Affinity Water

AFW113 Baringa on treatment of energy costs in AMP8

Ofwat's PR24 Draft Determinations for the treatment of energy costs in AMP8

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Contents

Summary

The energy price shock following the war in Ukraine has led to significant increases in energy prices and energy price volatility. The energy sector remains exposed to geopolitical events so future volatility and elevated prices – that water companies cannot control or fully mitigate – remains an ongoing risk. Numerous energy market specialists expect energy costs to remain higher than pre-Ukraine war levels for the rest of the decade. Against this backdrop, and in response to water company submissions, Ofwat has proposed in its PR24 draft determinations changes to the way that energy costs are treated to help ensure that the allowances water companies receive in the period 2025-30 are efficient, and the ongoing risks that water companies are exposed to are appropriately shared and managed.

The direction that Ofwat is proposing in terms of the treatment of energy costs in PR24 is broadly appropriate and aligned with Ofwat's statutory duties which include protecting the interests of consumers and securing that water companies can finance the delivery of their functions. **However, the approach to implementation that Ofwat proposes risks being detrimental to the recovery of efficient energy costs. The adjustment that Ofwat is proposing to modelled costs (including energy) would actually reduce energy cost allowances by almost £250m over AMP8 (2025-30).** Given the scale of companies' expenditure on energy (e.g. they anticipated spending £1.27bn in FY25), this reduction to allowed costs would represent a material difference to their overall energy costs.

Allowed energy costs over the 2025-2030 period would be lower than Ofwat's pre-RPE modelled (and allowed) costs, which are based upon analysis over the period FY12 to FY23**.** We do not expect energy prices to decrease over the AMP8 period relative to the FY12 to FY23 period, so Ofwat's adjustment would lead to a decrease in the allowance given to water companies, when they are likely to be paying more for energy. This is not borne out by forecasts of energy prices, particularly when additional costs such as policy costs and network charges are considered. Jonathan Brearley (CEO of Ofgem), speaking to the House of Commons Energy Security and Net Zero Committee in May 2024 said that "prices remain significantly higher than they were before the crisis," and looking ahead he cautioned that "prices are expected to remain high and volatile over time". On 23 August 2024, Ofgem announced the retail price cap would rise by 10% in October 2024.

While an ex-post true-up mechanism can rectify forecast differences, it will leave water companies with cashflow timing challenges to manage. More importantly, Ofwat knowingly setting allowances that are likely to be 'predictably' incorrect is inconsistent with funding efficient costs through allowances.

We have identified **three key issues with Ofwat's proposed approach** that can be summarised as:

1) the use of a price series for calculating the Real Price Effects (RPE) factor that is unhedged and unrepresentative of the costs water companies face (the series is also used for a period of anomalously high peak prices)
2) the use of inconsistent (hedged and unhedged) energy prices and indices for the uplift and RPE calculations
3) a methodology that is highly sensitive to parameter changes and is thus capable of producing arbitrary outcomes.

We have developed five alternative options that directly seek to address the issues we have identified while seeking to preserve the core policy intent of Ofwat to minimise risk of volatile energy costs to water companies.

We recommend Ofwat, when calculating the RPE factor, replace the Ofgem day ahead electricity baseload energy price for the base forecast year with DESNZ extra-large users price data (that includes hedging activity). We also propose that same DESNZ data is used to calculate the uplift to modelled base costs. Finally, we recommend that the base year takes account of most recently available data of prices and is moved forward to FY24 (from FY23). This ensures consistent and appropriate prices and indices are used and the most recent available data on representative, hedged, energy costs is used. This recommended alternative option would increase allowances during AMP8 by £972m compared to Ofwat's negative adjustment of £244m. This represents a £1.2bn difference, highlighting the importance of addressing this issue at Final Determinations.

1 Introduction and background

1.1 Introduction

Baringa has been commissioned by Water UK, the trade association for the water industry, to review and assess Ofwat's proposals on the treatment of energy costs from 2025 to 2030; consider if the approach set out in those proposals is fit-for purpose, and; propose amendments to that approach, as necessary.

We conducted our work in July and August 2024. This involved a review of Ofwat's proposals, discussions with regulatory teams at water companies, and the application of Baringa's subject matter expertise in price controls, the water sector, and the energy sector. We identified several areas where the proposals for the treatment of energy costs in AMP8 can be improved and we have set out options, and recommendations, for dealing with these areas in this report.

1.2 AMP8 and the price control process

The Asset Management Period (AMP) 8 price control will cover the five-year period 2025 to 2030. The 2024 price review (PR24) is the process by which the price control for the AMP8 period will be set.

As part of PR24, Ofwat published draft determinations on 11 July 2024 and was, when this report was submitted to Water UK in August 2024, consulting on those draft determinations. That consultation was scheduled to close at the end of August 2024. Ofwat will publish its final determinations in December 2024.

The PR24 period, as in the case of previous price controls, is of key importance to water companies and consumers. It aims to hold water companies to account for the outcomes that customers pay for and incentivises companies to go further where it is in the interests of customers and the environment. PR24 is central to Ofwat's delivery of its statutory duties which include protecting the interests of existing and future consumers and securing that water companies can finance the delivery of their functions.

1.3 Base expenditure and energy costs in PR24

A key component of the PR24 process is setting efficient total expenditure (totex) allowances for water companies. Totex is made up of base and enhancement expenditure. Base expenditure includes expenditure on routine recurring costs; maintaining assets; improving efficiency, and; complying with legal obligations.

As water companies are monopoly providers in many of the services they deliver, Ofwat cannot rely on competition to deliver high service quality and efficient costs. Instead, it uses various regulatory tools – in common with regulators in other sectors such as energy – to incentivise companies to reveal efficient costs and seek to ensure that customers pay a fair price.

The assessment of totex is one of these regulatory tools, and this assessment varies between different cost categories. Energy costs – the costs incurred by water companies to pay for the energy necessary to run their businesses (for example powering water pumping facilities) – falls within the category of base expenditure. Energy is a substantial cost for water companies. In their PR24 business plans, water companies anticipate spending £1.27bn in FY25 across their water and

wastewater activities[1]. The assessment of energy costs in PR24, and Ofwat's draft determinations for the treatment of energy costs in AMP8, is the focus of this report[2].

The next section sets out Ofwat's proposals for setting the energy costs element of base costs.

[1] Source: Company PR24 business plan data tables, CW2 and CWW2

[2] In PR19, energy costs were treated in-line with other operating costs in base costs.

