PR24: INPUT PRICE INFLATION

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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

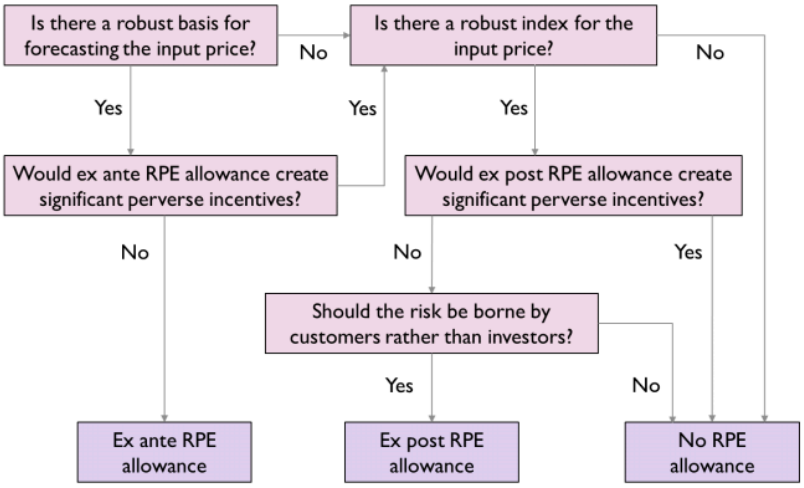
No.	Question
1	Is the expected value of the wedge between the input price and CPIH materially different from zero?
2	Does the wedge between the input price and CPIH exhibit high volatility over time?
3	Are there sufficient and convincing reasons to think that CPIH does not adequately capture the input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

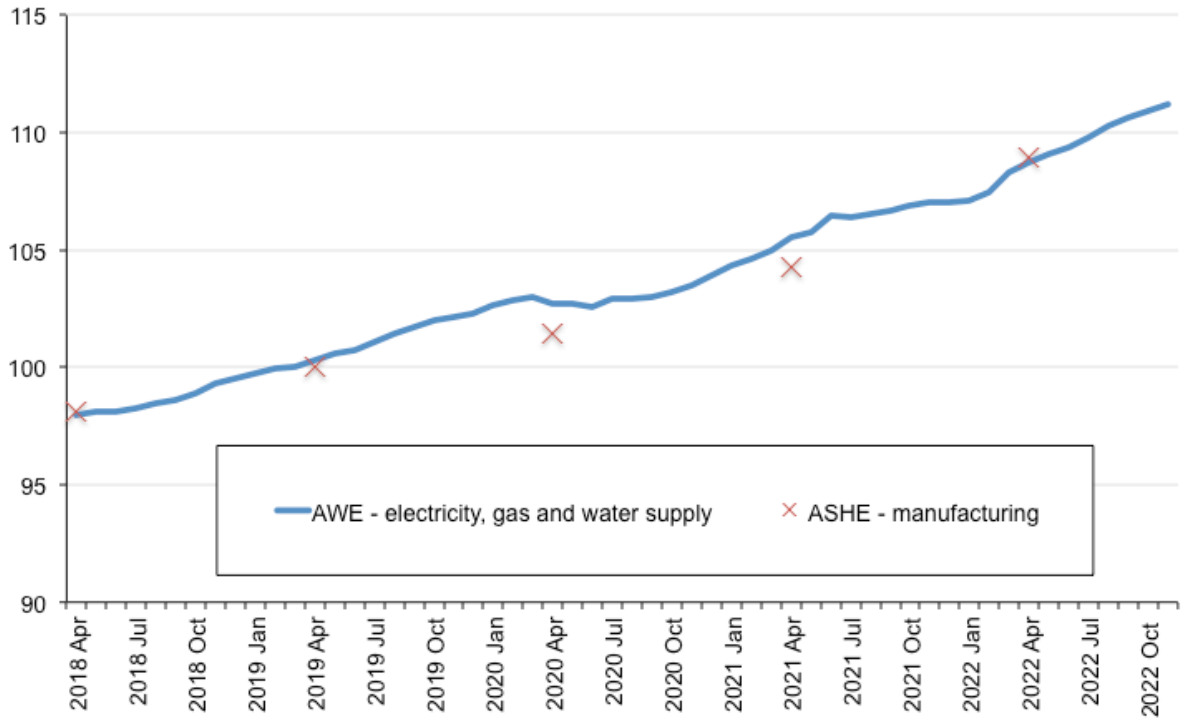
4. AN ANALYSIS OF INPUT PRICE INFLATION BY COST CATEGORY

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:

