# High-level forecast of Portsmouth Water PR24 allowances

A paper prepared for Portsmouth Water

05 September 2023

Frontier Economics was engaged by Portsmouth Water (PRT) to develop independent high-level forecasts of PRT's PR24 wholesale water and retail base cost allowances (excluding enhancement costs, cost adjustment claims, and Havant Thicket).

At PR19, 80% of the wholesale base cost allowance[1] and all of the retail cost allowance consisted of modelled costs, which were determined by Ofwat using a range of econometric benchmarking models. At PR24, Ofwat will follow a similar approach and in April 2023, Ofwat published a consultation on the draft base cost models that it is considering for PR24.[2]

PRT asked us to develop our forecasts based on the draft base cost models and by making high-level assumptions around the other components of Ofwat's methodology (e.g. unmodelled base costs, frontier shift). PRT provided to us forecasts of the cost drivers of the base cost models, which we used to predict efficient costs from the draft base cost models.

## Summary of our findings

We developed a range of allowances to account for the uncertainty around which base cost models Ofwat will use at PR24 and some of the details around its methodology. The table below shows our high-level forecasts of PRT's PR24 allowances.

### Table 1 Our high-level forecast of PRT's PR24 allowances

| Control | PR24 allowance (FY2023 prices) |
|---|---|
| Wholesale water base cost allowance | £182m-£212m |
| Retail base cost allowance | £30m-£32m |

*Source:* *Frontier Economics*

*Note:* *Allowances above exclude cost adjustment claims and enhancement costs. Allowances depend on forecasts of cost drivers which PRT provided to us and which we have not reviewed.*

[1] At PR19, wholesale modelled base cost is £145m (2018 prices) compared to a total base cost allowance for PAYG (net of Havant Thicket) of £182m.

[2] https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/econometric-base-cost-models-for-pr24/

# Structure of the remainder of this note

In the remainder of this note we explain the approach and assumptions that we have followed to derive the high-level forecasts of PRT's PR24 wholesale and retail allowances.

# Wholesale

## Overview of our approach

The three key components of the wholesale base cost allowance are modelled costs, unmodelled costs, and enhancement costs. At PR19, modelled costs accounted for 80% of PRT base cost allowance (excluding Havant Thicket); unmodelled costs and enhancement costs accounted for about 10% each.[3]

We forecast modelled and unmodelled costs as indicated below. As part of our high-level forecasts we were asked not to consider cost adjustment claims[4] and enhancement costs.

- Modelled base costs. These are estimated based on results from a range of econometric benchmarking base cost models of wholesale costs, and assumptions around frontier shift and real price effects. We use the base cost models in Ofwat's April consultation.
- Unmodelled base costs. These include abstraction charges, traffic management act and local authority and cumulo rates. These are assessed separately by Ofwat using ad-hoc approaches. Ofwat's calculations can be found in its 'unmodeled base costs feeder models'.[5]

As mentioned above, modelled base costs are the largest component of the base cost allowance we were asked to forecast. Our approach to the five main areas of uncertainty[6] in estimating the allowance are as follows.

- *Choice of models.* We address the uncertainties around the choice of models by considering a number of potential high-level assumptions. We use these assumptions to define a high case and low case scenario.
- *Choice of weighting of models.* We do not have reasons to believe that Ofwat will use a different weighting of models at PR24. Therefore, we have used the PR19 weighting in line with the PR19 approach.

[3] The overall totex allowance for PAYG was £182ml modelled costs were £145m, unmodelled costs £18m, and enhancement costs £19m. All allowances are in FY2018 constant prices.

[4] While we do not consider cost adjustment claims explicitly, we consider models with average pumping head as a proxy of network topography. Some companies have raised some cost adjustment claims which rely on average pumping head.

[5] https://www.ofwat.gov.uk/final-determinations-models/

[6] There is also uncertainty around the cost driver forecasts, but we take these as given.

- *Estimation of catch-up efficiency.* There is no indication that Ofwat will use a different choice of catch-up efficiency at PR24. Therefore, we have set catch-up assumptions in line with the PR19 approach.
- *Estimation of frontier shift and Real Price Effects (RPEs).* We address the uncertainties around the choice of frontier shift and RPE by considering a number of potential high-level assumptions. We use these assumptions to define a high case and low case scenario.
- *Whether Ofwat will cap the allowance at 10% as done at PR19.* We do not apply a cap as we do not know what Ofwat will do if PRT's proposed botex will exceed Ofwat's estimated efficient costs.