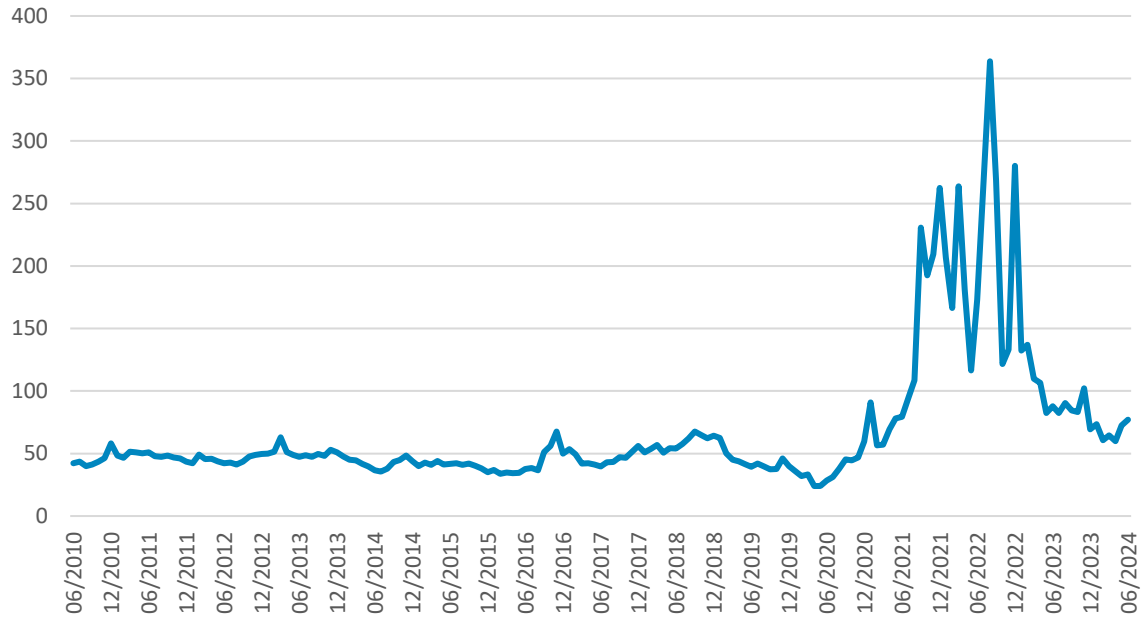
2 Ofwat's proposals on energy costs

2.1 The energy price crisis and energy costs in AMP8

Since late 2021, there has been a substantial increase in the level and volatility of wholesale energy prices. This was driven by the recovery of the global economy after the pandemic and accelerated following the Russian invasion of Ukraine in early 2022.

Figure 1 below sets out the path wholesale day-ahead prices, which illustrate the volatility in energy prices.

Figure 1 Wholesale day-ahead electricity prices 2010-2024 (£/MWh)



Note: This figure uses Ofgem's day-ahead electricity baseload prices

Volatile day-ahead prices translate into volatile energy costs for businesses, but often with a lag as the impact of hedges and fixed price energy contracts means that immediate impacts of wholesale energy price rises are muted, and impacts are deferred. Furthermore, other elements of the cost of energy, such as network charges have risen. Jonathan Brearley (CEO of Ofgem), speaking to the House of Commons Energy Security and Net Zero Committee in May 2024 said that "that despite this stabilisation, prices remain significantly higher than they were before the crisis", and looking ahead he cautioned that "prices are expected to remain high and volatile over time".[3]

Furthermore, recent analysis from Cornwall Insight suggests that energy costs (and the default price) are set to rise again and remain above pre-crisis levels: "While prices have stabilised somewhat compared to the previous two years, the market has not fully recovered from the energy crisis and the impact of Russia's invasion of Ukraine. As a result, the market remains highly sensitive to any global events that could disrupt supply. The UK's reliance on imported energy leaves the country very

[3] https://www.energylivenews.com/2024/05/23/ofgem-boss-warns-of-high-energy-prices-ahead-of-price-cap-announcement/

vulnerable to this global volatility. This is seeing both household and business energy bills forecast to staying far above pre-crisis levels."[4]

Most of the water companies referred to rising energy costs in their PR24 business plans. The companies set out potential issues which arise from the interaction between the increases in energy costs and Ofwat's assessment of base costs. The issue was described by water companies as follows:

- Ofwat's modelled base costs are based on econometric cost modelling using companies' historical expenditure over financial years FY12 to FY23 and this is used to set allowances over AMP8.
- Recent and forecast energy price increases mean historical costs are not a reliable benchmark for future costs: most years included in the Ofwat sample include energy prices that were considerably lower compared to those at the end of the modelled period. Only two of the observations of modelled data (2022 and 2023) include some of the impact of energy price increases. Therefore, on average, the historical energy costs are likely to underpredict the current and future energy costs compared to the most recent data points.
- By not accounting fully for the recent increase in energy costs in the econometric models, allowances for the AMP8 period may mean that water companies are underfunded for efficient energy costs.
- Recent experience has shown that energy costs can be highly volatile due to geopolitical events and water companies cannot control or fully mitigate this volatility and are not best placed to bear this risk.

In summary, companies are concerned that the cost allowances do not align with the current forecasts of their actual energy costs during AMP8 and that changes to the adjustment are necessary.

Water company proposals

Most companies included in their PR24 business plans proposals for some form of mechanism to address the increase in level and volatility of energy costs. These proposals included some (or, in many cases, all) of the following three mechanisms:

- **An 'uplift' adjustment to base costs** to address the modelling issues covered above. Companies proposed approaches to adjust or apply an 'uplift' to the base cost modelling to help ensure allowances reflected recent increases to energy costs.
- **An ex-ante energy real price effects (RPE) allowance** to take into account the expected ongoing difference in expected energy price growth compared to CPIH.
  As the price control allowances are indexed to the CPIH inflation measure, and as energy costs are driven by factors outside of water companies' control, an RPE was proposed by some companies. The RPE would adjust allowances for the difference between CPIH and an energy price index that better reflects changes in energy costs than the generic CPIH inflation measure.

  This RPE allowance would complement the energy cost 'uplift' and help ensure water companies are not overfunded for AMP8 given a general expectation that energy costs will decline over AMP8.

[4] Cornwall Insight release final forecast for October price cap (cornwall-insight.com)

- **An uncertainty mechanism** to adjust allowances ex-post at the end of AMP8 to reflect the outturn path of energy prices.

The ex-ante RPE allowance will necessitate a forecast of energy costs for the AMP8 period. Given that energy costs have been volatile in recent years due to macroeconomic and geopolitical events, there is uncertainty around how energy costs will evolve over AMP8. Most water companies proposed an uncertainty mechanism to mechanistically adjust allowances at the end of the price control period to reflect outturn energy costs. The Department for Energy Security and Net Zero (DESNZ) electricity price index[5] for large industrial users was suggested, both for the uncertainty mechanism and the uplift by some water companies.

Ofwat's proposals at draft determinations

At PR24 draft determinations, Ofwat accepted the need for a sector-wide energy cost adjustment and an end-of-period true-up uncertainty mechanism to avoid underfunding companies for efficient energy costs and to address the significant uncertainty around energy costs over AMP8. Economic consultancy CEPA advised Ofwat on how this should be implemented. At a high-level, **Ofwat's proposals are a four-step process** set out below:

1. **Calculating modelled base costs based on historical company expenditure.**

   Ofwat's base cost models are used to produce a measure of efficient modelled energy costs, as part of the standard price review process.

2. **An 'uplift factor' to bring modelled base costs up to market prices in FY23.**

   For the wholesale water and wastewater network plus controls (in which water companies are net energy users), an adjustment to base costs energy costs is made recognising that energy costs are a material proportion of base costs, and comparing company outturn energy costs and the energy allowance indicates that Ofwat's econometric base cost models do not fully capture the impact of recent energy price increases.

   CEPA reviewed three approaches to making an adjustment to ensure modelled costs would reflect energy prices (in March 2024, when the analysis was done). These were:

   - an adjustment to submitted costs prior to running the econometric models ('pre-modelling adjustment').
   - the inclusion of an energy cost driver within the econometric models ('within modelling adjustment').
   - an adjustment to modelled costs after running the econometric models ('post-modelling adjustment').

   CEPA selected the third option – the post-modelling adjustment - as it found that the other options produced undesirable impacts on the base cost econometric models.

