18 August 2025

RIIO-3 DD INDIRECT COSTS ASSESSMENT

Report for Scottish Power Transmission

Economic Insight Ltd

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INTRODUCTION AND EXECUTIVE SUMMARY

INTRODUCTION

Ofgem's RIIO-T3 draft determination (DD) has disallowed £334m (35%) of Scottish Power Transmission's (SPT) submitted costs for two categories of indirect costs: business support costs and closely associated indirect costs (referred to as BSC and CAI, respectively).

Ofgem assesses BSC and CAI using both historical and forecast data. This includes: (i) econometric cost benchmarking models based on historical data; (ii) 'trend analysis' using forecast data; and (iii) 'ratio benchmarking' using forecast data. The historical models are based on sector-wide data (including gas transmission data for BSC), while the forecast models are generally based on company-specific data.

This report sets out: (a) the key issues with Ofgem's DD approach for BSC and CAI; and (b) proposed remedies to address the flaws in Ofgem's approach.

OUR FINDINGS

Ofgem attaches equal weight to historical and forecast evidence when estimating efficient BSC and CAI. Given the circumstances facing transmission networks at RIIO-3, historical data is likely to be less informative as a basis for evaluating the efficiency of future expenditure plans. Ofgem should consider greater use of forecast evidence by: (i) placing greater weight on forward-looking approaches; and/or (ii) incorporating forecast data into its regression modelling.

EXECUTIVE SUMMARY

Ofgem assesses BSC and CAI using both historical and forecast data. This includes: (i) econometric cost benchmarking models based on historical data; (ii) 'trend analysis' using forecast data; and (iii) 'ratio benchmarking' using forecast data. The historical models are based on sector-wide data (including gas transmission data for BSC), while the forecast models are generally based on company-specific data. Each approach uses a different benchmark to estimate efficient indirect costs for SPT, as set out in Table 1 below.

Table 1: Overview of Ofgem's modelling approaches for indirect costs in the RIIO-3 DD

	Indirect costs	Modelling approach	Implied efficiency benchmark
Historical (regression) models	BSC	Pooled OLS model with a CSV as the cost driver and a GT sector dummy variable.	Average (mean) ET company's costs over 2013/14–2023/24.
	CAI	Pooled OLS model with capex and MEAV as cost drivers and a linear time trend.	Average (mean) ET company's costs over 2013/14–2023/24.
Forecast models	BSC[1]	'Trend analysis': 2025/26 BSC projected forward by annual FTE growth. We note this is equivalent to a unit cost approach in terms of calculating the model-predicted costs.[2]	SPT's costs in 2025/26.
	CAI	50:50 weighting of two 'ratio benchmarking' approaches: (i) median CAI/capex ratio multiplied by the capex forecast; and (ii) median CAI/MEAV ratio multiplied by the MEAV forecast.	Median of SPT's costs over RIIO-3.

Source: Economic Insight analysis.

The regulator believes that its assessment of indirect costs *"strikes the right balance"* by equally weighting models using historical data and models relying on forecast costs.[3] Specifically, Ofgem considers its approach enables it to: (a) use historical information on outturn costs and their relationship to cost drivers; but also (b) account for RIIO-3 cost pressures, such as increasing full-time equivalent staff numbers (FTEs) which are only observable in the forecast data.

Issues and proposed remedies in Ofgem's BSC cost assessment

Issue 1: Ofgem equally weights (historical) regression and (forecast) trend BSC models

Ofgem sets each company's BSC allowances by equally weighting modelled costs from: (a) network-specific trend models based only on SPT's forecast RIIO-3 costs; and (b) industry-wide regression models based on the historical outturn period (2013/14–2023/24). In the current circumstances, there are good reasons to expect forecast data and network-specific benchmarks to provide a more reliable basis for assessing BSC efficiency.

[1] *Insurance-related BSC are assessed separately and use ET sector-wide data, specifically the median unit cost (with respect to network length) over RIIO-3.*

[2] *We note this approach is equivalent to the 2026 BSC unit cost (per FTE) multiplied by the FTE forecast.*

[3] *'RIIO-3 Draft Determinations – Electricity Transmission', Ofgem (July 2025); paragraph 5.103.*

- **Historical data may no longer provide a reliable basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past.** For example, SPT expect large headcount increases to *"manage the growth in volume of work from connections, the HND and ASTI, the tCNSP2 and other projects in RIIO-T3"*.[4]

- **Cross-company comparisons will be unreliable when important cost drivers cannot be controlled for.** Ofgem's BSC regression model controls for scale, but cannot control for other differences, such as those in network characteristics, investment timing and operating environments. These factors are likely to be especially important drivers of BSC in RIIO-3. Network-specific forecasts are therefore likely to provide a more robust basis for estimating efficient costs at RIIO-3.

- **Consistent with these observations, we note that Ofgem's regression model estimates efficient BSC for SPT of £93m.** This represents a disallowance of 64% of SPT's submitted costs.[5] Such a large discrepancy between the model-predicted costs and SPT's requested costs calls into question the plausibility of Ofgem's historical regression model and necessitates further investigation.

Remedy 1: Place greater weight on BSC forecast evidence

We propose that Ofgem should place greater weight on BSC forecast evidence, to reflect the fact that historical evidence is less likely to provide a reliable basis for estimating efficient costs over RIIO-3.

There are two ways that Ofgem could place greater weight on forecast evidence.

- First, **Ofgem could change the weighting it applies to BSC historical and forecast models,** placing greater weight on the latter than at DDs. We note that:
    - There is regulatory precedent for adjusting weightings to reflect the strength of the available evidence (e.g., Ofgem's approach at RIIO-ED1).
    - There are strong reasons to place a 100% weighting on models using forecast data, e.g., additional business support activity SPT expects is required for RIIO-3.

- Second, **Ofgem could incorporate forecast data into its BSC regression model.** Options for doing so range from: (i) extending the data included in the regression models to include forecast data alongside outturn data; to (ii) developing a version of the model that only uses forecast data.

The choice between the two depends on: (a) the level of confidence in the ability of the econometric model to control for network-specific cost drivers; versus (b) the risks of relying on network-specific forecast data, without any benchmarking across companies. We find the circumstances of RIIO-3 mean that there are strong arguments for relying only on forecast data due to, e.g., the reliability of Ofgem's econometric model and that alternative model specifications indicate a wide range in model-predicted costs

[4] *'Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan'. SP Energy Networks (November 2024); page 53.*

[5] *Disallowance calculated as the difference between Ofgem's predicted costs from its historical regression and SPT's submitted costs (excluding insurance, pension scheme admin, PPF levy and IT & telecoms costs).*

Issue 2: Ofgem underestimates efficient BSC by using its adjusted FTE forecast

Ofgem uses two different estimates of FTEs for companies over RIIO-3: (a) company-submitted FTEs (used in its forecast analysis); and (b) a downward adjusted FTE forecast (used in its historical analysis). Ofgem does not justify its inconsistent use of different forecasts of FTEs across its cost assessment approach.

Ofgem estimates its adjusted FTE forecast by considering, first, how much less capex it considers is required (i.e., the percentage difference between submitted capex and baseline capex); and second, the relationship between capex and FTEs, in order to estimate the level of FTEs associated with Ofgem's view of required capex. We have a number of methodological concerns with Ofgem's approach:

- **Ofgem's assumed level of capex required.** We understand from SPT that it expects to incur a minimum level of BSC even for capex projects which are at not 'fully agreed' due to outstanding Government decisions in relation to e.g., Clean Power 2030. Ofgem's adjusted FTE forecast risks under-estimating efficient BSC because Ofgem only considers 'agreed' capex projects.

- **Ofgem's analytical approach for estimating the relationship (elasticity) between capex and FTEs.** We find the approximation Ofgem uses to estimate the elasticity between capex and FTEs is applied inappropriately.

- **The plausibility of a relationship between capex and FTEs in practice.** Ofgem's approach assumes that a company's FTEs can automatically and immediately adjust to reflect the extent of its capex. In reality, FTEs are likely to be especially difficult to adjust downwards.

- **The plausibility of the large reduction in FTEs implied by Ofgem's adjusted FTE forecast**. For RIIO-3, the adjusted FTE forecast is 59% lower than SPT's submitted FTE forecasts. We note that such a sharp drop in FTEs seems implausible given the associated redundancy costs with workforce reductions alone (even if there were a case for some reduction in FTEs).

Remedy 2: Ofgem should use company-submitted FTEs in its regression modelling

We recommend that Ofgem use company-submitted FTEs in its regression model. This is because, as outlined above: (i) there are several methodological concerns with Ofgem's DD approach to constructing its adjusted FTE forecast; and (ii) it would ensure greater internal consistency across Ofgem's cost assessment approach.

Summary of proposed BSC remedies

In summary, we recommend that:

- Ofgem should increase the weight it attaches to BSC forecast evidence. It could do so by:

  (i) attaching greater weight to its existing trend model (which uses forecast data); or

  (ii) incorporating forecast data into its regression modelling.

- Ofgem should use company-submitted FTEs in its regression models, rather than unreliable adjusted figures.

The table below summarises the impact of the remedies outlined above on SPT's BSC allowances before including separately assessed costs and adjustments for ongoing efficiency (OE). The figures

in the table use company-submitted FTE forecasts (rather than Ofgem's adjusted FTE forecast) for both the 50:50 and 75:25 weightings between trend and regression analysis.[6]

- Incorporating more forecast data implies higher modelled BSC for all three weightings between trend and regression analysis. For example, for Ofgem's preferred 50:50 weighting between its regression and trend analysis (shown by the first row of the table), Ofgem's models using RIIO-2 & RIIO-3 data imply a modelled BSC of £198m. This represents a £28m increase compared to Ofgem's DD modelled BSC (£170m). Only including forecast data (column 3) results in an even higher modelled BSC (£202m) – a £32m increase compared to Ofgem's DD modelled BSC.

