

South Staffs Water's PR24 topography and power costs representation 22 August 2024

Overview

Oxera was commissioned to provide independent assurance of the robustness of South Staffs Water's (SSC) PR24 topography and power costs representation, as submitted to Ofwat on 28 August 2024. Specifically, we have reviewed SSC's representation on Ofwat's proposed post-modelling adjustments for energy and evidence on whether SSC has unique operating circumstances related to network topography and power costs.

This assurance is provided in line with the cost efficiency assurance requirement (Appendix 9 to Ofwat's final methodology)¹ and the broader cost adjustment claim (CAC) guidance regarding the uniqueness of the companies' operating circumstances and the calculation of implicit allowances provided therein.²

The scope of this assurance covers:

- 1 the uniqueness of SSC's topographical characteristics and the associated mechanistic efficient cost adjustment to allowances incorporating the 2023/24 data—which includes the implicit allowance calculations;

¹ Ofwat (2022), 'PR24 Final methodology, Appendix 9: Setting expenditure allowances', December 2022, section A1.2.2, p. 158.

² Ofwat (2022), 'PR24 Final methodology, Appendix 9: Setting expenditure allowances', December 2022, section A1, pp. 154–162.

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- 2 an independent assessment of Ofwat's proposed modelling adjustments for energy and the associated mechanistic calculation of the implicit allowance for power costs.

We have reviewed the robustness of the efficient cost estimates by assessing their consistency, accuracy in calculation, and alignment with Ofwat's CAC guidance. We have also checked that all costs reported in real terms are in 2022/23 prices, consistent with Ofwat's 'official' price base for PR24.

In conducting this exercise, we did not review the efficiency of SSC's forward-looking power costs from a bottom-up perspective but have drawn conclusions based on updated CAC values and Ofwat's ex ante adjustments for energy. We also have not traced other company data back to its original source (for example, confirming the accuracy of data reported in other company annual performance reports, or APRs). Company data received is generally taken as given and accurate, unless stated otherwise.

The review team included consultants with expertise in efficiency assessments. As economics consultants, and not engineers, our review focused on economic assurance of cost efficiency.

Details of the specific calculations and/or review per area are included in the sections below.

1 Topography

We reviewed SSC's evidence on its unique characteristics with regard to topography.

Ofwat considers that SSC did not originally provide compelling evidence of its topographical uniqueness—while accepting that it is top of the sector in average pumping head (APH), it noted that it is not unusual with regards to the number of booster pumping stations (BPS) per length of mains.³

We have reviewed SSC's response to Ofwat's feedback and consider that it is in line with Ofwat's guidance and Ofwat's stated position on the merits of APH and BPS per length of mains.⁴ On the latter, as

³ Ofwat, (2024), 'PR24-DD-SSC_Cost-adjustment-claims.xlsx', July.

⁴ Ofwat (2022), 'PR24 Final methodology, Appendix 9: Setting expenditure allowances', December, section A1, pages 160–161.

acknowledged by Ofwat, APH has a stronger engineering rationale than the number of BPS per length of mains:⁵

1. [BPS] has weaker engineering rationale than APH as it only counts the number of boosters.

2. APH has a better engineering rationale as it is a more direct measure of pumping requirements as it captures the volume of water pumped and the pressure at which it is pumped.

3. booster pumping stations per length of mains is used as an imperfect proxy for pumping requirements.

Given the strong operational rationale for APH as a proxy for topography, and as SSC has the largest APH in the industry, there is clear evidence that SSC is unique.

SSC also explains that the non-uniqueness in the number of BPS per length of mains is due to its response to its unique topography, which has led to the use of a smaller number of larger assets rather than a large number of smaller ones.

On this point, we note that SSC has the second highest average capacity of BPS. When normalising the total capacity by km of mains, SSC has also the second highest value in the industry, which is only 1% below Thames Water over the benchmark period.⁶ These two points are mentioned again below when listing the different evidence demonstrating SSC's unique position across a combination of measures.

SSC further corroborates this uniqueness with evidence that its power costs constitute the highest proportion of water base costs in the industry. This holds whether the focus is on total power costs or on power costs related to treated water distribution (TWD). In addition, SSC has the highest total energy consumption by km of mains or connected properties, with a significant gap of 25–28% with the second company. While a company may incur more power expenditure or consume more energy as a result of inefficiency, this is very unlikely to be the case in the current context, as SSC also demonstrates its cost efficiency by referring to Ofwat's own assessment of its base costs which shows SSC

⁵ Ofwat (2024), 'PR24 draft determinations: Expenditure allowances – Base cost modelling decision appendix', July, pp. 21–22.

⁶ However, Thames has the third lowest APH value in the industry, so unlike SSC, the company is not an outlier across the two measures.

to be one of the most efficient companies in terms of base costs (see also section 1.2 below).