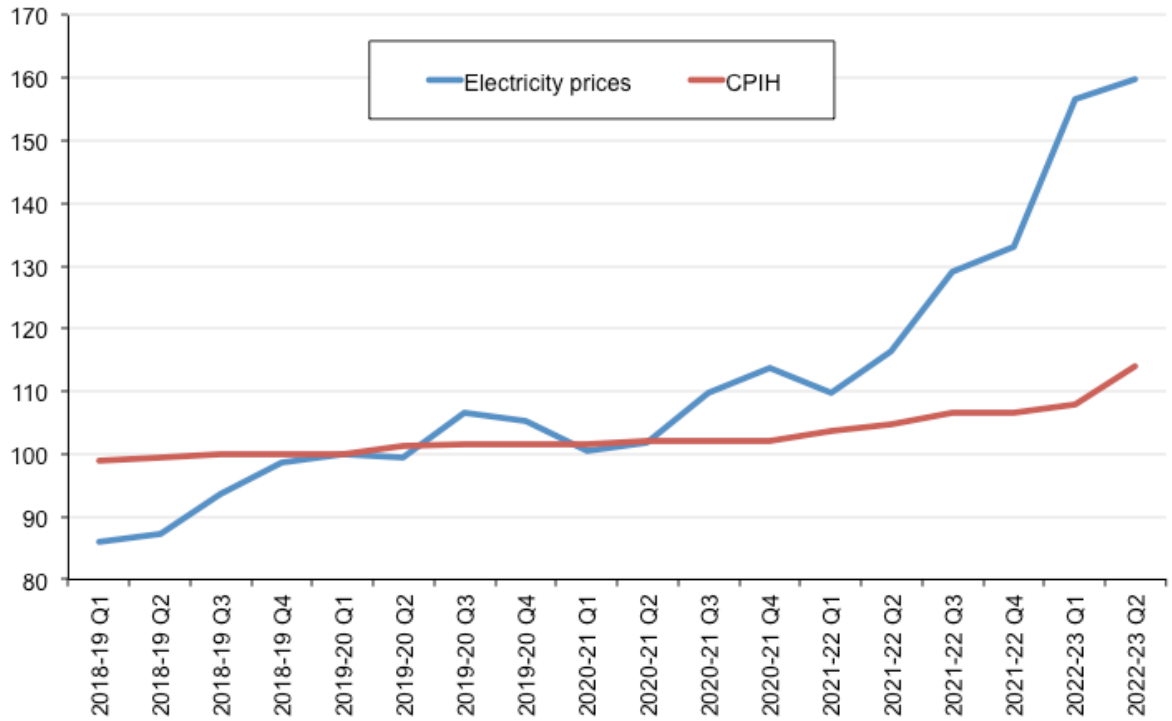
- first, there will be inevitable differences between rates of wage growth in two distinct industries – i.e. an index of manufacturing wages is, at best, only ever going to give a rough guide to labour cost pressures in the water and wastewater sector; and
- second, Ofwat's chosen index takes the form 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.