- Placing more weight on the trend analysis implies higher modelled BSC. For example, for Ofgem's DD regression model (shown in column 1) a 75:25 weighting implies a modelled BSC of £211m. A 100:0 weighting, i.e., placing full weight on the forward-looking trend analysis and no weight on the regression modelling implies a modelled BSC of £247m (a £77m increase relative to Ofgem's DD modelled BSC). As we set out above, the circumstances of RIIO-3 mean that there are strong arguments for relying only on forecast data.

Table 2: Impact of remedies on SPT's modelled BSC allowance (excluding separately assessed areas and before OE)

Weighting between trend and regression analysis	Timeframe for regression analysis		
	(1) Historical data (Ofgem's DD model)	(2) RIIO-2 & RIIO-3[7]	(3) Forecast data only[8]
50:50 *(using company-submitted FTEs)*	£176m (+£6m)	£198m (+£28m)	£202m (+£32m)
75:25 *(using company-submitted FTEs)*	£211m (+£41m)	£222m (+£53m)	£224m (+£54m)
100:0	£247m (+£77m)	£247m (+£77m)	£247m (+£77m)

Source: Economic Insight analysis.

Note: Ofgem's Model 3 uses the CSV as a cost driver, while Ofgem's Model 6 uses log(MEAV) and log(FTEs) instead.

[6] *The 100:0 weighting between trend and regression analysis is based solely on Ofgem's trend analysis.*

[7] *The regression analysis used consists of an average of the model-predicted costs of Ofgem's Models 3 and 6 which use RIIO-2 & RIIO-3 as the time period of the analysis. Model 3 uses a CSV (as per Ofgem's preferred model) and Model 6 includes log(MEAV) and log(FTE) as separate variables.*

[8] *The regression analysis used consists of Ofgem's preferred DD model using only forecast data (the final two years of RIIO-2 and the entire RIIO-3 period) and company-submitted FTEs (rather than Ofgem's adjusted FTE forecast).*

Issues and proposed remedies in Ofgem's CAI cost assessment

Issue 1: Ofgem equally weights (historical) regression and (forecast) ratio benchmarking CAI models

As with BSC, Ofgem sets each company's CAI allowances by equally weighting modelled costs from its regression model (which uses outturn data) and its ratio benchmarking models (which use forecast data for RIIO-3). In the current circumstances, there are good reasons to expect forecast data and network-specific benchmarks to provide a more reliable basis for assessing CAI efficiency.

- **Historical data may no longer provide a reliable basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past.** SPT note an important driver of its RIIO-3 CAI is *"the increasing complexity of processes with connection reform including additional interactions between SPT and the Department of Energy Security and Net Zero (DESNZ), their Mission Control department, the National Electricity System Operator (NESO), and Ofgem."*[9]

- **Cross-company comparisons will be unreliable when important cost drivers cannot be controlled for.** The historical CAI regression model controls for scale but cannot control for other differences, such as those in network characteristics, investment timing and operating environments. These factors are likely to be especially important drivers of CAI in RIIO-3. Network-specific forecasts are therefore likely to provide a more robust basis for estimating efficient RIIO-3 costs.

- **Consistent with these observations, we note that Ofgem's regression model estimates efficient CAI for SPT of £181m.** This represents a disallowance of 66% of SPT's submitted costs.[10] Such a large discrepancy between the model-predicted costs and SPT's requested costs calls into question the plausibility of Ofgem's historical regression model and necessitates further investigation.

Remedy 1: Place greater weight on CAI forecast evidence

As with BSC, Ofgem should increase the weight it attaches to forecast evidence. Again, in principle Ofgem could do so by: (a) placing greater weight on its ratio benchmarking CAI models, which are based on forecast data, relative to its historical regression model; and/or (b) incorporating forecast data into its regression model.

Our analysis indicates that, in practice, the extent to which forecast data for RIIO-3 can be incorporated into the CAI regression model while retaining intuitively signed, statistically significant explanatory variables is limited. As such, placing greater weight on ratio benchmarking models for CAI is the primary option for making greater use of forecast evidence in this case. The fact that the CAI model is not robust to the inclusion of RIIO-3 data itself calls into question its utility as a basis for assessing efficient future costs. However, we note that the inclusion of *RIIO-2* forecast data combined with the removal of the linear time trend *does* produce a model that, overall, performs similarly to Ofgem's DD model on the available measures of model performance.

As noted above, there are strong reasons to place a 100% weighting on models using forecast data. This is because (as set out in the preceding section) historical data may no longer provide a reliable

[9] *'Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan'. SP Energy Networks (November 2024); page 47.*

[10] *Disallowance calculated as the difference between Ofgem's predicted costs from its historical regression and SPT's submitted costs (excluding separately assessed areas).*

basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past. For example, SPT expects there to be increased indirect activities with greater complexity relative to RIIO-2.

Issue 2: Ofgem includes a negative and statistically insignificant time trend in its CAI model

Ofgem states that its approach to developing its econometric models as having *"been guided by economic and engineering rationale, statistical robustness, and relevance to the activities being assessed."*[11] We do not consider that this characterisation applies to Ofgem's decision to include a linear time trend term in its historical CAI model.

- **The linear time trend in Ofgem's DD model is negative.** Ofgem estimates a coefficient of *minus* 0.04 on the linear time trend. This suggests CAI cost have fallen over the 2014–2024 period – and Ofgem assumes that this will continue indefinitely into the future.

- **Applying a historical time trend to a forecast period is an unjustified modelling decision.** Ofgem has not provided any economic or engineering rationale to support why it expects CAI to decrease each year over the RIIO-3 period.

- **Conceptually, it is not clear how the negative time trend is different to OE.** In principle a negative time trend in a cost model could be interpreted as representing ongoing productivity improvements.

- **The cost reductions implied for the forecast period using Ofgem's historical time trend are not plausible.** We do not consider the assumed 4% per annum reduction in CAI is credible in terms of its magnitude, especially given Ofgem's separate post-modelling adjustment for OE (1% per annum).

- **Including a time trend which is statistically insignificant is inconsistent with Ofgem's model selection process.** Ofgem's general model selection process is to exclude any insignificant explanatory variables.[12]

Furthermore, we note that including a linear time trend is: (i) a departure from Ofgem's RIIO-2 model; and (b) also inconsistent with Ofgem's econometric approach for BSC at RIIO-3.[13]

Remedy 2: Ofgem should remove the linear time trend from its regression model

For the reasons set out above, Ofgem should remove the time trend from its CAI regression model. This could be combined with additional changes such as: (i) including RIIO-2 forecast data; and/or (ii) attaching greater weight to the CAI ratio benchmarking models; in order to place more emphasis on forecast data when assessing CAI for RIIO-3. However, we note this remedy is only required where the historical regression model is given weight. The issue outlined above does not arise when the ratio benchmarking approach is given a 100% weighting, in which case no adjustment is necessary.

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[11] 'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph A2.5.

[12] We note that the inclusion of a statistically insignificant variable can be justified if there is a strong economic rationale for its inclusion, and that its magnitude accords with this rationale. On the other hand, there are good reasons to favour parsimonious models, given the limited number of data points available in this case.

[13] We find that the inclusion of a linear time trend in Ofgem's BSC model also results in a statistically significant (albeit positive) coefficient.

Summary of proposed CAI remedies

In summary, we recommend that:

- Ofgem should increase the weight it attaches to CAI forecast evidence by placing more weight on its ratio benchmarking models.
- Ofgem should remove the time trend from its CAI regression model and include RIIO-2 forecast data.

The table below summarises the impact of the remedies outlined above on SPT's modelled CAI allowances (before including separately assessed costs and adjustments for OE).

- Placing more weight on ratio benchmarking implies higher modelled CAI. For example, for Ofgem's preferred CAI model (shown in column 1), a 75:25 weighting implies a modelled CAI of £451m (a £90m increase relative to modelled CAI allowances in Ofgem's DD). A 100:0 weighting (i.e., placing full weight on ratio benchmarking and no weight on the regression model) implies modelled CAI of £541m (a £180m increase relative to Ofgem's DD modelled CAI).
- Excluding the time trend implies higher modelled CAI relative to Ofgem's DD model. For Ofgem's preferred 50:50 weighting between ratio benchmarking and its regression model (as shown in the first row), removing the linear time trend from Ofgem's model (as shown in column 2) implies modelled CAI of £414m (a £53m increase relative to Ofgem's DD modelled CAI). A 75:25 weighting excluding the time trend would result in a £117m increase in modelled CAI relative to Ofgem's DD approach. Combining the removal of the time trend with the additional RIIO-2 forecast data (as shown in column 3) increases modelled CAI further – a 50:50 weighting implies modelled CAI of £420m, a £60m increase compared to Ofgem's DD modelled CAI.

Table 3: Impact of remedies on SPT's modelled CAI allowance (excluding separately assessed areas and before OE)

Weighting between ratio benchmarking and regression analysis	Timeframe and specification for regression analysis		
	(1) Historical data, linear time trend (Ofgem's DD model)	(2) Historical data, no time trend	(3) Historical data and RIIO-2 forecasts, no time trend
50:50	£361m (±0m)	£414m (+53m)	£420m (+60m)
75:25	£451m (+90m)	£477m (+117m)	£480m (+120m)
100:0	£541m (+180m)	£541m (+180m)	£541m (+180m)

Source: Economic Insight analysis.

REPORT STRUCTURE

The remainder of this report is structured as follows:

- Chapter 2 sets out: (a) Ofgem's DD approach to setting the efficient BSC for ET networks; (b) the key issues with its approach; and (c) our proposed remedies. We also consider issues with Ofgem's proposed BSC re-opener.
- Chapter 3 sets out: (a) Ofgem's DD approach to setting the efficient CAI for ET networks; (b) the key issues with its approach; and (c) our proposed remedies.
- Chapter 4 contains an annex which contains supplementary information.