3. **An RPE adjustment to allowances, based on CEPA's forecast of a fall in energy prices over the AMP8 period.**

   As prices are expected (based on wholesale forward contract prices) to decline over AMP8, an RPE forecast is then applied to the initial adjustment in (2), to account for this expected fall in energy prices over AMP8. This aim of this is to protect consumers by ensuring companies are not overfunded for energy costs over AMP8.

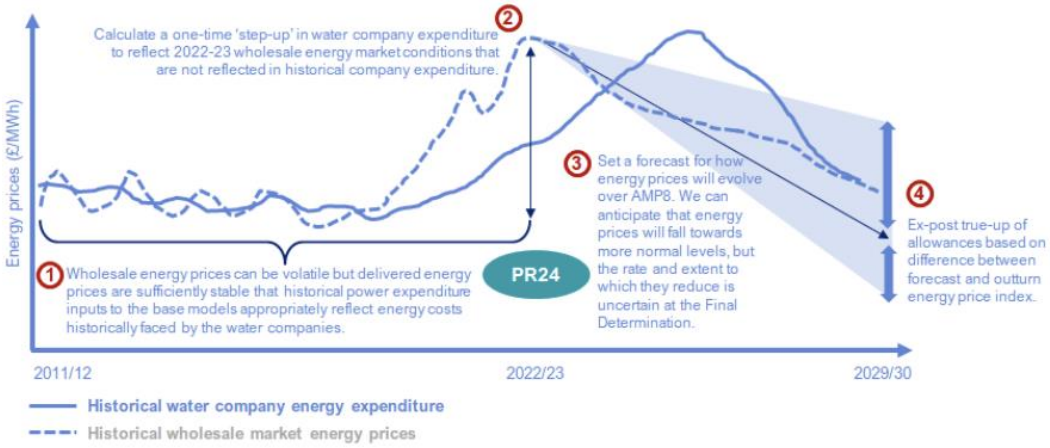
[5] DESNZ industrial energy price statistics are available from: https://www.gov.uk/government/statistical-data-sets/industrial-energy-price-indices

This overall energy cost adjustment (ie steps (2) and (3)), adjusts base costs as modelled in step (1). Recognising uncertainty around energy cost outturns over AMP8, Ofwat also propose:

4. **An ex-post true-up between forecast and outturn energy prices using the DESNZ industrial electricity price index for large industrial users**.

Ofwat's approach is summarised in the figure below, from CEPA's report:

Figure 2 Ofwat's four-step energy cost adjustment and uncertainty mechanism



Note: From Ofwat's PR24 draft determinations, July 2024 "Expenditure allowances" (reproducing CEPA's "Frontier shift, real price effects and energy crisis cost adjustment mechanism", Figure 2.15, July 2024

Ofwat's proposals and the impact on energy cost allowances

Overall, Ofwat's aims, and the broad approach it proposes to achieve its aims, align well with the ambition to avoid underfunding companies for efficient energy costs and to reduce energy price risk. It does so by setting a sector-wide energy cost adjustment that is applied to company specific energy costs shares, and an accompanying end-of-period true-up mechanism to account for uncertainty.

Overall, Ofwat's proposed treatment of energy costs has a negative impact on base allowances (at -£244 million across water and wastewater network plus activities where companies are net energy users)[6]. This is because CEPA forecast energy prices to fall rapidly and to fall below the average energy price over the historical modelling period by 2025-26. We explain this impact in the rest of this section. We now consider the two key steps of the CEPA/Ofwat's methodology, Step 2 (the 'uplift factor') and Step 3 (the RPE adjustment to allowances).

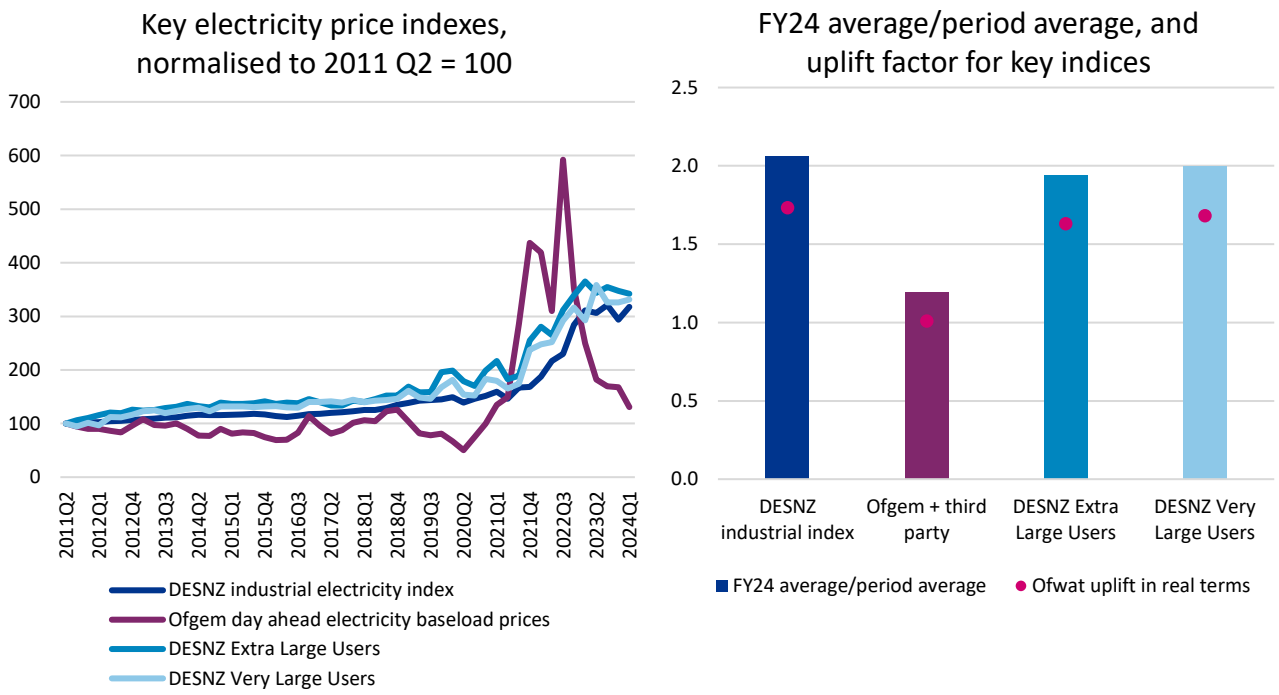
Step 2: An 'uplift factor' to bring modelled base costs up to market prices in the year FY23

The uplift factor in Step 2 is the post-modelling adjustment that Ofwat proposes. It seeks to adjust the energy related share of modelled allowances after running the base cost models in Step 1. To do this, an independent price index which reflects the energy costs companies face is necessary. CEPA considered two electricity price indices. The first considered is the DESNZ electricity price index for the industrial sector (as suggested by several companies in their business plans). This index is based on a survey of companies and reflects the final cost to the industrial companies, including hedging arrangements, and government support. The second considered was the DESNZ electricity price

[6] In addition, there is a positive adjustment to bioresources of +£40m where companies are energy producers.

index for extra-large non-domestic consumers. These prices are based on a sample of eight gas and six electricity suppliers of the volume and value of gas and electricity sold to non-domestic consumers. These two indices (plus the DESNZ electricity price index for very-large non-domestic consumers) are shown below alongside the Ofgem wholesale price index. The figure on the right hand side presents the ratio of the FY24 average to the whole period average (2011 Q2 to 2024 Q1).

