RIIO-T2 cost of debt and financeability assessment

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Executive summary

Scottish Hydro Electric Transmission plc (SHE-T) has asked Oxera Consulting LLP (Oxera) to provide scenario analysis of different options for the cost of debt index against the forecast cost of debt for SHE-T in RIIO-2. We have also been asked to undertake an assessment of the financeability of the SHE-T business plan.

Cost of debt assessment

For the cost of debt assessment, the 11–15-year trombone average proposed in the Sector Specific Methodology Decision (SSMD) document[1] is modelled under the base case, high, and low interest rate scenarios for RIIO-T2. Alternative specifications of the cost of debt index are also modelled. These allowances are compared against the forecasts of the 'all-in' cost of debt for SHE-T to estimate the average funding impact in RIIO-2 (estimated as the £m difference between the actual and the allowed cost of debt).

The all-in cost of debt is composed of debt raised prior to RIIO-2, new debt issued during RIIO-2, and the associated costs (i.e. issuance costs, cost of carry, the premium for issuing nominal vs real debt, and the premium for issuing bonds rated BBB+ instead of issuing A/BBB simple average bonds). These costs have been provided to us by SHE-T and amount to around 40–60bp.

The main findings from our analysis of the cost of debt are as follows.

- The analysis based on the cost of **debt issued by SHE-T** shows that implementing a simple 15-year trailing average would provide an increase in funding relative to the 11–15-year trombone average but is less likely to underfund the all-in cost of debt for SHE-T over RIIO-T2.
- The analysis based on the embedded debt costs that would have been incurred by a **notional company** that had issued longer term debt (20-year tenor) in RIIO-T1 shows that the 11–15-year trombone average underfunds the all-in cost of debt in the high interest rate scenario and provides only a marginal coverage of debt costs in the base case.

Moreover, moving to a longer averaging period may also encourage the issuance of longer-term bonds.

Financeability assessment

We assess the financeability of both the **notional** and the **actual** company.

- The **notional** company is assessed by assuming that the allowed cost of debt equals the actual cost of debt, which is modelled using Ofgem's proposed 11–15-year trombone and by assuming that 25% of the company's debt is index-linked (linked to CPIH). The notional company is also assumed to have a dividend yield of 3%.
- The **actual** company is assessed based on SHE-T's expected actual cost of debt in RIIO-2 where cost of new debt is modelled based on the projected 1-year average interest rates on A/BBB iBoxx indices and other issuance

[1] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May.

costs (40–60bp) instead of the allowed trombone.[2] The net debt to RAV remains constant at 60% throughout RIIO-2 for the actual company.

Our financeability analysis is based on the SHE-T financial model under a **base TOTEX** scenario and a **high TOTEX** scenario, informed by Ofgem's working assumptions. We consider the impact on the financeability metrics when these assumptions are varied (Ofgem and SHE-T sensitivities) and model the potential actions for addressing the financeability constraints.

The main findings from our financeability analysis for the notional and the actual company at a 4.3% CPIH-real equity return (i.e. assuming no outperformance) are as follows.

- **Key financeability metrics for the notional and the actual company leave little headroom above the minimum investment-grade threshold guidance of the credit rating agencies**. In particular, we note that the modelling of the AICR on a notional company basis, at around 1.15x and the actual company at 1.27,[3] is below Fitch's guidance threshold of 1.5x to 1.75x for BBB and A ratings, respectively. It is also below Moody's recent guidance on the threshold range for a Baa2 rating (i.e. below 1.2x).[4]

- Oxera analysis previously provided to Ofgem has demonstrated that the differential between the asset and debt risk premia that is implied by the SSMD is low relative to estimates of this differential based on a large sample of bonds issued by UK utilities.[5] Specifically, the middle of the CAPM-implied range in the SSMD (before making the adjustment for expected versus actual returns),[6] is around the 25th percentile of the distribution. This is one of the main reasons why the notional company would have credit metrics consistent with a Baa3 rating.

- Given the size of the SHE-T capital programme in RIIO-2 and the corresponding forecast growth in the RAV, the implied dividend yield is **below** Ofgem's working assumption of 3% for the notional company. **The equity issuance required to maintain a notional dividend yield of 3% and a gearing of 60% would be around £340m**.[7] This is in excess of 20% of the current equity value[8] and would put further pressure on the credit ratios.

- Changes to the asset life assumption are ineffective in materially alleviating pressure on gearing or interest coverage ratios.[9] Revising the capitalisation rate to generate an AICR of 1.4x, in line with the minimum for the current Baa1 guidance threshold, would require the capitalisation rate to be reduced

[2] We understand that Ofgem's Price Control Financial Model (PCFM) assumes that new debt is raised at the RIIO-T2 trombone, which is higher than the current market data on iBoxx A/BBB indices. We note that our disaggregated 'all-in' cost of debt approach better approximates the actual cost of raising new debt in the RIIO-2 period.
[3] The actual company AICR of 1.27 is based on a cost of debt assumption of 1-year average A/BBB indices for the cost of new debt and does not include the impact of transaction and other costs (ranging from 40–60bp). When these additional costs are considered, the AICR for the actual company ranges from 1.13 to 1.19, below Moody's' target Baa2 credit rating threshold.
[4] Moody's (2018), 'Regulated electric and gas networks – UK. Risks are rising, but regulatory fundamentals still intact', 29 May, p. 4.
[5] Oxera (2019), 'Risk premium on assets relative to debt,' 25 March.
[6] See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, Table 9.
[7] Note that increasing gearing from 55% in RIIO-1 to 60% in RIIO-2 implies that the company would pay an additional one-off re-gearing dividend in the last year of RIIO-1.
[8] Estimated as £340m divided by £1,573m closing equity RAV as of March 2019/20.
[9] Regarding gearing, this is because debt costs are driven by the maintenance of a constant notional gearing ratio in line with the RAV growth projected by SHE-T. Regarding interest coverage, this is because changes to the asset life assumption for depreciation would be reflected in the calculation of the FFO but then offset by a revised estimate of RAV depreciation within the numerator for the AICR (or PMICR) ratio.

from 90% to 86%. However, the credit rating agencies may 'look through' adjustments that are NPV-neutral, such as modifying the capitalisation rate and the depreciation profile. Therefore, the efficacy of reducing the capitalisation rate in order to improve rating agency assessments of credit-worthiness is questionable.

- Moreover, the 86% capitalisation rate will not generate an AICR of 1.4x in a scenario with a 0% index-linked debt assumption (AICR is 1.13x in this scenario). The sensitivity of a 0% index-linked debt assumption for the notional company is shown because a +/-5% sensitivity to the 25% CPI-linked debt assumption does not reflect the range of different debt structures present in the energy sector and the uncertainty about the availability of new CPI-linked debt.

- A reduction in gearing to 55% (RIIO-1 level) is also not effective in achieving the 1.4x target threshold. The notional company with a gearing of 55% and 25% index-linked debt has an AICR of 1.32x. If 0% index-linked debt is assumed for the notional company, then the AICR is even lower at 1.14x.[10] The AICR for the actual company with a gearing of 55% varies between 1.34x and 1.46x depending the additional cost of debt uplift (40–60bp) varying around Moody's' target threshold of 1.4x for a Baa1 credit rating.[11]

- A combined scenario with a 55% gearing assumption and an 86% capitalisation rate improves the credit metrics, assuming that rating agencies do not look through these adjustments. AICR for the notional company with 25% index-linked debt is 1.59x (a solid Baa1 rating), and that for the actual company varies between 1.62x and 1.66x (in line with an A3 rating).

- Another scenario that shows a significant improvement in the financeability testing is to increase the cost of equity to the 6.5% (CPIH-real) allowance assumed in SHE-T's business plan, which results in an AICR of 1.57x for the notional company with 25% index-linked debt, slightly below a Moody's A3 rating and ranges between 1.59x and 1.64x for the actual company when 40–60bp additional borrowing costs are included.

- The CPIH transition has a significant positive cash flow impact in RIIO-2 due to higher cash flows from a higher return allowance (due to a higher cost of capital expressed in CPIH terms), relative to RPI indexation. Absent the CPIH transition, the notional company's financeability metrics would be under significantly more pressure. If, instead, the credit rating analysis was undertaken using a cost of capital stated in RPI-deflated terms and RPI indexation was retained in relation to the indexation of the RAV, we estimate that a 7.0% cost of equity (CPIH-real), 5.89% (RPI-real) would be required to raise the AICR to 1.15x, consistent with the notional company under CPIH indexation. As this leaves little headroom above the minimum investment-grade threshold, further mitigating action would be required (i.e. reducing gearing and/or reducing the capitalisation rate). While the transition to CPIH improves revenues in the short term (relative to RPI indexation), and hence financeability metrics, it would be expected to reduce them in the long term, all else being equal. The long-term implications for financeability therefore need to be considered.

[10] This is at a gearing assumption of 55%.
[11] While the gearing is reduced to 55%, the cost of equity is held constant at 4.3% CPIH-real, consistent with how Ofgem addressed financeability constraints in RIIO-1. If the cost of equity had been re-calibrated at a 55% gearing, the credit metrics may not improve with a change in gearing.

- In the high TOTEX scenario, the AICR ratio for both the notional and actual company is higher. This is because the increase in fast money in the high TOTEX scenario is not being offset by the RAV depreciation (proxy for maintenance CAPEX used in the numerator of the AICR), putting an upward pressure on the metric. However, SHE-T is experiencing RAV growth in RIIO-2 (i.e. it is not in steady state as per the notional company assumption), and the RAV depreciation may not be a good proxy for maintenance CAPEX. If RAV depreciation is lower than maintenance CAPEX, the notional company AICR by design will be higher under a higher TOTEX (RAV growth) scenario. Given that SHE-T also has a growing RAV in the base case scenario, this would imply that the estimated AICR of 1.15x is an overestimate of the likely AICR.

- We have considered the credit metrics analysis undertaken by Ofgem in relation to the notional electricity transmission company in RIIO-T2, as reported in the SSMD. For this preliminary, high-level, financeability assessment, Ofgem uses the economic form of the ratios,[12] rather than the accounting form, where the accounting form is consistent with credit rating agencies' methodologies, as well as Ofgem's financeability guidance[13] (see Appendix A2 for details). We have been able to broadly replicate the economic form of the ratios that Ofgem has derived.[14] This shows that the average ratios for RIIO-2 using the economic form are higher than those using the accounting form.[15] Our analysis focuses on the accounting form of the metrics based on actual business plan information provided by SHE-T.

- We also assess the financeability of the notional and the actual company using the SSMD estimate of the expected equity return of 4.8% (real, CPIH) assuming 50bp of outperformance. Under SHE-T's base case TOTEX profile, the notional company with 25% index-linked debt achieves a Baa2 credit rating and the AICR improves to 1.25x. The actual company AICR improves to 1.38x, marginally below the threshold for a Baa1 credit rating (1.40x) when additional borrowing costs are not included. With the inclusion of 40–60bp transaction and other borrowing costs, the AICR of the actual company varies between 1.26x and 1.29x. Both the notional and the actual company comfortably achieve a Baa1 credit rating under SHE-T's higher TOTEX profile, but as stated earlier, the increase in AICR metric is likely to be due to the mismatch in RAV depreciation and maintenance CAPEX.

- Lastly, we consider the financeability of the notional and the actual company using the cost of equity of 6.5% (real, CPIH) from the SHE-T business plan. A Baa1 credit rating or higher is attained under both the notional and the actual company under the base case TOTEX profile with an AICR of 1.57x for the notional company with 25% index-linked debt and an AICR ranging from 1.59x to1.64x for the actual company based on a 40–60bp additional

[12] Ofgem stated in the SSMD: 'We come to this view having conducted an extracted [sic] high-level analysis of some of the key credit ratios based on a sector average notional company using the working assumptions set out in this decision document and the economic form of the key ratios as shown in Table 13.' See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, para. 4.39.
[13] Ofgem (2019), 'Financeability Assessment for RIIO-2: Further Information', 26 March.
[14] For example, the economic form of the average RIIO-2 AICR for the notional company using SHE-T's financial model is 1.51x (which is similar to Ofgem's estimate of 1.48x—the difference of 3bp stems from the decline in the market cost of debt in the last six months, the cut-off date of our analysis is 31 October 2019). This includes Ofgem's 50bp outperformance wedge to facilitate comparison between the metrics. For avoidance of doubt, we do not agree with the inclusion of Ofgem's expected 50bp outperformance wedge within the cost of equity allowance, when modelling the base case credit metrics.
[15] This likely difference had been acknowledged by Ofgem, which stated in the SSMD that: 'In practice the key credit ratios are calculated from accounting information, may be subject to individual rating agencies' adjustments and will be influenced by the impact of incentives, timing, movements in working capital, actual company capital structures and actual debt costs.' See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, para. 4.39.

borrowing costs assumption. The transition to SHE-T's higher TOTEX profile increases the AICR for both the notional and the actual company, but as stated earlier, the increase in the AICR metrics is likely to be due to the mismatch in RAV depreciation and maintenance CAPEX.

1 Introduction

Scottish Hydro Electric Transmission plc (SHE-T) has asked Oxera Consulting LLP (Oxera) to provide scenario analysis of different options for the cost of debt index against the forecast cost of debt for SHE-T in RIIO-2. We have also undertaken an assessment of the financeability of the SHE-T business plan.

The report is structured as follows.

- Section 2 provides scenario analysis of different options for the cost of debt index against the forecast cost of debt for SHE-T in RIIO-2.
- Section 3 provides our review of the financeability of the SHE-T business plan, on a notional company basis.
- Appendix A1 presents supplementary data relating to the cost of debt analysis.
- Appendix A2 provides supplementary data relating to the financeability analysis.

2 Cost of debt assessment

This section provides scenario analysis of different options for the cost of debt index against the forecast cost of debt for SHE-T in RIIO-2.

2.1 Approach

The 11–15-year trombone average proposed in the SSMD document[16] is modelled under the base case, high, and low interest rate scenarios for RIIO-T2. Alternative specifications of the cost of debt index are also modelled. These allowances are compared against the forecasts of the all-in cost of debt for SHE-T.

The all-in cost of debt is composed of debt raised prior to RIIO-2, new debt issued during RIIO-2, and the associated costs (i.e. issuance costs, cost of carry, the premium for issuing nominal vs real debt and the premium for issuing bonds rated BBB+ instead of issuing A/BBB simple average bonds).

2.2 Main findings

The main findings from our analysis of the cost of debt are as follows.

- The analysis based on the cost of debt issued by SHE-T shows that implementing a simple 15-year trailing average would provide an increase in funding relative to the 11–15-year trombone average but is less likely to underfund the all-in cost of debt for SHE-T over RIIO-T2.
- The analysis based on the embedded debt costs that would have been incurred by a notional company that had issued longer-term debt (20-year tenor) in RIIO-T1 shows that the 11–15-year trombone average underfunds the all-in cost of debt in the high interest rate scenario, and provides only a marginal coverage of debt costs in the base case.

Moreover, moving to a longer averaging period may encourage the issuance of longer-term bonds.

This section is structured as follows.

- Section 2.3 describes the allowed cost of debt mechanisms used in RIIO-T1 and those proposed for RIIO-T2 by Ofgem. We also outline Ofgem's principles for setting the cost of debt indexation mechanism.
- Section 2.4 describes the potential cost of debt mechanisms assessed in this report.
- Section 2.5 details the methodology used to model and evaluate the debt mechanisms outlined in section 2.4.
- Sections 2.6, 2.7 and 2.8 summarise the findings of our quantitative and qualitative debt assessment against Ofgem's cost of debt principles.

2.3 Cost of debt allowance under RIIO-T1 and proposals for RIIO-T2

2.3.1 Cost of debt allowance

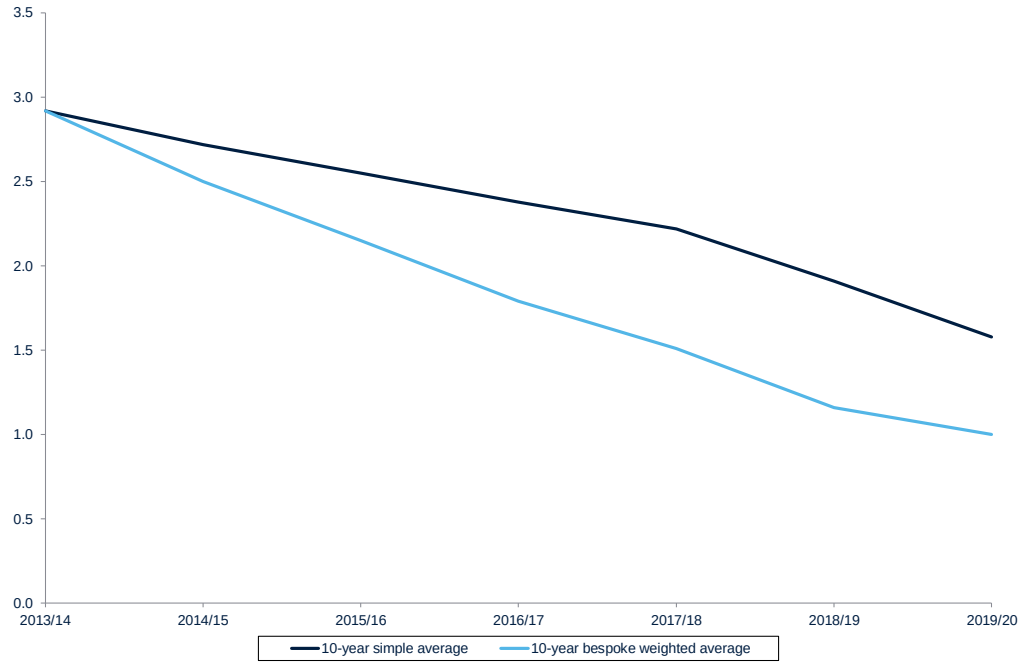
During RIIO-T1, Ofgem used two cost of debt indexation mechanisms: a 10-year simple trailing average; and a 10-year 'bespoke weighted' trailing average. The former was used for Scottish Power Transmission Limited

[16] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May.

(SPTL) and National Grid Electricity Transmission (NGET), while the latter was used for SHE-T (see Figure 2.1).

The reasoning behind SHE-T having a 'bespoke weighted' trailing average was to reflect the substantial growth in SHE-T's RAV over RIIO-T1. It was considered that this bespoke weighting would more accurately reflect the SHE-T cost of debt due to the company's greater reliance on new debt and significant RAV growth.[17]

Figure 2.1 Ofgem 10-year simple average cost of debt and 10-year bespoke weighted average cost of debt during RIIO-T1, RPI-deflated (%)



Source: Ofgem cost of debt indexation model, Annual Iteration Process 2018.

For RIIO-T2, Ofgem has proposed using an 11–15-year trombone average for the cost of debt indexation mechanism.[18] This assumption is for illustrative purposes only, to facilitate business plan submissions. Post-business plan submission, when more information is available, Ofgem aims to calibrate the index so that it represents efficient debt costs across the sector.

On potential calibration of the cost of debt allowance, Ofgem notes the following:[19]

> Our intention is to broadly match debt allowances with sector expected efficient debt costs for RIIO-2 through the calibration of the index. There are a number of ways the index could be calibrated to meet this aim, including adjusting the trailing average period, changing the specific iBoxx indices referenced or the weightings of the indices used, and/or providing a 'wedge' for expected sector embedded debt cost differential to the index. The calibration will consider Business Plan information regarding expected volume of new debt to be raised in RIIO-2 and will also consider the efficiency of sector embedded debt. Calibration may exclude inefficiently raised debt and/or complex, unusual or opaque products that would not be contemplated for the notional company.

[17] RIIO-T1 (2012), 'Initial Proposals for SP Transmission Ltd and SHE-T', 20 March, p. 49, para. 5.44.
[18] Ofgem (2018), 'RIIO-2 Framework Consultation', March, p. 119, para. 12.16.
[19] Ofgem (2019), 'RIIO-2 Sector Specific Methodology – Core document', 24 May, para. 12.15.

2.3.2 Principles for assessing the cost of debt indexation mechanism

In the RIIO-2 framework consultation, Ofgem highlighted the following principles for setting the cost of debt indexation mechanism in RIIO-2.[20]

1. The mechanism should allow for recovery of efficiently incurred cost of debt (i.e. consumers should pay only an efficient cost of debt).
2. The indexation mechanism should incentivise companies to obtain the lowest cost financing without incurring undue risk.
3. The mechanism should be simple and transparent while providing adequate protection for consumers.

This report assesses the potential cost of debt mechanisms against these Ofgem principles.

2.4 Potential cost of debt mechanisms

The cost of debt mechanisms modelled are described in the table below. All scenarios are modelled based on a simple average of yields on the nominal iBoxx A/BBB 10-year+ non-financial corporate bond indices. This is not exactly aligned with the target and current SHE-T credit rating of BBB+/Baa1, a factor that is likely to contribute to underfunding of the cost of debt.

Table 2.1 Potential cost of debt indexation mechanisms in RIIO-T2

Cost of debt mechanism	Description
RIIO-T2 trombone	11–15-year trombone starting from November 2011
15-year trailing	15-year trailing average starting from November 2006
Trombone 16–20-year average	16–20-year trombone starting from November 2005
ED1 trombone	10–20-year trombone starting from November 2002 (assumes continuation of ED1 trombone into RIIO-T2)
20-year trailing	20-year trailing average starting from November 2001

Source: Oxera analysis.