2

BSC

This chapter sets out: (i) Ofgem's DD approach to setting the efficient BSC for ET networks; (ii) key issues with Ofgem's approach and proposed remedies; and (iii) issues with Ofgem's proposed BSC re-opener.

2A Chapter structure

The structure of this chapter is as follows:

- **First**, we set out an overview of Ofgem's DD approach for BSC.
- **Second**, we set out each of the key issues with Ofgem's approach (and the proposed remedies Ofgem should consider ahead of its FD).
- **Third,** we consider the issues with Ofgem's proposed re-opener for BSC.

2B Overview of Ofgem's DD approach for BSC

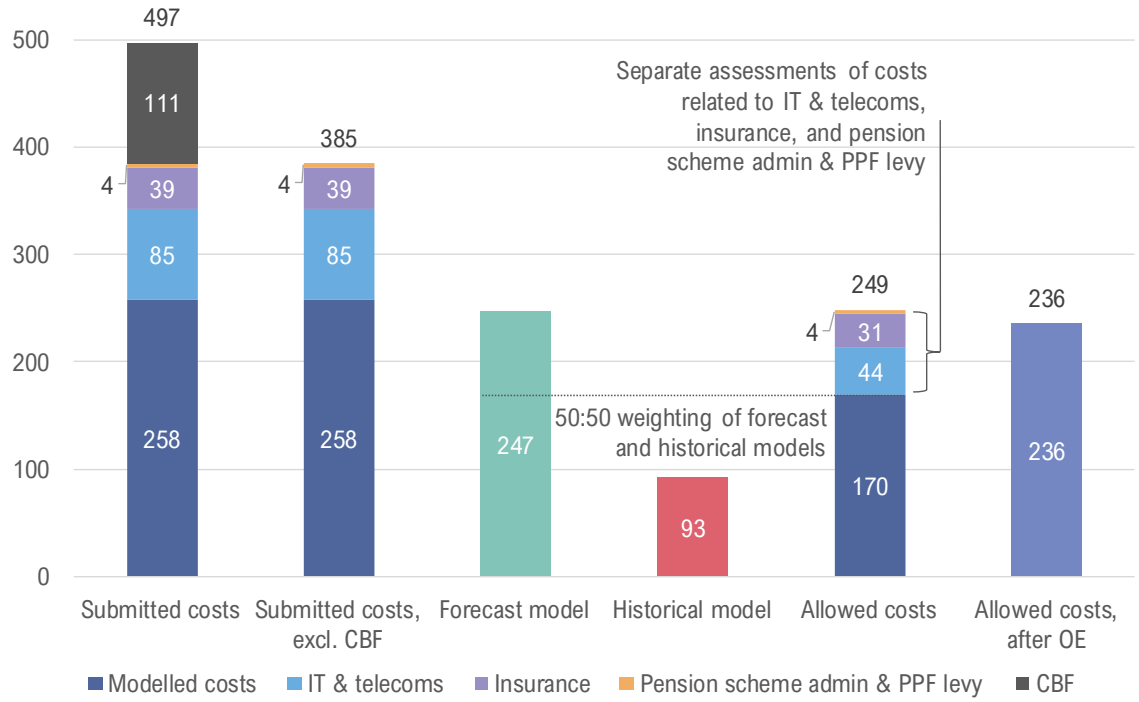
Ofgem sets its proposed allowance for SPT's BSC in several steps, as shown in Figure 1 below. Specifically, its assessment consists of:

- Modelled costs of £170m[14] which is based on an equal weighting of: (a) model-predicted costs from a historical model (£93m); and (b) model-predicted costs from a forecast model (£247m).
    - Ofgem's historical model consists of a single econometric benchmarking (pooled OLS) model which uses outturn data for the ET and GT sector (from 2013/14 to 2023/24). We set out further details of Ofgem's BSC model in the Annex.
    - Ofgem's forecast model consists of a forward-looking 'trend analysis' using only SPT data. Specifically, Ofgem estimates RIIO-3 costs by using SPT's BSC for 2025/26 and projecting it forward using the year-on-year growth of SPT's FTE forecasts. We note this is equivalent to a unit cost approach (i.e., it produces the same modelled costs) in which SPT's 2025/26 costs per FTE are used as the efficient benchmark and multiplied by the FTE forecast.
- A separate assessment for insurance (£31m), pension scheme admin & PPF levy (£4m) and IT & telecoms costs (£44m).
    - BSC insurance is assessed through an industry-wide 'ratio benchmarking' approach based on network length.[15]
    - Pension scheme admin and PPF levy is subject to a qualitative assessment, with submitted costs allowed in full.[16]
    - IT & telecoms costs are assessed based on expert reviews by external consultants, resulting in 51% of submitted costs being allowed.[17]
- An adjustment for OE of 1% per annum (−£13m). This is equal to Ofgem's OE target for the RIIO-3 period.

[14] *All figures are stated in 2023/24 prices, unless indicated otherwise.*
[15] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); page 145.*
[16] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); page 145.*
[17] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.55.*

Overall, Ofgem's DD assessment leads to a disallowance of £149m (39%) of SPT's submitted BSC.[18]

Figure 1: Ofgem's approach to setting SPT's allowed BSC in the RIIO-3 DD (£m)



Source: Economic Insight analysis.

2C Issue 1: Ofgem equally weights (historical) regression and (forecast) trend BSC models

Ofgem sets each ET company's BSC allowances by equally weighting modelled costs from: (a) network-specific trend models based only on each company's own forecast RIIO-3 costs; and (b) an industry-wide regression model based on the historical outturn period (2013/14–2023/24).

Ofgem provides the following justification for applying equal weighting:

> *"To ensure our approach remains balanced, we assigned equal weights (50:50) to historical regressions and forward-looking ratio and trend analyses. We do not consider it appropriate to diminish the importance of the robust relationship between costs and drivers that can be observed in historical data. At the same time, we ought to be considering forward-looking pressures, such as increasing FTEs or operational expansion, which are not visible in historical data. We consider weighting past and future the same to be appropriate to take a balanced view."*[19]

[18] *SPT submitted costs excludes Community Benefit Fund (CBF).*

[19] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.100.*

Although we agree with Ofgem that it is essential to take a balanced view where multiple sources of evidence are available, we do not consider this necessarily implies assigning equal weight to each. Instead, how much weight to assign to each piece of evidence depends on how reliable it is likely to be as a basis for estimating future efficient costs.

In practice, the choice of weighting between the two types of models depends on the advantages and disadvantages of both: (i) forecast versus historical data; and (ii) whether efficient cost benchmarks are based on network-specific data or cross-company comparisons. In the current circumstances, there are good reasons to expect forecast data and network-specific benchmarks to provide a more reliable basis for assessing efficiency.

- **Historical data may no longer provide a reliable basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past.** There are good reasons to expect external cost drivers to have changed significantly between RIIO-2 and RIIO-3. Ofgem states that its *"blended approach ensures baseline allowances reflect, **to some extent**, the increasing network scale and operations"* (emphasis added).[20] We note that companies should receive allowances to *fully* reflect the efficient costs of increasing network scale and operations at RIIO-3. For example, SPT expect large headcount increases to *"manage the growth in volume of work from connections, the HND and ASTI, the tCNSP2 and other projects in RIIO-T3"*.[21] This will result in additional costs from e.g.: (i) recruitment and other HR costs such as setting an appropriate rewards package; (ii) acquiring land rights for additional substations as part of load-related capex; and (iii) increased requirements for FTEs to support connections, competition, and regulatory compliance.[22]

- **Cross-company comparisons will be unreliable when important cost drivers cannot be controlled for.** Ofgem's BSC regression model controls for scale (as measured by MEAV, FTEs, and totex), but cannot control for other differences, such as those in network characteristics, investment timing and operating environments. These factors are likely to be especially important drivers of BSC in RIIO-3. Network-specific forecasts are therefore likely to provide a more robust basis for estimating efficient costs at RIIO-3.

- **Consistent with these observations, we note that Ofgem's regression model estimates efficient BSC for SPT of £93m.** This represents a disallowance of 64% of SPT's submitted costs and is much lower than Ofgem's forecast model estimate of £247m.[23] Such a large discrepancy between the model-predicted costs and SPT's requested costs (as well as predicted costs from the forecast model) calls into question the plausibility of Ofgem's historical regression model and necessitates further investigation. We note Ofgem does not acknowledge this discrepancy in its DD – despite the fact it recognises that TO-specific forecasts for RIIO-3 capture *"the future network growth specific to each TO."*[24]

[20] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.99.*

[21] *'Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan'. SP Energy Networks (November 2024); page 53.*

[22] *'Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan'. SP Energy Networks (November 2024); Table 6.8.*

[23] *Disallowance calculated as the difference between Ofgem's predicted costs from its historical regression and SPT's submitted costs (excluding insurance, pension scheme admin, PPF levy and IT & telecoms costs).*

[24] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.114.*

2D Remedy 1: Place greater weight on BSC forecast evidence

We propose that Ofgem should place greater weight on BSC forecast evidence, to reflect the fact that historical evidence is less likely to provide a reliable basis for estimating efficient costs over RIIO-3.

There are two ways that Ofgem could place greater weight on forecast evidence.

- First, **Ofgem could change the weighting it applies to BSC historical and forecast models,** placing greater weight on the latter than at DDs.
- Second, **Ofgem could incorporate forecast data into its BSC regression model.** We note that Ofgem appears to have considered doing so, based on its DD modelling files.