The most material of these assumptions is around the choice of models.

Unmodelled base costs are a considerably smaller component of the base cost allowance we were asked to forecast. We have used Ofwat's PR19 feeder models and updated the PR19 forecasts with actual data available from the APR. We have then made some high-level assumptions to adjust these forecasts if actual data differed materially from the PR19 forecast, although these assumptions are largely immaterial.

The table below summarises the key assumptions we have used to define our range. In the sections below the table, we provide a high-level overview of Ofwat's PR19 approach and we describe in more detail the approach that we have adopted and our assumptions.

## Table 2 Our key assumptions for setting the wholesale water allowance

| Component | Value of parameters | | Assumptions | |
|---|---|---|---|---|
| | Low case | High case | Low case | High case |
| **Modelled (£2018 prices)** | **£136m** | **£162m** | | |
| *Base costs* | *£146m* | *£168m* | *50% LAD booster, 50% LAD APH* | *100% LAD boosters* |
| *Catch-up efficiency* | *94%* | *97%* | *Top 4 scores as at PR19* | |
| *Frontier shift and RPE* | *-£10m* | *-£7m* | *frontier shift 1% as per CMA, labour RPE* | *frontier shift 1% as per CMA, no labour RPE* |
| *Capping* | *0.00* | *0.00* | *No capping assumed* | |

| Component | Value of parameters | | Assumptions | |
|---|---|---|---|---|
| | Low case | High case | Low case | High case |
| **Unmodelled (£2018 prices)** | **£17.6m** | **£18.2m** | | |
| *Abstraction charges* | *£6m* | *£6m* | *As PR19* | |
| *Traffic management act* | *£1.2m* | *£1.8m* | *30% lower than PR19* | *As PR19* |
| *Local authority and cumulo rates* | *£10m* | *£10m* | *As PR19* | |
| **Overall totex allowance (£2018 prices)** | **£154m** | **£180m** | | |
| **Overall totex allowance (£2023 prices)** | **£182m** | **£212m** | | |

*Source: Frontier Economics*

*Notes: sum of parts may not be equal to total due to rounding.*

*The overall totex allowance is net of any cost adjustment claim, enhancement costs, and Havant Thicket costs.*

*We inflated the overall totex allowance from £2018 prices top £2023 prices by approximately 18%. 18% is the cumulative CPIH inflation between FY2018 and FY2023, derived from monthly CPIH data from the ONS Consumer price inflation tables released on 16 August 2023 https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/consumerpriceinflation.*

## Overview of Ofwat's PR19 approach

At PR19, Ofwat set the wholesale water allowance as the sum of modelled, unmodelled, and enhancement costs. We are not considering enhancement costs therefore we only summarise the approach adopted for modelled and unmodelled costs.

For modelled costs, Ofwat followed these steps:

- **Estimation of efficiency scores.** Ofwat estimated historical efficiency scores for all companies as the ratio of actual costs and predicted costs. Predicted costs are derived by triangulating predictions from a range of top-down models and bottom-up models (water resources and treated water distribution). Ofwat assigned equal weights to the predictions from models within each cost category (total costs, water resources, and

treated water distribution). It then weighted top-down and bottom-up models by assigning equal weights to the predictions from the top-down models and the sum of the predictions from the water resources and treated water distribution models. The scores are calculated as an average score over the 5-year period from 2015 to 2019.

- **Estimation of catch-up efficiency.** Ofwat estimated the catch-up efficiency as the 4th smallest efficiency score.
- **Estimation of frontier shift and RPE.** Ofwat estimated a frontier shift of 1.1% and allowed a labour RPE adjustment (with an ex-post true up).
- **Calculation of modelled base costs.** Ofwat calculated modelled base costs by adding to the efficient base costs any Cost Adjustment Claims (none for PRT at PR19) and subtracting the proportion of base that is enhancement opex (to avoid double counting). Efficient base costs are derived by multiplying the triangulated predicted costs by the catch-up efficiency and then adjusting for frontier shift, RPEs, and the 'capping' of allowances. At PR19, Ofwat capped PRT's efficient costs so that they do not exceed 10% of PRT's costs as per their submission (and also for a small negative adjustment for growth of £400k).

For unmodelled costs, Ofwat summed together its assessment of efficient abstraction charges, traffic management act, and local authority and cumulo rates.