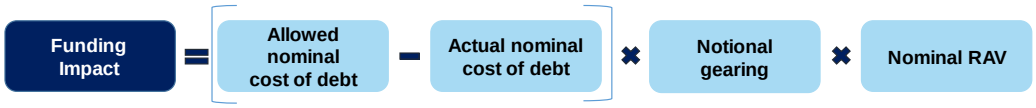
2.5 Methodology used to assess the cost of debt mechanisms

In the draft business plan for RIIO-T2, SHE-T is proposing a 15-year trailing average of yields on A/BBB iBoxx non-financial corporate bond indices.[21]

We have assessed the impact of the proposed SHE-T cost of debt mechanism against a range of alternative mechanisms under several scenarios of future interest rates. The impact is presented as the forecast £m difference in value (i.e. cost of debt * notional gearing * RAV) between the expected allowed and actual costs of debt (as projected in the SHE-T business plan), representing an assessment against the first Ofgem principle; namely, the recovery of efficiently incurred cost of debt (see Figure 2.2).

[20] Ofgem (2018), 'RIIO-2 Framework Consultation', March, p. 78, para. 7.11.
[21] For the cost of debt assessment, SHE-T provided Oxera with the business plan, which included the embedded cost of debt along with the planned profile of refinancing and issuance of new debt to finance CAPEX in RIIO-T2.

Figure 2.2 Measuring the recovery of debt costs (£m, nominal terms)



Note: The expected allowed cost of debt is based on interest rate projections and alternative cost of debt indexation mechanisms. The actual cost of debt represents the bundled effective interest rate of the embedded and new debt. Both cost of debt rates are expressed in nominal terms. The notional gearing working assumption is in line with the Ofgem methodology (i.e. 60% for RIIO-T2). Nominal RAV is estimated as the simple average of the opening RAV and NPV-neutral closing RAV. The latter is estimated using the relevant one-year WACC discounting factor.

Source: Oxera.

The expected allowed cost of debt is based on interest rate projections that are taken as inputs into the various cost of debt indexation mechanisms. The actual cost of debt is based on the cost of embedded debt and the projected cost of new debt raised in RIIO-T2.[22] It is estimated as follows:

$$\text{Actual CoD} = (\text{embedded interest} + \text{interest on new debt}) / \text{total net debt}$$

The interest rate on cash and cash equivalents is assumed to be zero.[23]

In forecasting the cost of debt indexation mechanisms, the following steps are undertaken.

1. The forward curve for 10-year UK gilts is calculated, with a cut-off date of 31 October 2019.
2. The spreads of the iBoxx 10-year+ A and 10-year+ BBB non-financial corporate indices over 10-year UK gilts are calculated for the past year. The average tenor of the bonds in these indices is between 17 and 19 years. The simple average of these spreads is then taken to estimate the spread applicable for the SHE-T credit rating of BBB+.[24]
3. The simple average spread from Step 2 is combined with the forward curve from Step 1 to estimate the future spot cost of debt.
4. This forecast of the spot or prevailing cost of debt—and, where possible, the actual outturn data of the iBoxx 10-year+ A and 10-year+ BBB non-financial corporate indices—is used to forecast the cost of debt indexation mechanisms.

It is our understanding that Ofgem conceptually used a similar approach to forecast the cost of debt indexation mechanism in the RIIO-2 SSMD document.[25]

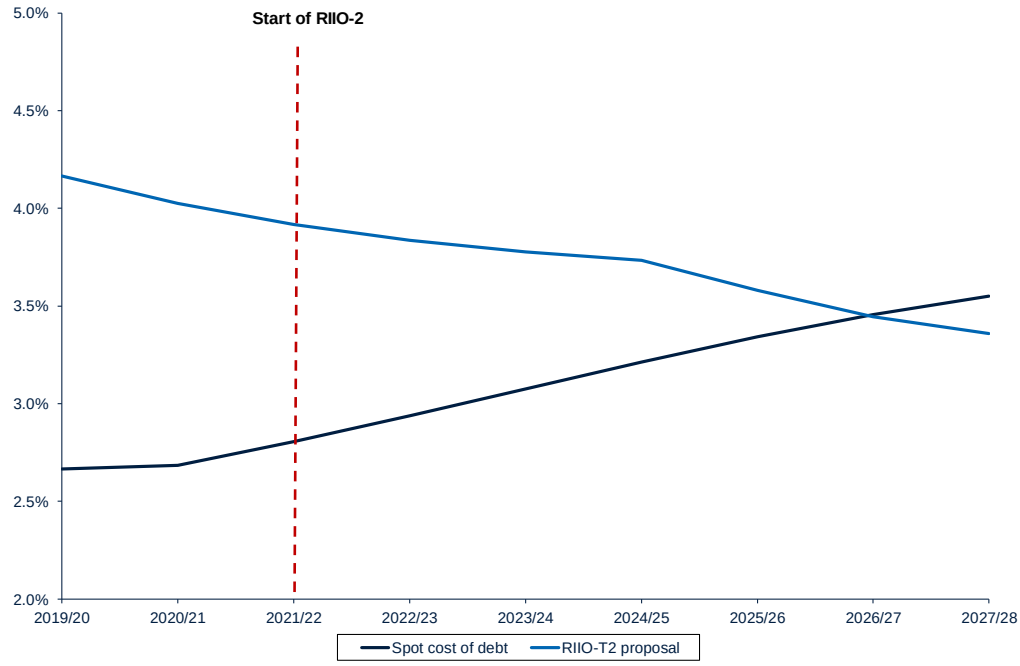
We have also tested the sensitivity of our results to alternative scenarios (high and low interest rate scenarios) for future interest rates. We did this by applying deviations to our forward curve. The high and low scenarios assume a ±25bp increase in interest rates in each year relative to the forward curve starting from October 2020 up to the end of RIIO-T2. This allows us to see the

[22] The issuance profile of new debt is based on data provided to Oxera by SHE-T. We assume that the new debt will be issued at the prevailing market rate based on our forward curve analysis described above.
[23] This is in line with the SHE-T business plan assumption for RIIO-T2.
[24] As noted later in this report, this is not exactly aligned with the [target and/or actual] SHE-T credit rating of BBB+ [or Baa1], which is a factor likely to contribute to underfunding of the cost of debt.
[25] For Ofgem's forecast, see Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, Table 5.

impact of scenarios when debt yields do not follow the same path as predicted by the forward curve.

The results of our forecast for the spot cost of debt and the proposals for RIIO-T2 are shown below. These results are for the base scenario based on the predicted nominal forward curve.

Figure 2.3 Results of forecast for the spot cost of debt and the proposals for RIIO-T2 in the base case scenario



Source: Oxera analysis.

We see from Figure 2.3 that the prevailing or spot cost of debt is forecast to be above the proposed 11–15-year trombone index by the end of RIIO-T2.

In addition to our quantitative analysis, we have undertaken a qualitative assessment of the various debt indexation mechanisms against Ofgem's stated principles.

2.6 Assessment against principle 1: funding of efficient cost of debt

The impacts on funding (£m) in RIIO-T2 under the cost of debt mechanisms in each future interest rate scenario are presented in Figure 2.4 and Table 2.3 below. Positive values indicate that the allowance is forecast to be above the actual cost of debt; negative values indicate that SHE-T is forecast to be underfunded relative to efficiently incurred debt costs.[26]

The analysis presented below takes into account the following costs associated with issuing debt.

1. **New issue premium**—the iBoxx indices are based on yields derived from bonds trading in the secondary market, whereas investors in new issues may require a premium over the prevailing secondary market rates.

2. **Cost of carry**—debt is typically raised in tranches, with cash held on deposit until needed for CAPEX. This creates a cost of carrying the debt on

[26] For an annual comparison between the actual and allowed cost of debt under the base interest rate scenario, see Appendix A1.

the balance sheet until the cost of debt allowance is increased in line with RAV growth.

3. **Premium on nominal debt**—we understand from SHE-T that the cost of debt allowance does not fully compensate for the yield spread between issuing nominal and real debt.

4. **BBB+ versus A/BBB simple average**—the SHE-T credit rating of BBB+ is lower than the simple average of A/BBB, which would be expected to lead to higher yields than the simple average.

SHE-T provided us with the following ranges for these costs (Table 2.2).

Table 2.2 Costs associated with issuing debt

Costs of issuing debt	Basis points (bp)
New issue premium	20
Cost of carry	15–20
Premium on nominal debt	15
Differential on BBB+ debt versus A/BBB index	10
Total	60–65

Source: Cost assumptions provided by SHE-T.

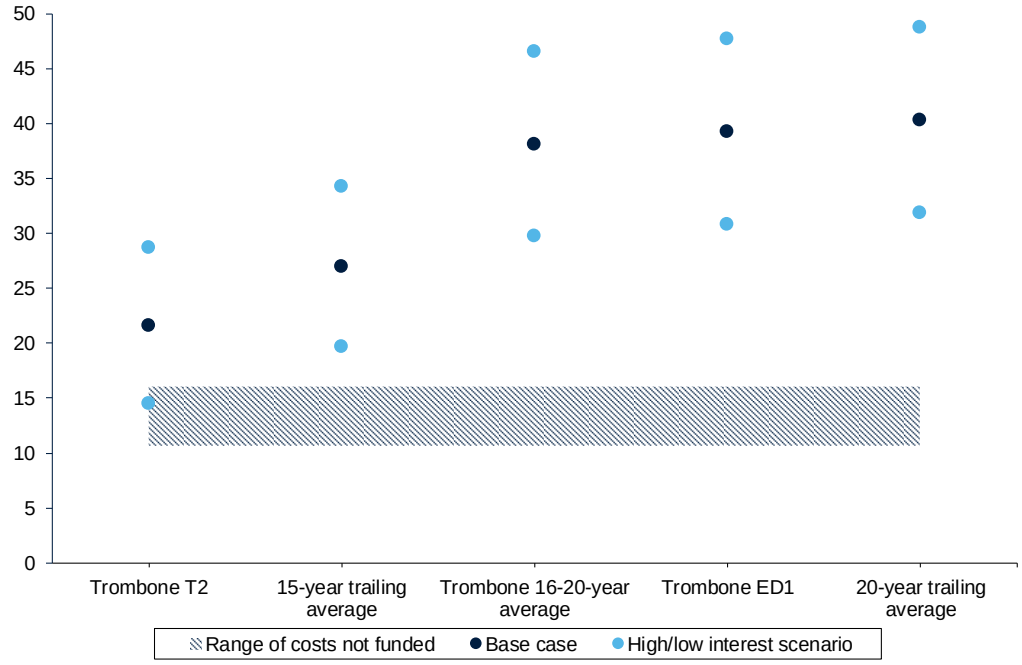
Based on the information provided by SHE-T, we have assumed a range of 40–60bp for costs not covered by the cost of debt mechanism. We note that this does not include any allowance for bank or rating agency fees.

Figure 2.4 below shows the net impacts on annual funding of various cost of debt mechanisms relative to the forecast actual cost of debt. It compares these to the range of 40–60bp for costs not covered by the cost of debt mechanism. A scenario outcome in or below the 'costs not funded range' indicates that allowed debt costs would be insufficient to recover the actual cost of debt.

Figure 2.4 shows that Ofgem's proposal to apply an 11–15-year trombone average to calculate the cost of debt allowance covers the forecast all-in cost of debt for SHE-T in RIIO-2 once the costs of issuing long-term debt are accounted for.

Under a scenario where interest rates increase faster than the current market-derived forecast (i.e. the high interest scenario), an 11–15-year trombone average will underfund SHE-T's all-in cost of debt. Implementing a simple 15-year trailing average would provide an increase in funding relative to the 11–15-year trombone average, but is less likely to underfund the all-in cost of debt for SHE-T over RIIO-T2.

Figure 2.4 Average annual funding impact in RIIO-2 under different cost of debt mechanisms (£m nominal)



Note: The lower bound of the range corresponds to the funding impact (£m) under the high interest rate scenario, while the upper bound reflects the funding impact in a low interest rate scenario. The midpoint of the range is the base case scenario (i.e. no deviation from the nominal forward rates). The costs not funded are assumed to equal 40–60bp, and represent the new issue premium; the cost of carry; a premium for issuing nominal debt relative to index-linked debt; issuing at BBB+ yields that are higher than the average of A and BBB yields.

Source: Oxera analysis.

Table 2.3 presents the funding impact for the potential cost of debt mechanisms net of these other costs. The RIIO-2 trombone underfunds the SHE-T all-in cost of debt in the high interest rate scenario by up to £2m when costs not covered by the cost of debt mechanism are included in the analysis.

Table 2.3 Average annual funding impact in RIIO-2 under different cost of debt mechanisms net of costs not covered by the cost of debt mechanism (40–60bp) (£m nominal)

Cost of debt mechanism	Base case	Low interest rate scenario	High interest rate scenario
Trombone T2	6–11	13–18	(2)–4
15-year trailing average	11–16	18–24	4–9
Trombone 16–20-year average	22–27	30–36	14–19
Trombone ED1	23–29	32–37	15–20
20-year trailing average	24–30	33–38	16–21

Note: The impact on funding is reported on a per annum nominal (£m) basis. The low and high interest rate scenarios reflect the annual funding impact in RIIO-2, subject to a ±25bp deviation from the nominal forward curve.

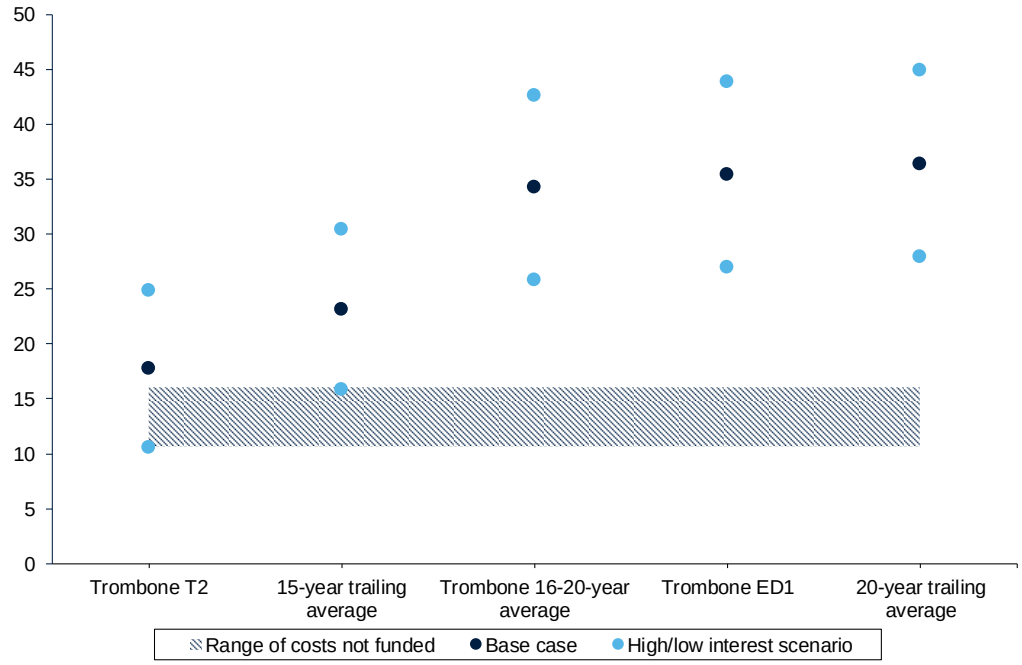
The cost of debt analysis presented above is based on the actual cost of the debt already raised by SHE-T. The average tenor of debt issued by SHE-T in RIIO-T1 is around 10 years, aligned with the averaging period of the RIIO-T1 index. We have also modelled a scenario where the SHE-T embedded cost of debt is replaced by the embedded debt costs that would have been incurred by a notional company that had issued longer-term debt (20-year tenor) in RIIO-

T1. This is modelled by increasing the SHE-T embedded cost of debt by the difference between the real gilt yields of 10-year maturity and 20-year maturity.

The spread between 20-year and 10-year yields estimated over RIIO-T1 is approximately 30bp.[27] Figure 2.5 shows the funding impact of the various cost of debt mechanisms with the embedded cost of debt in RIIO-T2 adjusted upwards by 30bp.

Under this scenario, Ofgem's proposal to apply an 11–15-year trombone average to calculate the cost of debt allowance underfunds the forecast all-in cost of debt in RIIO-T2 in the high interest rate scenario, and marginally funds the all-in cost of debt in the base case. As before, implementing a simple 15-year trailing average would provide an increase in funding relative to the 11–15-year trombone average, but is less likely to underfund the all-in cost of debt over RIIO-T2.

Figure 2.5 Average annual funding impact in RIIO-2 under different cost of debt mechanisms (£m nominal) with term premium



Source: Oxera analysis.

SHE-T considers the term premium impact of the embedded debt to be 60bp (instead of 30bp). For illustration, we have modelled this scenario where the SHE-T embedded cost of debt is increased by 60bp in Appendix A1.4.

2.7 Assessment against principle 2: incentivise companies to obtain the lowest cost financing without incurring undue risk

Ofgem's principles mean that in addition to considering the recovery of the efficiently incurred cost of debt, it is important to consider how the cost of debt mechanism affects networks' incentives to issue debt.

The way the cost of debt allowance is set may influence the way the company issues debt. The company is incentivised to adopt a financing strategy that

[27] The spread is estimated as the difference between the average real UK gilt yields of 10 and 20 years' maturity where the averaging period is eight years, in line with the duration of the RIIO-1 price control (from May 2011 to April 2019).

achieves a lower cost of debt than the allowance. When issuing new debt, a company will consider the number of years over which the cost of debt allowance is averaged. Under the current 10-year average applied in RIIO-T1, the company knows that the yields at the time when new debt is raised will remain in the index for only ten years. Issuing debt with a term longer than ten years therefore exposes the company to the risk that, after ten years, the index will not reflect the cost of this debt. This may encourage the issuance of comparatively short-term bonds more aligned with the averaging period of the cost of debt allowance.

The working assumption proposed by Ofgem in the RIIO-T2 sector methodology decision is to use an 11–15-year trombone average. The yields on the market benchmark for bonds issued in RIIO-2 will remain in the cost of debt allowance for 15 years, which may encourage the issuance of longer-term bonds.

2.8 Assessment against principle 3: the mechanism should be simple and transparent, and provide adequate protection for consumers

All the mechanisms considered in this report are either simple or trombone trailing averages. They are therefore similar in terms of simplicity and transparency, although, arguably, the approach of a simple trailing average is slightly more simple and transparent.

All the mechanisms expose consumers to changes in interest rates during RIIO-T2. The indices that are least volatile and therefore least sensitive to changes in interest rates during T2 are those that have longer averaging periods.

3 Financeability assessment

This section provides our review of the financeability of the SHE-T business plan and Ofgem's approach to financeability assessment, as described in the RIIO-2 business plan guidance of 9 September,[28] the SSMD document of 24 May,[29] and the financeability guidance document of 26 March.[30]

3.1 Approach

We assess the financeability of both the **notional** and the **actual** company.

- The **notional** company is assessed by assuming that the allowed cost of debt equals the actual cost of debt, which is modelled using Ofgem's proposed 11–15-year trombone and by assuming that 25% of the company's debt is index-linked (linked to CPIH). However, as discussed in the previous section, the proposed 11–15-year trombone average may not be sufficient to cover the cost of debt plus issuance costs across all interest rate scenarios.[31]
- The **actual** company is assessed based on SHE-T's expected actual cost of debt in RIIO-2 where cost of new debt is modelled based on the projected 1-year average interest rates on A/BBB iBoxx indices and other issuance costs (40–60bp, see Table 2.2 above) instead of the allowed trombone.[32] The net debt to RAV remains constant at 60% throughout RIIO-2 for the actual company.

We undertake the following analysis for the financeability assessment of the notional and the actual company.

- We use the SHE-T financial model under a **base TOTEX** scenario and a **high TOTEX** scenario, informed by Ofgem's working assumptions. We consider the impact on the financeability metrics when these assumptions are varied (Ofgem and SHE-T sensitivities).
- We discuss the appropriateness of using a 25% CPI-linked debt assumption for the notional company and the cash flow impact of the transition to CPIH.
- We model potential actions for addressing financeability and discuss the implications for dividend yield, the additional debt or the additional equity that would be required to attain the notional gearing of 60% and notional dividend yield assumption of 3%.
- We also assess the impact of higher TOTEX and CAPEX on the AICR ratio.
- Finally, we assess Ofgem's proposed definitions of the financeability metrics, relative to those of the credit rating agencies.

[28] Ofgem (2019), 'RIIO-2 Business Plan Guidance', 9 September.
[29] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May.
[30] Ofgem (2019), 'Financeability Assessment for RIIO-2: Further Information', 26 March.
[31] The impact of including transaction costs would be to reduce the credit ratios by increasing the interest expense.
[32] We understand that Ofgem's PCFM assumes that new debt is raised at the RIIO-T2 trombone, which is higher than the current market data on iBoxx A/BBB indices. We note that our disaggregated all-in cost of debt approach better approximates the actual cost of raising new debt in the RIIO-2 period.

3.2 Main findings

The main findings from our financeability analysis for the notional and the actual company at a 4.3% CPIH-real equity return (i.e. assuming no outperformance) are as follows.