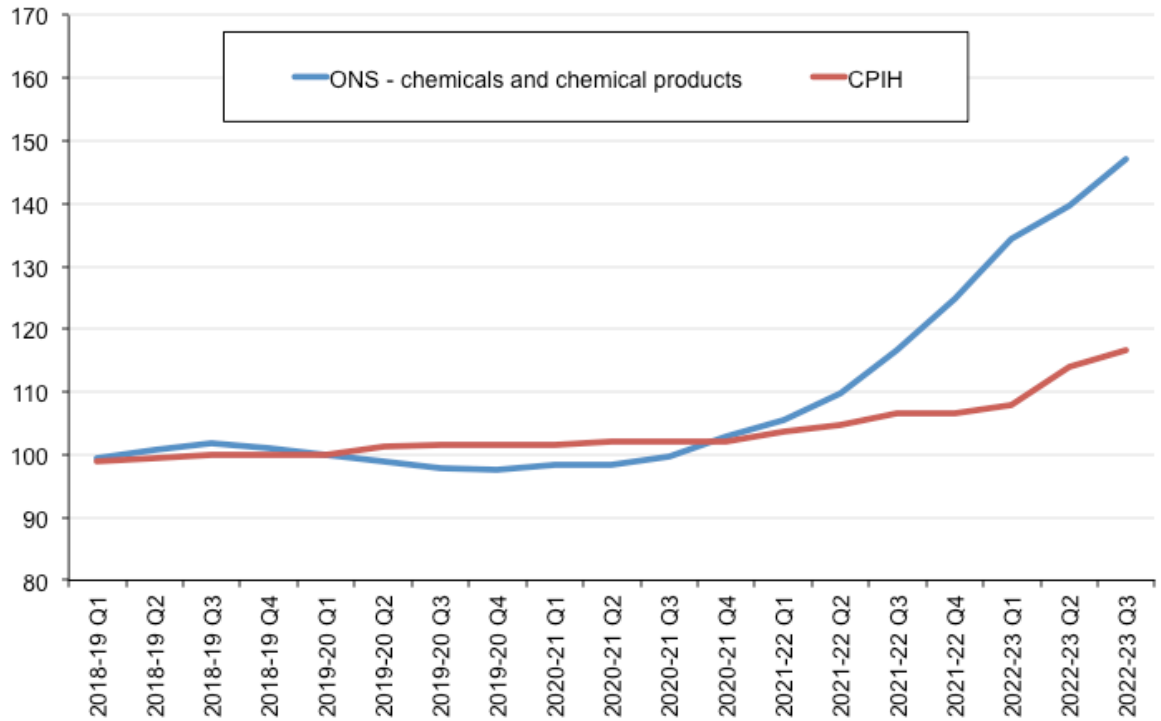
The BEIS index puts cumulative industrial electricity price inflation at approximately 75% since 2018/19. (Note that the BEIS index tracks the price that customers actually pay for their electricity, after forward purchasing arrangements, and so may not (yet) capture the increase that there has been 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