The choice between the two depends on: (a) the level of confidence in the ability of the econometric model to control for network-specific cost drivers; versus (b) the risks of relying on network-specific forecast data, without any benchmarking across companies. In the circumstances of RIIO-3, the reliability of the econometric model is low, given that it controls only for scale and that alternative model specifications to Ofgem's preferred model indicate a wide range in model-predicted costs. We note that the Independent Water Commission's review of regulation in the water sector (the "Cunliffe Review") stressed the limitations of econometric models when there are differences between companies that cannot be controlled for, stating that: *"there are fundamental limits to how precise and accurate a benchmarking framework and econometric tools can be. Differences between water companies naturally limit the extent to which these can be relied upon when assessing whether individual company costs are reasonable, whether the company is improving efficiency, and whether the company's performance overall is satisfactory"*.[25]

In the remainder of this section, we set out further detail on how each of these two options could be implemented in practice.

Changing the weighting applied to BSC historical and forecast models

There is regulatory precedent for adjusting weightings to reflect the strength of the available evidence. For example, in areas of its RIIO-ED1 cost assessment Ofgem assigned a 75% weighting to qualitative expert review and 25% weighting to quantitative evidence (from unit cost benchmarking).[26] This was because Ofgem had greater confidence in the qualitative assessment *"[d]ue to the depth of the qualitative assessment"* but still considered the quantitative assessment to be informative.[27]

In this case, **there are strong reasons to place a 100% weighting on models using forecast data.** This is because (as set out in the preceding section) historical data may no longer provide a reliable basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past. For example, SPT expects there to be additional business support activity required to recruit and retain FTEs for activities such as securing land rights for RIIO-3 projects.

[25] *'Final Report'. Independent Water Commission (July 2025); paragraph 388.*

[26] *'RIIO-ED1 Final Determinations for the slow-track electricity distribution companies – Business plan expenditure assessment', Ofgem (November 2014); Table 3.1*

[27] *RIIO-ED1 Draft Determinations for the slow-track electricity distribution companies – Business plan expenditure assessment', Ofgem (July 2014); paragraph 8.5.*

Table 4 shows how SPT's allowances change when greater weight is placed on the forecast model. Increasing the weight attached to forecast models to 75% implies a £38m increase in SPT's modelled costs to £208m, while relying fully on forecast models implies a £77m increase to £247m.

Table 4: SPT's BSC modelled costs under different forecast versus historical modelled cost weightings

	Modelled BSC before adjustments
Historical model	£93m
Forecast model	£247m
50:50	£170m (DD)
75:25	£208m (+38m)
100:0	£247m (+£77m)

Source: Economic Insight analysis.

Note: The £170m figure is Ofgem's DD modelled BSC (which averages the modelled cost of its forecast and historical approaches) before the inclusion of costs for separately assessed components.

Incorporating forecast data into the BSC regression model

Ofgem could incorporate available forecast data in its BSC regression model. Options for doing so range from: (i) extending the data included in the regression models to include forecast data alongside outturn data; to (ii) developing a version of the model that relies only on forecast data.

Although Ofgem relies on a single regression model including only historical data for BSC, it considered at least six models (including its preferred model) in its underlying DD modelling files, four of which include RIIO-3 forecast data. The models vary across two key dimensions.

- **Cost driver.** The models include two approaches for the cost driver specifications: (i) a composite scale variable based on MEAV (79.5% weighting), FTEs (11.5%) and totex (9%)[28] (its preferred approach); and (ii) including two of the three underlying CSV components separately – MEAV and FTE.[29] Models 1–3 use CSV as the only cost driver and Models 4–6 use the individual MEAV and FTE variables (in logs).

- **Time period.** The six models use three distinct time periods: (i) Models 1 and 5 use the historical sample from 2013/14 to 2023/24 (Ofgem's preferred time period); (ii) Models 2 and 4 use the entire sample from 2013/14 to 2030/31, including both historical and forecast data;

[28] *Ofgem's CSV weightings are based on linking the various subcategories of BSC to the most relevant drivers. For example, HR is mainly driven by headcount, which has been linked to FTEs in the calculation of CSV weights. The variables are logged and standardised before being weighted to calculate the CSV.*

[29] *Totex is excluded in the disaggregated version of the Ofgem's CSV for BSC to avoid multicollinearity issues.*

and (iii) Models 3 and 6 use the RIIO-2 and RIIO-3 period from 2022 to 2031, which includes mostly forecast data.

We present and summarise the model results and model-predicted costs across all six of Ofgem's models in Table 5. In addition, we have estimated versions of the models that use only forecast data, for both of Ofgem's specifications for controlling for cost drivers, as set out in Table 6.

Table 5: Summary of Ofgem's considered historical BSC regression models

	Model 1 (DD)	Model 2	Model 3	Model 4	Model 5	Model 6
Cost driver	CSV			Log(FTE) and log(MEAV) included as separate variables		
Time period	Historical (2013/14–2023/24)	Entire sample (2013/14–2030/31)	RIIO-2 & RIIO-3 (2021/22–2030/31)	Entire sample (2013/14–2030/31)	Historical (2013/14–2023/24)	RIIO-2 & RIIO-3 (2021/22–2030/31)
CSV	0.84***	0.76***	0.54***	—	—	—
Log(MEAV)	—	—	—	0.47**	0.37	0.38*
Log(FTE)	—	—	—	0.52**	0.72*	0.37*
GT dummy	−0.77***	−0.66***	−0.52***	−0.35**	−0.23	−0.37**
Constant	3.51***	3.57***	3.68***	−4.76**	−5.21**	−2.76*
Adjusted R-squared	0.87	0.82	0.79	0.86	0.88	0.84
RESET	0.075[30]	0.001	0.001	0.043	0.043	0.721
Heterosced-asticity	0.01	0.001	0.039	0.003	0.235	0.01
Normality	0.950[31]	0.184	0.001	0.406	0.684	0.023
Pooling	1.000	1.000	0.226	—	—	—
SPT model-predicted costs	£93m	£101m	£137m	£104m	£105m	£127m
SPT dis-allowance[32]	−64%	−61%	−47%	−60%	−59%	−51%

Source: Economic Insight analysis.

*Note: Statistical significance levels are denoted as follows: *** 1% level; ** 5% level; * 10% level.*

[30] We note that Ofgem reports a p-value of 0.056 in Table 21 of its ET annex for its RESET test. However, Ofgem's code generates a p-value of 0.075. This p-value is based on cluster-robust standard errors (clustered by network).

[31] We note that Ofgem reports a p-value of 0.102 Table 21 of its ET annex for its normality test. However, Ofgem's code generates a p-value of 0.201 (which includes out-of-sample residuals). The reported results in this table are based on only on the residuals over the years used to estimate the models.

[32] This is calculated as the percentage difference from SPT's gross 'BSC Submitted excl Insurance and IT&T' costs over RIIO-3 (of £258m).

Table 6: Summary of BSC model results estimated using only forecast data

	Forecast data only	
Cost driver	CSV	Log(FTE) and log(MEAV) included as separate variables
Time period	(2024/25–2030/31)	(2024/25–2030/31)
CSV	0.46***	—
Log(MEAV)	—	0.50***
Log(FTE)	—	0.15*
GT dummy	−0.36***	−0.38***
Constant	3.73***	−2.10*
Adjusted R-squared	0.93	0.92
RESET	0.539	0.322
Heteroscedasticity	0.124	0.110
Normality	0.483	0.599
Pooling	0.152	—
SPT model-predicted costs	£152m	£150m
SPT disallowance[33]	−41%	−42%

Source: Economic Insight analysis.

*Note: Statistical significance levels are denoted as follows: *** 1% level; ** 5% level; * 10% level.*

Across its six models, Ofgem's preferred model results in the lowest model-predicted cost for SPT. The five alternative specifications result in model-predicted costs that are between £9m and £44m higher than Ofgem's DD model (ranging from £101m to £137m).[34] Notably, Ofgem has not provided a clear rationale for its preferred BSC model over the other viable alternative specifications. We note

[33] This is calculated as the percentage difference from SPT's gross 'BSC Submitted excl Insurance and IT&T' costs over RIIO-3 (of £258m).

[34] We also note that Ofgem's input data for estimating its econometric models uses a data series for forecast BSC that is lower than the figures submitted by ET companies. Using company-submitted figures may result in higher model-predicted costs for models estimated with forecast data (specifically Models 2,3,4 and 6).

that almost all the models have: (i) statistically significant coefficients (excluding Model 5); (ii) intuitively signed coefficients of cost drivers; and (iii) are associated with high adjusted R-squared values. While Ofgem's selected model performs comparatively well in terms of the Regression Equation Specification Error Test (RESET), it performs less well in terms of heteroscedasticity tests.

As we set out above, the circumstances of RIIO-3 mean that there are strong arguments for relying only on forecast data.[35] As we set out in the table below, this results in model-predicted costs of £152m, which is £59m above the DD model. To the extent that Ofgem wishes to place weight on both historical and forecast data, Ofgem could triangulate across some of the models set out above. Triangulating between models that include both RIIO-2 and RIIO-3 data results in £39m additional model-predicted costs relative to Ofgem's DD model. We note there is regulatory precedent for relying on several models. For instance, Ofgem has itself stated that the use of multiple models provides a *"richer view of relative efficiency"* in its RIIO-GD3 Sector Specific Methodology Decision in relation to totex modelling.[36] Ofwat also regularly triangulates across multiple models to *"ensure [it does] not rely on any one model to estimate efficient costs, which will mitigate the risk of error and bias"*.[37]

Table 7: Modelled BSC including forecast data

Modelling approach	Modelled cost
(a) Regression model with only forecast data (using CSV driver)	£152m (+£59m)
(b) Triangulate across models using RIIO-2 and RIIO-3 data (Ofgem's models 3 and 6)[38]	£132m (+£39m)

Source: Economic Insight analysis.

Issue 2: Ofgem underestimates efficient BSC by using its adjusted FTE forecast

Ofgem uses two different estimates of FTEs for companies over RIIO-3: (a) company-submitted FTEs (used for its forecast analysis); and (b) a downward adjusted FTE forecast (used in its historical analysis). Ofgem does not justify its inconsistent use of different forecasts of FTEs across its cost assessment approach.