- **Key financeability metrics for the notional and the actual company leave little headroom above the minimum investment-grade threshold guidance of the credit rating agencies**. In particular, we note that the modelling of the AICR on a notional company basis, at around 1.15x and the actual company at 1.27[33], is below Fitch's guidance threshold of 1.5x to 1.75x for BBB and A ratings, respectively. It is also below Moody's recent guidance on the threshold range for a Baa2 rating (i.e. below 1.2x).[34]

- Oxera analysis previously provided to Ofgem has demonstrated that the differential between the asset and debt risk premia that is implied by the SSMD is low relative to estimates of this differential based on a large sample of bonds issued by UK utilities.[35] Specifically, the middle of the CAPM-implied range in the SSMD (before making the adjustment for expected versus actual returns),[36] is around the 25th percentile of the distribution. This is one of the main reasons why the notional company would have credit metrics consistent with a Baa3 rating.

- Given the size of the SHE-T capital programme in RIIO-2 and the corresponding forecast growth in the RAV, the implied dividend yield is **below** Ofgem's working assumption of 3% for the notional company. **The equity issuance required to maintain a notional dividend yield of 3% and a gearing of 60% would be around £340m**.[37] This is in excess of 20% of the current equity value[38] and would put further pressure on the credit ratios.

- Changes to the asset life assumption are ineffective in materially alleviating pressure on gearing or interest coverage ratios.[39] Revising the capitalisation rate to generate an AICR of 1.4x, in line with the minimum for the current Baa1 guidance threshold, would require the capitalisation rate to be reduced from 90% to 86%. However, the credit rating agencies may look through adjustments that are NPV-neutral, such as modifying the capitalisation rate and the depreciation profile. Therefore, the efficacy of reducing the capitalisation rate in order to improve rating agency assessments of credit-worthiness is questionable.

- Moreover, the 86% capitalisation rate will not generate an AICR of 1.4x in a scenario with a 0% index-linked debt assumption (AICR is 1.13x in this scenario). The sensitivity of a 0% index-linked debt assumption for the notional company is shown because a +/-5% sensitivity to the 25% CPI-

[33] The actual company AICR of 1.27 is based on a cost of debt assumption of 1-year average A/BBB indices for the cost of new debt and does not include the impact of transaction and other costs (ranging from 40–60bp). When these additional costs are considered, the AICR for the actual company ranges from 1.13 to 1.19, below Moody's target Baa2 credit rating threshold.
[34] Moody's (2018), 'Regulated electric and gas networks – UK. Risks are rising, but regulatory fundamentals still intact', 29 May, p. 4.
[35] Oxera (2019), 'Risk premium on assets relative to debt,' 25 March.
[36] See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, Table 9.
[37] Note that increasing gearing from 55% in RIIO-1 to 60% in RIIO-2 implies that the company would pay a an additional one-off re-gearing dividend in the last year of RIIO-1.
[38] Estimated as £340m divided by £1,573m closing equity RAV as of March 2019/20.
[39] Regarding gearing, this is because debt costs are driven by the maintenance of a constant notional gearing ratio in line with the RAV growth projected by SHE-T. Regarding Interest coverage, this is because changes to the asset life assumption for depreciation would be reflected in the calculation of the FFO but then offset by a revised estimate of RAV depreciation within the numerator for the AICR (or PMICR) ratio.

linked debt assumption does not reflect the range of different debt structures present in the energy sector and the uncertainty about the availability of new CPI-linked debt.

- A reduction in gearing to 55% (RIIO-1 level) is also not effective in achieving the 1.4x target threshold. The notional company with a gearing of 55% and 25% index-linked debt has an AICR of 1.32x. If 0% index-linked debt is assumed for the notional company, then the AICR is even lower at 1.14x.[40] The AICR for the actual company with a gearing of 55% varies between 1.34x to 1.46x depending the additional cost of debt uplift (40–60bp) varying around Moody's' target threshold of 1.4x for a Baa1 credit rating.[41]

- A combined scenario with a 55% gearing assumption and an 86% capitalisation rate improves the credit metrics, assuming that rating agencies do not look through these adjustments. AICR for the notional company with 25% index-linked debt is 1.59x (a solid Baa1 rating), and that for the actual company varies between 1.62x and 1.66x (in line with an A3 rating).

- Another scenario that shows a significant improvement in the financeability testing is to increase the cost of equity to the 6.5% (CPIH-real) allowance assumed in SHE-T's business plan, which results in an AICR of 1.57x for the notional company with 25% index-linked debt, slightly below a Moody's A3 rating and ranges between 1.59x and 1.64x for the actual company when 40–60bp additional borrowing costs are included.

- The CPIH transition has a significant positive cash flow impact in RIIO-2 due to higher cash flows from a higher return allowance (due to a higher cost of capital expressed in CPIH terms), relative to RPI indexation. Absent the CPIH transition, the notional company's financeability metrics would be under significantly more pressure. If, instead, the credit rating analysis was undertaken using a cost of capital stated in RPI-deflated terms and RPI indexation was retained in relation to the indexation of the RAV, we estimate that a 7.0% cost of equity (CPIH-real), 5.89% (RPI-real) would be required to raise the AICR to 1.15x, consistent with the notional company under CPIH indexation. As this leaves little headroom above the minimum investment-grade threshold, further mitigating action would be required (i.e. reducing gearing and/or reducing the capitalisation rate). While the transition to CPIH improves revenues in the short term (relative to RPI indexation), and hence financeability metrics, it would be expected to reduce them in the long term, all else being equal. The long-term implications for financeability therefore need to be considered.

- In the high TOTEX scenario, the AICR ratio for both the notional and actual company is higher. This is because the increase in fast money in the high TOTEX scenario is not being offset by the RAV depreciation (proxy for maintenance CAPEX used in the numerator of the AICR), putting an upward pressure on the metric. However, SHE-T is experiencing RAV growth in RIIO-2 (i.e. it is not in steady state as per the notional company assumption), and the RAV depreciation may not be a good proxy for maintenance CAPEX. If RAV depreciation is lower than maintenance CAPEX, the notional company AICR by design will be higher under a higher TOTEX (RAV growth) scenario. Given that SHE-T also has a growing RAV

[40] This is at a gearing assumption of 55%.
[41] While the gearing is reduced to 55%, the cost of equity is held constant at 4.3% CPIH-real, consistent with how Ofgem addressed financeability constraints in RIIO-1. If the cost of equity had been re-calibrated at a 55% gearing, the credit metrics may not improve with a change in gearing.

in the base case scenario, this would imply that the estimated AICR of 1.15x is an overestimate of the likely AICR.

- We have considered the credit metrics analysis undertaken by Ofgem in relation to the notional electricity transmission company in RIIO-T2, as reported in the SSMD. For this preliminary, high-level, financeability assessment, Ofgem uses the economic form of the ratios[42], rather than the accounting form, where the accounting form is consistent with credit rating agencies' methodologies, as well as Ofgem's financeability guidance[43] (see Appendix A2 for details). We have been able to broadly replicate the economic form of the ratios that Ofgem has derived.[44] This shows that the average ratios for RIIO-2 using the economic form are higher than those using the accounting form.[45] Our analysis focuses on the accounting form of the metrics based on actual business plan information provided by SHE-T.

- We also assess the financeability of the notional and actual company using the SSMD estimate of the expected equity return of 4.8% (real, CPIH) assuming 50bp of outperformance. Under SHE-T's base case TOTEX profile, the notional company with 25% index-linked debt achieves a Baa2 credit rating and the AICR improves to 1.25x. The actual company AICR improves to 1.38x, marginally below the threshold for a Baa1 credit rating (1.40x) when additional borrowing costs are not included. With the inclusion of 40–60bp transaction and other borrowing costs, the AICR of the actual company varies between 1.26x and 1.29x. Both the notional and actual company comfortably achieve a Baa1 credit rating under SHE-T's higher TOTEX profile but as stated earlier the increase in AICR metric is likely to be due to the mismatch in RAV depreciation and maintenance CAPEX.

- Lastly, we consider the financeability of the notional and actual company using the cost of equity of 6.5% (real, CPIH) from the SHE-T business plan. A Baa1 credit rating or higher is attained under both the notional and the actual company under the base case TOTEX profile with an AICR of 1.57x for the notional company with 25% index-linked debt and an AICR ranging from 1.59x to1.64x for the actual company based on a 40–60bp additional borrowing costs assumption. The transition to SHE-T's higher TOTEX profile increases the AICR for both the notional and the actual company, but as stated earlier the increase in the AICR metrics is likely to be due to the mismatch in RAV depreciation and maintenance CAPEX.

This section is structured as follows.

[42] Ofgem stated in the SSMD: 'We come to this view having conducted an extracted [sic] high-level analysis of some of the key credit ratios based on a sector average notional company using the working assumptions set out in this decision document and the economic form of the key ratios as shown in Table 13.' See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, para. 4.39.
[43] Ofgem (2019), 'Financeability Assessment for RIIO-2: Further Information', 26 March.
[44] For example, the economic form of the average RIIO-2 AICR for the notional company using SHE-T's financial model is 1.51x (which is similar to Ofgem's estimate of 1.48x—the difference of 3bp stems from the decline in the market cost of debt in the last six months, the cut-off date of our analysis is 31 October 2019). This includes Ofgem's 50bp outperformance wedge to facilitate comparison between the metrics. For avoidance of doubt, we do not agree with the inclusion of Ofgem's expected 50bp outperformance wedge within the cost of equity allowance, when modelling the base case credit metrics.
[45] This likely difference had been acknowledged by Ofgem, which stated in the SSMD that: 'In practice the key credit ratios are calculated from accounting information, may be subject to individual rating agencies' adjustments and will be influenced by the impact of incentives, timing, movements in working capital, actual company capital structures and actual debt costs.' See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, para. 4.39.

- Section 3.3 explains the assumptions underlying the notional and the actual company and outlines the expenditure in the base and the high TOTEX scenarios.
- Section 3.4 discusses our analysis of the financeability of the notional company using the SHE-T financial model. We comment on the appropriateness of the 25% index-linked debt assumption for the notional company and also analyse the impact of the mitigation actions on the financeability metrics.
- Section 3.5 discusses our analysis of the financeability of the actual company using the SHE-T financial model and the analysis of the impact of the mitigating actions on the financeability metrics.
- Section 3.6 analyses the impact of the CPIH transition on credit metrics and cash flows.
- Section 3.7 provides our review of Ofgem's financeability guidelines and its proposed financeability metrics, comparing them with those of the credit rating agencies.
- Appendix A2 provides further details of our financeability metrics analysis.

3.3 Assumptions for notional and actual company and TOTEX scenarios

In the SSMD, Ofgem reiterated that it would primarily rely on the notional company to assess the financeability of the RIIO-2 control but has also asked companies to present an actual financeability assessment of their business plans.

We have used the SHE-T financial model as the basis for assessing the financeability of the notional and the actual company.[46] Our assumptions have been informed by the latest working assumptions used in Ofgem's own modelling of the notional company, as discussed in the Finance annex of the SSMD (see also Appendix A2).[47] The main assumptions underlying the notional and the company base case are summarised in Table 3.1 below.

[46] We used SSE financial model 'SHET RIIO-2 Financial Modelling Oxera v2.2' dated 7 November 2019. We have not undertaken a full audit of the model.
[47] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May.

Table 3.1 Main assumptions for notional and actual company

Parameter	Notional company assumption	Actual company assumption
Allowed cost of equity	Baseline estimate of 4.3% (real, CPIH) and a high cost of equity scenario of 4.8% (real, CPIH)[1]	Baseline estimate of 4.3% (real, CPIH) and a high cost of equity scenario of 4.8% (real, CPIH)[1]
Allowed cost of debt	RIIO-2 11–15-year trombone in the base case and a 15-year trailing average scenario	RIIO-2 11–15-year trombone in the base case and a 15-year trailing average scenario
Index-linked debt	Comprises 25% of total debt, indexed to CPIH in the base case	0% in line with SHE-T forecast capital structure for RIIO-2
Interest expense	Equal to the cost of debt (11–15-year trombone)[2]	Equal to SHE-T actual cost of debt for embedded debt and 1-year average iBoxx A/BBB indices plus issuance and other costs (40–60bp) for new debt[6]
Gearing	60%. Gearing maintained in line with notional assumption through equity injection(s)[3]	60%. Gearing maintained in line with notional assumption through equity injection(s) or dividend restrictions[3]
Inflation	CPIH of 2.0%[4]	CPIH of 2.0%[4]
Dividend yield	3.0% in line with Ofgem's allowance for the notional company in RIIO-2	0% based on SHET's planned (and implied) dividend policy for RIIO-2
Capitalisation rate	90.0%. Corresponds to the SHE-T rate in RIIO-1, consistent with Ofgem SSMD guidance.	90.0%. Corresponds to the SHE-T rate in RIIO-1, consistent with Ofgem SSMD guidance.
Depreciation	Asset life phased to 45 years through RIIO-2 for post-vesting assets.[5] We take the CAPEX profile as given in SHE-T's model.	Asset life phased to 45 years through RIIO-2 for post-vesting assets.[5] We take the CAPEX profile as given in SHE-T's model.
Incentives (TOTEX, business plan, outcomes)	No under- or over-performance. This is consistent with the approach in RIIO-1. Only base revenues were considered in Ofgem's financeability assessment then.	No under- or over-performance. This is consistent with the approach in RIIO-1. Only base revenues were considered in Ofgem's financeability assessment then.
Equity issuance transaction costs	5.0% in line with Ofgem's working assumption	SHE-T does not forecast any issuance costs in its Business Plan Data Template

Notes: [1] Ofgem has also included a 50bp uplift to the allowed cost of equity due to assumed outperformance of the price control. The base equity return is 4.8% in Ofgem's financeability modelling. [2] Our interest costs (expressed as a percentage of net debt), as well as those used by Ofgem in its notional financeability assessment as described in the Finance annex of the SSMD, are shown in section A2.3 of Appendix A2. We note that our estimates of the interest cost differ from those of Ofgem as they are based on recent market data (cut-off date of 31st October 2019). [3] Net debt is assumed to be at the notional level at the start of RIIO-2. [4] We note that the CAPEX profile is specified in constant 2009/10 prices in SHE-T's financial model. The movement from RPI to CPI alters the CAPEX profile in nominal terms. [5] We have retained SHE-T's modelling of a phased transition to a 45 year asset life in RIIO-2 for post-vesting assets. The asset life increases from 33.75 year in 2021/22 to 45 years by 2025/26. We have used the SHE-T bottom-up modelling estimates of depreciation, allowing for differing depreciation policy assumptions over time. We note that Ofgem's guidance for modelling the notional company is to use depreciation rates as a percentage of RAV based on expenditures at the RIIO-1 average level. [6]

Source: Ofgem (2019), 'RIIO-2 Business Plan Guidance', 9 September, Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May. Ofgem (2012), 'RIIO-T1: Final Proposals for SP Transmission Ltd and Scottish Hydro Electric Transmission Ltd', 23 April. Ofgem (2012), 'RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas' 17 December.

The total expenditure in RIIO-2 under the base and high TOTEX scenarios in SHE-T's financial model is as follows.

Table 3.2 Total expenditure under base and high TOTEX scenarios, £m 2018/19 prices

TOTEX scenario	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	Total RIIO-2
Base case	452	578	503	493	330	2,356
High scenario*	765	932	833	819	606	3,955

Note: The range for the additional TOTEX in the high TOTEX scenario (the 'Likely Outturn' in the SHE-T business plan) was between £1.1bn to £1.3bn. However, we have only used an additional £1.1bn (relative to the base TOTEX) as a high TOTEX scenario in this report.

Source: Oxera analysis based on the SHE-T financial model.

3.4 Financeability analysis of the notional company in RIIO-2

3.4.1 Baseline TOTEX

The averages of the credit metrics for the notional company during RIIO-2 are provided in Table 3.3, alongside the credit rating agencies' guidance ranges for an investment-grade credit rating.

Table 3.3 Average credit metrics during RIIO-2 for the notional company on a 4.3% (CPI, real) cost of equity assumption versus indicative ranges for investment-grade rating from the credit rating agencies

Ratio	Fitch[1]		Moody's		Standard & Poor's[2]		Notional company base case
Debt metrics	A	BBB	A	Baa	A	BBB	
Net debt/RAV (%)	60	70	45–60	60–75	<70	>70	**60.0%**
FFO interest cover, including accretion (i.e. total interest expense) (x)*	4.5	3.5	4–5.5	2.8–4			**3.4**
FFO interest cover, excluding accretion[3] (i.e. cash interest) (x)*					>3.5	2.5–3.5	**4**
AICR (x)*	1.75	1.5	1.6–1.8[4]	1.2–1.4[4]			**1.15**
Nominal PMICR (x)*[5]							**1.8**
FFO (cash interest)/ net debt (%)*			18–26	11–18	>12	8–12	**9.7%**
RCF/net debt (%)			14– 21	7–14			**7.8%**

Note: * Ofgem's key credit metrics as per the Finance annex of the SSMD. The ratios are calculated using credit rating agency formulas. [1] Fitch also considers other financial ratios, including lease-adjusted FFO/debt and lease-adjusted FFO/net debt. These measures have not been explicitly highlighted by Ofgem as measures of interest when assessing financeability. [2] Unlike Moody's and Fitch, S&P does not provide indicative ranges. The ranges interact with additional considerations such as the business risk profile and industry risk. See Standard & Poor's (2013), 'Criteria | Corporates | General: Corporate Methodology', tables 3, 17–19. We have reported the indicative ranges provided by Ofgem during the RIIO-1 period. See Ofgem (2011), 'Decision on strategy for the next transmission and gas distribution price controls – RIIO-T1 and GD1 Financial issues', 31 March, p. 40. [3] Moody's subtracts inflation accretion from FFO and the interest expense to the extent that it is included. Ofgem's approach, which is the same used by S&P, includes inflation accretion in the denominator of the FFO interest cover ratio. [4] Moody's guidance minimum rating for a Baa2 rating (1.2), Baa1 rating (1.4), A3 rating (1.6), and A2 rating (1.8) from 29 May 2019 commentary. Moody's does not provide a guidance figure for a Baa3 rating. [5] Nominal PMICR is a metric estimated by Ofgem and is not used by the credit rating agencies.

Source: Fitch (2018), 'Corporate rating criteria Sector Navigators', p. 165; Moody's (2017), 'Rating Methodology Regulated Electric and Gas Networks, 16 March, p. 19; Moody's (2018), 'Regulated electric and gas networks – UK. Risks are rising, but regulatory fundamentals still intact', 29 May, p. 4; Ofgem (2011), 'Decision on strategy for the next transmission and gas distribution price controls – RIIO-T1 and GD1 Financial issues', 31 March, p. 40.

As shown in the table, for the notional company during RIIO-2, the AICR (or PMICR) falls towards the bottom end of Moody's guidance of 1.2–1.4x and 1.4–2.0x for a Baa rating. The AICR is slightly below the guidance for a Baa2 rating indicated in recent commentary from Moody's (i.e. 1.2x).[48] The AICR is below Fitch's guidance of 1.5x for a BBB rating. FFO interest cover including inflation accretion is below the lower end of Fitch's guidance of 3.5x for a BBB rating. FFO/net debt (including and excluding accretion) is below the lower end of Moody's guidance for a Baa rating of 11%.

We note that average credit ratios in RIIO-2 using Ofgem's economic form[49] for the AICR, FFO/net debt and RCF/net debt are higher than the values using the accounting forms of the ratios shown in Table 3.3. Our analysis focuses on the accounting form of the metrics based on actual business plan information provided by SHE-T. The difference to the economic form ratios reported by Ofgem is also driven by Ofgem assuming that the notional company outperforms the price control assumptions and earns an additional 50bp return on regulated equity as well as the difference in the cost of debt assumption—our analysis is based on a more recent estimate of the cost of debt (cut-off date of 31 October 2019). Table A2.3 in Appendix A2 provides the values of the financial ratios using the economic form presented by Ofgem. For comparison with Ofgem's figures, Table A2.2 in Appendix A2 provides the value of the ratios using the economic form, including the 50bp return for outperformance.

Overall, our modelling of the notional company using the SHE-T business plan suggests that **financeability metrics are under pressure and leave limited headroom for downside scenarios**. In RIIO-1, Ofgem indicated that it targeted a 'comfortable investment grade' credit rating in the range of BBB–A.[50]

The Competition Commission has previously interpreted the definition of a comfortable investment-grade rating in the context of ensuring financeability in the regulated airports sector, as below:[51]

> Our interpretation of a solid investment-grade rating is BBB+ (using S&P's and Fitch's terminology) and Baa1 (using Moody's terminology) which is a couple of 'notches' above the bottom of investment grade of BBB– or Baa3. Our aim is thus for the two airports, at our assumed gearing level of 60 per cent, to be in a position to absorb unanticipated downside risk and still retain an investment grade credit rating range.

Following this guidance from Ofgem and the Competition Commission, modelling of the notional company using the SHE-T business plan suggests that the AICR would be below Fitch's guidance level for a BBB rating (i.e. 1.5x) and Moody's guidance level for a Baa1 rating (i.e. 1.4x).

Our analysis shows that the credit metrics are under pressure for SHE-T for the RIIO-2 period, on a notional company basis. Whether a credit rating

[48] Moody's (2018), 'Regulated electric and gas networks – UK. Risks are rising, but regulatory fundamentals still intact', 29 May, p. 4.
[49] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.39.
[50] Ofgem (2012), 'RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas', 17 December, para. 4.6.
[51] Competition Commission (2007), 'BAA Ltd', 28 September, para. 5.14.

agency would downgrade an actual company should its financial metrics fall below the guidance thresholds for that company would depend on the precise calibration of the RIIO-2 package, and on the holistic assessment of the quantitative and qualitative factors that underpin the assigned credit rating.