## Details of our approach

To forecast the PR24 allowance, we adopted an approach similar to Ofwat's approach at PR19 but use the updated draft base cost models as per Ofwat's base cost model consultation.

For modelled costs, we made these assumptions:

- **Estimation of efficiency scores.** Ofwat is consulting on a range of base cost models. The main area of uncertainty (and the most material for PRT) is around the choice of proxies of network topography. Ofwat is consulting on both models with the variable used at PR19 – booster pumping stations per length of mains – and models with treated water distribution average pumping head (APH). We accounted for this uncertainty by giving different weights to these models. These weights are used to weigh predictions from different models within each cost category (total costs, water resources costs, and treatment water costs). In our low case scenario we assign equal weight to models with booster pumping stations per length of mains and models with APH. In our high-case scenario we do not assign any weight to the APH models in line with the PR19 approach.

  Ofwat is also consulting on proxies of population density. Ofwat is considering three proxies: a) weighted average density LAD from MSOA – this is most similar to the PR19 LAD variable; b) weighted average density MSOA; c) properties per length of main. The choice of the population density variable has a smaller impact for PRT compared to the choice of the proxy of network topography. Therefore, for setting a high-level forecast

allowance we decided to retain only the models with the variable that is most similar to the PR19 proxy of density, i.e. variable a).

We assigned equal weight to top-down and bottom-up models, as done by Ofwat at PR19.

- **Estimation of catch-up efficiency.** We adopted the same approach followed by Ofwat at PR19 and set the catch-up efficiency as the 4th lowest efficiency score. We estimated average efficiency scores over the most recent 5 year in the estimation sample, i.e. 2018-2022.
- **Estimation of frontier shift and RPEs.** We set the frontier shift at 1% p.a., in line with the CMA's decision at the PR19 appeals. There is uncertainty around the RPEs. In our high case scenario we set RPEs to zero. In our low case scenario we allowed a labour RPE consistently with PR19. We calculate the labour RPE using Ofwat's PR19 approach updated with the latest forecast of real average hourly earnings from the OBR. This results in a negative adjustment over PR24.
- **Calculation of modelled base costs.** We adopted Ofwat's PR19 approach. As mentioned earlier, for the purposes of our high-level forecast we did not consider any potential cost adjustment claims. We also did not consider any enhancement costs and therefore we did not remove any potential implicit allowance for enhancement opex (at PR19 this had a relatively small impact as the implicit allowance was about 1%).

As mentioned above, at PR19 unmodelled costs represented a relatively small component of the base cost allowance for PRT. Therefore, to forecast these costs we adopted a simpler approach than our approach for modelled costs.

For each of the three components of unmodeled costs, we compared outturn data for PRT with the allowances set by Ofwat at PR19. Outturn data for abstraction charges and local authority and cumulo rates is similar to the respective allowances; outturn data for traffic management act is about 30% lower than the allowance. Hence, we decided to set the forecast of the first two components equal to the PR19 allowance. For the last component, in our low case scenario we set the forecast equal to 30% less than the PR19 allowance; in our high case scenario we set the forecast in line with the PR19 allowance. We note that the PR19 traffic management allowance was relatively small compared to the total wholesale base costs (about 1%), so this high-level assumption has a small impact on our range of allowances.

# Retail allowances

## Overview of our approach

The retail base cost allowance consists only of modelled costs. To set the retail allowance we adopted a similar approach to Ofwat's PR19 approach, which is based on the results of a set

of econometric benchmarking models of retail costs. There are three key areas of uncertainties:[7]

- *Choice of models.* We address some of these uncertainties around choice of models by considering a number of assumptions that define a low case and high case scenario.
- *Choice of weighting of models.* We do not have reasons to believe that Ofwat will use a different weighting of models at PR24 so we have used the PR19 weighting.
- *Estimation of catch-up efficiency.* We address some of these uncertainties around catch-up efficiency by considering a number of assumptions that define a low case and high case scenario.

The assumptions that we have taken to define our ranges are summarised in the table below. The most material assumption is around the estimation of the forward-looking catch-up efficiency.

The table below summarises the key assumptions we have used to define our range. In the sections below the table, we provide a high-level overview of Ofwat's PR19 approach and we describe in more detail the approach that we have adopted and our assumptions.