Figure 3 Indices relevant to the energy price adjustment[7]



Note 1: Sources: DESNZ Industrial Energy Price Indices and series, Ofgem Wholesale Market Indicators. Apart from the DESNZ industrial electricity index, the other lines shown have been converted to indices as they are presented in £/MWh.

Note 2: The discrepancy between the FY24 index average/whole period average, and the uplift factors for each index is due to the fact that the uplift factors have been adjusted by CPIH growth. Additionally, the values shown in the right-hand graph include FY24 data, so the uplift factor shown will be different to the value used in some of the modelling calculations. Particularly, note that the Ofgem data is based on a FY24 index value which has fallen from the FY23 peak. The FY23-based equivalent Ofgem value would be higher than the other indices.

The three DESNZ series move broadly in-line with each other. They all represent energy costs to businesses which includes hedging activity, so tend to react less quickly to changes in underlying wholesale prices as the observation in any one period will reflect hedging strategies from prior periods that seek to smooth out price fluctuations. The DESNZ industrial electricity index has increased by less than the DESNZ extra- and very-large user indices, albeit by a relatively small amount. This may be due to the inclusion of energy intensive industries in the former who have exemptions from some policy and network costs which have increased over the period, though we have not been able to verify this. The point of comparison for calculating the base year uplift factor to energy costs is the ratio of the FY24 index to the period average index from Q2 2011 to Q1 2024. On this basis the proportionate uplift across all three DESNZ indices relative to their historic average

[7] Note that while CEPA found the most appropriate index for water companies (for the uplift), was the DESNZ industrial index, there are concerns that this index may understate energy costs to water companies to the extent that the index includes energy intensive users who may benefit from exemptions from policy costs and network charges. The water sector will not benefit from these exemptions, so will pay higher unit costs than industrial consumers in eligible sectors.

is broadly similar (see Figure 3 RHS). The Ofgem index is based on day-ahead wholesale prices so this is more volatile than the DESNZ indices and will generally tend to 'lead' changes in the DESNZ indices, with (for example) earlier, briefer, and higher peaks. This also means that recent falls in wholesale prices will lead price movements in the DESNZ indices. Were wholesale prices to remain where they currently are, we would expect the DESNZ indices to trend towards current wholesale prices.

CEPA decided that the DESNZ electricity price index for the industrial sector was preferred, though we note this preference was not overwhelmingly decisive and was based on the extra-large users' index including some less relevant users (eg retail), and as some water companies consume less energy than the extra-large non-domestic users. Using this preferred index produces a 64% uplift factor to base modelled costs and applying that produces an energy cost adjustment as shown in CEPA's Table 2.6 reproduced below.

Table 1 Recreation from CEPA's report showing (outlined in purple) the impact of the post-modelling uplift

Industry total		Pre-modelling	Including cost driver	Post-modelling
Wholesale water	***£m***	826	1,374	1,653
	% of efficient modelled base costs	3.8%	6.2%	7.6%
Wastewater network plus	*£m*	994	802	1,589
	% of efficient modelled base costs	5.4%	4.6%	8.9%

Note: To calculate the post-modelling adjustment, CEPA have used company specific cost shares to calculate the measure of efficient energy costs pre-uplift. Also note that this is not the final adjustment applied to AMP8 allowances due to the forecast change in energy prices applied over the period 2023-24 to 2029-30, as described in Section 2.6 of CEPA's report. Sources: CEPA's July 2024 report

Step 3: An RPE adjustment to allowances, based on CEPA's forecast of a fall in energy prices over the AMP8 period

To protect consumers from unnecessary increases in bills, given the expectation of declining energy prices, an RPE forecast reflecting the expected fall in energy costs is combined with step (2). The approach taken here is to forecast how energy prices are expected to fall over AMP8 and use that forecast to reduce the overall adjustment which is applied to energy costs. Ofwat uses a forecast for the period FY24 to FY30 using the average of electricity seasonal baseload forward contract prices (£/MWh) for the relevant summer (April to September) and winter (October to March) sourced from Bloomberg as of 29 March 2024. For FY23, Ofwat uses Ofgem day-ahead electricity baseload prices. This is a key decision and point of contention as it has a significant bearing on the subsequent RPE factor and therefore allowance adjustment. The relevant prices, and the resulting adjustment to allowances is shown below.

Table 2 Step 3: CEPA's forecasts of delivered electricity prices and the combined uplift/RPE factors

Forecast	Unit	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
Delivered electricity price	*£/MWh*	277.0	232.7	181.3	179.1	185.0	182.5	182.0	180.4
	Adjustment factor	**1.64**	**1.30**	**1.00**	**0.97**	**0.99**	**0.96**	**0.93**	**0.91**

Note: Sources: CEPA's July 2024 report

The use of the Ofgem day-ahead price for FY23 followed by the Bloomberg data for FY24 onwards leads to a significant and steep drop in energy prices in FY24 and FY25 which translates to a steep reduction in the RPE adjustment.

These combined uplift/RPE figures are then applied to modelled base costs producing the results below:

Table 3 Net ex-ante energy cost adjustment, using post-modelling adjustment for initial uplift, then applying an energy RPE (Wholesale water and wastewater networks plus)

Cost	Unit	FY26	FY27	FY28	FY29	FY30	AMP8 Total
Wholesale water	*£m*	-13.7	-6.0	-22.6	-33.9	-48.2	**-124.4**
Wastewater network plus	*£m*	-13.3	-5.8	-21.7	-32.5	-46.0	**-119.3**
Total	***£m***	**-27.0**	**-11.7**	**-44.3**	**-66.5**	**-94.2**	**-243.7**

Note: Sources: CEPA's July 2024 report, Baringa calculations

Overall, Ofwat's proposed treatment of energy costs has a negative impact on base allowances (at -£244 million across water and wastewater network plus activities, where companies are net energy users).

Our analysis set out in the next section shows that the proposed implementation results in water companies being exposed to an imperfect match for their energy costs and additional cashflow timing risk (which may increase external finance raising requirements). Without modification, Ofwat's proposed approach will lead to a detrimental treatment of energy costs in AMP8.

3 Issues with Ofwat's approach

3.1 Overview

As noted in Section 2, Ofwat's intent and high-level approach is consistent with its stated aims of reducing energy price risk by setting a sector wide energy cost adjustment and accompanying end-of-period true-up mechanism to account for this uncertainty.

However, the detail of the proposed implementation means that there is a risk that water companies will be underfunded for energy costs over AMP8. This may cause cashflow timing issues. It also undermines the overall goal of the PR24 totex process to set base expenditure allowances - the totex component that includes energy costs – at an efficient level so customers obtain value for money and, most pertinently, companies have sufficient funding to maintain asset health, provide a good level of service and deliver improvements to customers and the environment.

