient as the upper quartile firm in all four of Ofwat's historical PR19 cost benchmarking models – and was in fact the most efficient for the top-down model,[31] and one of the three bottom-up models.[32]

The extent to which Yorkshire can influence its retail labour costs

As set out in the previous section, we consider that Yorkshire may have limited scope to further improve efficiency, as the evidence suggests that it is already efficient in retail. Nonetheless, we consider in this section the extent to which Yorkshire is actually able to influence its retail labour cost base at all. We test this using economic theory, in addition to information provided to us by Yorkshire. Overall, we consider that Yorkshire has **limited ability to reduce its labour cost base** because it has limited ability to change either the price or volume of labour.

Wage rates and salaries

Economic theory and evidence from Yorkshire would suggest that, in the market for the retail labour, Yorkshire is a price taker, as opposed to a price setter – i.e. it has **very limited ability to influence the price** paid for labour (wage rates and salaries).

Based on economic theory:

[31] *This was the total retail cost model (RTC).*
[32] *This was the model that combines bad debt costs and other retail cost.*

- Many of the skills required by the retail workforce are transferable to other sectors / companies. For instance, customer service assistants working in a call centre could feasibly work in any call centre that is customer-facing; whilst meter readers could alternatively work for energy water retailers.

- West Yorkshire (which is where the majority of the retail workforce is based) is a highly populous area, with major settlements such as Leeds, Bradford and Huddersfield. As such, geographical location is not a limiting factor to retail employees seeking alternative employment opportunities. Furthermore, the workforce that is not based in Yorkshire work remotely, implying that these employees can in theory work remotely for other UK-based companies – meaning that geographical location is also not an inhibiting factor for these employees. As such, this suggests that the labour markets in which Yorkshire's retail arm competes are likely to be relatively competitive.

We note that this conclusion is consistent with Ofwat at PR19.[33]

This is further supported by information provided to us by Yorkshire. In relation to setting wages, this sets out the following:

  - There are several unions that engage in collective bargaining with Yorkshire, on factors including pay.

  - Annual pay increases are also subject to negotiations with unions, and are subsequently balloted on by members.

Economic theory and evidence provided by Yorkshire also suggest that, at least in the long-term, Yorkshire is **limited in its ability to shield itself from volatility** in wage rates and salaries.

Based on economic theory:

- Although, in theory, Yorkshire could place its employees on long-term contracts, at the end of these contracts, it would likely be required to increase these salaries up to the market rate – particularly given the evidence set out above in relation to Yorkshire being a price taker.

- As such, wage inflation at the end of these contracts would be much greater and thus more volatile, with one sharp rise in wage inflation.

[33] *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 202.*

Evidence provided to us by Yorkshire suggests that it does indeed have some ability to mitigate itself against wage volatility, but that this may only apply for short periods. As such, Yorkshire may be able to protect itself from unexpectedly high wage inflation (and thus IPP relating to retail labour costs) for the first 1-2 years of PR24, but the extent to which it is able to do this for the entirety of the price control is limited. Specifically, the evidence indicates that:

- Previously, wage agreements would have been linked to inflation (with longer term deals capped) but the most recent deal was set by way of a fixed value (and percentage increase for some colleagues). This suggests that Yorkshire is somewhat able to mitigate itself against volatile inflation rates.
- Longer term deals (up to 5 years) used to be agreed, but now these are primarily 1-2 year deals. This suggests that Yorkshire is only able to mitigate itself against wage inflation for short periods of time.

Volumes

Economic theory, and evidence from retail cost benchmarking at PR19 and PR24, would suggest that Yorkshire has **minimal ability to reduce its volumes** of labour, in order to mitigate costs.

Economic theory would suggest that Yorkshire may be able to:

- Automate some of its retail processes (i.e. substituting labour for capital).
- Remove labour inefficiencies (i.e. reduce labour input without reducing output).

In practice, Yorkshire is unlikely to be able to automate all its processes, given the need for labour to engage with customers. Furthermore, the extent to which there is scope to make these changes is related to Yorkshire's relative retail efficiency. As was discussed above, Yorkshire is in fact highly efficient (relative to other companies) in retail. As such, this would suggest that the scope for inefficiencies to be removed is limited – given that inefficiencies should have been capitalised upon already.

2C. Considered elsewhere in the price control

In this section, we examine the interaction between retail IPP and other elements of the price control:

- Firstly, we consider where inflationary pressures are captured within Ofwat's cost assessment process, to ensure it is appropriately reflected.
- Secondly, we consider the interaction between frontier shift and IPP, specifically that if improved labour productivity is used to justify a higher frontier shift challenge, then the associated increased wage costs need to be accounted for.
- Thirdly, we highlight that, despite the cost sharing mechanism cited by Ofwat as a protection mechanism for companies, high IPP would still lead to companies incurring significant additional costs that would not be accounted for.