Financeability scenario analysis

We have tested the financeability of the notional company based on the working assumptions proposed by Ofgem. We have then assessed the sensitivities prescribed by Ofgem on both the baseline and the high TOTEX scenarios in the SHE-T financeability model, followed by SHE-T's sensitivities and proposed mitigation actions.

Table 3.4 shows the Ofgem working assumptions and the SHE-T business plan assumptions on the cost of equity and cost of debt parameters.

Table 3.4 Ofgem vs SHE-T business plan assumptions

	Ofgem	SHE-T
Cost of equity CPIH-real (%)	4.3%[1] 4.8%[2]	6.5%
Cost of debt	11–15-year trombone	15-year trailing average[3]

Note: [1] Baseline cost of equity, [2] Assumes 50bp outperformance on the baseline cost of equity assumption. [3] Setting the allowed cost of debt as well as the interest expense to a 15-year trailing average of yields on A/BBB iBoxx non-financial corporate bond indices (see 'Cost of debt mechanisms' in section 2 of this report). The 15-year trailing average cost of debt index excludes the impact of transaction costs and the cost of carry. We note that SHE-T is currently engaging with Ofgem on the appropriate length of the trailing average period; therefore, the sensitivity modelled here is not intended to preclude the possibility of a different trailing average period as an outcome from SHE-T's business planning process and engagement.

Source: Ofgem (2019), 'RIIO-2 Business Plan Guidance', 9 September, SHE-T business plan.

Ofgem sensitivities

Ofgem-prescribed sensitivities include:

- change in CPIH of +/- 1%;
- change in RPI/CPIH wedge of +/-0.5%;
- change in interest rate of +/-1%;
- change in TOTEX performance of +/-10%;
- change in RORE of +/- 2%;
- change in inflation-linked debt assumption of +/-5% (i.e. inflation-linked debt assumption of 20% and 30%).

SHE-T sensitivities and mitigating actions

SHE-T additional sensitivities include:

- the continued use of the RPI index;
- assuming that no inflation-linked debt is used, which more closely reflects the existing SHE-T debt portfolio, (we also discuss the appropriateness of

the 25% index-linked debt assumption used by Ofgem for the notional company in section 3.2.3).[52]

Mitigation measures to address financeability include:

- measuring the change in the capitalisation rate required to achieve credit metrics that would be consistent with the upper end of the guidance range from Moody's for a Baa1 rating[53], in line with the Competition Commission's (2007) guidance for a 'solid' investment-grade rating;
- assuming a reduction in the notional gearing assumption from 60% to 55%;
- assuming a reduction in the both the notional gearing and capitalisation rate.

The results from these tests are summarised in the tables below. All scenarios assume an equity return in line with the base case assumption for the notional company (**i.e. 4.3%, CPIH-real**), unless otherwise noted. We have also undertaken the financeability analysis for both the actual and the notional company at a 4.8% CPIH-real cost of equity and a 6.5% CPIH-real cost of equity assumption. The results from these scenarios are presented in Annex A2.

Ofgem sensitivities

Ofgem sensitivity analysis based on changes to the interest rate projections, changes to the inflation assumptions and TOTEX and RORE under/overperformance (see Table 3.5 and Table 3.6) **suggest that the notional company will not achieve a Baa1 target credit rating under any scenario with the exception of the +2% RORE scenario.** Overall, we note that:

- a decline (increase) in interest rates will slightly improve (worsen) the AICR;
- an increase in inflation will increase the AICR due to the increase in allowed revenues and inflation accretion relative to the cash interest. The opposite will be true for a decrease in inflation (i.e. AICR will decrease);
- TOTEX outperformance of 10% will increase the AICR to 1.21x (min threshold for Baa2) while TOTEX overspend of 10% will further put pressure on the AICR, pushing it to 1.09x;
- 2% outperformance on the RORE will increase the AICR to 1.76x, whereas a 2% underperformance will reduce the AICR to 0.54x.

[52] It is also relevant to note that the current market for CPI(H)-linked debt is not developed in the UK.
[53] Moody's (2018), 'Regulated electric and gas networks – UK. Risks are rising, but regulatory fundamentals still intact', 29 May, p. 4.

Table 3.5 Ofgem sensitivity analysis of financeability metrics for the notional company (interest rates and inflation)

	Base case	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI-CPI* wedge -0.5%	RPI-CPI* wedge +0.5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.4	3.3	3.6	3.4	3.4	3.4	3.4
FFO interest cover (cash interest) (x)	4.0	3.7	4.3	4.3	3.7	4.0	4.0
AICR (or PMICR) (x)	1.15	1.13	1.17	1.24	1.07	1.15	1.15
Nominal PMICR	1.8	1.7	1.8	2.2	1.4	1.8	1.8
FFO (interest expense)/net debt (%)	9.2%	9.1%	9.2%	9.2%	9.2%	9.2%	9.2%
FFO (cash interest)/net debt (%)	9.7%	9.7%	9.7%	9.9%	9.4%	9.7%	9.7%
RCF/net debt (%)	7.8%	7.8%	7.8%	8.0%	7.5%	7.8%	7.8%
EBITDA/RAV (x)	9.3%	9.4%	9.1%	9.3%	9.2%	9.3%	9.3%
RORE (%)[1]	11.2%	11.2%	11.2%	11.4%	11.1%	11.2%	11.2%
Dividend cover (x)	2.7	2.7	2.7	2.7	2.6	2.7	2.7
Implied[2] dividend yield (%)	-0.8%	-0.8%	-0.8%	0.7%	-2.3%	-0.8%	-0.8%
Required[3] equity buyback/(issuance) (£m)*	(340)	(342)	(337)	(214)	(460)	(340)	(340)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case.
[1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on SHE-T business plan data.

Table 3.6 Ofgem sensitivity analysis of financeability metrics for the notional company (TOTEX performance and RORE)

	Base case	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.4	3.5	3.3	4.0	2.9
FFO interest cover (cash interest) (x)	4.0	4.1	3.9	4.6	3.4
AICR (or PMICR) (x)	1.15	1.21	1.09	1.76	0.54
Nominal PMICR	1.8	1.8	1.7	2.3	1.3
FFO (interest expense)/net debt (%)	9.2%	9.5%	8.9%	11.1%	7.2%
FFO (cash interest)/net debt (%)	9.7%	10.0%	9.4%	11.6%	7.7%
RCF/net debt (%)	7.8%	8.1%	7.5%	9.8%	5.8%
EBITDA/RAV (x)	9.3%	9.5%	9.0%	10.9%	7.6%
RORE (%)[1]	11.2%	11.8%	10.7%	14.3%	8.1%
Dividend cover (x)	2.7	2.9	2.5	3.7	1.6
Implied dividend yield (%)[2]	-0.8%	1.3%	-2.8%	2.3%	-3.9%
Required equity buyback/(issuance) (£m)[3]	(340)	(147)	(532)	(61)	(619)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on SHE-T business plan data.

Table 3.7 Ofgem sensitivity analysis for the notional company (index-linked debt)

	Base case (25% Inflation-linked debt)	Inflation-linked debt +5%	Inflation-linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.4	3.4	3.4
FFO interest cover (cash interest) (x)	4.0	4.1	3.8
AICR (or PMICR) (x)	1.15	1.19	1.11
Nominal PMICR	1.8	1.8	1.8
FFO (interest expense)/net debt (%)	9.2%	9.2%	9.2%
FFO (cash interest)/net debt (%)	9.7%	9.8%	9.6%
RCF/net debt (%)	7.8%	7.9%	7.7%
EBITDA/RAV (x)	9.3%	9.3%	9.3%
RORE (%)[1]	11.2%	11.2%	11.2%
Dividend cover (x)	2.7	2.7	2.7
Implied dividend yield (%)[2]	-0.8%	-0.8%	-0.8%
Required equity buyback/(issuance) (£m) [3]	(340)	(338)	(341)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on SHE-T business plan data.

Additional sensitivities

The additional sensitivity tests (Table 3.8) on the RAV indexation and inflation-linked debt assumptions add further pressure on the financeability metrics:

- If Ofgem had retained RPI-based allowances instead of CPIH-based allowances, the AICR would have been even lower, at around 0.63x. This is well below Moody's' guidance threshold for a Baa2 rating (of 1.2x). We discuss the impact of CPIH transition in section 0.
- Removing the assumption that 25% of debt is inflation-linked results in a decrease of the AICR to 0.99x (from 1.15x in the base case), well below Moody's guidance threshold for a Baa2 rating (of 1.2x). The AICR metric declines with a reduction in the proportion of index-linked debt due to the decrease in the FFO (cash interest expense, which is deducted from FFO, is higher). We further discuss the appropriateness of Ofgem's assumption on index-linked debt in section 3.4.3.

Table 3.8 Additional sensitivity analysis for the notional company

	RPI	No inflation-linked debt
Net debt/RAV (%)	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.0	3.4
FFO interest cover (cash interest) (x)	3.4	3.4
AICR (or PMICR) (x)	0.63	0.99
Nominal PMICR	1.7	1.8
FFO (interest expense)/net debt (%)	7.5%	9.2%
FFO (cash interest)/net debt (%)	8.0%	9.2%
RCF/net debt (%)	6.1%	7.3%
EBITDA/RAV (x)	7.8%	9.3%
RORE (%)[1]	10.3%	11.2%
Dividend cover (x)	1.8	2.7
Implied dividend yield (%)[2]	-1.9%	-0.9%
Required equity buyback/(issuance) (£m) [3]	(457)	(346)
Dividend/regulated equity (%)	3.0%	3.0%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on SHE-T business plan data.

Proposed mitigation actions

Ofgem has suggested a number of mitigation actions to address financeability constraints, including restricting dividends, reducing gearing by injecting equity, and changing the capitalisation rate. Table 3.9 below suggests that while these mitigation measures improve the credit ratios, they are still **largely ineffective** in materially alleviating financeability constraints. For instance, the AICR ratio is still below the target credit rating of 1.4x in most of the scenarios (with the exception of the two 86% capitalisation rate scenarios). In particular, we note that:

- changes to the asset life assumption are ineffective in materially alleviating pressure on interest coverage ratios;[54]
- reducing the notional gearing to 55% in line with RIIO-1 would improve credit metrics—for example, AICR would increase to 1.32x.[55];
- revising the capitalisation rate to generate an AICR estimate of 1.4x, in line with a Baa1 guidance threshold, would require a reduction from a rate of 90% to 86%. However, the credit rating agencies may look through adjustments that are NPV-neutral, such as modifying the capitalisation rate and the depreciation profile. For example, Fitch has indicated that it does

[54] This is because changes to the asset life assumption for depreciation would be reflected in the calculation of FFO, but then offset by a revised estimate of RAV depreciation within the numerator for the AICR (or PMICR) ratio.
[55] While the gearing is reduced to 55%, the cost of equity is held constant at 4.3% CPIH-real, consistent with how Ofgem addressed financeability constraints in RIIO-1.

not view alternative capitalisation or depreciation rates as helping PMICRs;[56]

- a zero dividend yield (one of Ofgem's mitigation actions to address financeability) would not have any impact on the AICR;
- a scenario that shows a significant improvement in the AICR to 1.59x, which is slightly below the upper end of Moody's Baa1 rating, would **result from simultaneously reducing the capitalisation rate to 86% and the gearing to 55%**.

Table 3.9 Mitigation measures to address financeability

	Base* case	Dividend yield = 0%	Capitali-sation rate = 85.8%	Gearing = 55%	Gearing = 55% and cap rate = 85.8%
Net debt/RAV (%)	60.0%	60.0%	60.0%	55.0%	55.0%
FFO interest cover (interest expense) (x)	3.4	3.4	3.7	3.8	4.1
FFO interest cover (cash interest) (x)	4.0	4.0	4.2	4.4	4.7
AICR (or PMICR) (x)	1.15	1.15	1.40	1.32	1.59
Nominal PMICR	1.8	1.8	2.0	2.0	2.2
FFO (interest expense)/net debt (%)	9.7%	9.7%	10.6%	11.1%	12.0%
FFO (cash interest)/net debt (%)	9.2%	9.2%	10.1%	10.6%	11.5%
RCF/net debt (%)	7.8%	9.7%	8.7%	8.7%	9.7%
EBITDA/RAV (x)	9.3%	9.3%	10.0%	9.5%	10.2%
RORE (%)[1]	11.2%	11.2%	12.5%	10.5%	11.6%
Dividend cover (x)	2.7	n/a	3.1	2.6	3.0
Implied dividend yield (%)[2]	-0.8%	-0.8%	-0.4%	-2.6%	-2.2%
Required equity buyback/(issuance) (£m) [3]	(340)	(71)	(298)	(563)	(516)
Dividend/regulated equity (%)	3.0%	0.0%	3.0%	3.0%	3.0%

Note: *Base case assumes 25% index-linked debt for the notional company. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

SHE-T business plan assumptions

The SHE-T business plan assumptions include the 15-year trailing average for the cost of debt instead of the RIIO-2 trombone and a 6.5% CPIH-real for allowance for the cost of equity.[57]

[56] Fitch Ratings (2019), 'Fitch Rtgs: Ofgem's Credit-Enhancing Mechanisms Unlikely to Benefit Ratings', 28 February.
[57] The analysis set out earlier in this report indicates that a simple 15-year trailing average would be less likely to underfund the actual all-in cost of debt for SHE-T over RIIO-T2 when compared with an 11–15-year trombone average.

We note that moving to a 15-year trailing average cost of debt index would cause a slight deterioration in the AICR for the notional company whereas a cost of equity of 6.5% CPI, real will improve the financeability metrics—AICR is 1.57, which is a solid Baa1 credit rating.

Table 3.10 SHE-T sensitivity analysis of financeability metrics for the notional company

	Base case*	15-year trailing average cost of debt	Cost of equity (6.5%, CPIH-real)
Net debt/RAV (%)	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.4	3.3	3.8
FFO interest cover (cash interest) (x)	4.0	3.8	4.4
AICR (or PMICR) (x)	1.15	1.13	1.57
Nominal PMICR	1.8	1.7	2.1
FFO (interest expense)/net debt (%)	9.2%	9.1%	10.6%
FFO (cash interest)/net debt (%)	9.7%	9.7%	11.1%
RCF/net debt (%)	7.8%	7.8%	9.2%
EBITDA/RAV (x)	9.3%	9.4%	10.5%
RORE (%)[1]	11.2%	11.2%	13.5%
Dividend cover (x)	2.7	2.7	3.4
Implied dividend yield (%)[2]	1.3%	-0.8%	1.4%
Required equity buyback/(issuance) (£m) [3]	(340)	(342)	(143)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%

Note: *Base case assumes 25% index-linked debt for the notional company and a cost of debt allowance set equal to the RIIO-T2 trombone. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

The sensitivity analysis presented in this section is based on a baseline cost of equity of 4.3% (CPIH-real). We have also undertaken a similar sensitivity analysis for a 4.8% (CPIH-real) and a 6.5% (CPIH-real) equity return assumption. The results are presented in Appendix A2.3.

As expected, a higher equity return assumption leads to an improvement in the financeability metrics for the notional company. However, the AICR ratios are still below Moody's' Baa1 threshold of 1.4x for the 4.8% equity return assumption (AICR is 1.25x) and in line with a Baa1 rating for the 6.5% cost of equity assumption as stated above.

3.4.2 Implications for the dividend yield

The above financeability assessment of the notional company suggests that Ofgem's assumption of a 3% dividend yield is **not realistic**. We have therefore

examined the requirement for net new equity issuance over RIIO-2 to maintain a dividend assumption of 3% and a gearing of 60%.[58]

In the base case TOTEX scenario, the size of SHE-T's RAV growth over RIIO-2 implies that maintaining notional gearing at 60% would require net new equity issuance over the period of £155m if the transition from the 55% gearing in the last year of RIIO-1 is included in the analysis as a one-off re-gearing dividend. The net equity issuance would be £340m if the transition from the 55% gearing in the last year of RIIO-1 is excluded from the analysis, as shown in Table 3.11. We consider that the latter approach is more relevant to the analysis of financeability within the RIIO-2 period.[59]

A £340m equity injection would therefore be required to maintain the notional company financial parameters. This is in excess of 20% of the current equity value and would further add pressure to the credit metrics.

Table 3.11 Equity (issuance)/buybacks during RIIO-2 for the notional company (£m)

Dividend scenario	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	Total RIIO-2
Dividend yield = 3% and closing gearing for RIIO-1 is 55%	134.9	(110.0)	(80.9)	(75.7)	(23.8)	(155)
Dividend yield = 3% and closing gearing for RIIO-1 is 60%	(49.2)	(110.0)	(80.9)	(75.7)	(23.8)	(340)

Note: As a sensitivity, we have modelled a notional gearing ratio of 55% for SHE-T in the last year of RIIO-1. This implies that there is an increase in cash in the first year of RIIO-2 due to 'gearing up' by 5%. In the base case we model the gearing for the last year of RIIO-1 at 60%, to allow the proportion of debt financing to increase by 5% of RAV in the last year of RIIO-1 and to align with the revision in the notional gearing assumption (i.e. 55% to 60%) in the start of RIIO-2. In the base case, maintaining the notional company financial parameters (i.e. 3% dividend yield assumption) require an equity issuance of £340m.

Source: Oxera analysis based on the SHE-T financial model.

3.4.3 Appropriateness of Ofgem's 25% index-linked debt assumption

In its modelling of the notional company, Ofgem assumes that 25% of debt is index-linked to inflation. To justify the 25% index-linked debt assumption, Ofgem notes:[60]

> As a working assumption, we have included 25% inflation-linked debt in the draft business plan financial model (consistent with RIIO-1). This is also consistent with RFPR data on the level of inflation-linked debt across the industry. However, we have included a suggested scenario where this assumption is flexed by ±5% (to 20% or 30%). We also expect to review this assumption following receipt of business plans and to decide on the appropriate proportion of inflation linked debt for the notional company at Final Determination.

The Regulatory Financial Performance Reporting (RFPR) data (which is on a pre-derivative basis) shows that while the average index-linked debt in the industry is around 25%, there is a wide range of index-linked debt between

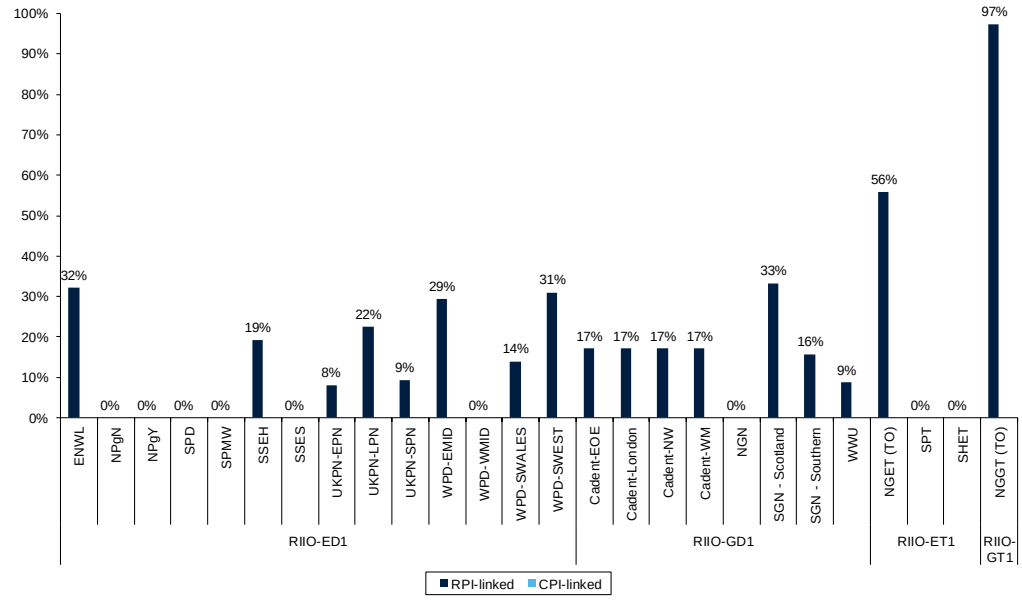
[58] The profile of cash flow modelled during RIIO-T2 implies that there will be equity issuance in some years and buybacks in other years, assuming a constant dividend yield. The reported net equity issuance is net of buybacks.
[59] We have this approach (i.e. assumed that there is no step-change in gearing at the start of RIIO-2) in this report unless otherwise noted.
[60] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, para. 4.109.

companies (see Figure 3.1 below). Moreover, the data shows that the energy sector does not have any CPI-linked debt in RIIO-1.

Ofgem has not presented any evidence on the availability of CPI-linked debt to support the financeability assessment of the notional company. It has also not presented any evidence on the equivalence of swapping RPI index-linked debt using CPIH swaps.

Given the uncertainty about the availability of new CPI-linked debt and the wide variance in RPI-linked debt across the sector, a +/-5% sensitivity to the 25% CPI-linked debt assumption does not seem appropriate.

Figure 3.1 Companies index-linked debt for RIIO-1



Source: Oxera analysis based on RFPR data.

We have therefore tested a 'no index-linked debt' sensitivity for the notional company as we understand from SHE-T that its actual debt portfolio does not include index-linked debt. Removing the assumption that 25% of debt is inflation-linked results in a decrease of the AICR to 0.99x (from 1.15x in the base case), well below Moody's' guidance threshold for a Baa2 rating (of 1.2x).[61]

3.4.4 High TOTEX scenario

In this section, we present the financial metrics under the high TOTEX scenario provided to us by SHE-T (see Table 3.13 below). It is perhaps counterintuitive that a high TOTEX scenario results in a higher AICR ratio (1.4x relative to 1.15x in the base TOTEX scenario).