With respect to SSC's unique operating circumstances, and in addition to some of the points mentioned above, we therefore confirm that SSC has the:

- highest value for APH TWD;
- second highest value for total APH;
- highest proportion of TWD power costs with respect to TWD BOTEX plus;
- highest proportion of total power costs with respect to wholesale water BOTEX plus;
- second highest average capacity of BPS;
- second highest average of the total capacity of BPS divided by km of mains;
- highest proportion of total energy consumption per km of mains;
- highest proportion of energy consumption for water network plus per km of mains.

Although these measures are not exhaustive, they appear to be the most relevant for assessing whether SSC has unique characteristics related to topography.

1.1 Adjustments to cost allowances

Ofwat states that:⁷

We do not consider it appropriate to remove models containing booster pumping stations per network length from the modelling suite.

In response, SSC suggests that Ofwat makes a company specific adjustment to its cost allowances. This negates Ofwat's point.

Ofwat also states that:⁸

We still have some concerns with data quality, with estimated data still being used in some cases.

However, data quality should not stop Ofwat from appropriately adjusting SSC's costs. No data is 100% accurately measured. Indeed, in response to data issues elsewhere, SSC notes that Ofwat has used

⁷ Ofwat, (2024), 'PR24-DD-SSC_Cost-adjustment-claims.xlsx', July.

⁸ Ofwat, (2024), 'PR24-DD-SSC_Cost-adjustment-claims.xlsx', July.

approximations (e.g. density measures and deprivation metrics). We also note that the sector has worked to improve data quality on APH and SSC's APH has been very stable over time, with a fluctuation limited to 6% between the highest value of 131.65 in 2023/24 and the lowest value of 124.09 in 2012/13. Moreover, the use of BPS capacity (instead of the number of BPS) per length of mains also demonstrates that SSC's cost allowance insufficiently accounts for its unique topography.

Ofwat also states that:⁹

SSC has not provided compelling evidence that its wholesale water modelling base cost allowance in the round would be insufficient to accommodate the factor with the claim.

In response to this, SSC has now calculated its funding gap based on Ofwat's draft determination base cost allowance for wholesale water (post frontier shift and real price effects), which is estimated to be £24m once removing the uplift for net zero and meter replacement PCDs that were not part of SSC's business plan.¹⁰

Linked to the topography issue, SSC investigated whether its funding gap was driven by an insufficient allowance for power costs and found that it was the case, as evidenced by the comparison between the implicit allowance for power costs and SSC's bottom-up forecasts for AMP8. We have audited SSC's calculations and agree with the calculations of a £77m implicit allowance for power costs, corresponding to £82m from econometric models minus the £5m negative ex ante adjustment for power costs.

Based on forecast power costs of £99m over AMP8, this leads to a gap of c. £22m, which represents SSC's request for additional funding for power costs (see section 2).

1.2 Cost efficiency

Ofwat states that:¹¹

The company has not provided compelling evidence that its cost estimates are efficient.

⁹ Ofwat, (2024), 'PR24-DD-SSC_Cost-adjustment-claims.xlsx', July.

¹⁰ Based on a £568m base cost allowance for wholesale water, which is compared SSC's business plan of £590m (pre uplift for additional net zero and metering PCDs). Source: Ofwat (2024), 'Base costs aggregator.xlsx', June, tab 'Water-Outputs'.

¹¹ Ofwat, (2024), 'PR24-DD-SSC_Cost-adjustment-claims.xlsx', July.

In addition, Ofwat states that:¹²

South Staffs Water is among the most efficient water companies.

According to Ofwat's final PR24 methodology, an implicit allowance should follow these generic guidelines, albeit with some degree of flexibility:¹³

Implicit allowances can be estimated using various approaches. There is no single correct approach. It may be appropriate to use a range of approaches to come to a robust estimate of the implicit allowance. Approaches applied at PR19 included:

- removal of an expenditure category from the models;
- removal of an explanatory variable from the models; and
- assessment of average unit costs related to the claim.

We reviewed the approach to quantify the gross value of the claim and the implicit allowance. In both cases, the costs are estimated based on Ofwat's proposed top down econometric models and therefore provide cost estimates relative to other companies. The modelled costs have been subject to a catch-up efficiency challenge. With the inclusion of the 2023/24 data, we find an updated value of £29m for its topography claim.¹⁴ Given the above, we consider the net claim as being efficient and is independent of SSC's power costs forecasts for AMP8.

We confirm that SSC has strictly followed Ofwat's guidance to calculate the implicit allowance of its topography claim by calculating the difference in the efficient cost predictions between Ofwat's proposed modelling suite and a modelling suite with a 100% weighting assigned on APH. This corresponds to Ofwat's second approach with the 'removal of

¹² Ofwat, (2024), 'PR24-DD-SSC_Cost-adjustment-claims.xlsx', July.

¹³ Ofwat (2022), 'PR24 Final methodology, Appendix 9: Setting expenditure allowances', December, section A1, pages 30–31.