Retail cost benchmarking

At PR19, Ofwat's retail cost benchmarking approach involved using both historical and forward-looking costs. Actual historical costs will include realised IPP, and forward-looking costs included estimated IPP over the PR19 period. Furthermore, Ofwat rebased the historical costs that it used in its benchmarking based on CPIH, and calculated efficiency changes using both historical and forward-looking costs. IPP therefore features in a variety of ways in Ofwat's PR19 approach, but a specific allowance for IPP was not provided for.

It is important that IPP is fully reflected in Ofwat's PR24 approach to ensure that companies receive efficient cost allowances. Although Ofwat has not fully specified its approach to retail cost assessment at PR24, based on Ofwat's PR19 approach we have no reason to believe that IPP would be accounted for elsewhere, and therefore there is a need for an IPP allowance at PR24.

Interactions with frontier shift

At PR19, Ofwat granted an RPE for labour in relation to wholesale *"for real wage growth to reflect improvements in labour productivity."*[34] Furthermore, Ofwat states that *"[a]s total factor productivity estimates remove the impact of improvements in labour quality, then we could be allowing for the additional costs of improved labour quality without allowing for the additional benefits in terms of increased productivity."*[35] As such, it considered that, given that it was granting companies with additional allowances resulting from increasing wage rates (via the RPE), it was also necessary to ensure that reductions in costs resulting from improved labour productivity were accounted for. It used this as part of the rationale for choosing a higher frontier shift challenge out of its range of estimates.[36]

We consider it important that there is internal consistency in Ofwat's approach to frontier shift and RPEs (and thus IPP for retail). Specifically, if Ofwat chooses to impose a higher frontier shift challenge on the basis of improved labour productivity, then it must ensure that additional wage costs are granted in the form of an IPP allowance. This is particularly pertinent in the case of retail, where allowances are not indexed to inflation. We note that, in the SUP11 table of the PR24 business plan tables, Ofwat has requested that a retail-specific frontier shift estimate be provided. Therefore, if Ofwat chooses to use these estimates to apply an ex-post frontier shift adjustment at PR24, it should also do the same for IPP.

[34] *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 176.*
[35] *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 176.*
[36] *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 199.*

Cost sharing mechanism

At PR19, as part of its rationale for requiring companies to make a *"compelling case"* for an allowance in relation to real price effects, Ofwat stated that *"water companies already benefit from a range of protections not provided to companies that operate in other parts of the economy."*[37] One of the protections that it cited was the cost sharing mechanism.

We note that, at PR19, Ofwat did not apply cost sharing for retail on the basis that companies would be granted additional revenue if the number of customers served was different to the estimate at final determinations. As such, any additional expenditure over and above allowed costs that did not relate to outturn volumes of customers would be fully incurred by companies.[38] Therefore, at PR19, companies would have to fully incur any retail labour costs resulting from input price pressure.

At PR24, Ofwat has implied that it will apply the cost sharing mechanism in the case of retail, with bioresources the only price control area not covered.[39] As such, any overspend by companies resulting from unaccounted-for IPP for retail labour will in part be covered by customers. However, this will correspond to at most 50% of the overspend (depending on Ofwat's assessment of the company's plan). Therefore, companies would still be required to incur significant additional costs.

In the table below, we set out a stylised example that show the amount that Yorkshire would incur under different assumptions of input price pressure and Ofwat's business plan category. Specifically, the figures in red in the table show that, based on Yorkshire's forecast retail totex at PR24, companies would incur the following costs based on Ofwat's assessment of their business plans:

- £1.0m - £1.2m, if IPP is 1.5%.
- £1.9m - £2.3m, if IPP is 3.0%.

As such, even with Ofwat's cost sharing mechanism, without an IPP adjustment, Yorkshire is at risk of experiencing significant costs in the case of overspend at PR24 – that it would need to incur itself, without being able to charge customers.

[37] *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 139.*
[38] *'PR19 final determinations - Securing cost efficiency technical appendix.' Ofwat (December 2019); p. 139.*
[39] *'Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances.' Ofwat (December 2022); p. 44.*

Table 4: Stylised example of costs incurred by overspend from unaccounted-for IPP

Scenario 1	**Total PR24 estimated retail totex provided by Yorkshire**		£128.8m
	IPP rate		1.5%
	Ofwat business plan category	**Overspend rate**	**Implied costs incurred by Yorkshire (2022/23 prices)**
	Outstanding	50.0%	£1.0m
	Standard	50.0%	£1.0m
	Lacking ambition	55.0%	£1.1m
	Inadequate	60.0%	£1.2m
Scenario 2	**Total PR24 estimated retail totex provided by Yorkshire**		£128.8m
	IPP rate		3.0%
	Ofwat business plan category	**Overspend rate**	**Implied costs incurred by Yorkshire (2022/23 prices)**
	Outstanding	50.0%	£1.9m
	Standard	50.0%	£1.9m
	Lacking ambition	55.0%	£2.1m
	Inadequate	60.0%	£2.3m

Source: Economic Insight analysis of Ofwat's final methodology and data provided by Yorkshire

3 Findings

As we have shown in chapter 2, we consider there to be a strong case for an IPP allowance based on the evidence assessed.