Ofgem calculates its adjusted FTE forecast for each company for each year of RIIO-3 by multiplying:

(a) company-submitted FTEs in each year of the RIIO-3 period; by

(b) an estimated elasticity of FTEs with respect to capex (i.e., the percentage change in FTEs following a 1% change in capex), which Ofgem has estimated using a regression model which regresses log(FTEs) on log(capex) for 2013/14–2030/31;[39] and

[35] *Forecast data consists of the final two years of RIIO-2 and the entire RIIO-3 period.*

[36] *'RIIO-3 Sector Specific Methodology Decisions – GD Annex'. Ofgem (July 2024); paragraph 5.20.*

[37] *'Assessing base costs at PR24'. Ofwat (December 2021); page 16.*

[38] *Model 3 uses a CSV and Model 6 includes log(MEAV) and log(FTE) as separate variables.*

[39] *Ofgem estimate this using SHET data in 2021 is removed as it is identified as an outlier.*

(c) the percentage change between submitted capex and baseline capex for each year of the RIIO-3 period.

In other words, Ofgem estimates its adjusted FTE forecast by considering, first, how much less capex it considers is required (i.e., the percentage difference between submitted capex and baseline capex); and second, the relationship between capex and FTEs, in order to estimate the level of FTEs associated with Ofgem's view of required capex. We have a number of methodological concerns with Ofgem's approach:

- **Ofgem's assumed level of capex required.** We understand from SPT that it expects to incur a minimum level of BSC even for capex projects which are not fully completed. Ofgem's adjusted FTE forecast risks under-estimating efficient BSC because Ofgem only considers 'agreed' capex projects. The key issue with this approach is that a company can incur (efficient) BSC for capex projects which are not yet fully agreed. For example, the ongoing work for Clean Power 2030 means the portfolio of projects in TO's business plans is still subject to change.[40] However, networks may still have to incur the BSC associated with the initial stages of planning and project management for projects which are de-prioritised.

- **Ofgem's analytical approach for estimating the relationship (elasticity) between capex and FTEs.** We find the approximation Ofgem uses to estimate the elasticity between capex and FTEs is applied inappropriately. Ofgem uses the capex coefficient in its log-log regression model to estimate the relationship between capex and FTEs. In practice, the coefficient on capex in a log-log regression of FTEs on capex can be interpreted as the percentage change in FTEs for a given percentage change in capex for *small* changes only. This interpretation does not apply for *large* changes, such as the −90% change between submitted and baseline capex in the DDs. This is because the interpretation of the coefficient as a percentage change relies on the approximation that $\log(1 + x) \approx x$ which is only valid for small x. For large changes, the approximation becomes less accurate[41] as illustrated in Figure 2.

- **The plausibility of a relationship between capex and FTEs in practice.** Ofgem's approach assumes that a company's FTEs can automatically and immediately adjust to reflect the extent of its capex. In reality, FTEs are likely to be especially difficult to adjust downwards. That is, workforce reductions may be constrained due to employment practices and the associated costs of redundancy. Furthermore, it may be more cost efficient for a company to retain its FTEs rather than to 'fire and re-hire', due to the potential costs of large-scale recruitment. As highlighted by SPT in its RIIO-3 workforce strategy, the *"challenge of resourcing the workforce to deliver for RIIO-T3 cannot be understated"* and will require it to *"develop [its] people internally and work with them to grow their skills and retain them for the long-term."*[42]

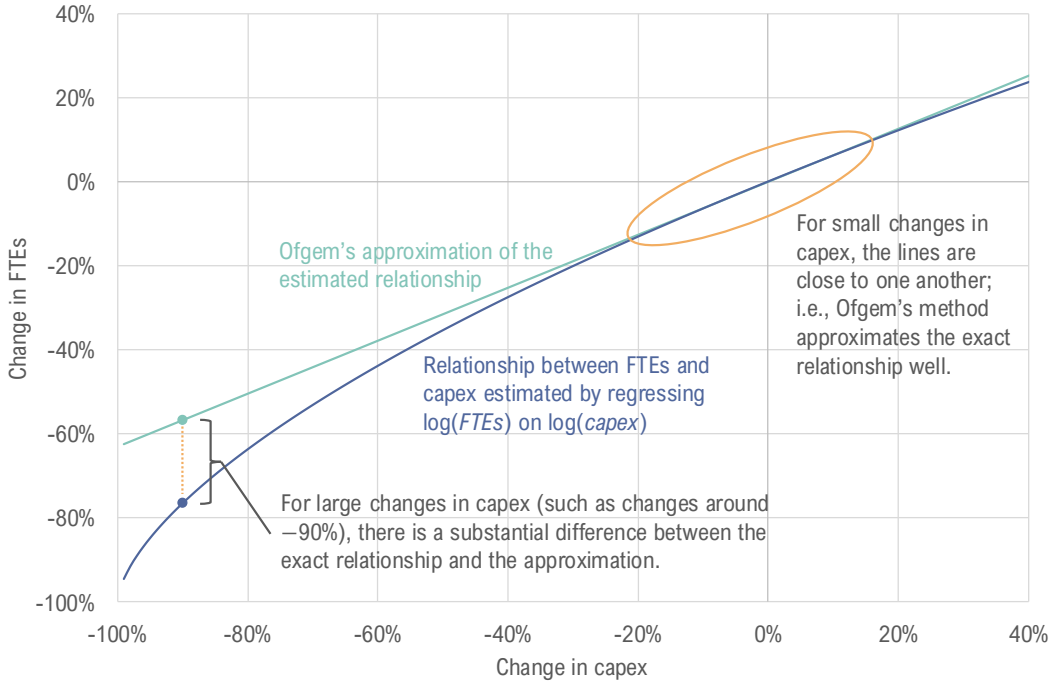
- **The plausibility of the large reduction in FTEs implied by Ofgem's adjusted FTE forecast**. Figure 3 below shows SPT's submitted FTE forecast compared to the adjusted FTE forecast used by Ofgem in its modelling. For RIIO-3, the adjusted FTE forecast is 59% lower than SPT's submitted FTE forecasts. Ofgem's adjusted FTE forecast implies a reduction of 961 FTEs (50% reduction) between the end of RIIO-2 and the start of RIIO-3. In any event, such a sharp drop in FTEs seems implausible given the associated redundancy costs with workforce reductions alone (even if there were a case for some reduction in FTEs).

[40] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 4.6.*

[41] *This is due to the non-linear nature of the log transformation.*

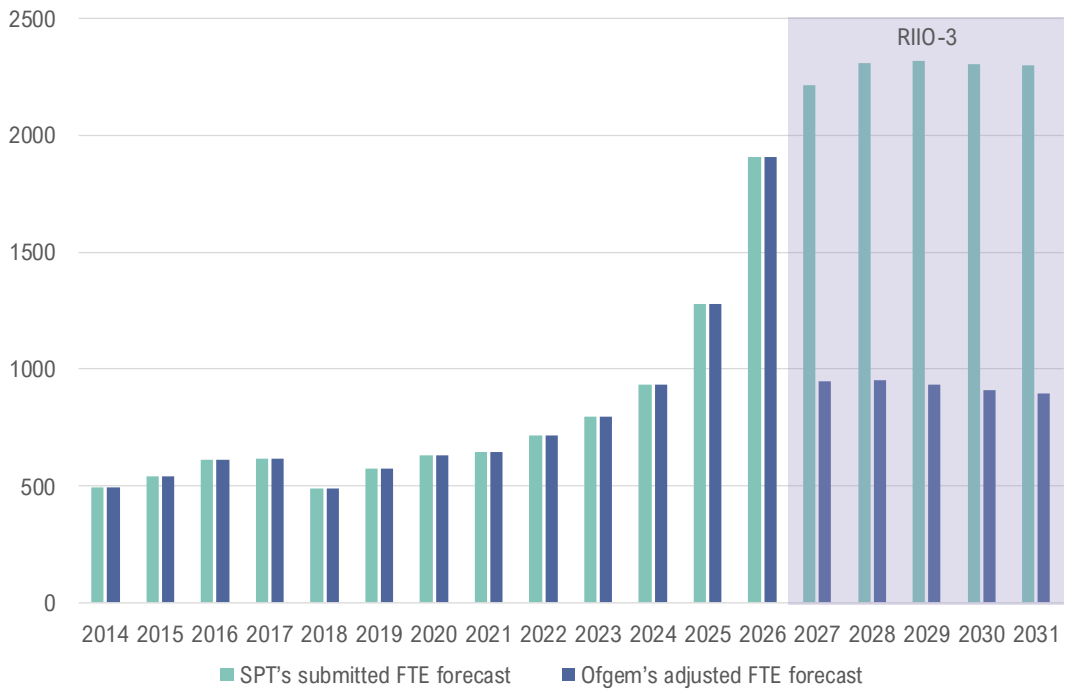
[42] *'Workforce & Supply Chain Resilience Strategy'. SP Energy Networks (November 2024); page 11.*

Figure 2: The interpretation of log-log regression coefficients as elasticities only holds for small changes



Source: Economic Insight analysis.

Figure 3: Comparison between SPT's submitted FTEs and Ofgem's adjusted FTE forecast



Source: Economic Insight analysis.

2F Remedy 2: Ofgem should use company-submitted FTEs in its regression modelling

We recommend that Ofgem use company-submitted FTEs in its regression modelling. As outlined in the preceding section, there are several methodological concerns with Ofgem's DD approach to constructing its adjusted FTE forecast. Doing so would also achieve greater internal consistency, since Ofgem uses company-submitted FTE forecasts for its forecast models. We note that Ofgem has already stated that it will consider *"more accurate estimates for baseline FTEs*[43] *(for DDs [Ofgem] could only use a regression-based approximation of FTEs baseline figures)."*[44]

Table 8 shows the model-predicted BSC for Ofgem's DD specification, and how this differs when using company-submitted FTE forecasts as opposed to Ofgem's adjusted forecast. Using SPT's FTE forecasts results in model-predicted costs of £104m – around £11m higher than Ofgem's estimate. For models which incorporate forecast data, using company-submitted FTE forecasts also increases SPT's model-predicted costs. However, for the forecast data only regression model, the increase from using company-submitted FTE forecasts is smaller, at £5m.