We have identified three specific issues with the proposed implementation of the treatment in energy costs. We deal with them in turn in this section:

1. **The use of different indices and price series has a negative impact on ex-ante base allowances that is unreasonable.**
2. **The use of the Ofgem electricity day-ahead monthly baseload contract price for the FY23 RPE adjustment results in forecast energy costs that decrease markedly and rapidly.**
3. **The RPE model is not robust: the impact on allowances of the energy cost adjustment is sensitive to the base year in which the adjustment is made.**

Note on our analysis

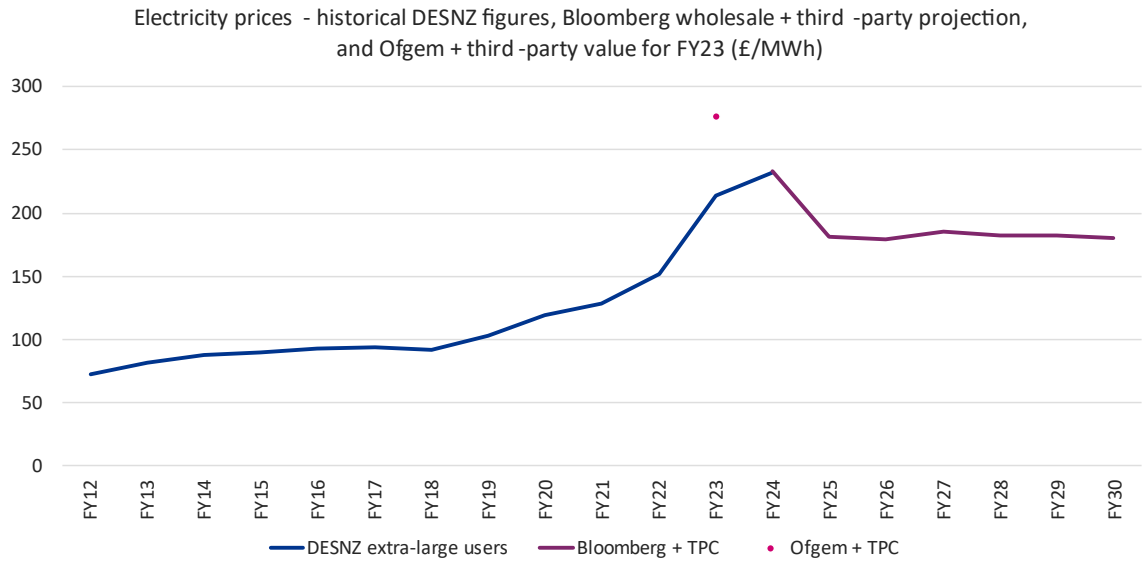
In conducting this analysis, we have used the RPE model published by Ofwat in July 2024 alongside the CEPA report and Ofwat's PR24 draft determinations, also published in July 2024. We have not quality assured or otherwise assessed the RPE model or accuracy of data sources.

3.2 The use of different indices and price series has a negative impact on ex-ante base allowances that is unreasonable

The broad principle that applies here, and to the following two specific issues, is summarised in the figure below. This shows the DESNZ electricity price series for extra-large non-domestic consumers (blue line). While Ofwat does not use it in its RPE model, this series tracks the index that Ofwat did use very closely (as shown in Figure 3) and is broadly reflective of the hedged energy costs that water companies incur. In FY23 this series produces a price of £214/MWh.

For comparison, the pink data point in Figure 4 below shows the Ofgem FY23 baseload energy price. In FY23, this price, including third-party costs, was £277/MWh. This is the price point used by Ofwat as the starting point for the series which drives the ongoing RPE adjustment. The purple line represents the trend in season ahead, wholesale energy prices, from futures contracts, sourced from Bloomberg prices (plus third-party costs) that Ofwat uses for its forecasts of energy prices up to, and during AMP8.

Figure 4 Electricity prices used to calculate Ofwat's proposed uplift and RPE adjustment to energy costs



The RPE over the AMP8 is highly sensitive to the starting value used. The use of different indices and price series – and in particular the use of the Ofgem FY23 price, risks an implausible evolution of prices for the RPE adjustment. The Ofgem FY23 price is £63 above the DESNZ extra-large users FY23 price. When this is used as the base year, it produces a steep decline in the RPE adjustment factor from 1.64 in FY23 to 1.30 in FY24. The data on DESNZ extra-large user prices for FY24 is available – and shown in the diagram – and this makes clear that both the Ofgem FY23 price and the fall in prices in FY24 it implies is implausible. Furthermore, usual water company hedging behaviour means that companies will not experience a dramatic and steep fall in energy costs implied by Ofwat's use of the Ofgem day ahead base load price series in FY23, as the energy costs water companies incurred in FY23 are actually well below the Ofgem level. This is the crux of the issue that we explore further in this section.

3.3 The use of the Ofgem electricity day-ahead monthly baseload contract price for the FY23 RPE adjustment results in forecast energy costs that decrease markedly and rapidly

The Ofwat RPE model uses the DESNZ industrial electricity price index to adjust modelled costs in step (2). In step (3), it uses the average of electricity seasonal baseload forward contract prices for FY24 – FY30 for the RPE adjustment (source Bloomberg + third party charges). Step (3) also uses, for FY23, Ofgem's Electricity Prices, Day Ahead Baseload Contracts to set the price level for the initial year of the RPE adjustment.

This Ofgem day-ahead price + third-party charges for FY23, is significantly above the prices in other relevant price series.

Table 4 FY23 delivered (ie including third-party charges) electricity price using the Ofgem price series and two DESNZ price series

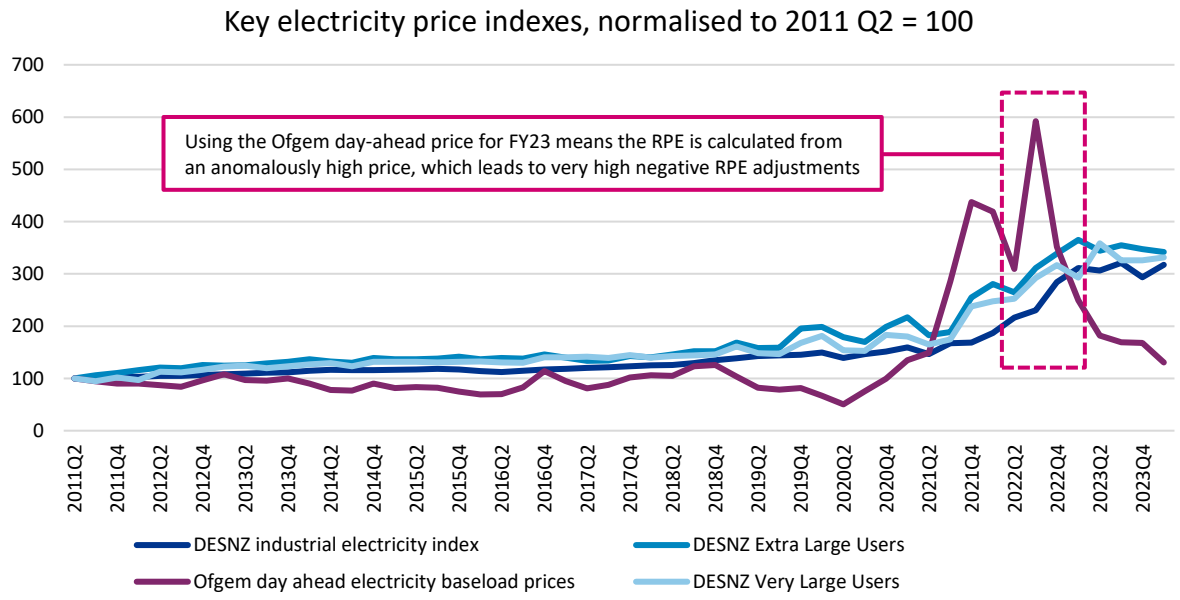
Series	FY23 average delivered price (£/MWh)
Ofgem day-ahead wholesale + third-party charges	276.97
DESNZ very large users	209.05
DESNZ extra-large users	214.28

Note: We have used data from the CEPA July 2024 report (table 5.7) for the Ofgem price, to which we have added 'electricity third-party charges' (same source). For the DESNZ prices we have used the figures from the Extra Large, and Very Large categories of DESNZ's Industrial Energy Indices, published June 2024

The proposal to use the Ofgem electricity day-ahead monthly baseload contract price for the FY23 RPE adjustment is inappropriate. While this is an objective forecast of forward energy prices it is not an appropriate index for considering the direction of wholesale energy costs that regulated water companies are expected to incur in FY23 (and during AMP8). One important reason is that the Ofgem data on day-ahead wholesale prices does not include any element of hedging so is therefore not reflective of the actual prices faced by water companies that undertake hedging activities.