Nonetheless, as we showed in section 2B, the OBR is the only agency that provides a third-party forecast of wage inflation at PR24. On the basis of available third-party estimates, the OBR forecasts provide an appropriate basis for an IPP allowance. In the table below, we summarise:

- The March 2023 iteration of the OBR forecasts, for each year between 2022-23 and 2029-30. Based on these figures, across the PR24 years, the **average labour IPP would be 2.66%** at PR24.
- The corresponding monetary IPP cost that would be incurred as a result in each year of the PR24 price control (i.e. 2025-26 up to 2029-30). The **total IPP cost allowance for Yorkshire would be £3.42m**, based on these forecasts.

Table 5: IPP forecasts at PR24

	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	Total at PR24[40]
IPP forecast (%)	5.77%	4.11%	1.66%	1.66%	2.06%	2.48%	3.49%	3.60%	
IPP cost (£m)				£0.43m	£0.53m	£0.64m	£0.90m	£0.93m	**£3.42m**

Source: OBR March 2023 forecasts and data provided by Yorkshire

The "IPP forecast (%)" figures in the table above can be used by Yorkshire in its SUP11 table.[41] Furthermore, these forecasts can be reviewed once updated information is published – specifically if the OBR publishes its long-term forecasts following their Spring 2024 release, this should provide updated data for the entirety of the PR24 period.[42]

[40] *As PR24 only includes the years from 2025-26 up to 2029-30, these are the years that are used in this calculation.*

[41] *At the time of writing the report, the SUP11 table did not contain a separate entry for retail IPP. However, Ofwat has said that the table will be updated to allow for companies to enter different estimates for retail and wholesale (please see: https://www.ofwat.gov.uk/wp-content/uploads/2023/04/PR24-BPT-query-responses-release-6.xlsx, cell E116).*

[42] *The OBR's Spring 2024 medium-term forecast is unlikely to include the final year of PR24; therefore we propose using the OBR's long-term forecast that is generally published a few months later. The Autumn 2024 forecasts will likely be released too late to be incorporated into final determinations in December 2024.*

4 Annex 1: Matching of job roles to SOC codes

Table 6: Results of matching process between Yorkshire Water retail labour roles and 2-digit SOC codes

Job role	SOC code description	SOC code
Brand and Marketing	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35
Customer Digital	SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS	21
Customer Recovery	CUSTOMER SERVICE OCCUPATIONS	72
Customer Resolution	CUSTOMER SERVICE OCCUPATIONS	72
Customer Service Strategy	BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS	24
CX Ops Business Continuity	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35
CX OPS Learning & Development	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35
Forecasting & Planning	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35
Operational Scripts	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35
Performance & MI	BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS	24
Performance Excellence	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35

Job role	SOC code description	SOC code
Customer Experience Leadership	CORPORATE MANAGERS AND DIRECTORS	11
Ops Cus Exper	CUSTOMER SERVICE OCCUPATIONS	72
Contract Support Team	BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS	24
Customer Response Team	CUSTOMER SERVICE OCCUPATIONS	72
Customer Side Leakage Team	PROCESS, PLANT AND MACHINE OPERATIVES	81
Field Operations	SKILLED CONSTRUCTION AND BUILDING TRADES	53
IPSL Team	BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS	24
Leakage Team	PROCESS, PLANT AND MACHINE OPERATIVES	81
Metering Team	PROCESS, PLANT AND MACHINE OPERATIVES	81
Operational Contracts	CORPORATE MANAGERS AND DIRECTORS	11
Resource & Asset Planning	BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS	35
Street Works Team	SKILLED CONSTRUCTION AND BUILDING TRADES	53
Technical Engineering - Customer&Bursts	SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS	21
Water Efficiency Team	SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS	21

Job role	SOC code description	SOC code
Water Planning & Engineering	SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS	21
Water Resillience & Response	SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS	21
Third Party Claims	ADMINISTRATIVE OCCUPATIONS	41
Comm&Contract	BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS	24
Loop Billing & Collections	SALES OCCUPATIONS	71
Loop Customer Services	CUSTOMER SERVICE OCCUPATIONS	72
Loop Integration & Improvement	BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS	24
Loop Management	CORPORATE MANAGERS AND DIRECTORS	11

Source: Economic Insight analysis of Yorkshire Water and ONS data

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