The AICR is estimated as follows:

$$AICR = \frac{FFO\ (pre\ cash\ net\ interest) - RAV\ depreciation}{Cash\ net\ interest}$$

In the high TOTEX scenario, the additional TOTEX is capitalised at 90% and the remaining 10% is recovered as 'fast' money. In this scenario, the increase

[61] The AICR metric declines when reducing the proportion of index-linked debt due to FFO increasing (cash interest expense, which is deducted from FFO, is higher).

in FFO due to the increase in fast money is **not** offset by the RAV depreciation from the increase in CAPEX as SHE-T has a growing RAV. In other words, RAV depreciation may not be a good proxy for maintenance CAPEX and therefore the numerator of the ratio is increasing relative to the denominator, resulting in a higher AICR.

If SHE-T was in a steady state instead, as per the Ofgem definition of the 'notional company' (i.e. RAV depreciation was equal to CAPEX), then the AICR ratios would have been even lower than the AICR ratios estimated in both the baseline and the high TOTEX scenarios (note that SHE-T has a growing RAV in both the baseline and the high TOTEX scenarios), **further worsening** the financeability of the notional company. For the purpose of illustration, we present the SHE-T RAV depreciation and CAPEX profile over RIIO-2 in Table 3.12 below.

Table 3.12 CAPEX and RAV depreciation in base scenario, £m 2018/19 prices

TOTEX scenario	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	Total RIIO-2
CAPEX	406	521	453	444	297	2,121
RAV depreciation	205	218	231	242	249	1,146

Source: Oxera analysis based on the SHE-T financial model.

Table 3.13 High TOTEX scenario base case

	Base case
Net debt/RAV (%)	60.0%
FFO interest cover (interest expense) (x)	3.5
FFO interest cover (cash interest) (x)	4.0
AICR (or PMICR) (x)	1.40
Nominal PMICR	1.9
FFO (interest expense)/net debt (%)	9.2%
FFO (cash interest)/net debt (%)	9.8%
RCF/net debt (%)	7.9%
EBITDA/RAV (x)	9.5%
RORE (%)[1]	11.5%
Dividend cover (x)	2.7
Implied dividend yield (%)[2]	-4.6%
Required equity buyback/(issuance) (£m) [3]	(768)
Dividend/regulated equity (%)	3.0%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

3.5 Financeability analysis of the actual company in RIIO-2

In line with Ofgem's requirement, we have tested the financeability of the actual company based on the working assumptions proposed by Ofgem. We have then assessed the sensitivities prescribed by Ofgem on both the baseline

and the high TOTEX scenarios in the SHE-T financeability model, followed by SHE-T's sensitivities and proposed mitigation actions. The results of the Ofgem and SHE-T business plan sensitivities are presented in Appendix A2.2.

The main difference between the actual and the notional company pertains to the cost of debt assumption. For the actual company, we use the actual cost of debt for the SHE-T embedded debt, and the 1-year average spot interest rates on iBoxx A/BBB indices (with an additional 40–60bp in issuance and other costs) for the cost of new debt.[62]

3.5.5 Baseline TOTEX scenarios

Table 3.14 below shows the base case sensitivities for the various assumptions on the additional cost of new debt.

Table 3.15, Table 3.16 and Table 3.17 show Ofgem's proposed mitigation actions to address financeability for the various assumptions on additional cost of new debt (zero, 40bp and 60bp) respectively.

The main conclusions from the actual company financeability assessment are as follows.

- The AICR for the actual company is 1.27x, still below Moody's minimum threshold for Baa1 credit rating assuming zero issuance costs for new debt. With a 40–60bp uplift to the cost of new debt, the AICR ranges between 1.16x and 1.19x, which is below the Moody's threshold for a Baa2 rating.
- Reducing gearing to 55% or reducing the capitalisation rate to 86% will improve the AICR, although it will still be below Moody's' A3 rating threshold of 1.6x when issuance costs of new debt are assumed to be zero. With debt issuance costs of 40–60bp, the AICR will range between 1.34x and 1.46x, i.e. it will vary around Moody's' Baa1 threshold of 1.4x.[63]
- Reducing both the gearing to 55% and the capitalisation rate to 86% will allow the company to achieve a solid investment grade credit rating (AICR ranges from 1.62x to 1.76x).

[62] We understand that Ofgem's PCFM assumes that new debt is raised at the RIIO-T2 trombone, which is higher than the current market data on iBoxx A/BBB indices. We note that our disaggregated all-in cost of debt approach better approximates the actual cost of raising new debt in the RIIO-2 period.
[63] While the gearing is reduced to 55%, the cost of equity is held constant at 4.3% CPIH-real, consistent with how Ofgem addressed financeability constraints in RIIO-1. If the cost of equity had been re-calibrated at a 55% gearing (leading to a lower cost of equity), the credit metrics may not improve with a change in gearing.

Table 3.14 Financeability metrics for the actual company

	Base case (zero additional cost of debt)	40bp additional cost of debt	60bp additional cost of debt
Net debt/RAV (%)	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.4	4.1	4.0
FFO interest cover (cash interest) (x)	4.4	4.1	4.0
AICR (or PMICR) (x)	1.27	1.19	1.16
Nominal PMICR	2.3	2.1	2.1
FFO (interest expense)/net debt (%)	10.0%	9.8%	9.7%
FFO (cash interest)/net debt (%)	10.0%	9.8%	9.7%
RCF/net debt (%)	10.0%	9.8%	9.7%
EBITDA/RAV (x)	9.4%	9.4%	9.4%
RORE (%)[1]	12.5%	12.2%	12.0%
Dividend cover (x)	n/a	n/a	n/a
Implied dividend yield (%)[2]	0.4%	0.1%	-0.1%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. [2] The implied dividend yield is the outcome from the modelling of the actual company.

Source: Oxera analysis based on the SHE-T financial model.

Table 3.15 Mitigation measures to address financeability for the actual company (zero additional cost of debt)

	Base case (zero additional cost of debt)	Capitalisation rate = 85.8%	Gearing = 55%	Gearing =55% and capitalisation rate = 85.8%
Net debt/RAV (%)	60.0%	60.0%	55.0%	55.0%
FFO interest cover (interest expense) (x)	4.4	4.7	4.9	5.2
FFO interest cover (cash interest) (x)	4.4	4.7	4.9	5.2
AICR (or PMICR) (x)	1.27	1.55	1.46	1.76
Nominal PMICR	2.3	2.6	2.5	2.9
FFO (interest expense)/net debt (%)	10.0%	10.9%	11.4%	12.4%
FFO (cash interest)/net debt (%)	10.0%	10.9%	11.4%	12.4%
RCF/net debt (%)	10.0%	10.9%	11.4%	12.4%
EBITDA/RAV (x)	9.4%	10.2%	9.7%	10.4%
RORE (%)[1]	12.5%	13.8%	11.5%	12.7%
Dividend cover (x)	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	0.4%	0.9%	-1.6%	-1.2%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. [2] The implied dividend yield is the outcome from the modelling of the actual company.

Source: Oxera analysis based on the SHE-T financial model.

Table 3.16 Mitigation measures to address financeability for the actual company (40bp additional cost of debt)

	Base case (40bp additional cost of debt)	Capitalisation rate = 85.8%	Gearing = 55%	Gearing = 55% and capitalisation rate = 85.8%
Net debt/RAV (%)	60.0%	60.0%	55.0%	55.0%
FFO interest cover (interest expense) (x)	4.1	4.4	4.6	4.9
FFO interest cover (cash interest) (x)	4.1	4.4	4.6	4.9
AICR (or PMICR) (x)	1.19	1.46	1.38	1.66
Nominal PMICR	2.1	2.4	2.4	2.7
FFO (interest expense)/net debt (%)	9.8%	10.7%	11.2%	12.2%
FFO (cash interest)/net debt (%)	9.8%	10.7%	11.2%	12.2%
RCF/net debt (%)	9.8%	10.7%	11.2%	12.2%
EBITDA/RAV (x)	9.4%	10.1%	9.6%	10.3%
RORE (%)[1]	12.2%	13.5%	11.3%	12.4%
Dividend cover (x)	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	0.1%	0.5%	-1.9%	-1.4%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in

the SHE-T business plan. [2] The implied dividend yield is the outcome from the modelling of the actual company.

Source: Oxera analysis based on the SHE-T financial model.

Table 3.17 Mitigation measures to address financeability for the actual company (60bp additional cost of debt)

	Base case (zero additional cost of debt)	Capitalisation rate = 85.8%	Gearing = 55%	Gearing =55% and capitalisation rate = 85.8%
Net debt/RAV (%)	60.0%	60.0%	55.0%	55.0%
FFO interest cover (interest expense) (x)	4.0	4.3	4.4	4.8
FFO interest cover (cash interest) (x)	4.0	4.3	4.4	4.8
AICR (or PMICR) (x)	1.16	1.41	1.34	1.62
Nominal PMICR	2.1	2.3	2.3	2.6
FFO (interest expense)/net debt (%)	9.7%	10.6%	11.1%	12.1%
FFO (cash interest)/net debt (%)	9.7%	10.6%	11.1%	12.1%
RCF/net debt (%)	9.7%	10.6%	11.1%	12.1%
EBITDA/RAV (x)	9.4%	10.1%	9.6%	10.3%
RORE (%)[1]	12.0%	13.3%	11.2%	12.3%
Dividend cover (x)	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	-0.1%	0.4%	-2.0%	-1.6%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. [2] The implied dividend yield is the outcome from the modelling of the actual company.

Source: Oxera analysis based on the SHE-T financial model.

3.5.6 High TOTEX scenario

As stated previously in section 3.4.4, the high TOTEX scenario inflates the AICR (1.55x assuming no additional cost of debt) as the RAV depreciation does not proxy well for the actual maintenance CAPEX. Table 3.18 below shows the base case sensitivities for the high TOTEX scenario under the 4.3% CPIH-real cost of equity.

Table 3.18 Financeability metrics for the actual company (high TOTEX scenario)

	High TOTEX (zero additional cost of debt)	40bp additional cost of debt	60bp additional cost of debt
Net debt/RAV (%)	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.4	4.1	4.0
FFO interest cover (cash interest) (x)	4.4	4.1	4.0
AICR (or PMICR) (x)	1.55	1.44	1.39
Nominal PMICR	2.5	2.3	2.2
FFO (interest expense)/net debt (%)	10.1%	9.8%	9.7%
FFO (cash interest)/net debt (%)	10.1%	9.8%	9.7%
RCF/net debt (%)	10.1%	9.8%	9.7%
EBITDA/RAV (x)	9.7%	9.6%	9.6%
RORE (%)[1]	12.8%	12.4%	12.2%
Dividend cover (x)	n/a	n/a	n/a
Implied dividend yield (%)[2]	-3.4%	-3.8%	-4.0%

Note: [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. [2] The implied dividend yield is the outcome from the modelling of the actual company.

Source: Oxera analysis based on the SHE-T financial model.

3.6 Impact of the CPIH transition

In the SSMD, Ofgem proposes switching from RPI to CPIH as a measure of inflation. It has indicated that the switch should, on an ex ante basis, secure NPV-neutrality for the regulated companies. Specifically, a lower depreciation allowance (due to lower RAV indexation under the CPIH) is expected to be offset with a higher return allowance (due to a higher cost of capital expressed in CPIH terms).

The CPIH transition has a significant positive cash flow impact in RIIO-2 due to higher cash flows from a higher return allowance (due to a higher cost of capital expressed in CPIH terms). Absent the CPIH transition, the notional company's financeability metrics would be under significantly more pressure in RIIO-2. This can be seen in the 'RPI inflation' scenario in Table 3.8 above. This scenario assumes that RPI inflation continues to be used in the control. The AICR declines to 0.63x (from 1.15x in the base case), below Moody's' guidance of 1.2x for a Baa2 investment-grade credit rating and well below its guidance of 1.4–2.0x for a Baa rating. These values are below the 'solid' investment-grade ratings of Baa1 or BBB+, as implied by the guidance from the Competition Commission (2007). FFO (cash interest)/net debt declines to 8.0%, below Moody's' guidance range for an investment-grade credit rating of Baa; while RCF/net debt falls to 6.1%, also below Moody's' guidance for an investment-grade credit rating of Baa.

This demonstrates that, but for the transition to CPIH inflation, the credit metrics would not have been consistent with the threshold guidance for investment-grade ratings. If the status quo of the RPI basis had been retained,

the price control parameters would have appeared mis-calibrated in ensuring the financeability of the notional company. If, instead, the cost of capital were stated in RPI-deflated terms and RPI indexation were retained in relation to the indexation of the RAV, we estimate that a 7.0% cost of equity (real, CPI) would be required to raise the AICR to 1.15x, consistent with the notional company under CPIH indexation. This would imply a cost of equity of 5.89% (real, RPI).

While the transition to CPIH improves revenues in the short term (relative to RPI indexation), and hence financeability metrics, it would be expected to reduce them in the long term, all else being equal (see Appendix A2).[64] The long-term implications for financeability therefore need to be considered.

3.7 Assessment of Ofgem's guidelines and metrics to assess financeability

3.7.1 Actions in response to financeability concerns

As explained in the SSMD, Ofgem is putting the onus on companies to take action to address financeability concerns. Ofgem suggests several courses of action: changes to dividend policy, equity injections, debt refinancing, alternative capitalisation rates and/or depreciation rates (if appropriate), and adjusting notional gearing.[65]

In relation to a reduction in dividends and/or injections of equity, we observe that in the SSMD, Ofgem suggested that a reduction or cessation of dividends could be used for companies facing financeability constraints, stating the following.[66]

> As discussed in the notional company credit metrics section above we believe the credit metrics for the notional company are mainly improved compared to RIIO-1 so we do not believe long term dividend restraint for the notional company would be required. Therefore, any requirement for dividend restraint would likely be due to company specific actual financeability constraints, which it is appropriate for network companies to consider addressing through dividend restraint or equity injection. Ofgem considers that restricting dividends can be an effective measure for addressing company-specific financeability constraints as this would increase funds available for making debt service payments or, if used to pay down debt (either at maturity or before to pay for refinancing high coupon debt or other financial commitments), it can reduce gearing and/or debt interest costs and improve key credit metrics.

In the quotation above, Ofgem assumes that forgone dividends would be used to reduce gearing and/or debt interest costs. However, this may not be practical due to, for example, transaction costs and refinancing costs. Refinancing debt is likely to entail a buyback premium, and it would not be effective if the embedded debt had been financed on terms equal to or better than the current rates available to the company.

We have shown that, in line with SHE-T's projected RAV growth for the RIIO-2 period, the equity issuance requirement over the period is around £340m assuming RIIO-1 closes at 60% gearing, to ensure that gearing is aligned with the notional assumption of 60% and a dividend yield of 3%.

We have also noted why changes, such as capitalisation rates or asset lives, may not be practical or effective if the credit rating agencies make offsetting

[64] Assuming an expected level of inflation, our calculations using a simplified version of SHE-T's financial model indicate that the NPV of the nominal revenues under the CPIH or RPI (discounted at the nominal WACC) would be equal in both cases (i.e. the transition is NPV-neutral).
[65] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.5.
[66] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.66.

adjustments for NPV-neutral reprofiling of cash flows when estimating credit metrics. For example, Fitch has indicated that it does not view alternative capitalisation or depreciation rates as helping PMICRs.[67]

3.7.2 Ofgem's financeability metrics

Table 3.19 compares Ofgem's metrics with those of the credit rating agencies.

Table 3.19 Comparative review of Ofgem's financeability metrics

Metrics and formulas used by Ofgem and the credit rating agencies	Differences
Debt ratios	
Gearing $\frac{Net\ debt}{RAV}$	None
FFO interest cover (interest expense) Ofgem: $\frac{FFO\ (pre\ cash\ net\ interest)}{Cash\ net\ interest + principal\ inflation\ accretion}$ Moody's (2017): $\frac{FFO\ (pre\ cash\ net\ interest)}{Cash\ net\ interest}$	Ofgem's metric explicitly includes principal inflation accretion in the denominator, which is the increase in the value of index-linked debt due to increases in the inflation rate It is unclear formulaically how the credit rating agencies treat inflation-linked debt, however both Moody's (2017) and S&P (2013) mention that they make appropriate adjustments
FFO interest cover (cash interest) $\frac{FFO\ (pre\ cash\ net\ interest)}{Cash\ net\ interest}$	None
AICR Ofgem (2019): $\frac{FFO\ (pre\ cash\ net\ interest) - RAV\ depreciation}{Cash\ net\ interest}$ Moody's (2017): $\frac{FFO\ (pre\ cash\ net\ interest) - non\ cash\ accretion - capital\ charges}{Cash\ net\ interest - non\ cash\ accretion}$	Capital charges, such as regulatory depreciation, the excess of 'fast money' over OPEX, and the excess of 'profiled revenue' over 'un-profiled revenue' are subtracted from FFO by Moody's Non-cash accretion is deducted in the numerator, only to the extent that it has been included in FFO, and is deducted from the denominator only to the extent that it has been included in interest expense
Nominal PMICR Ofgem (2019): $\frac{FFO\ (pre\ cash\ net\ interest) - RAV\ depreciation + YoY\ RAV\ inflation}{Cash\ net\ interest + principal\ inflation\ accretion}$ Fitch (2018): $\frac{FFO\ (pre\ cash\ net\ interest) \pm net\ working\ capital - maintenance\ capex}{Cash\ net\ interest}$	Similar to the AICR, Ofgem subtracts RAV depreciation from FFO, but it is unclear whether it makes adjustments for other capital charges Fitch takes a different approach by subtracting maintenance CAPEX and net working capital from FFO. Ofgem adds RAV inflation to FFO, and adds principal inflation accretion to the interest expense in the denominator
FFO/net debt (interest expense) Ofgem (2019): $\frac{FFO\ (post\ cash\ interest) - principal\ inflation\ accretion}{Net\ debt}$	Ofgem's calculation of the metric includes an adjustment for principal inflation accretion in the numerator

[67] FitchRatings (2019), 'Fitch Rtgs: Ofgem's Credit-Enhancing Mechanisms Unlikely to Benefit Ratings', 28 February.

Metrics and formulas used by Ofgem and the credit rating agencies	Differences
Standard & Poor's (2013) and Moody's (2017): $\frac{FFO\ (post\ cash\ interest)}{Net\ debt}$	
FFO/net debt (cash interest) Ofgem (2019): $\frac{FFO\ (post\ cash\ interest)}{Net\ debt}$ Standard & Poor's (2013) and Moody's (2017): $\frac{FFO\ (post\ cash\ interest)}{Net\ debt}$	Ofgem's calculation of the metric is the same as that of the credit rating agencies
RCF/net debt Ofgem (2019): $\frac{FFO\ (post\ cash\ interest) - dividends - principal\ inflation\ accretion}{Net\ debt}$ Moody's (2017): $\frac{FFO\ (post\ cash\ interest) - dividends}{Net\ debt}$	Ofgem's calculation of the metric includes an adjustment for principal inflation accretion in the numerator
Equity ratios	
EBITDA/RAV Ofgem (2019): $\frac{EBITDA}{RAV}$	n/a
RORE Ofgem (2019): $\frac{EBIT - tax - (cost\ of\ debt * debt\ RAV)}{Equity\ RAV}$	n/a
Dividend cover Ofgem (2019): $\frac{Profit\ after\ tax}{Dividends\ declared}$ Fitch (2018): $\frac{FFO\ (post\ cash\ interest)}{Dividends\ declared}$	Ofgem considers this metric from an accounting profit perspective, while the credit rating agencies work on a cash basis
Dividend/regulated equity Ofgem (2019): $\frac{Dividends\ declared}{Equity\ RAV}$	n/a

Notes: [1] The PMICR is described as the ratio between cash flows from operations less maintenance CAPEX and net interest expense. Cash flows from operations are FFO plus net working capital. For a more detailed description of Fitch's' definitions of cash flow measures, see Fitch (2019), 'Corporates – Corporate Rating Criteria: Master Criteria', 19 February, p. 46.

Source: Oxera analysis; Moody's (2017), 'Regulated Electric and Gas Networks', 16 March, p. 19; Fitch (2018), 'Corporates—Sector Navigator: Addendum to the Corporate Rating Criteria', March, p. 189; Standard & Poor's (2013), 'Corporate Methodology: Ratios and Adjustments', 19 November, p. 36; Fitch (2018), 'Corporates—Sector Navigator: Addendum to the Corporate Rating Criteria', March, p. 117.

From the comparison of the formulas, it is not clear where there will be systematic differences between Ofgem's findings and those of the credit rating agencies. This is not least because the latter do not always set out explicitly what adjustments they will make formulaically. For example, Moody's (2017) and S&P (2013) both mention that they make appropriate adjustments for inflation-linked debt, notwithstanding that these adjustments are not stated in the formulas (e.g. for FFO interest cover).

To account for regulatory decisions that alter the timing of cash flows, the credit rating agencies make adjustments to ratios—for example, through

changes to asset lives, depreciation policy, capitalisation ratio, and revenue profiling.[68] Moody's (2017) states: '[t]he adjusted ICR attempts to normalize for these 'regulatory levers' by adjusting FFO by an amount of money ("Capital Charges") that can be influenced by regulatory decision making in the allowed revenue calculation'. This is partly why, as noted earlier in the report, changes to such assumptions as a tool to address financeability concerns may not be effective or practical. To the extent that Ofgem, in calculating credit metrics, does not make such adjustments itself, it may formulaically find an improvement in credit metrics from revising the asset life assumption for RIIO-2, for example, which is a change that the credit rating agencies may then look through in their calculations.