Table 8: SPT's model-predicted BSC from regression models including submitted FTE forecasts (2023/24 prices)

BSC	FTE forecast	
	Ofgem's adjusted forecast (Ofgem's DD approach)	Company's submitted forecast
Ofgem's DD model (Model 1)	£93m	£104m (+£11m)
Forecast data model	£152m (+£59m)	£157m (+64m)
Triangulation of Ofgem's RIIO-2 & RIIO-3 models	£132m (+£39m)	£149m (+£56m)

Source: Economic Insight analysis.

2G Summary of proposed remedies

In summary, we recommend that:

- Ofgem should increase the weight it attaches to BSC forecast evidence. It could do so by:
  - (i) attaching greater weight to its existing trend model (which uses forecast data); or
  - (ii) incorporating forecast data into its regression modelling.
- Ofgem should use company-submitted FTEs in its regression models, rather than unreliable adjusted figures.

[43] *Ofgem's generally refers to its adjusted FTE forecast as its baseline FTEs.*

[44] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); footnote 75.*

The table below summarises the impact of the remedies outlined above on SPT's BSC allowances (before including separately assessed costs and adjustments for OE). The figures in the table use company-submitted FTE forecasts (rather than Ofgem's adjusted FTE forecast) for both the 50:50 and 75:25 weightings between trend and regression analysis.[45]

- Incorporating more forecast data implies higher modelled BSC for all three weightings between trend and regression analysis. For example, for Ofgem's preferred 50:50 weighting between its regression and trend analysis (shown by the first row of the table), Ofgem's models using RIIO-2 & RIIO-3 data imply a modelled BSC of £198m. This represents a £28m increase compared to Ofgem's DD modelled BSC (£170m). Only including forecast data (column 3) results in an even higher modelled BSC (£202m) – a £32m increase compared to Ofgem's DD modelled BSC.

- Placing more weight on the trend analysis implies higher modelled BSC. For example, for Ofgem's DD regression model (shown in column 1) a 75:25 weighting implies a modelled BSC of £211m. A 100:0 weighting, i.e., placing full weight on the forward-looking trend analysis and no weight on the regression modelling implies a modelled BSC of £247m (a £77m increase relative to Ofgem's DD modelled BSC). As we set out above, the circumstances of RIIO-3 mean that there are strong arguments for relying only on forecast data.

Table 9: Impact of remedies on SPT's modelled BSC allowance (excluding separately assessed areas and before OE)

Weighting between trend and regression analysis	Timeframe for regression analysis		
	Historical data (Ofgem's DD model)	(2) RIIO-2 & RIIO-3[46]	(3) Forecast data only[47]
50:50 *(using company-submitted FTEs)*	£176m (+£6m)	£198m (+£28m)	£202m (+£32m)
75:25 *(using company-submitted FTEs)*	£211m (+£41m)	£222m (+£53m)	£224m (+£54m)
100:0	£247m (+£77m)	£247m (+£77m)	£247m (+£77m)

Source: Economic Insight analysis.

Note: Ofgem's Model 3 uses the CSV as a cost driver, while Ofgem's Model 6 uses log(MEAV) and log(FTEs) instead.

[45] *The 100:0 weighting between trend and regression analysis is based solely on Ofgem's trend analysis.*

[46] *The regression analysis used consists of an average of the model-predicted costs of Ofgem's Models 3 and 6 which use RIIO-2 & RIIO-3 as the time period of the analysis. Model 3 uses a CSV (as per Ofgem's preferred model) and Model 6 includes log(MEAV) and log(FTE) as separate variables.*

[47] *The regression analysis used consists of Ofgem's preferred DD model using only forecast data (the final two years of RIIO-2 and the entire RIIO-3 period) and company-submitted FTEs (rather than Ofgem's adjusted FTE forecast).*

2H Ofgem's proposed re-opener for BSC

In its DD, Ofgem proposes introducing a BSC re-opener to address companies' growth beyond what is funded via ex-ante allowances. The re-opener is *"triggered mid-period if both [non-variant] totex and BSC outturn costs are above 15% of allowances."*[48] Ofgem's provides the following justification for a trigger based on non-variant totex:

> *"This is to ensure the BSC re-opener is only triggered after the TO has made all the efforts to efficiently use existing fungible funding, but also to avoid for it not to be triggered because of potential underspend on ring-fenced allowances such as PCDs."*[49]

There are two key issues with the design of Ofgem's proposed re-opener: (a) the trigger is based on 15% overspend on totex; and (b) the trigger is 'mid-period'.

A totex-based trigger means BSC may not re-opened even if material BSC overspends occur

The trigger requires a 15% overspend on totex, in addition to a 15% overspend on BSC. This means a network can exceed 15% of its expected BSC but not trigger a re-opener if its outturn costs in other totex areas are below its allowances. For SPT, a totex overspend of £238m would be required to trigger the BSC re-opener.[50] Notably, this required overspend is broadly the same as SPT's DD allowance for BSC.[51] In other words, if SPT did not overspend on *non-BSC* totex it would need to spend *double* its BSC allowances to trigger the BSC re-opener. While we understand Ofgem's intention is to ensure networks make efforts to use existing funding from their overall allowances, Ofgem risks creating perverse incentives. Specifically, networks' cost efficiencies in other cost areas could offset BSC overspends and prevent the re-opener from being triggered. That is, networks which expect to significantly overspend on BSC may (at the margin) have lower incentives to limit overspending in other cost areas.

A simple alternative trigger is to set the trigger based purely on BSC, i.e., exceeding a set threshold of BSC allowances. To ensure companies make efficient use of their other allowances, Ofgem could set BSC overspends net of underspends in a set of specific cost categories (such as other indirect cost areas). That is, using, e.g., companies' indirect cost allowances as the trigger metric, rather than the entirety of totex. Consequently, this should mitigate the extent of any perverse incentives created.

A 'mid-period' re-opener creates uncertainty for companies

A re-opener that occurs mid-period will mean that companies must wait until later in the price control to receive additional allowances to recover higher-than-expected efficient costs. This creates uncertainty for networks in terms of: (i) how higher-than-expected efficient costs will be assessed; and (ii) the extent to which higher-than-expected efficient costs will be recovered. This uncertainty could create delivery risks for networks if they are unable to access the required funding for critical investment projects, or require them to re-allocate funds from other areas, which will have wider consequences for the business. Furthermore, we note a single mid-period re-opener could also be

[48] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.142.*

[49] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); footnote 85.*

[50] *We calculate this figure as 15% of SPT's DD proposed totex of £1,589m.*

[51] *SPT is allowed £236m for BSC at DDs.*

too late for networks which expect to incur the majority of their BSC toward the end of RIIO-3, leaving them without a re-opener mechanism to recover any higher-than-efficient costs.

As an alternative, Ofgem should consider having more regular windows for companies to submit applications for re-openers. For example, the CSNP-F re-opener is 'authority triggered' with windows for applications open twice a year.[52] Ofgem should also re-consider an 'automatic' mechanism based on, for example, key drivers of BSC such as FTE and capex. This could involve the provision of allowances if set thresholds of growth in FTEs/capex above company forecasts are exceeded. This more flexible approach avoids the need to set a specific re-opener period.

[52] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 4.124.*

3

CAI

This chapter sets out: (i) Ofgem's DD approach to setting the efficient CAI for ET networks; (ii) key issues with Ofgem's approach; and (iii) our proposed remedies.

3A Chapter structure

The structure of this chapter is as follows:

- **First**, we set out an overview of Ofgem's DD approach for CAI.
- **Second**, we set out each of the key issues with Ofgem's CAI approach (and the associated remedies for each issue).

3B Overview of Ofgem's DD approach for CAI

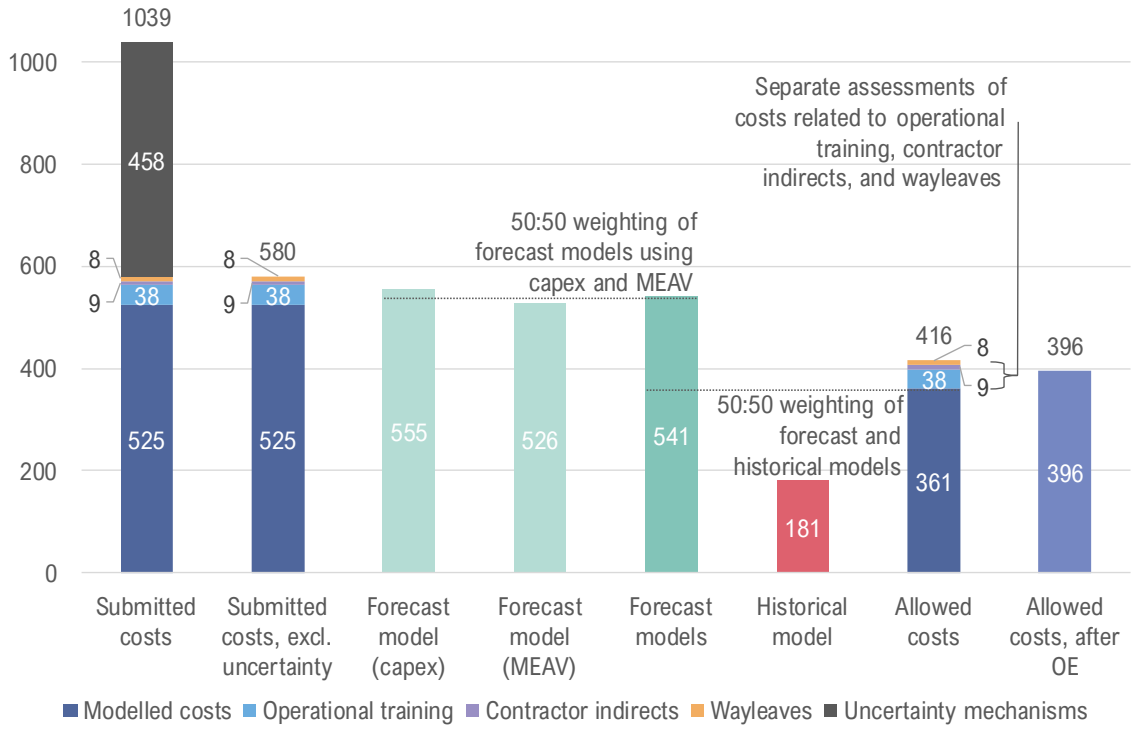
Ofgem sets its proposed allowance for SPT's CAI in several steps, as shown in Figure 4 below. Specifically, its assessment consists of:

- Modelled costs of £361m which is based on an equal weighting of: (a) model-predicted costs from an industry-wide regression models based on the historical outturn period (£181m); and (b) model-predicted costs from two ratio benchmarking models using forecast data (£541m).
    - Ofgem's historical model consists of a single econometric benchmarking (pooled OLS) model which uses outturn data for the ET sector (2013/14–2023/24). We set out further details of Ofgem's CAI model in the Annex.
    - Ofgem's forecast approach consists of averaging across two 'ratio benchmarking' models which: (i) calculate SPT's the average (median) ratio of its CAI to a cost driver; and (ii) applies the ratio to SPT's forecast of said cost driver. Ofgem uses this approach for two cost drivers (capex and MEAV) and takes an average of the model-predicted costs (£555m and £526m, respectively).
- Separate assessments for operational training (£38m), contractor indirects (£9m) and wayleaves (£8m).
    - Operational training is assessed separately based on Ofgem's consideration of the quantitative and qualitative evidence, and submitted costs are allowed in full.
    - Contractor indirects are assessed separately, applying the same efficiency challenge that is applied to load and non-load capex.[53]
    - Wayleaves are assessed using a qualitative assessment, with submitted costs allowed in full.[54]
- An adjustment for OE of 1% per annum (−£20m). This simply set as Ofgem's chosen OE target for the RIIO-3 period.

Overall, Ofgem's DD assessment results in SPT being subject to a disallowance of £185m (32%) compared to its submitted CAI.

[53] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.121.*
[54] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.145.*

Figure 4: Ofgem's approach to setting SPT's allowed CAI in the RIIO-3 DD (£m, 2023/24 prices)



Source: Economic Insight analysis.

Note: 'Uncertainty mechanisms' also includes costs labelled 'non-baseline', 'crossover', 'ASTI', 'UIOLI', and 'VD'.

3C

Issue 1: Ofgem equally weights (historical) regression and (forecast) ratio benchmarking CAI models

As with BSC, Ofgem sets each company's CAI allowances by equally weighting modelled costs from its regression model (which uses outturn data) and its ratio benchmarking models (which use forecast data for RIIO-3). As set out in the preceding chapter, a balanced view, does not necessarily imply assigning equal weight to each. Instead, how much weight to assign to each piece of evidence depends on how reliable it is likely to be as a basis for estimating future efficient costs.

- **Historical data may no longer provide a reliable basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past.** There are good reasons to expect external cost drivers to have changed significantly between RIIO-2 and RIIO-3. For example, SPT state the increase in CAI is the result of *"increased indirect activities required to support the increased volume of work for SPT from connections, ASTI, the HND, tCNSP2, the Strategic Spatial Energy Plan and other RIIO-T3 investment"*.[55] SPT note an important driver of its RIIO-3 costs is *"the increasing complexity of processes with connection reform including additional interactions between SPT and the Department of Energy Security and Net Zero*

[55] *'Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan'. SP Energy Networks (November 2024); page 46.*

(DESNZ), their Mission Control department, the National Electricity System Operator (NESO), and Ofgem."[56]

- **Cross-company comparisons will be unreliable when important cost drivers cannot be controlled for.** The historical CAI regression model controls for scale (as measured by capex and MEAV), but cannot control for other differences, such as those in network characteristics, investment timing and operating environments. These factors are likely to be especially important drivers of CAI in RIIO-3. Network-specific forecasts are therefore likely to provide a more robust basis for estimating efficient costs at RIIO-3.

- **Consistent with these observations, we note that Ofgem's regression model estimates efficient CAI for SPT of £181m.** This represents a disallowance of 66% of SPT's submitted costs and is much lower than Ofgem's ratio benchmarking approach estimate of £541m.[57] Such a large discrepancy between the model-predicted costs and SPT's requested costs (as well as predicted costs from the forecast model) calls into question the plausibility of Ofgem's historical regression model and necessitates further investigation. As with BSC, we note Ofgem does not acknowledge this discrepancy in its DD.

3D Remedy 1: Place greater weight on CAI forecast evidence

As with BSC, Ofgem should increase the weight to attaches to forecast evidence. Again, in principle Ofgem could do so by: (a) placing greater weight on its ratio benchmarking CAI models, which are based on forecast data, relative to its historical regression model; and/or (b) incorporating forecast data into its regression model.

As we set out in section 3E, there are further issues with the inclusion of a negative and statistically insignificant time trend in the regression model, which interact with the time period of the model. In this section we therefore set out the implications of placing greater weight on the ratio benchmarking models, and in the next section we set out the implications of incorporating forecast data into the regression model, alongside our analysis of the time trend.

As we further explain in section 3F, our analysis indicates that, in practice, the extent to which forecast data for RIIO-3 can be incorporated into the CAI regression model while retaining intuitively signed, statistically significant explanatory variables is limited. As such, placing greater weight on ratio benchmarking models for CAI is the primary option for making greater use of forecast evidence in this case. The fact that the CAI model is not robust to changes in its time period to the inclusion of RIIO-3 data itself calls into question its utility as a basis for assessing efficient future costs. However, we find the inclusion of *RIIO-2* forecast data combined with the removal of the linear time trend *does* result in a model that, overall, performs similarly to Ofgem's DD model on the available measures of model performance.

Table 10 shows how SPT's modelled CAI changes when greater weight is placed on the forecast modelling. As discussed in Chapter 2, there is regulatory precedent to adjust the weightings to reflect the strength of the available evidence. For example, as part of RIIO-ED1, Ofgem gave a 75% weighting to a qualitative assessment and a 25% weighting to quantitative assessment. Increasing the weight

[56] *'Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan'. SP Energy Networks (November 2024); page 47.*

[57] *Disallowance calculated as the difference between Ofgem's predicted costs from its historical regression and SPT's submitted costs (excluding separately assessed areas).*

attached to forecast models to 75% implies a £90m increase in SPT's modelled costs to £451m, while relying fully on forecast models implies a £180m increase to £541m.

As noted in the previous section, there are strong reasons to place a 100% weighting on models using forecast data. This is because historical data may no longer provide a reliable basis to assess the efficiency of future expenditure plans, where the future is expected to be different to the past. For example, SPT expects there to be increased indirect activities with greater complexity relative to RIIO-2.

Table 10: SPT's modelled CAI costs under different forecast versus historical modelled cost weightings (before OE)

	Modelled CAI before adjustments
Historical model	£181m
Forecast model	£541m
50:50	£361m (DD)
75:25	£451m (+90m)
100:0	£541m (+£180m)

Source: Economic Insight analysis.

Note: The £361m figure is Ofgem's DD modelled BSC (which averages the modelled cost of its forecast and historical approaches) before the inclusion of costs for separately assessed components.

3E

Issue 2: Ofgem includes a negative and statistically insignificant time trend in its CAI model

Ofgem states that its approach to developing its econometric models as having *"been guided by economic and engineering rationale, statistical robustness, and relevance to the activities being assessed."*[58] We do not consider that this characterisation applies to Ofgem's decision to include a linear time trend term in its historical CAI model.

- **The linear time trend in Ofgem's DD model is negative.** Ofgem estimates a coefficient of *minus* 0.04 on the linear time trend. This suggests CAI cost have fallen over the 2013/14–2023/24 period – and Ofgem assumes that this will continue indefinitely into the future. In terms of modelled costs, the time trend implies a 4% per annum reduction in CAI over RIIO-3, and a £107m reduction in model-predicted costs for SPT over the RIIO-3 period.[59]

- **Applying a historical time trend to a forecast period is an unjustified modelling decision.** Ofgem has not provided any economic or engineering rationale to support why it expects CAI to decrease each year over the RIIO-3 period. Indeed, Ofgem has noted that it does not expect

[58] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph A2.5.*

[59] *We estimate this as the difference in model-predicted costs to a version of the CAI model excluding the linear time trend.*

historical cost relationships/trends to apply in future; and that forward-looking pressures, such as increasing FTEs or operational expansion *"are not visible in historical data"*.[60] Furthermore, extrapolating negative time trends (e.g., historical cost reductions) into the future to predict decreases in costs has been found to be unreliable when tested in court in the context of damages litigation.[61]

- **Conceptually, it is not clear how the negative time trend is different to OE.** In principle a negative time trend in a cost model could be interpreted as representing ongoing productivity improvements. However, this directly overlaps with Ofgem's post-modelling adjustments for OE which *"reflects the productivity improvements that [Ofgem] consider even the most efficient company can achieve"*.[62] We note that Ofwat has previously raised concerns that *"the time trend may interact with our separate frontier shift assumptions and as a result introduce unnecessary complexity".*[63]

- **The cost reductions implied for the forecast period using Ofgem's historical time trend are not plausible.** We do not consider the assumed 4% per annum reduction in CAI is credible in terms of its magnitude, especially given Ofgem's separate post-modelling adjustment for OE – which already aims to account for cost efficiencies – of 1% per annum. Overall, the time trend and the OE challenge together imply companies are expected to reduce their CAI by approximately 5% each year, well in excess of even the most optimistic estimates for future potential productivity growth. We previously published analysis which concluded the plausible range of OE at RIIO-3 will between 0.2% to 0.8%.[64]

- **Including a time trend which is statistically insignificant is inconsistent with Ofgem's model selection process.** Ofgem's general model selection process is to exclude any insignificant explanatory variables.[65] The linear trend term has a p-value of 0.28, i.e., there is a 28% chance of observing a coefficient as high if there is no true time trend. This does not satisfy the conventional thresholds of statistical significance and suggests the estimated (negative) relationship between the time trend and CAI costs could simply be driven by random variation in the data.