As companies hedged in 2023 (and before) to manage risks, the energy prices they locked in would have been set in the months and years beforehand, in particular during the period when energy costs were lower. Consequently, using the day-ahead price – particularly in FY23, which the figure below shows is also a highly anomalous year - is not representative of the actual costs water companies incurred. The actual costs water companies incurred in FY23 is better reflected in the DESNZ price series which include hedging behaviour[8].

Figure 5 Comparison of key relevant electricity price indexes



[8] Water companies adopt different strategies including wholesale energy trading, hedging, using Purchase Power Agreements (PPAs) from a third party, self-generation, or a mix of all of these. All of these strategies are reasonable for an efficient company. Arguably, an inefficient company is less likely to adopt such strategies and would face additional risk from acquiring its energy on more volatile spot markets. This means that any index will be an imperfect match for individual water company energy costs. However, a price series that does not include hedging will be decidedly imperfect.

The Ofgem FY23 day-ahead electricity baseload price is thus inappropriate. As it is anomalously high in FY23, it means that using this data as the basis of RPE projections will result in future energy costs falling rapidly leading to large and inappropriate negative changes to the RPE adjustment that translates to the negative adjustments to base allowances.

In our view, efficient and prudent companies are likely to have used hedging arrangements to set some of their energy costs during the higher cost (and, indeed, all) period(s), and as they continue this strategy the energy costs they face are expected to fall less quickly than those assumed by Ofwat when applying the day-ahead prices. This choice of calculating the RPE index by Ofwat leads to negative adjustments and potential shortfall in cashflow during AMP8 which is a material issue for companies needing to finance their activities.

3.4 The RPE model is not robust: the impact on allowances of the energy cost adjustment is sensitive to the base year in which the adjustment is made

A robust RPE model, used for setting efficient totex allowances for water companies, should not be overly sensitive to changes in input variables such as (in this case) the use of a base year.

Ofwat's forecast of a fall in energy prices is derived from forward contract prices (source: Bloomberg) over the 2025-26 to 2029-30 period, using Ofgem 2022/23 as the base year. In the following section, we update the DESNZ industrial prices index for the latest data – bringing it up to FY24 - and move the start of the RPE adjustment to FY24. This has highly significant impacts on the RPE adjustment, as shown in the next section.

The high sensitivity of the approach to changes in inputs indicates that the outcome for companies has an element of arbitrariness: simply updating the base year to accommodate more recently available data causes swings in sector-wide energy allowances of hundreds of millions of pounds. This arbitrariness indicates the approach is not robust and we note that this lack of robustness is largely caused by the use of the highly volatile, unhedged, and unrepresentative Ofgem price data.

4 Identification and evaluation of alternatives

4.1 Overview

Given the issues with the Ofwat approach to calculating the adjustment presented in Section 3, we consider a set of alternatives which address some of these issues without sacrificing the core methodology of the original RPE model. The rationale and outcomes of each of these are considered in turn in this section. These alternatives are based on our analysis of the issues with Ofwat's proposals and potential ways to address those issues. They are also informed by discussions we held with regulatory teams at water companies and input from Baringa experts on price controls in the water and other GB regulated sectors.

4.2 Option 1: Replacing the Ofgem day-ahead price in FY23 as the basis of the RPE adjustment

The first alternative addresses the use of the Ofgem electricity day-ahead monthly baseload contract price as the basis for the RPE adjustment. Rather than using an anomalously high, day-ahead market-based price point for FY23 which results in a large downwards adjustment, we use the price paid by extra-large non-domestic consumers, based on DESNZ data. This index takes into account hedging activity and other market factors affecting the price paid by extra-large[9] energy consumers.

The outcome of this change is a less steep decline in forward energy prices. In fact, FY24 sees a slight increase in the uplift/RPE factor as opposed to the very steep decline seen in the Ofwat RPE model. This results in a higher uplift/RPE factor, and a positive overall RPE adjustment in allowances due to energy costs:

Table 5 Comparison of adjustment factor and amount between the Ofwat RPE model and Option 1

	Unit	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	Total
Ofwat RPE model	*Adjustment factor*	1.64	1.30	1.00	0.97	0.99	0.96	0.93	0.91	-
	Adjustment, £m				**-27.03**	**-11.71**	**-44.26**	**-66.47**	**-94.23**	**-243.71**
Option 1	*Adjustment factor*	1.64	1.69	1.29	1.26	1.28	1.24	1.21	1.17	-
	Adjustment, £m				**257.19**	**278.85**	**238.79**	**212.04**	**178.35**	**1,165.22**

This option directly addresses the inappropriate use of the unhedged Ofgem electricity day-ahead monthly baseload contract price for the RPE adjustment in FY23 by replacing it with a credible hedged price. (As noted in Section 3, CEPA preferred the DESNZ industrial index to the extra-large consumers price series, but this choice was marginal.) In this option the true-up at the end of the

[9] In the DESNZ survey extra-large users have consumption demand greater than 150,000 MWh per year

period would still be based upon the DESNZ industrial index, so the impact of this option is on the profile of allowed revenues during the 2025-30 period and not the overall cost to customers.[10]

4.3 Option 2A: Using the DESNZ extra-large users' data for the Ofgem day-ahead price in FY23 and for the uplift

The second alternative follows Option 1 in using the DESNZ extra-large users' data to provide the FY23 delivered energy price for calculating the RPE adjustment. It also uses this dataset to replace the DESNZ industrial users index when calculating the initial uplift factor. This ensures consistency in the data used in the RPE model.

As with Option 1, this leads to a higher uplift/RPE factor, and positive overall adjustments for energy costs in relation base totex models:

Table 6 Comparison of adjustment factor and amount between the Ofwat RPE model and Option 2A

	Unit	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	Total
Ofwat RPE model	*Adjustment factor*	1.64	1.30	1.00	0.97	0.99	0.96	0.93	0.91	-
	Adjustment, £m				**-27.03**	**-11.71**	**-44.26**	**-66.47**	**-94.23**	**-243.71**
Option 2A	*Adjustment factor*	1.68	1.72	1.32	1.28	1.30	1.26	1.23	1.20	-
	Adjustment, £m				**283.91**	**306.17**	**265.40**	**238.23**	**203.98**	**1,297.69**

This option is superior to option 1 as it both removes the Ofgem data and ensures that the data for the uplift and the base year of the RPE is based on a single consistent – and appropriate – index[11]. In this option the true-up at the end of the period might be based upon the DESNZ extra-large user price series (rather than the industrial index), so while the impact of this option is mainly on the profile of allowed revenues over 2025-30, it may also impact the overall cost to customers depending on the evolution of those indices.

4.4 Option 2B: As 2A, but using data up to FY24 to calculate uplift, and a FY24 RPE baseline (in-line with Ofwat updating base cost models at FD)

A slight variation on Option 2A, Option 2B uses the DESNZ extra-large users' price data as the index for calculating uplift, as well as the first price point for the RPE calculation (which uses FY24 as the baseline year).

[10] Costs to consumers will vary depending on which DESNZ index or price series is used for the end of period true-up.