Finally, we have considered the credit metrics analysis undertaken by Ofgem in relation to the notional electricity transmission company in RIIO-T2, as reported in the SSMD. We observe that, for this preliminary financeability assessment, Ofgem uses the economic form of the ratios, rather than the accounting form, where the accounting form is consistent with the credit rating agencies' methodologies, as well as Ofgem's financeability guidance.[69] We have been able to broadly replicate the economic form of the ratios derived by Ofgem,[70] using the SHE-T financial model.[71]

This shows that the economic form of the average ratios for RIIO-2 is higher than the accounting form.[72] However, our analysis in this report focuses on the accounting form of the metrics based on business plan information provided by SHE-T.

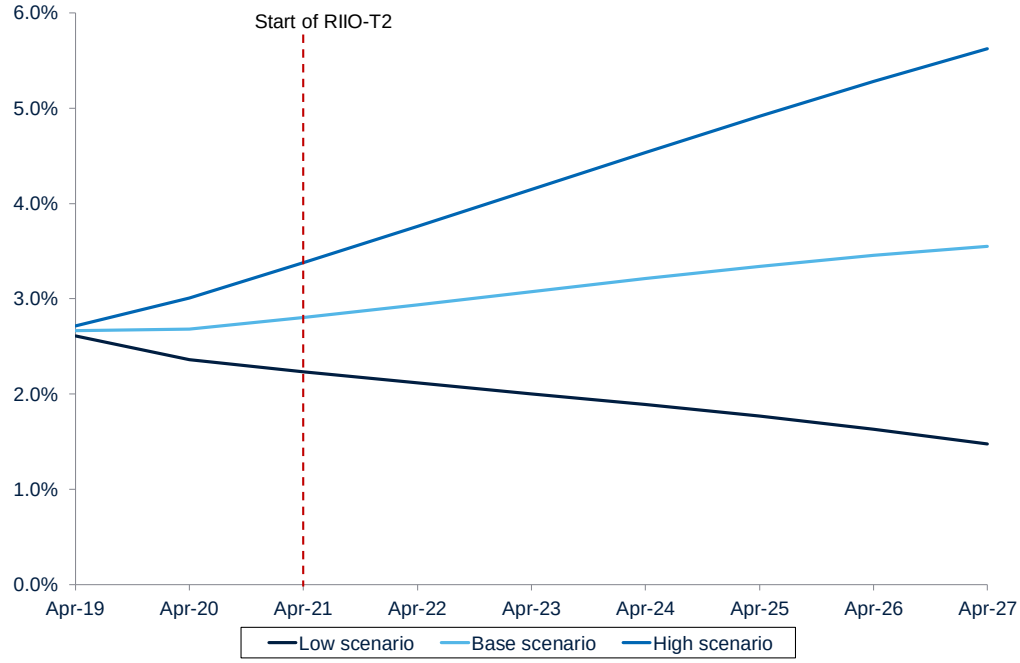
[68] Moody's (2017), 'Ratings Methodology for Regulated Electric and Gas Networks', 16 March, Appendix B.
[69] Ofgem (2019), 'Financeability Assessment for RIIO-2: Further Information', 26 March.
[70] For the avoidance of doubt, we do not agree with the inclusion of Ofgem's expected 50bp outperformance wedge within the cost of equity allowance in modelling the base case credit metrics.
[71] The differences arise due to the difference in the cost of debt assumption—our analysis is based on more recent market data (cut-off date of 31st October 2019) compared to Ofgem.
[72] This likely difference has been acknowledged by Ofgem, which states in the SSMD that: 'In practice the key credit ratios are calculated from accounting information, may be subject to individual rating agencies' adjustments and will be influenced by the impact of incentives, timing, movements in working capital, actual company capital structures and actual debt costs.' See Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision – Finance', 24 May, para. 4.39.

A1 Cost of debt assessment

A1.1 Interest rate scenarios

Figure A1.1 presents the evolution of the spot cost of debt (average of A and BBB iBoxx 10-year+ non-financial corporate bond indices) under the base, high and low future interest rate scenarios.

Figure A1.1 Spot cost of debt: evolution under the base, high and low future interest rate scenarios



Source: Oxera analysis based on data from Thomson Reuters.

The table below presents the difference between the allowed and the actual cost of debt net of other costs (i.e. transaction costs, cost of carry, etc.) per annum in percentage terms. Negative values indicate that SHE-T will not be able to fund the all-in cost of debt under the scenario.

Table A1.1 Percentage difference between the allowed and the actual cost of debt net of costs not covered by the allowed cost of debt mechanism (0.4–0.6%) (%)

Cost of debt mechanism	Base case	Low interest rate scenario	High interest rate scenario
Trombone T2	0.22–0.42	0.47–0.67	(0.03)–0.17
15-year trailing average	0.45–0.65	0.7–0.9	0.19–0.39
Trombone 16–20-year average	0.84–1.04	1.13–1.33	0.54–0.74
Trombone ED1	0.89–1.09	1.18–1.38	0.59–0.79
20-year trailing average	0.93–1.13	1.23–1.43	0.63–0.83

Note: The difference between the allowed and actual cost of debt is estimated on a per annum basis. The low and high interest rate scenarios reflect the annual impact in percentage terms in RIIO-2, subject to a ±25bp deviation from the nominal forward curve. The () indicate negative values—SHE-T will not be able to fund the all-in cost of debt under the scenario.

Source: Oxera analysis.

A1.2 Alternative interest rate sensitivities based on Ofgem's assumptions

In the SSMD document, Ofgem has suggested interest rate sensitivities of ±1% as scenarios for the movement in interest rates in RIIO-2.[73]

We have therefore tested the cost of debt mechanisms based on Ofgem's ±1% scenarios for future interest rates. We did this by applying a ±1% deviations to the base forward curve. The high and low sensitivities based on Ofgem's assumption, refer to a ±100 bp fixed deviation from the nominal forward curve starting from October 2020 up to the end of RIIO-T2.

The impacts on funding (£m) in RIIO-T2 based on Ofgem's interest rate sensitivities, under the various cost of debt mechanisms net of other costs (i.e. transaction costs, cost of carry, etc.) are presented below.

Table A1.2 Average annual funding impact in RIIO-2 based on Ofgem's interest rate sensitivities, under different cost of debt mechanisms net of costs not covered by the cost of debt mechanism (40–60bp) (£m nominal)

Cost of debt mechanism	Base case	Ofgem's low interest rate scenario	Ofgem's high interest rate scenario
Trombone T2	5–11	12–17	(0.6)–5
15-year trailing average	11–16	17–23	4–10
Trombone 16–20-year average	22–27	30–36	14–19
Trombone ED1	23–29	32–37	15–20
20-year trailing average	24–30	33–38	16–21

Note: The impact on funding is reported on a per annum nominal (£m) basis. The low and high interest rate scenarios reflect the annual funding impact in RIIO-2, subject to Ofgem's suggested sensitivities of ±100bp deviation from the nominal forward curve.

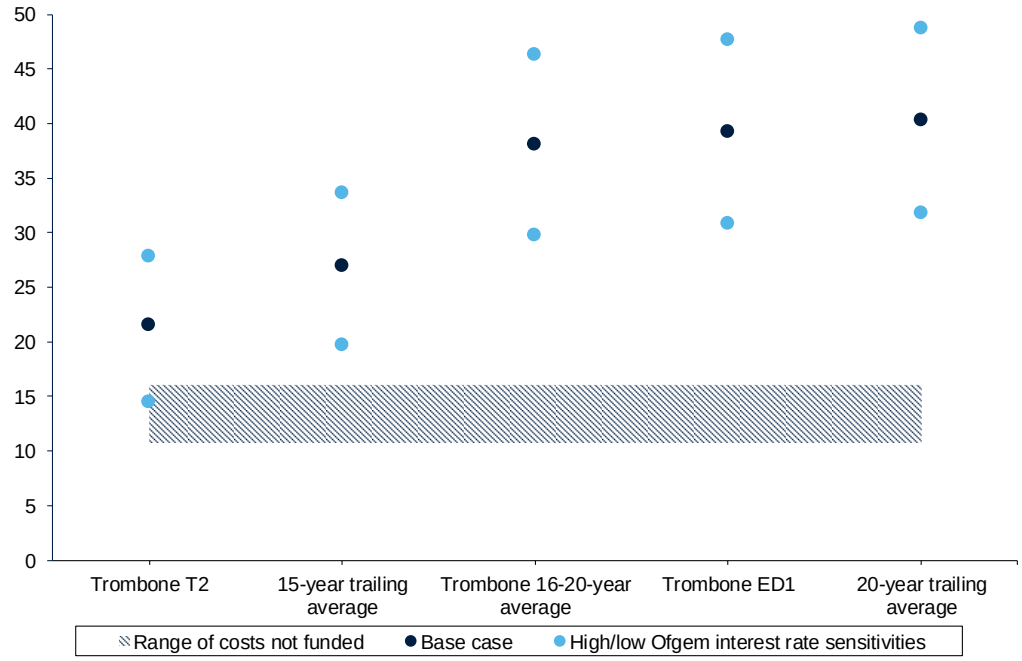
Source: Oxera analysis.

Under a scenario where interest rates are 100bp higher than the current market-derived forecast, an 11–15-year trombone average will underfund SHE-T's all-in cost of debt. Implementing a simple 15–year-trailing average would provide an increase in funding relative to the 11–15-year trombone average, but is less likely to underfund the all-in cost of debt for SHE-T over RIIO-T2.

Figure A1.2 shows that the cost of debt mechanism based on the 11-15 year trombone average, would not allow SHE-T to recover its actual cost of debt in Ofgem's high interest rate scenario.

[73] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.74.

Figure A1.2 Average annual funding impact in RIIO-2 based on Ofgem's interest rate sensitivities, under different cost of debt mechanisms (£m nominal)



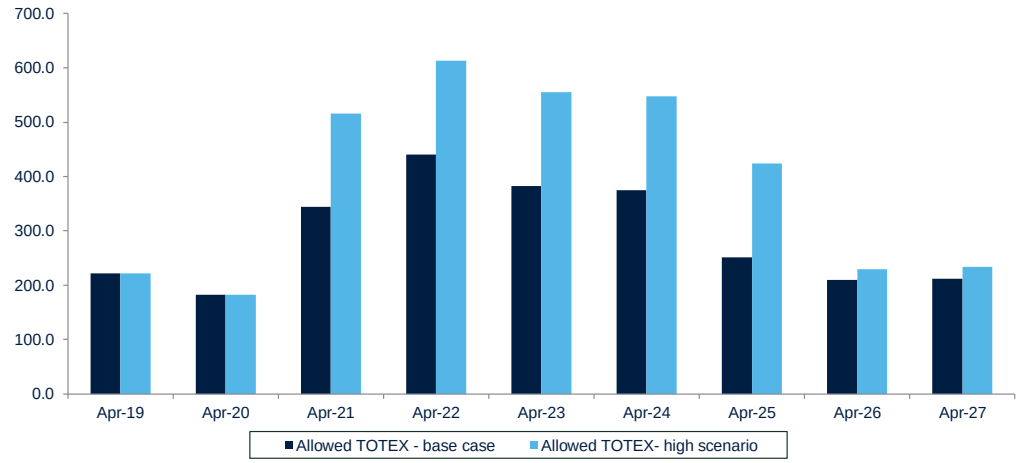
Note: The lower bound of the range corresponds to the funding impact (£m) under Ofgem's high interest rate sensitivity, while the upper bound reflects the funding impact in Ofgem's low interest rate sensitivity. The midpoint of the range is the base case scenario (i.e. no deviation from the nominal forward rates). The costs not funded are assumed to equal 40–60bp, and represent the new issue premium; the cost of carry; a premium for issuing nominal debt relative to index-linked debt; issuing at BBB+ yields that are higher than the average of A and BBB yields.

Source: Oxera analysis.

A1.3 Sensitivity based on SHE-T TOTEX scenarios

In the draft business plan for RIIO-T2, SHE-T considered two TOTEX scenarios. The difference between the base case and high TOTEX scenarios is illustrated in the figure below.

Figure A1.3 Allowed TOTEX projections in the base case and high scenarios (£m nominal)



Source: Oxera analysis based on SHE-T model.

So far, our assessment of the average annual funding impact in RIIO-2 under different allowed cost of debt mechanisms net of other debt associated costs (40–60bp) relies on the base TOTEX projections.

For the purpose of scenario analysis, we have also tested the sensitivity of the results based on the high TOTEX projections.

In the table below, we present the impacts on funding (£m) in RIIO-T2 based on the high TOTEX values, under the various cost of debt mechanisms net of other costs (i.e. transaction costs, cost of carry, etc.).

Table A1.3 Average annual funding impact in RIIO-2 based on the high TOTEX scenario, under different cost of debt mechanisms net of costs not covered by the cost of debt mechanism (40–60bp) (£m nominal)

Cost of debt mechanism	Base case	Low interest rate scenario	High interest rate scenario
Trombone T2	6–12	16–22	(4)–2
15-year trailing average	12–18	22–28	2–8
Trombone 16–20-year average	24–30	36–42	13–19
Trombone ED1	26–32	37–43	15–21
20-year trailing average	27–33	38–44	16–22

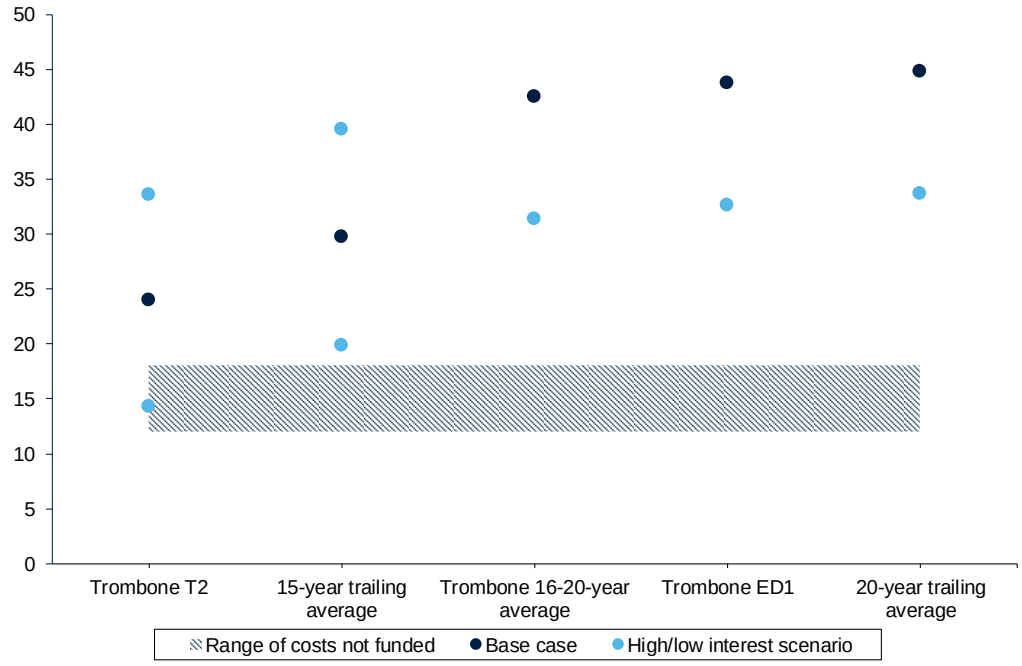
Note: The impact on funding is reported on a per annum nominal (£m) basis. The low and high interest rate scenarios reflect the annual funding impact in RIIO-2, subject to ±25bp deviation from the nominal forward curve.

Source: Oxera analysis.

Under a scenario where interest rates are 25bp higher than the current market-derived forecast and TOTEX follows the same path as SHE-T's projections in the high scenario, an 11–15-year trombone average will underfund SHE-T's all-in cost of debt by approximately £4m. This is a larger funding deficit than in the base TOTEX scenario. Implementing a simple 15-year trailing average would provide a small increase in funding relative to the 11–15-year trombone average, and is less likely to underfund the all-in cost of debt for SHE-T over RIIO-T2.

The figure below shows that the cost of debt mechanisms based on the 11–15-year trombone average, would not allow SHE-T to recover its actual cost of debt in the high interest rate and high TOTEX scenario.

Figure A1.4 Average annual funding impact in RIIO-2 based on the high TOTEX scenario, under different cost of debt mechanisms (£m nominal)



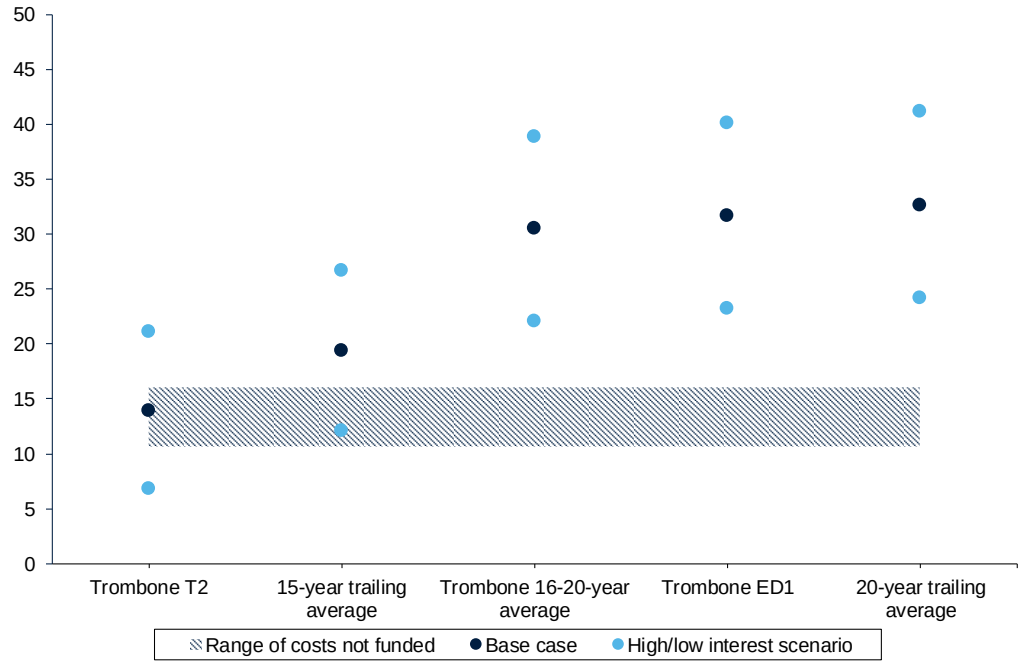
Note: The lower bound of the range corresponds to the funding impact (£m) under the high interest rate sensitivity, while the upper bound reflects the funding impact in the low interest rate sensitivity. The midpoint of the range is the base case scenario (i.e. no deviation from the nominal forward rates). The costs not funded are assumed to equal 40–60bp, and represent the new issue premium; the cost of carry; a premium for issuing nominal debt relative to index-linked debt; issuing at BBB+ yields that are higher than the average of A and BBB yields.

Source: Oxera analysis.

A1.4 SHE-T view on the term premium

The figure below shows the scenario where the embedded cost of debt is uplifted by 60bp, as per SHE-T's view on the term premium between 10-year and 20-year bonds.

Figure A1.5 Average annual funding impact in RIIO-2 under different cost of debt mechanisms (£m nominal) with SHE-T term premium assumption (60bp)



Note: The lower bound of the range corresponds to the funding impact (£m) under the high interest rate scenario, while the upper bound reflects the funding impact in the low interest rate scenario. The midpoint of the range is the base case scenario (i.e. no deviation from the nominal forward rates). The costs not funded are assumed to equal 40–60bp, and represent the new issue premium; the cost of carry; a premium for issuing nominal debt relative to index-linked debt; issuing at BBB+ yields that are higher than the average of A and BBB yields.

Source: Oxera analysis.

A2 Financeability assessment

A2.1 Overview of modelling key parameters for the notional and actual company

Our modelling assumes that net debt grows in line with RAV growth, maintaining notional gearing at a constant of 60%. We use the annual closing RAV as estimated by SHE-T in its financial model. The notional net debt is therefore exogenous to the model and does not fluctuate year-by-year with changes in other input parameters.

Interest expense for the notional company is estimated using the notional net debt and allowed cost of debt (i.e. our estimates of Ofgem's 11–15-year trombone under the base case). We perform a sensitivity test using SHE-T's proposal for a 15-year trailing average of yields on A/BBB iBoxx non-financial corporate bond indices for the cost of debt (see 'Cost of debt mechanisms' in section 2 of this report).[74] For the actual company financeability assessment, we have calculated SHE-T's cost of debt incurred on its actual debt profile. Whilst the actual cost of debt is used to model SHE-T's cost of embedded debt, we model any new debt at the spot average of yields on A/BBB iBoxx non-financial corporate bond indices. In addition, we include a 40–60bp uplift to the cost of new debt to account for transaction and other issuance costs (see section 2 for more details).