¹⁴ We have identified a potential inconsistency in the reporting of Portsmouth Water's (PRT) BPS (BN11390) in Ofwat's cost assessment dataset and its APR. That is, Ofwat has reported a value of 22 for PRT's boosters in 2022/23, despite PRT's 2022/23 APR data table stating a value of 40, which is consistent with PRT's values in previous years. Furthermore, the 2024 APR data share reports a value of 23 for PRT's boosters in 2023/24. Since this driver is usually stable over time, and is expected to increase according to the forecasts in PRT's business plan, we consider that it is unlikely that PRT has decommissioned almost half of its boosters, before recommissioning them in AMP8. We have therefore corrected manually and reverted PRT's number of BPS to the historical value of 40.

an explanatory variable from the models', here the number of BPS per length of mains.

Given SSC's specific operating circumstances, as outlined at the beginning of Section 1, we consider that Ofwat's current modelling is not able to capture its unique position due to:

- a very low correlation between the number of BPS per length of mains, i.e. the topography driver used in half the models, and energy consumption by distribution input—with an estimated R^2 below 0.1.
- a relatively high correlation between APH TWD, i.e. the sole topography driver used by SSC in its cost adjustment claim, and energy consumption by distribution input—with an estimated R^2 of 0.56.
- the absence of correlation between the two topography drivers used by Ofwat—with an estimated R^2 of 0.05.
- the 50% weighting assigned to the number of BPS per length of mains in the modelling.

Given the uniqueness of SSC's situation and the stability of its APH values over time, we consider this approach to provide reasonable estimate of the additional efficient costs incurred by the company due to the topography of its operating area and associated power costs.¹⁵

2 Energy

We reviewed SSC's evidence on its power cost adjustment claim.

2.1 Adjustments to cost allowances

In its representation, SSC demonstrates that:

- the overall negative adjustment (-£5m for SSC) at draft determinations is driven by a forecast that falls sharply for 2023/24 and then continues to reduce over AMP8.

¹⁵ While, from a theoretical perspective, other companies' potential approximations of reported APH values could affect SSC's relative efficiency, we consider that the degree of confidence in APH values at the industry level does not alter the precision of SSC's estimates. This is consistent with Ofwat's decision to use APH in half of the treated water distribution and wholesale water models. In addition, SSC has a significant efficiency headroom of 23% with the upper-quartile company (i.e. the fifth company) based on Ofwat's draft determination models and of 28% if a 100% weighting is assigned to APH models. Given its unique position on APH, we consider highly unlikely that a much lower efficiency gap would be found with presumed 'perfect' APH values for other companies. Finally, we note that SSC has taken a conservative approach by applying an additional 25% efficiency challenge to this estimate, requesting only the £m gap driven by power costs (see section 2 for further details).

- when updating for 2023/24 actual data, this forecast reduction did not actually manifest and the trend is even reversed.

We have checked the DESNZ industrial users index, and can confirm SSC's analysis that the index rose substantially in 2023/24 in real terms. The 2023/24 index is 320 compared to 269.36 in 2022/23.¹⁶ Since CPIH has increased by 5.55% between 2022/23 and 2023/24,¹⁷ this corresponds to an annual growth rate net of CPIH of 12.56%. However, Ofwat has assumed a negative growth rate net of CPIH of 20.52% in its draft determinations. We confirm SSC's findings that the negative ex ante adjustment applied to the company and to the industry is therefore not justified based on the evidence from 2023/24.

2.2 Cost efficiency

Based on an implicit allowance of £77m for energy,¹⁸ as mentioned in section 1.2, the gap between SSC's AMP8 power cost forecasts of £99m and the implicit allowance is therefore £22m. This is broadly aligned with the updated value of the topography claim, albeit £7m lower than the £29m (see section 1.2).

We note that SSC has decided to adopt a conservative approach by requesting additional funding only for the current c. £22m gap observed for power costs, even though applying Ofwat's CAC guidance mechanistically for topography would result in an estimate £7m higher. This choice provides strong evidence of the efficiency of the cost estimates, as a triangulated approach could have also been proposed, rather than simply retaining the lowest estimate. By opting for the lower estimate, SSC imposes on itself an additional efficiency challenge of approximately 25%,¹⁹ on top of the inherent efficiency challenge derived from the modelling approach.

¹⁶ Department for Energy Security and Net Zero (2024), 'Fuel price indices for the industrial sector in current and real terms: excluding/including CCL', 27 June, Table 3.3.2 column I.

¹⁷ Office for National Statistics (2024), 'Consumer price inflation time series (MM23). CPIH INDEX 00: ALL ITEMS 2015=100', August 14.

¹⁸ In line with Ofwat's CAC guidance, the modelling has been performed with and without power costs.

¹⁹ This corresponds to the ratio between the updated CAC for topography, £29m, and £22m, the current funding gap for power costs.