## Table 3 Our key assumptions for setting the retail allowance

| Component | Value of parameters | | Assumptions | |
|---|---|---|---|---|
| | Low case | High case | Low case | High case |
| Modelled base costs (£2018 prices) | £29.5m | £29.6m | Same proxies of probability of default as used at PR19, same weighting of bottom-up and top-down models | Include additional proxy of probability of default, same weighting of bottom-up and top-down models |
| Catch-up historical | 90.7% | 91.0% | Upper quartile of average efficiency over 2018-2022 | |
| Catch-up forward-looking | 80.2% | 91.0% | 12% (=1-80.2%/91.0%) lower than historical efficiency | Same as historical efficiency |
| **Retail allowance** | **£25m** | **£27m** | | |

[7] There is also uncertainty around the cost driver forecasts, but we take these as given.

| Component | Value of parameters | | Assumptions | |
|---|---|---|---|---|
| | Low case | High case | Low case | High case |
| **(£2018 prices)** | | | | |
| **Retail allowance (£2023 prices)** | **£30m** | **£32m** | | |

*Source: Frontier Economics*

*Notes: sum of parts may not be equal to total due to rounding.*

*We inflated the overall totex allowance from £2018 prices top £2023 prices by approximately 18%. 18% is the cumulative CPIH inflation between FY2018 and FY2023, derived from monthly CPIH data from the ONS Consumer price inflation tables released on 16 August 2023 https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/consumerpriceinflation.*

## Overview of Ofwat's PR19 approach

At PR19, Ofwat set the retail allowance by following these steps:

- **Estimation of efficiency scores.** Ofwat calculated both historical and forward-looking efficiency scores. Ofwat estimated historical scores as the ratio of actual costs and predicted costs. Similarly, Ofwat estimated forward-looking scores as the ratio of forecast costs and predicted costs. Predicted costs are derived by triangulating the predicted costs[8] from a range of top-down models and bottom-up models (bad debt and other costs). Ofwat assigned equal weights to the models within each cost category (total, bad debt, and other costs). It then weighted top-down and bottom-up models by assigning 75% weight to the predictions from the top-down models and 25% weight to the sum of the predictions from the bad debt and other cost models. Historical efficiency scores are average scores over the 5-year period FY2015-FY2019. Forward-looking efficiency scores are average scores over the 5 years of PR19.
- **Estimation of catch-up efficiency.** Ofwat set the catch-up efficiency as the arithmetic average of the historical catch-up and forward-looking catch-up. Both historical and forward-looking catch-up efficiency are set as the lower quartile of the scores (the lowest score being the most efficient the company).
- **Calculation of modelled base costs.** Ofwat calculated the retail allowance by applying the catch-up efficiency derived at the previous step to the triangulated predicted costs.

No adjustment for frontier shift or real price effect was applied.

[8] For retail, Ofwat estimated unit cost models on a per household basis. For a given model, predicted costs are calculated by multiplying the predicted unit costs by number of households connected.

## Details of our approach

To forecast the PR24 allowance, we adopted an approach similar to Ofwat's PR19 approach. We use the updated draft base cost models as per Ofwat's base cost model consultation.

- **Estimation of efficiency scores.** Ofwat is consulting on a new proxy for the propensity to default on bills payment – average number of county court judgments/partial insight accounts per household from Equifax. There is uncertainty on the variables that Ofwat will use as well as the weights it will assign to the different models.

  We accounted for this uncertainty by giving different weights to these models. These weights are used to weigh predictions within each cost category (total costs, bad debt costs, and other costs). In our low case scenario we assign equal weight to the models with the three proxies. In our high-case scenario we do not assign any weight to the model with the new proxy.

  When averaging top-down and bottom-up models we use the same weighting used by Ofwat at PR19, i.e. 75% top-down and 25% bottom-up.

  Our assumption on the weights has a small impact on the modelled base costs as can be seen from the table above.
- **Estimation of catch-up efficiency.** We applied the same approach for the historical period and derived the average historical efficiency scores over the last 5 year of data available in the sample, i.e. 2018-2022. We could not calculate the forward-looking efficiency scores as this would require the PR24 forecasts of cost drivers for all other companies. Instead, we accounted for the uncertainty around this through our choice of scenarios:
  - In our low case scenario we set the forward-looking efficiency catch-up at 12% less than the historical efficiency catch-up. 12% is the difference between the PR19's forward-looking and historical efficiency catch-up.
  - In our high case scenario we set the forward-looking efficiency catch-up equal to the historical efficiency catch-up.
- **Calculation of modelled base costs.** We adopted the same approach adopted by Ofwat at PR19 and do not apply any adjustment for frontier shift and real price effects.