Furthermore, we note that including a linear time trend is: (a) a departure from Ofgem's RIIO-2 model; and (b) also inconsistent with Ofgem's econometric approach for BSC at RIIO-3.[66]

[60] *'RIIO-3 Draft Determinations – Electricity Transmission'. Ofgem (July 2025); paragraph 5.100.*
[61] *'Granville Technology Group Limited and others v LG Display Co. Ltd and others'. [2024] EWHC 13 (Comm); paragraph 69.*
[62] *'RIIO-3 Draft Determinations – Overview Document'. Ofgem (July 2025); paragraph 8.22.*
[63] *'Assessing base costs at PR24'. Ofwat (December 2021); page 32.*
[64] *'Ongoing efficiency for gas networks at RIIO-3'. Economic Insight (October 2024).*
[65] *We note that the inclusion of a statistically insignificant variable can be justified if there is a strong economic rationale for its inclusion, and that its magnitude accords with this rationale. On the other hand, there are good reasons to favour parsimonious models, given the limited number of data points available in this case.*
[66] *We find that the inclusion of a linear time trend in Ofgem's BSC model also results in a statistically significant (albeit positive) coefficient.*

3F Remedy 2: Ofgem should remove the linear time trend from its regression model

If Ofgem retains use of the historical CAI regression model in its approach, it should remove the linear time trend from its model.[67] As set out above, including forecast data is one option, alongside attaching greater weight to the CAI ratio benchmarking models, for placing more emphasis on forecast data when assessing CAI for RIIO-3. We have therefore analysed the impact of removing the time trend, alongside other changes to the regression model's time period.

Table 11 shows the results of Ofgem's DD model with: (i) exclusion of the linear time trend; and/or (ii) inclusion of additional years of forecast data in the model.

- Excluding the time trend from Ofgem's regression model while retaining the use of outturn data only (2013/14–2023/24) results in a statistically *insignificant* capex cost driver, which is counter to economic rationale, and would fail Ofgem's model selection criteria.

- Excluding the time trend *and* including the final two years of RIIO-2 produces a model that, overall, performs similarly to Ofgem's DD model on the available measures of model performance, but avoids the problems associated with a negative and statistically insignificant time trend.[68] The model has statistically significant and correctly signed cost drivers and a high adjusted R-squared, and passes diagnostic tests regarding heteroscedasticity of residuals and functional form misspecification (RESET). While the adjusted R-squared is slightly lower than Ofgem's DD model, it is important to note: (i) 0.859 still represents a very high R-squared; and (ii) this measure of model fit should not solely drive model choice. This alternative model estimates CAI to be £119m higher than Ofgem's DD model.

- Including the entire sample of data, i.e., incorporating all available forecast data also results in substantially greater modelled allowances (£171m more than Ofgem's DD model). However, the capex cost driver is not statistically significant in this specification.

In addition to the models set out in Table 11, we have also examined versions of the CAI regression model based only on forecast data. In practice, the cost drivers in these models were not appropriately signed and/or statistically significant.

[67] *We note this remedy is not required if the ratio benchmarking approach is given a 100% weighting, in which case no adjustment is necessary.*

[68] *We note extending time period alone (whilst keeping the time trend) also results in failing on key selection criteria e.g., a statistically insignificant capex cost driver as shown in Table 11.*

Table 11: Impact of linear time trend and modelling period on Ofgem's CAI historical model

	Ofgem's DD model	Adjustments made to Ofgem's DD model			
		Remove time trend	Include RIIO-2 forecast data	Remove time trend; include RIIO-2 forecast data	Remove time trend; include all forecast data
Time period	2013/14–2023/24	2013/14–2023/24	2013/14–2025/26 (RIIO-1 & RIIO-2)	2013/14–2025/26 (RIIO-1 & RIIO-2)	2013/14–2030/31 (RIIO-1, RIIO-2 & RIIO-3)
Time trend	Yes	No	Yes	No	No
Statistically significant and correctly signed cost drivers?	× (Time trend is insignificant.)	× (Capex variable is insignificant.)	× (Capex variable and time trend are insignificant.)	✓	× (Capex variable is insignificant.)
Log(capex)	0.154*	0.118	0.181	0.190*	0.209
Log(MEAV)	1.014***	1.032***	0.967***	0.961***	0.649*
Time trend	−0.042	—	0.006	—	—
Constant	−5.688***	−5.901***	−5.614***	−5.573***	−2.764*
Adjusted R-squared	0.920	0.898	0.855	0.859	0.630
RESET	0.491	0.667	0.193	0.728	0.050
Heteroscedasticity	0.421	0.601	0.795	0.805	0.041
Normality	0.064	0.821	0.796	0.823	0.201
SPT model-predicted costs	£181m	£288m	£319m	£300m	£351m
Change in model-predicted costs relative to DD model	—	+£107m	+£138m	+£119m	+£171m
Impact on final CAI after 50:50 weighting applied	—	+£53m	+£69m	+£60m	+£85m

Source: Economic Insight analysis.

3G Summary of proposed remedies

In summary, we recommend that:

- Ofgem should increase the weight it attaches to CAI forecast evidence by placing more weight on its ratio benchmarking models.
- Ofgem should remove the time trend from its CAI regression model and include RIIO-2 forecast data.

The table below summarises the impact of the remedies outlined above on SPT's modelled CAI allowances (before including separately assessed costs and adjustments for OE).

- Placing more weight on ratio benchmarking implies higher modelled CAI. For example, for Ofgem's preferred CAI model (shown in column 1), a 75:25 weighting between ratio benchmarking and its regression analysis implies a modelled CAI of £451m (a £90m increase relative to modelled CAI allowances in Ofgem's DD). A 100:0 weighting (i.e., placing full weight on ratio benchmarking and no weight on the regression model) implies modelled CAI of £541m (a £180m increase relative to Ofgem's DD modelled CAI).
- Excluding the time trend implies higher modelled CAI relative to Ofgem's DD model. For Ofgem's preferred 50:50 weighting between ratio benchmarking and its regression analysis (as shown in the first row), removing the linear time trend from Ofgem's model (as shown in column 2) implies modelled CAI of £414m (a £53m increase relative to Ofgem's DD modelled CAI). A 75:25 weighting excluding the time trend would result in a £117m increase in modelled CAI relative to Ofgem's DD approach. Combining the removal of the time trend with the additional RIIO-2 forecast data (as shown in column 3) increases modelled CAI further – a 50:50 weighting implies modelled CAI of £420m, a £60m increase compared to Ofgem's DD modelled CAI.

Table 12: Impact of remedies on SPT's modelled CAI allowance (excluding separately assessed areas and before OE)

Weighting between ratio benchmarking and regression analysis	Timeframe and specification for regression analysis		
	(1) Historical data, linear time trend (Ofgem's DD model)	(2) Historical data, no time trend	(3) Historical data and RIIO-2 forecasts, no time trend
50:50	£361m (±0m)	£414m (+53m)	£420m (+60m)
75:25	£451m (+90m)	£477m (+117m)	£480m (+120m)
100:0	£541m (+180m)	£541m (+180m)	£541m (+180m)

Source: Economic Insight analysis.

4

ANNEX

4A Overview of Ofgem's DD modelling approaches

The table below details Ofgem's modelling approaches for each of its historical/forecast models for BSC/CAI.

Table 13: Overview of Ofgem's modelling approaches for indirect costs in the RIIO-3 DD

	Indirect costs	Modelling approach	Implied efficiency benchmark
Historical (regression) models	BSC	Pooled OLS model with a composite scale variable (CSV) as the cost driver and a gas transmission (GT) sector dummy variable. The CSV consists of a weighting of totex (9%), FTE (11.5%) and MEAV (79.5%).[69]	Average (mean) ET company's costs over 2013/14–2023/2024.[70]
	CAI	Pooled OLS model with capex and MEAV as cost drivers and a linear time trend.	Average (mean) ET company's costs over 2013/14–2023/2024.
Forecast models	BSC[71]	'Trend analysis': 2026 BSC projected forward by annual FTE growth. Where FTE growth is calculated as the year-on-year change in company-submitted FTE forecasts. We note this is equivalent to a unit cost approach.[72]	SPT's costs in 2025/26.
	CAI	50:50 weighting of two 'ratio benchmarking' approaches: (i) median CAI/capex ratio multiplied by the capex forecast; and (ii) median CAI/MEAV ratio multiplied by the MEAV forecast.	Median of SPT's costs over RIIO-3.

Source: Economic Insight analysis.

[69] This uses Ofgem's formula weighting used at RIIO-ET2 to link the various subcategories of BSC to its view of the most relevant drivers.

[70] While the model includes GT data, the inclusion of a GT sector dummy effectively means the efficient benchmark is set based only on the average ET company.

[71] Insurance-related BSC are assessed separately and use ET sector-wide data, specifically the median unit cost (with respect to network length) over RIIO-3.

[72] We note this approach is equivalent to the 2026 BSC unit cost (per FTE) multiplied by the FTE forecast.

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