[11] We considered another method to achieve consistency: using the Ofgem prices to create a retrospective index to also calculate the uplift as well – as Ofwat propose – as the first year of the RPE. We have not, however, pursued that as the use of the Ofgem price series is, as set out in this report, inappropriate. Using it for both the uplift and the RPE calculation extends the use of an inappropriate index.

This results in a positive overall adjustment, but the lowest of the alternative options we considered:

Table 7 Comparison of adjustment factor and amount between the Ofwat RPE model and Option 2B

	Unit	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	Total
Ofwat RPE model	*Adjustment factor*	1.64	1.30	1.00	0.97	0.99	0.96	0.93	0.91	-
	Adjustment, £m				**-27.03**	**-11.71**	**-44.26**	**-66.47**	**-94.23**	**-243.71**
Option 2B	*Adjustment factor*	-	1.63	1.25	1.22	1.24	1.20	1.17	1.14	**-**
	Adjustment, £m				**218.36**	**239.15**	**200.11**	**173.99**	**141.11**	**972.72**

As with 2A the true-up at the end of the period would also be based upon DESNZ extra-large user price series, so while the impact of this option is mainly on the profile of allowed revenues over 2025-30, it may also impact the overall cost to customers depending on the evolution of those indices.

This option risks introducing a slight inconsistency across the adjustment calculation as the energy costs each company is modelled to pay are currently calculated from FY12 to FY23 data. Assuming Ofwat updates the modelled expenditure on power costs to include FY24 data, this would be resolved. Ofwat will need to make broader decisions on the data to use to update all of its cost models, of which energy costs is one part.

4.5 Option 3: Updating the base year and removing the Ofgem day-ahead price

Option 3 demonstrates the sensitivity of the RPE model to the base year chosen for the uplift/RPE calculations. The key difference between Option 3 and the Ofwat RPE model is the use of FY24 as the baseline year instead of FY23. This difference means that Option 3 also avoids introducing the additional Ofgem wholesale price index, as Bloomberg data is used throughout the RPE period thereby offering consistency in the indices used across the calculations. As with option 2B, this introduces an inconsistency between the range of historical data used to calculate uplift (up to FY24) and water company power expenditure (up to FY23), which would be resolved if Ofwat updated the latter.

The resulting uplift/RPE factor and adjustment is higher than observed with Options 1 and 2:

Table 8 Comparison of adjustment factor and amount between the Ofwat RPE model and Option 3

	Unit	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	Total
Ofwat RPE model	*Adjustment factor*	1.64	1.30	1.00	0.97	0.99	0.96	0.93	0.91	-
	Adjustment, £m				**-27.03**	**-11.71**	**-44.26**	**-66.47**	**-94.23**	**-243.71**
Option 3	*Adjustment factor*	-	1.73	1.33	1.29	1.31	1.27	1.24	1.21	**-**
	Adjustment, £m				**293.22**	**315.69**	**274.67**	**247.35**	**212.91**	**1,343.84**

4.6 Option 4: Updating the base year and retaining the Ofgem day-ahead price

Option 4 further demonstrates the sensitivity of the RPE model to the baseline year selected. It follows the same methodology as the Ofwat RPE model, except it uses FY24 as the baseline year. The DESNZ industrial index is used to calculate the uplift factor, with an Ofgem day-ahead wholesale price value used for FY24 to inform the RPE calculation, followed by the Bloomberg data for the remainder of the forecast period.

The Ofgem day-ahead wholesale price point for FY24 is very low. This is because day-ahead wholesale prices have decreased far more quickly than hedged electricity prices. For this reason, we do not recommend this option as viable alternative to Ofwat's proposals as, by using the Ofgem index, it perpetuates a key issue with the proposed methodology by using the inappropriate Ofgem price series, which does not include any hedging impact as the base year for the RPE adjustment. We include the analysis here to demonstrate the volatility underlying Ofwat's choice of base year.

The uplift/RPE factor remains very high in this option to the end of the AMP8 period as wholesale prices have already fallen in this RPE model by FY24 based on the Ofgem price series so there is only a relatively minor change to the original uplift (which has captured the recent fall in wholesale prices). The resulting changes are significant increases in the uplift/RPE factor and the adjustment value.

Table 9 Comparison of adjustment factor and amount between the Ofwat RPE model and Option 4

	Unit	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	Total
Ofwat RPE model	*Adjustment factor*	1.64	1.30	1.00	0.97	0.99	0.96	0.93	0.91	-
	Adjustment, £m				**-27.03**	**-11.71**	**-44.26**	**-66.47**	**-94.23**	**-243.71**
Option 4	*Adjustment factor*	-	1.73	1.70	1.65	1.68	1.63	1.59	1.54	-
	Adjustment, £m				**653.45**	**683.97**	**633.42**	**600.36**	**558.39**	**3,129.59**

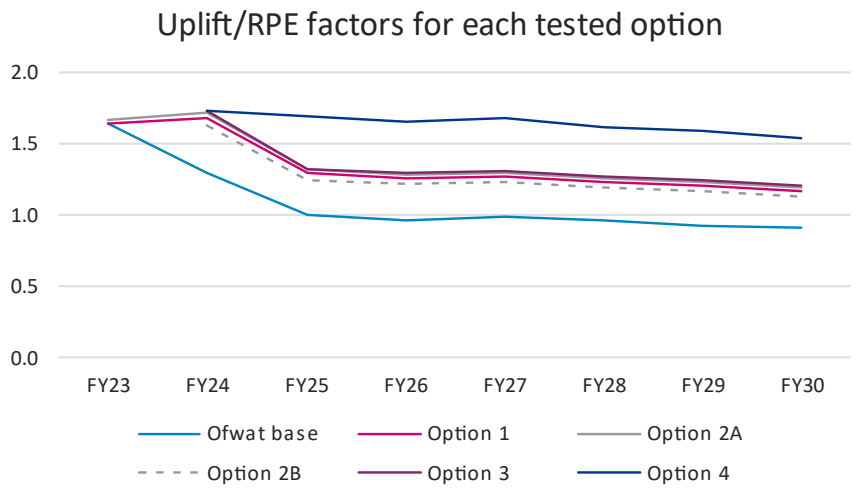
4.7 Summary

This section has set out alternative approaches to calculating the PR24 energy cost adjustment, building on the methodology and RPE model proposed by Ofwat. Below, Table 10 summarises the features of each option, and Figure 6 sets out the uplift/RPE adjustment factors for the five models we have considered and the current Ofwat model. It shows that the Ofwat model anticipates a rapid decline in energy costs to levels below that in the base costs prior to energy cost adjustments, and below the level of costs that companies expect to incur. Our options 1-3 anticipate costs more gradually declining over the modelled period. Option 4 sees very little change to the initial uplift for reasons set out above.