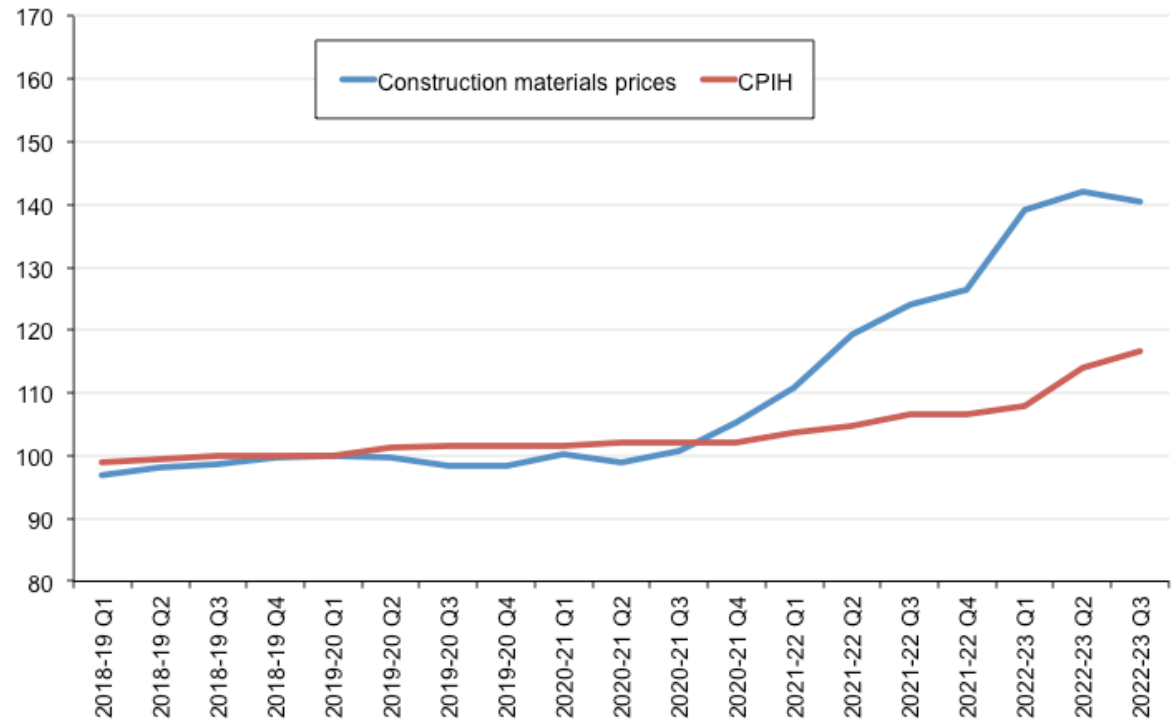
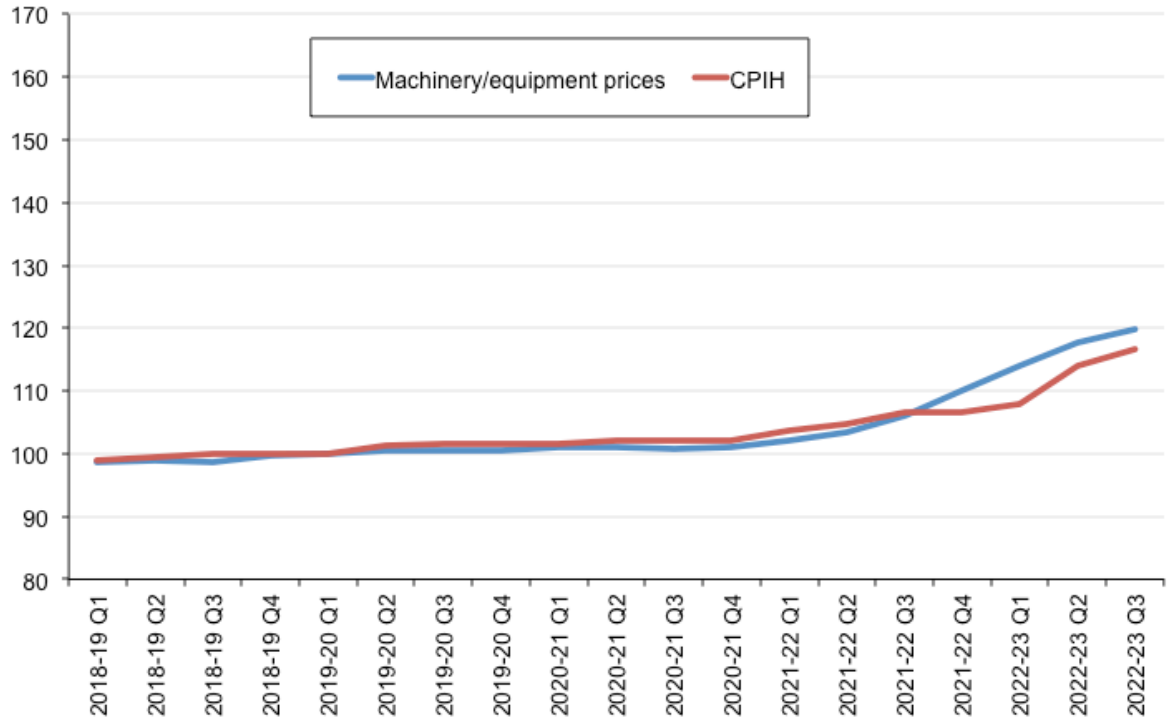


Figure 6: Machinery/equipment prices and CPIH, 2019/20 Q1 = 100



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.