Cash interest differs from interest expense in our financeability assessment due to the 25% inflation-linked debt in line with Ofgem's guidance for the notional company.[75] The introduction of index-linked debt for the notional company means that part of the interest expense that is incurred is not paid immediately and increases the value of the outstanding principal ('principal inflation accretion'). The FFO (cash interest)/net debt ratio is higher with the introduction of index-linked debt to the notional company as the numerator is on a cash interest basis and does not require an adjustment for principal inflation accretion. The FFO interest cover (excl. accretions) ratio is higher as the denominator is on a cash interest basis and does not require an adjustment for principal inflation accretion. SHE-T does not have any forecast index-linked debt for RIIO-T2, therefore the cash interest is the same as interest expense for actual company financeability assessment.

The dividend yield is assumed to be in line with the Ofgem assumption of 3% in the base case. On the other hand, the actual company has a forecast dividend yield of 0% in line with its expectations that it will need to raise equity during RIIO-T2. Dividends are calculated using the NPV-neutral equity RAV, as estimated by SHE-T in the financial model.

The equity injection required during RIIO-2 is estimated by modelling the movement in the notional net debt required to bring gearing back to 60% in each year, after accounting for regulatory revenues, pass-through cash flows, interest, tax and dividends. We assume that equity issuance costs for the notional company are 5% in line with Ofgem's working assumptions for RIIO-T2. The actual company is assumed to have 0% equity issuance costs as forecast in SHE-T's Business Plan Data Template.

[74] The 15-year trailing average cost of debt index excludes the impact of transaction costs and the cost of carry. We note that SHE-T is currently engaging with Ofgem on the appropriate length of the trailing average period; therefore, the sensitivity modelled here is not intended to preclude the possibility of a different trailing average period as an outcome from the SHE-T business planning process and engagement.
[75] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.43.

A2.2 Financeability metrics for the notional and the actual company under base case cost of equity (4.3% CPIH-real) and TOTEX profiles

Table A2.1 Notional company, high TOTEX scenario

	CoE 4.3%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.5	3.5	3.3	3.7	3.5	3.5	3.5	3.5	3.5	3.4	4.0	2.9	3.5	3.5
FFO interest cover (cash interest) (x)	4.0	3.5	3.7	4.3	4.3	3.7	4.0	4.0	4.1	3.9	4.6	3.4	4.1	3.9
AICR (or PMICR) (x)	1.40	1.21	1.36	1.44	1.51	1.30	1.40	1.40	1.45	1.35	2.00	0.79	1.44	1.35
Nominal PMICR	1.9	1.9	1.9	2.0	2.3	1.6	1.9	1.9	2.0	1.9	2.5	1.4	1.9	1.9
FFO (interest expense)/net debt (%)	9.8%	9.2%	9.7%	9.8%	10.0%	9.5%	9.8%	9.8%	10.1%	9.5%	11.7%	7.8%	9.9%	9.7%
FFO (cash interest)/net debt (%)	9.2%	9.2%	9.2%	9.3%	9.2%	9.2%	9.2%	9.2%	9.6%	9.0%	11.2%	7.3%	9.2%	9.2%
RCF/net debt (%)	7.9%	7.4%	7.9%	7.9%	8.1%	7.6%	7.9%	7.9%	8.2%	7.6%	9.9%	5.9%	8.0%	7.8%
EBITDA/RAV (x)	9.5%	9.5%	9.7%	9.3%	9.5%	9.5%	9.5%	9.5%	9.7%	9.3%	11.2%	7.8%	9.5%	9.5%
RORE (%)[1]	11.5%	11.5%	11.4%	11.5%	11.6%	11.3%	11.5%	11.5%	12.0%	10.9%	14.6%	8.3%	11.5%	11.5%
Dividend cover (x)	2.7	2.7	2.7	2.7	2.8	2.7	2.7	2.7	2.9	2.5	3.8	1.7	2.7	2.7
Implied dividend yield (%)[2]	-4.6%	-4.7%	-4.7%	-4.6%	-3.2%	-6.1%	-4.6%	-4.6%	-2.1%	-7.1%	-1.5%	-7.8%	-4.6%	-4.7%
Required equity buyback/(issuance) (£m) [3]	(768)	(778)	(772)	(765)	(640)	(890)	(768)	(768)	(500)	(1036)	(449)	(1087)	(766)	(770)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem

scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.2 Actual company, base TOTEX scenario, zero additional borrowing cost assumption

	CoE 4.3%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.4	4.4	3.7	4.9	4.4	4.4	4.4	4.4	4.5	4.3	5.1	3.7	4.2	4.4
FFO interest cover (cash interest) (x)	4.4	4.4	3.7	4.9	4.4	4.4	4.4	4.4	4.5	4.3	5.1	3.7	4.3	4.4
AICR (or PMICR) (x)	1.27	1.27	1.11	1.33	1.27	1.28	1.27	1.27	1.34	1.21	1.95	0.60	1.26	1.27
Nominal PMICR	2.3	2.3	1.9	2.5	2.8	1.8	2.3	2.3	2.4	2.2	2.9	1.6	2.2	2.3
FFO (interest expense)/net debt (%)	10.0%	10.0%	9.6%	10.1%	10.0%	10.0%	10.0%	10.0%	10.3%	9.7%	12.0%	8.0%	9.9%	10.0%
FFO (cash interest)/net debt (%)	10.0%	10.0%	9.6%	10.1%	10.0%	10.0%	10.0%	10.0%	10.3%	9.7%	12.0%	8.0%	9.8%	10.0%
RCF/net debt (%)	10.0%	10.0%	9.6%	10.1%	10.0%	10.0%	10.0%	10.0%	10.3%	9.7%	12.0%	8.0%	9.9%	10.0%
EBITDA/RAV (x)	9.4%	9.4%	9.5%	9.3%	9.4%	9.4%	9.4%	9.4%	9.7%	9.2%	11.1%	7.8%	9.4%	9.4%
RORE (%)[1]	12.5%	12.5%	11.9%	12.6%	12.6%	12.4%	12.5%	12.5%	13.1%	11.9%	15.6%	9.4%	12.3%	12.5%
Dividend cover (x)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	0.4%	0.4%	-0.2%	0.5%	1.9%	-1.0%	0.4%	0.4%	2.5%	-1.6%	3.5%	-2.7%	0.4%	0.4%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.3 Actual company, high TOTEX scenario, zero additional borrowing cost assumption

	CoE 4.3%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.4	4.4	3.6	5.0	4.4	4.4	4.4	4.4	4.5	4.3	5.1	3.7	4.2	4.4
FFO interest cover (cash interest) (x)	4.4	4.4	3.6	5.0	4.4	4.4	4.4	4.4	4.5	4.3	5.1	3.7	4.4	4.4
AICR (or PMICR) (x)	1.55	1.55	1.31	1.67	1.55	1.55	1.55	1.55	1.61	1.49	2.22	0.88	1.52	1.55
Nominal PMICR	2.5	2.5	2.1	2.8	2.9	2.0	2.5	2.5	2.6	2.4	3.2	1.8	2.4	2.5
FFO (interest expense)/net debt (%)	10.1%	10.1%	9.6%	10.2%	10.1%	10.1%	10.1%	10.1%	10.4%	9.8%	12.0%	8.1%	10.0%	10.1%
FFO (cash interest)/net debt (%)	10.1%	10.1%	9.6%	10.2%	10.1%	10.1%	10.1%	10.1%	10.4%	9.8%	12.0%	8.1%	9.9%	10.1%
RCF/net debt (%)	10.1%	10.1%	9.6%	10.2%	10.1%	10.1%	10.1%	10.1%	10.4%	9.8%	12.0%	8.1%	10.0%	10.1%
EBITDA/RAV (x)	9.7%	9.7%	9.7%	9.5%	9.7%	9.6%	9.7%	9.7%	9.9%	9.4%	11.4%	8.0%	9.6%	9.7%
RORE (%)[1]	12.8%	12.8%	12.0%	12.9%	12.9%	12.6%	12.8%	12.8%	13.3%	12.2%	15.9%	9.6%	12.5%	12.8%
Dividend cover (x)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	-3.4%	-3.4%	-4.2%	-3.3%	-2.0%	-4.9%	-3.4%	-3.4%	-0.9%	-5.9%	-0.3%	-6.6%	-3.5%	-3.4%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend.

Source: Oxera analysis based on the SHE-T financial model.

A2.3 Financeability metrics under higher cost of equity and TOTEX profiles

We model the notional and actual company using Ofgem's allowed equity return of 4.8% (CPIH-real) and SHE-T's actual cost of equity of 6.5% (CPIH-real). We consider both SHE-T's base and high TOTEX profiles.

A2.3.1 Ofgem's allowed equity return of 4.8%

Table A2.4 Notional company, base TOTEX scenario

	CoE 4.8%	No inflation-linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation-linked debt +5%	Inflation-linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.5	3.5	3.3	3.7	3.5	3.5	3.5	3.5	3.6	3.4	4.0	3.0	3.5	3.5
FFO interest cover (cash interest) (x)	4.1	3.5	3.8	4.4	4.4	3.8	4.1	4.1	4.2	4.0	4.7	3.5	4.2	3.9
AICR (or PMICR) (x)	1.25	1.08	1.22	1.27	1.35	1.16	1.25	1.25	1.31	1.19	1.85	0.64	1.29	1.21
Nominal PMICR	1.9	1.9	1.8	1.9	2.2	1.5	1.9	1.9	1.9	1.8	2.4	1.3	1.9	1.9
FFO (interest expense)/net debt (%)	10.0%	9.5%	10.0%	10.0%	10.2%	9.7%	10.0%	10.0%	10.3%	9.7%	12.0%	8.0%	10.1%	9.9%
FFO (cash interest)/net debt (%)	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.8%	9.2%	11.5%	7.5%	9.5%	9.5%
RCF/net debt (%)	8.1%	7.6%	8.1%	8.1%	8.3%	7.8%	8.1%	8.1%	8.4%	7.8%	10.1%	6.1%	8.2%	8.0%
EBITDA/RAV (x)	9.5%	9.5%	9.7%	9.4%	9.5%	9.5%	9.5%	9.5%	9.8%	9.3%	11.2%	7.9%	9.5%	9.5%
RORE (%)[1]	11.7%	11.7%	11.7%	11.7%	11.9%	11.6%	11.7%	11.7%	12.3%	11.2%	14.9%	8.6%	11.7%	11.7%
Dividend cover (x)	2.8	2.8	2.8	2.8	2.9	2.8	2.8	2.8	3.0	2.6	3.9	1.8	2.8	2.8
Implied dividend yield (%)[2]	-0.3%	-0.4%	-0.3%	-0.3%	1.2%	-1.8%	-0.3%	-0.3%	1.8%	-2.3%	2.8%	-3.4%	-0.3%	-0.3%
Required equity buyback/(issuance) (£m) [3]	(295)	(301)	(297)	(292)	(168)	(416)	(295)	(295)	(103)	(487)	(16)	(574)	(294)	(296)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.5 Actual company, base TOTEX scenario, zero additional borrowing cost assumption

	CoE 4.8%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.5	4.5	3.7	5.0	4.5	4.5	4.5	4.5	4.6	4.4	5.2	3.8	4.3	4.5
FFO interest cover (cash interest) (x)	4.5	4.5	3.7	5.0	4.5	4.5	4.5	4.5	4.6	4.4	5.2	3.8	4.4	4.5
AICR (or PMICR) (x)	1.38	1.38	1.20	1.46	1.38	1.38	1.38	1.38	1.45	1.32	2.05	0.71	1.36	1.38
Nominal PMICR	2.4	2.4	2.0	2.6	2.9	1.9	2.4	2.4	2.5	2.3	3.1	1.7	2.3	2.4
FFO (interest expense)/net debt (%)	10.3%	10.3%	9.9%	10.4%	10.3%	10.3%	10.3%	10.3%	10.6%	10.0%	12.3%	8.3%	10.3%	10.3%
FFO (cash interest)/net debt (%)	10.3%	10.3%	9.9%	10.4%	10.3%	10.3%	10.3%	10.3%	10.6%	10.0%	12.3%	8.3%	10.2%	10.3%
RCF/net debt (%)	10.3%	10.3%	9.9%	10.4%	10.3%	10.3%	10.3%	10.3%	10.6%	10.0%	12.3%	8.3%	10.3%	10.3%
EBITDA/RAV (x)	9.7%	9.7%	9.8%	9.5%	9.7%	9.7%	9.7%	9.7%	10.0%	9.5%	11.4%	8.0%	9.7%	9.7%
RORE (%)[1]	13.0%	13.0%	12.4%	13.1%	13.2%	12.9%	13.0%	13.0%	13.6%	12.5%	16.1%	9.9%	12.8%	13.0%
Dividend cover (x)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	0.9%	0.9%	0.3%	1.0%	2.4%	-0.5%	0.9%	0.9%	3.1%	-1.1%	4.0%	-2.2%	0.9%	0.9%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.6 Notional company, high TOTEX scenario

	CoE 4.8%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.5	3.5	3.4	3.8	3.5	3.5	3.5	3.5	3.6	3.5	4.1	3.0	3.5	3.5
FFO interest cover (cash interest) (x)	4.1	3.5	3.8	4.4	4.4	3.8	4.1	4.1	4.2	4.0	4.7	3.5	4.2	4.0
AICR (or PMICR) (x)	1.49	1.29	1.45	1.55	1.61	1.38	1.49	1.49	1.54	1.44	2.10	0.88	1.54	1.45
Nominal PMICR	2.0	2.0	2.0	2.1	2.4	1.7	2.0	2.0	2.1	2.0	2.6	1.5	2.0	2.0
FFO (interest expense)/net debt (%)	10.1%	9.6%	10.0%	10.1%	10.3%	9.8%	10.1%	10.1%	10.4%	9.8%	12.0%	8.1%	10.2%	10.0%
FFO (cash interest)/net debt (%)	9.6%	9.6%	9.5%	9.6%	9.6%	9.6%	9.6%	9.6%	9.9%	9.3%	11.5%	7.6%	9.6%	9.6%
RCF/net debt (%)	8.2%	7.7%	8.2%	8.2%	8.5%	8.0%	8.2%	8.2%	8.5%	7.9%	10.2%	6.2%	8.3%	8.1%
EBITDA/RAV (x)	9.8%	9.8%	9.9%	9.6%	9.8%	9.7%	9.8%	9.8%	10.0%	9.5%	11.5%	8.1%	9.8%	9.8%
RORE (%)[1]	12.0%	12.0%	12.0%	12.0%	12.1%	11.8%	12.0%	12.0%	12.6%	11.4%	15.2%	8.8%	12.0%	12.0%
Dividend cover (x)	2.9	2.9	2.9	2.9	2.9	2.8	2.9	2.9	3.1	2.7	4.0	1.8	2.9	2.9
Implied dividend yield (%)[2]	-4.1%	-4.2%	-4.2%	-4.1%	-2.7%	-5.7%	-4.1%	-4.1%	-1.6%	-6.6%	-1.0%	-7.3%	-4.1%	-4.2%
Required equity buyback/(issuance) (£m) [3]	(718)	(727)	(721)	(714)	(588)	(842)	(718)	(718)	(451)	(985)	(399)	(1037)	(716)	(720)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.7 Actual company, high TOTEX scenario, zero additional borrowing cost assumption

	CoE 4.8%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.5	4.5	3.7	5.1	4.5	4.5	4.5	4.5	4.6	4.4	5.2	3.9	4.3	4.5
FFO interest cover (cash interest) (x)	4.5	4.5	3.7	5.1	4.5	4.5	4.5	4.5	4.6	4.4	5.2	3.9	4.5	4.5
AICR (or PMICR) (x)	1.65	1.65	1.39	1.79	1.65	1.65	1.65	1.65	1.71	1.59	2.32	0.98	1.63	1.65
Nominal PMICR	2.6	2.6	2.1	2.9	3.1	2.1	2.6	2.6	2.7	2.5	3.3	1.9	2.5	2.6
FFO (interest expense)/net debt (%)	10.4%	10.4%	9.9%	10.5%	10.4%	10.4%	10.4%	10.4%	10.7%	10.1%	12.4%	8.4%	10.3%	10.4%
FFO (cash interest)/net debt (%)	10.4%	10.4%	9.9%	10.5%	10.4%	10.4%	10.4%	10.4%	10.7%	10.1%	12.4%	8.4%	10.2%	10.4%
RCF/net debt (%)	10.4%	10.4%	9.9%	10.5%	10.4%	10.4%	10.4%	10.4%	10.7%	10.1%	12.4%	8.4%	10.3%	10.4%
EBITDA/RAV (x)	9.9%	9.9%	10.0%	9.8%	10.0%	9.9%	9.9%	9.9%	10.2%	9.7%	11.6%	8.2%	9.9%	9.9%
RORE (%)[1]	13.3%	13.3%	12.5%	13.4%	13.4%	13.1%	13.3%	13.3%	13.8%	12.7%	16.5%	10.1%	13.0%	13.3%
Dividend cover (x)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	-3.0%	-3.0%	-3.8%	-2.8%	-1.5%	-4.4%	-3.0%	-3.0%	-0.4%	-5.4%	0.2%	-6.1%	-3.0%	-3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan.

Source: Oxera analysis based on the SHE-T financial model.

A2.3.2 SHE-T's actual cost of equity of 6.5%

Table A2.8 Notional company, base TOTEX scenario

	CoE 6.5%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.8	3.8	3.6	4.0	3.8	3.8	3.8	3.8	3.9	3.7	4.3	3.3	3.8	3.8
FFO interest cover (cash interest) (x)	4.4	3.8	4.1	4.7	4.8	4.1	4.4	4.4	4.5	4.3	5.0	3.8	4.5	4.3
AICR (or PMICR) (x)	1.57	1.36	1.52	1.64	1.70	1.46	1.57	1.57	1.64	1.51	2.18	0.97	1.62	1.53
Nominal PMICR	2.1	2.1	2.1	2.2	2.5	1.8	2.1	2.1	2.2	2.1	2.7	1.6	2.1	2.1
FFO (interest expense)/net debt (%)	11.1%	10.6%	11.0%	11.1%	11.3%	10.8%	11.1%	11.1%	11.4%	10.7%	13.0%	9.1%	11.2%	11.0%
FFO (cash interest)/net debt (%)	10.6%	10.6%	10.5%	10.6%	10.6%	10.6%	10.6%	10.6%	10.9%	10.2%	12.5%	8.6%	10.6%	10.6%
RCF/net debt (%)	9.2%	8.7%	9.2%	9.2%	9.4%	8.9%	9.2%	9.2%	9.5%	8.9%	11.1%	7.2%	9.3%	9.1%
EBITDA/RAV (x)	10.5%	10.5%	10.6%	10.3%	10.5%	10.4%	10.5%	10.5%	10.7%	10.2%	12.1%	8.8%	10.5%	10.5%
RORE (%)[1]	13.5%	13.5%	13.5%	13.5%	13.6%	13.3%	13.5%	13.5%	14.1%	12.9%	16.6%	10.3%	13.5%	13.5%
Dividend cover (x)	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.4	3.6	3.2	4.5	2.4	3.4	3.4
Implied dividend yield (%)[2]	1.4%	1.3%	1.4%	1.4%	2.9%	-0.1%	1.4%	1.4%	3.5%	-0.7%	4.5%	-1.7%	1.4%	1.4%
Required equity buyback/(issuance) (£m) [3]	(143)	(149)	(145)	(140)	(11)	(269)	(143)	(143)	46	(332)	136	(422)	(142)	(144)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem

scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.9 Actual company, base TOTEX scenario, zero additional borrowing cost assumption

	CoE 6.5%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.9	4.9	4.0	5.4	4.9	4.9	4.9	4.9	5.0	4.8	5.5	4.2	4.6	4.9
FFO interest cover (cash interest) (x)	4.9	4.9	4.0	5.4	4.9	4.9	4.9	4.9	5.0	4.8	5.5	4.2	4.8	4.9
AICR (or PMICR) (x)	1.75	1.75	1.50	1.87	1.74	1.75	1.75	1.75	1.82	1.68	2.42	1.07	1.72	1.75
Nominal PMICR	2.7	2.7	2.3	3.0	3.2	2.2	2.7	2.7	2.8	2.7	3.4	2.1	2.6	2.7
FFO (interest expense)/net debt (%)	11.4%	11.4%	11.0%	11.4%	11.4%	11.4%	11.4%	11.4%	11.7%	11.1%	13.4%	9.4%	11.3%	11.4%
FFO (cash interest)/net debt (%)	11.4%	11.4%	11.0%	11.4%	11.4%	11.4%	11.4%	11.4%	11.7%	11.1%	13.4%	9.4%	11.2%	11.4%
RCF/net debt (%)	11.4%	11.4%	11.0%	11.4%	11.4%	11.4%	11.4%	11.4%	11.7%	11.1%	13.4%	9.4%	11.3%	11.4%
EBITDA/RAV (x)	10.6%	10.6%	10.7%	10.5%	10.7%	10.6%	10.6%	10.6%	10.9%	10.4%	12.3%	9.0%	10.6%	10.6%
RORE (%)[1]	14.8%	14.8%	14.1%	14.9%	14.9%	14.6%	14.8%	14.8%	15.3%	14.2%	17.9%	11.6%	14.5%	14.8%
Dividend cover (x)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	2.6%	2.6%	2.0%	2.7%	4.1%	1.1%	2.6%	2.6%	4.8%	0.6%	5.8%	-0.5%	2.6%	2.6%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.10 Notional company, high TOTEX scenario

	CoE 6.5%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	3.8	3.8	3.6	4.1	3.8	3.8	3.8	3.8	3.9	3.7	4.3	3.3	3.8	3.8
FFO interest cover (cash interest) (x)	4.4	3.8	4.1	4.8	4.8	4.1	4.4	4.4	4.5	4.3	5.0	3.8	4.6	4.3
AICR (or PMICR) (x)	1.81	1.57	1.74	1.90	1.96	1.68	1.81	1.81	1.87	1.76	2.42	1.21	1.87	1.76
Nominal PMICR	2.3	2.3	2.2	2.4	2.7	1.9	2.3	2.3	2.4	2.3	2.8	1.8	2.3	2.3
FFO (interest expense)/net debt (%)	11.1%	10.6%	11.1%	11.1%	11.4%	10.9%	11.1%	11.1%	11.4%	10.8%	13.1%	9.1%	11.2%	11.0%
FFO (cash interest)/net debt (%)	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.9%	10.3%	12.6%	8.6%	10.6%	10.6%
RCF/net debt (%)	9.3%	8.8%	9.2%	9.3%	9.5%	9.0%	9.3%	9.3%	9.6%	9.0%	11.2%	7.3%	9.4%	9.2%
EBITDA/RAV (x)	10.7%	10.7%	10.9%	10.5%	10.7%	10.7%	10.7%	10.7%	11.0%	10.5%	12.4%	9.0%	10.7%	10.7%
RORE (%)[1]	13.7%	13.7%	13.7%	13.7%	13.9%	13.6%	13.7%	13.7%	14.3%	13.2%	16.9%	10.5%	13.7%	13.7%
Dividend cover (x)	3.5	3.5	3.5	3.5	3.5	3.4	3.5	3.5	3.7	3.3	4.5	2.4	3.5	3.5
Implied dividend yield (%)[2]	-2.5%	-2.6%	-2.5%	-2.4%	-1.0%	-4.0%	-2.5%	-2.5%	0.1%	-4.9%	0.7%	-5.7%	-2.5%	-2.5%
Required equity buyback/(issuance) (£m) [3]	(547)	(557)	(551)	(544)	(412)	(677)	(547)	(547)	(284)	(810)	(228)	(867)	(545)	(549)
Dividend/regulated equity (%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan. Our RORE in the base case is in line with the Ofgem RORE in two scenarios (10.6% and 11.9%). However, we are unable to reconcile our RORE numbers and the dividend cover ratios under all Ofgem scenarios in the PCFM. [2] The implied dividend yield is the outcome from the modelling of the notional company. [3] Forcing the dividend yield to 3% as per the notional company assumption would require equity issuance or equity buyback in the RIIO-2 price control.