Table 10 Comparison of each of the options considered

	Uplift index	Uplift/RPE baseline year	RPE baseline cost data source	RPE forecast energy cost source	Total adjustment (£m)
Ofwat model	DESNZ industrial electricity index	FY23	Ofgem day-ahead wholesale electricity prices	Bloomberg seasonal wholesale forecast	**-243.71**
Option 1	DESNZ industrial electricity index	FY23	DESNZ extra-large non-domestic consumers electricity prices	Bloomberg seasonal wholesale forecast	**1,165.22**
Option 2A	DESNZ extra-large non-domestic consumers electricity prices	FY23	DESNZ extra-large non-domestic consumers electricity prices	Bloomberg seasonal wholesale forecast	**1,297.69**
Option 2B	DESNZ extra-large non-domestic consumers electricity prices	FY24	DESNZ extra-large non-domestic consumers electricity prices	Bloomberg seasonal wholesale forecast	**972.72**
Option 3	DESNZ industrial electricity index	FY24	Bloomberg seasonal wholesale forecast	Bloomberg seasonal wholesale forecast	**1,343.84**
Option 4	DESNZ industrial electricity index	FY24	Ofgem day-ahead wholesale electricity prices	Bloomberg seasonal wholesale forecast	**3,129.59**

Figure 6 Comparison of uplift/RPE factors for Ofwat's proposals and the Baringa options



In the next section we set out an assessment of the options we have developed.

5 Assessment of the options and recommendation

In Section 4 we considered five alternative options to Ofwat's proposed methodology. Each alternative seeks to address some or all of the issues that we have identified with Ofwat's proposed treatment of energy costs. A table summarising how each option addresses the issues we have identified is presented below:

Table 11 Summary of issues addressed by each of the alternative options

	Use of consistent indices and price series	Use of price with hedging for initial RPE adjustment	Use of latest data
Ofwat proposed model	✘	✘	✘
Option 1: Replace Ofgem FY23 price data with FY23 DESNZ extra-large users' price	✘	✓	✘
Option 2A: As with 1, and replace DESNZ industrial electricity index with extra-large users' prices for uplift calculation	✓	✓	✘
Option 2B: As with 2A, but utilises FY24 data for uplift and a FY24 RPE baseline	✓	✓	✓*
Option 3: Ofwat scenario with FY24 data included in uplift, and FY24 RPE baseline using Bloomberg data	✓	✘	✓*
Option 4: Base scenario with FY24 data included in uplift, and FY24 RPE baseline using Ofgem data	✘	✘	✓*

*On the assumption Ofwat updates the modelled water company power expenditure to include FY24 data.

Option 1 removes the inappropriate Ofgem FY23 price (which does not contain any impact from hedging activity). It replaces it with the DESNZ extra-large users' price. While this is a price which incorporates the impact of hedging activity and therefore is preferable to the current Ofwat energy cost RPE model, it perpetuates the use of inconsistent indices and price series. **Option 4** is the closest methodology to the current Ofwat model. It improves on that approach by using the most recently available data, but it maintains the inappropriate use of the Ofgem price (albeit in FY24 rather than FY23) so in our view this option should not be considered as appropriate.

Option 3 addresses the issues in the current Ofwat model and makes use of the most recently available data. However, it maintains the use of a wholesale energy price, which does not include any hedging at the start of the RPE adjustment period. **Option 2A**, therefore, is preferable to Option 3. By using the DESNZ extra-large users' prices for the uplift and the first year of the RPE adjustment it removes the issue of inconsistency. However, **Option 2B** is preferable over both as it has the same consistency advantages as **2A** but uses the latest available data. Provided Option 2B can be implemented consistently with other models in the regulatory modelling suite then it becomes our preferred option.

To improve the accuracy of the proposed adjustments, there are two possibilities Ofwat should consider: firstly, the use of other energy price forecasts (eg from other independent consultancies) in place of the season-ahead wholesale price data based upon futures contracts. Secondly, Ofwat could also investigate using an econometric approach to construct a forecast of the DESNZ index used in the uplift calculation. This ensures consistency in the indices used to calculate both the uplift and RPE and could better capture the impact of company hedging activity on future energy costs.

Recommendation

While all the options we have considered represent an improvement on Ofwat's current energy cost RPE methodology, we are of the view that **Option 2B**, which uses DESNZ extra-large users electricity price data for the uplift and the RPE baseline and extends the period of the uplift into FY24 (as data is now available), is the most appropriate option to take forward. It assumes Ofwat will incorporate FY24 data into their base power expenditure model, fully aligning with the options which use a FY24 uplift/RPE baseline. There may be some scope for considering some of the choices embedded in this option – mainly around whether the very- or extra-large price series is most appropriate - but otherwise this option has the benefits of simplicity and consistency in addition to addressing the main issues that we have identified.

We recommend the relevant data inputs to the RPE model are updated prior to final determinations to ensure the most up-to-date observations are used.

6 Conclusion

6.1 Energy costs in AMP8

Ofwat's proposed approach to dealing with high and uncertain energy costs in AMP8 is, broadly, sound. It is well-established that the energy crisis has seen prices rise far faster than inflation (as measured by CPIH). This has, and will continue to, impact companies during the remainder of AMP7, and into AMP8. However, the aim of PR24 is not to address past problems, but (amongst other things) to set efficient expenditure allowances for water companies, including an allowance for energy costs.

The rapid increase – well above inflation – of energy costs in recent years, means that setting allowances for AMP8 purely based on modelled historical costs will likely lead to water companies being underfunded for the AMP8 period. The fact that the adjustment proposed by Ofwat would lead to allowances being reduced compared to modelled allowances without energy cost adjustment is counter-intuitive and inconsistent with expectations of energy market specialists, leading to reduced allowances despite anticipated higher energy costs during AMP8. While an ex-post true-up mechanism can rectify this, it will still leave water companies with cashflow timing challenges to manage. Ofwat knowingly setting allowances that are likely to be 'predictably' incorrect is inconsistent with funding efficient costs through ex-ante allowances. One solution to the cashflow timing issue is that the true-up could be made 'in-period' (e.g. annually) so that cashflow mismatches don't build over a 5 year period.

6.2 Ofwat's proposals

In principle, Ofwat's proposals to adjust energy costs are appropriate. However, as set out in this report, the implementation of that adjustment is highly problematic. We set out in this report the three key issues with Ofwat's proposed approach:

1. **The use of different indices and price series has a negative impact on ex-ante base allowances that is unreasonable.**
2. **The use of the Ofgem electricity day-ahead monthly baseload contract price for the FY23 RPE adjustment results in forecast energy costs that decrease markedly and rapidly.**
3. **The RPE model is not robust: the impact on allowances of the energy cost adjustment is highly sensitive to the base year in which the adjustment is made.**

The impact of Ofwat's proposed inconsistent approach is that the overall energy cost adjustment to base allowances is negative. Our analysis, and assessment of alternatives, shows that this is highly inappropriate as the outcome of Ofwat's model is driven by the flaws in the Energy cost RPE methodology. By correcting these flaws, materially different outcomes are produced.

6.3 Our recommendation

We have considered various options for addressing the issues with Ofwat's proposed treatment of energy costs while preserving the core methodology of the original RPE model. Our options focussed on removing the inappropriate use of Ofgem wholesale price data and on seeking consistency as far as possible between the use of indices and price series as discontinuities can – as is the case with using the Ofgem wholesale price data – lead to unreasonable outcomes.

While all the options we set out in the report would be an improvement on the Ofwat proposal, our recommendation is for an option ('2B') that uses a single, price series, which incorporates hedging activity to uplift modelled prices and set the base year for the RPE calculation. This has the advantage of being as consistent as possible (future costs will still be based on Bloomberg future wholesale energy costs data, as derived from futures contracts) and using an index that, while imperfect, is a good proxy for the energy costs that water companies experience. Using this option will allow Ofwat to set efficient allowances that better reflect future energy costs.

We note that whatever approach is taken, the relevant data inputs to the RPE model are updated prior to final determinations to ensure the most up-to-date observations are used.

6.4 Next steps

We understand that Water UK may use this report or refer to it in its representations on Ofwat's PR24 draft determinations.

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