Source: Oxera analysis based on the SHE-T financial model.

Table A2.11 Actual company, high TOTEX scenario, zero additional borrowing cost assumption

	CoE 6.5%	No inflation -linked debt	Interest rate +1%	Interest rate -1%	CPIH +1%	CPIH -1%	RPI–CPI wedge +0.5%	RPI–CPI wedge -0.5%	TOTEX perform-ance +10%	TOTEX perform-ance -10%	RORE +2%	RORE -2%	Inflation -linked debt +5%	Inflation -linked debt -5%
Net debt/RAV (%)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
FFO interest cover (interest expense) (x)	4.9	4.9	4.0	5.5	4.9	4.9	4.9	4.9	5.0	4.8	5.5	4.2	4.6	4.9
FFO interest cover (cash interest) (x)	4.9	4.9	4.0	5.5	4.9	4.9	4.9	4.9	5.0	4.8	5.5	4.2	4.8	4.9
AICR (or PMICR) (x)	2.01	2.01	1.68	2.20	2.01	2.01	2.01	2.01	2.07	1.95	2.68	1.34	1.98	2.01
Nominal PMICR	2.9	2.9	2.4	3.3	3.4	2.5	2.9	2.9	3.0	2.9	3.6	2.3	2.8	2.9
FFO (interest expense)/net debt (%)	11.4%	11.4%	10.9%	11.5%	11.4%	11.4%	11.4%	11.4%	11.7%	11.1%	13.4%	9.5%	11.4%	11.4%
FFO (cash interest)/net debt (%)	11.4%	11.4%	10.9%	11.5%	11.4%	11.4%	11.4%	11.4%	11.7%	11.1%	13.4%	9.5%	11.3%	11.4%
RCF/net debt (%)	11.4%	11.4%	10.9%	11.5%	11.4%	11.4%	11.4%	11.4%	11.7%	11.1%	13.4%	9.5%	11.4%	11.4%
EBITDA/RAV (x)	10.9%	10.9%	11.0%	10.7%	10.9%	10.9%	10.9%	10.9%	11.1%	10.6%	12.6%	9.2%	10.9%	10.9%
RORE (%)[1]	15.0%	15.0%	14.3%	15.2%	15.2%	14.9%	15.0%	15.0%	15.6%	14.5%	18.2%	11.8%	14.8%	15.0%
Dividend cover (x)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Implied dividend yield (%)[2]	-1.3%	-1.3%	-2.1%	-1.1%	0.2%	-2.7%	-1.3%	-1.3%	1.3%	-3.7%	1.9%	-4.5%	-1.3%	-1.3%

Note: * The RPI–CPI wedge sensitivities do not affect the notional company or the actual company, as SHE-T does not have any RPI-linked debt. They are presented for completeness to ensure compliance with Ofgem's prescribed sensitivities and are set equal to the base case. [1] We have modelled RORE and dividend cover ratios based on the formulas specified by Ofgem in the price control financial model (PCFM) provided to us by SHE-T and the numbers in the SHE-T business plan.

Source: Oxera analysis based on the SHE-T financial model.

A2.4 Accounting versus economic form of key credit metrics for Oxera base case

Table A2.13 compares the results in our base case scenario using the accounting ratios used by the credit rating agencies with the economic forms specified by Ofgem in the SSMD.[76]

The economic forms of the key ratios are as follows.

Table A2.12 Economic form credit metric formulas

AICR/PMICR	$\frac{WACC}{gearing \times cash\ interest}$
FFO cash interest cover	$\frac{WACC + \frac{Regulatory\ depreciation}{RAV}}{gearing \times cash\ interest}$
FFO interest exp cover	$\frac{WACC + \frac{Regulatory\ depreciation}{RAV}}{gearing \times interest\ expense}$
FFO (cash interest)/net debt	$\frac{WACC + \frac{Regulatory\ depreciation}{RAV} - gearing \times cash\ interest}{gearing}$
FFO (interest expense)/net debt	$\frac{WACC + \frac{Regulatory\ depreciation}{RAV} - gearing \times interest\ expense}{gearing}$

Note: Cash interest and interest expense differ due to principal inflation accretion of index-linked debt in the notional company.

Source: Oxera analysis.

The economic ratios for the AICR and FFO/net debt are higher on average than the accounting ratios. As Ofgem has noted, the difference between the ratios will be driven by a number of factors:[77]

> In practice the key credit ratios are calculated from accounting information, may be subject to individual rating agencies' adjustments and will be influenced by the impact of incentives, timing, movements in working capital, actual company capital structures and actual debt costs.

[76] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.39.
[77] Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, para. 4.39.

Table A2.13 Accounting versus economic form of key credit metrics for Oxera base case at 4.3% CPIH-real cost of equity

	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	RIIO-2 average
AICR						
Accounting	1.10	1.23	1.19	1.18	1.04	1.15
Economic	1.39	1.40	1.41	1.42	1.44	1.41
Difference	-0.30	-0.08	-0.08	-0.07	-0.06	-0.26
FFO (cash interest)/net debt						
Accounting	9.6%	9.9%	9.8%	9.7%	9.4%	9.7%
Economic	10.6%	10.4%	10.5%	10.5%	10.6%	10.5%
Difference	-1.0%	-0.6%	-0.7%	-0.8%	-1.2%	-0.9%
FFO (interest expense)/net debt						
Accounting	9.1%	9.4%	9.3%	9.2%	8.9%	9.2%
Economic	10.1%	9.9%	10.0%	10.0%	10.1%	10.0%
Difference	-1.0%	-0.6%	-0.7%	-0.8%	-1.2%	-0.9%
FFO/cash interest						
Accounting	3.81	3.97	4.00	4.01	4.07	3.97
Economic	4.11	4.14	4.21	4.25	4.46	4.23
Difference	-0.30	-0.17	-0.22	-0.24	-0.39	-0.26
FFO/interest expense						
Accounting	3.32	3.44	3.46	3.46	3.49	3.43
Economic	3.57	3.59	3.64	3.67	3.83	3.66
Difference	-0.26	-0.15	-0.19	-0.21	-0.34	-0.23

Note: Net debt is equal to gearing ratio (60%) × RAV.

Source: Oxera analysis and Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, Table 17.

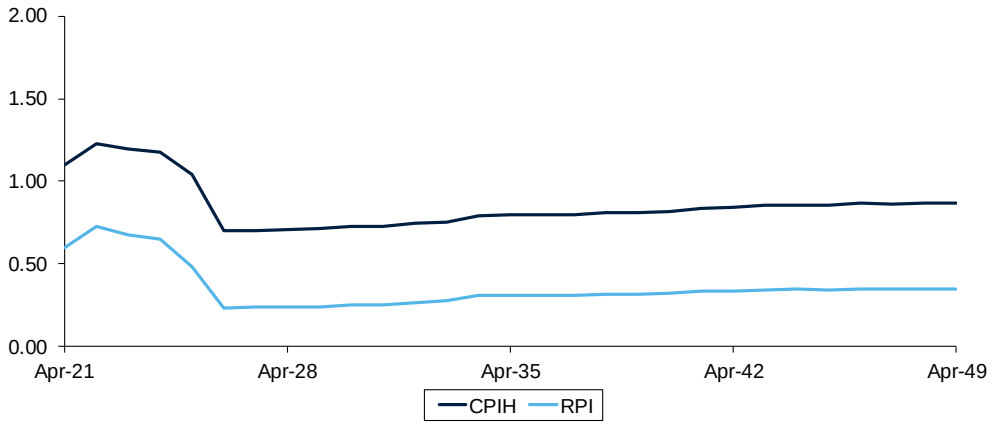
A2.5 Key notional company credit metrics, 2021–49

The figures below show the AICR, FFO/net debt and FFO interest cover ratios (both accounting and economic) of the notional company over the long term using the base case assumptions. On the basis of these assumptions, the majority of ratios under CPIH would eventually fall below the lower end of Moody's' guidance threshold for a Baa rating (or a Baa2 rating in the case of the AICR).

However, we note that the long-term ratios are highly sensitive to assumptions regarding the CAPEX profile, interest costs, and the WACC, among other factors. These assumptions would be assessed and revised periodically, in line with the five-year price control cycle. Therefore, we do not consider that the estimation of these ratios for the long term can be reliably predicted on the basis of RIIO-2 input assumptions using a financial model that is primarily focused on the business planning process for RIIO-2.

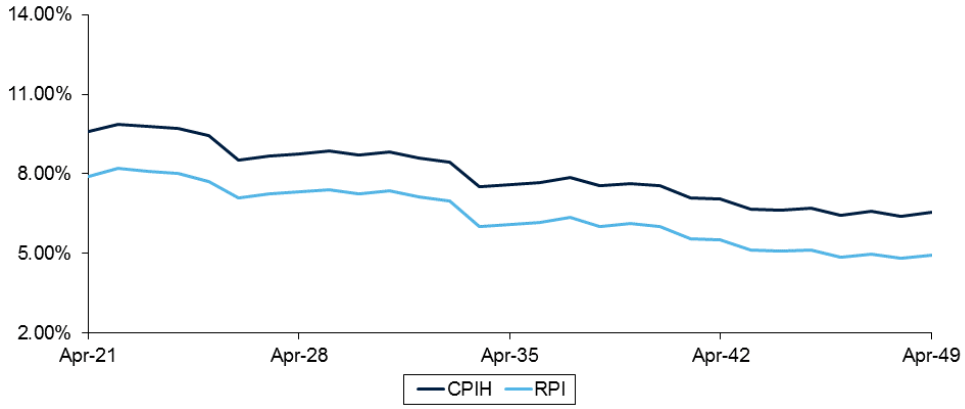
We also note that the ratios under RPI inflation are similar to those under CPIH inflation shown below, but are shifted downwards.

Figure A2.1 AICR, CPIH versus RPI, 2021–49



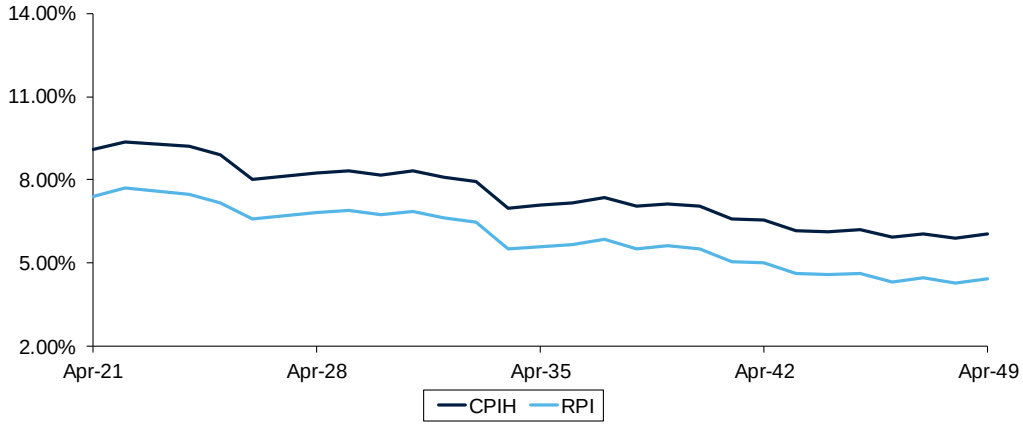
Source: Oxera analysis and SHE-T financial model.

Figure A2.2 FFO (cash interest)/net debt, CPIH versus RPI, 2021–49



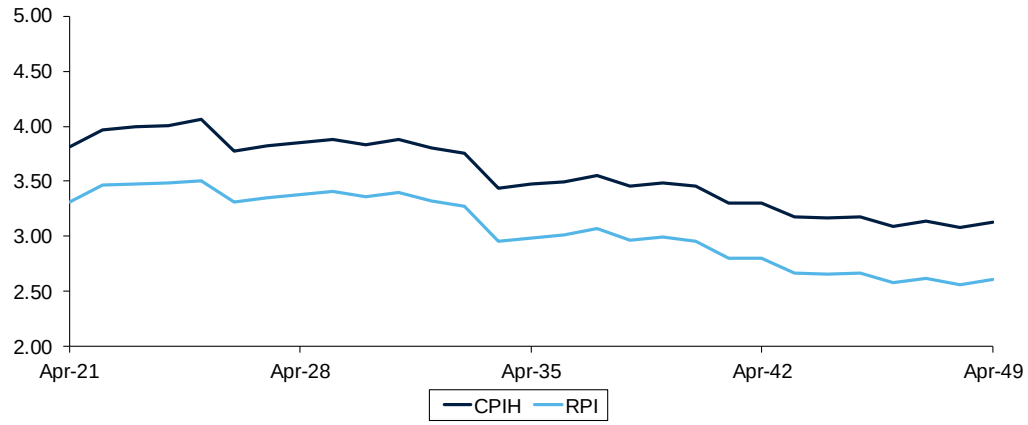
Source: Oxera analysis and SHE-T financial model.

Figure A2.3 FFO (interest expense)/net debt, CPIH versus RPI, 2021–49



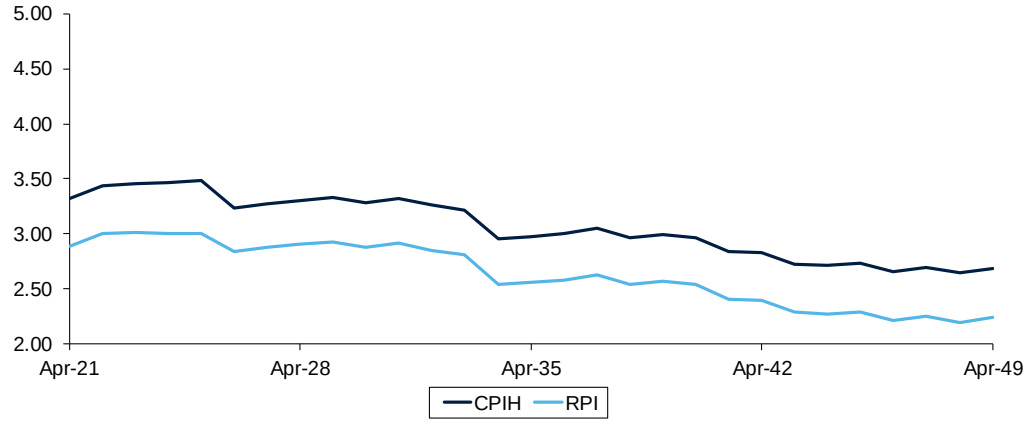
Source: Oxera analysis and SHE-T financial model.

Figure A2.4 FFO cash interest cover, CPIH versus RPI, 2021–49



Source: Oxera analysis and SHE-T financial model.

Figure A2.5 FFO interest expense cover, CPIH versus RPI, 2021–49



Source: Oxera analysis and SHE-T financial model.

A2.6 Reconciliation of key credit ratios with Ofgem figures

Table A2.14 compares our estimate of the economic form of the key credit ratios with those published by Ofgem in the SSMD Finance annex. Assuming a 50bp uplift to the cost of equity for expected outperformance is inconsistent with assuming that the notional company does not out- or underperform against regulatory allowances; therefore, these figures are presented for reconciliation purposes only.

Table A2.14 Oxera and Ofgem credit ratios using economic form, with uplift of 50bp to cost of equity for expected outperformance

	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	RIIO-2 average
Inputs						
Equity allowance						
Oxera	4.30%	4.30%	4.30%	4.30%	4.30%	4.30%
Ofgem	4.27%	4.29%	4.30%	4.31%	4.31%	4.30%
Difference	*0.03%*	*0.01%*	*0.00%*	*-0.01%*	*-0.01%*	*0.00%*
Incentive bias						
Oxera	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Ofgem	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%

	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	RIIO-2 average
Difference	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Expected equity return						
Oxera	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%
Ofgem	4.77%	4.79%	4.80%	4.81%	4.81%	4.80%
Difference	*0.03%*	*0.01%*	*0.00%*	*-0.01%*	*-0.01%*	*0.00%*
Allowance for debt						
Oxera	1.88%	1.80%	1.74%	1.70%	1.55%	1.73%
Ofgem	2.03%	1.96%	1.91%	1.88%	1.86%	1.93%
Difference	*-0.15%*	*-0.16%*	*-0.17%*	*-0.18%*	*-0.31%*	*-0.19%*
Notional gearing						
Oxera	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
Ofgem	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
Difference	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
WACC allowance						
Oxera	3.05%	3.00%	2.97%	2.94%	2.85%	2.96%
Ofgem	3.13%	3.09%	3.07%	3.05%	3.04%	3.08%
Difference	*-0.08%*	*-0.09%*	*-0.10%*	*-0.11%*	*-0.19%*	*-0.12%*
Cash interest						
Oxera	3.41%	3.33%	3.27%	3.23%	3.07%	3.26%
Ofgem	3.56%	3.49%	3.44%	3.40%	3.38%	3.45%
Difference	-0.15%	-0.16%	-0.17%	-0.17%	-0.31%	-0.19%
Interest expense						
Oxera	3.92%	3.84%	3.78%	3.73%	3.58%	3.77%
Ofgem	4.07%	4.00%	3.95%	3.91%	3.89%	3.96%
Difference	-0.15%	-0.16%	-0.17%	-0.18%	-0.31%	-0.19%
Depreciation/RAV						
Oxera	5.56%	5.46%	5.49%	5.48%	5.57%	5.51%
Ofgem	6.07%	5.97%	5.87%	5.80%	5.59%	5.86%
Difference	-0.51%	-0.51%	-0.38%	-0.32%	-0.02%	-0.35%
Key economic form ratios						
AICR/PMICR						
Oxera	1.49	1.50	1.51	1.52	1.55	1.51
Ofgem	1.46	1.48	1.49	1.49	1.50	1.48
Difference	0.03	0.02	0.02	0.03	0.05	0.03
FFO (cash interest)/ net debt						
Oxera	10.9%	10.8%	10.8%	10.8%	11.0%	10.9%
Ofgem	10.4%	10.6%	10.7%	10.9%	11.0%	10.7%
Difference	0.5%	0.2%	0.1%	-0.1%	0.0%	0.1%
FFO (interest expense)/ net debt						
Oxera	10.4%	10.3%	10.3%	10.3%	10.5%	10.4%
Ofgem	9.9%	10.1%	10.2%	10.4%	10.5%	10.2%
Difference	0.5%	0.2%	0.1%	-0.1%	0.0%	0.1%
FFO/cash interest						
Oxera	4.21	4.24	4.31	4.35	4.57	4.34
Ofgem	3.93	4.04	4.12	4.20	4.25	4.11
Difference	0.28	0.20	0.19	0.15	0.32	0.23

	Apr 2021	Apr 2022	Apr 2023	Apr 2024	Apr 2025	RIIO-2 average
FFO/interest expense						
Oxera	3.66	3.68	3.73	3.76	3.92	3.75
Ofgem	3.44	3.52	3.59	3.65	3.70	3.58
Difference	0.22	0.16	0.14	0.11	0.22	0.17

Note: Net debt is equal to gearing ratio (60%) × RAV.

Source: Oxera analysis and Ofgem (2019), 'RIIO-2 Sector Specific Methodology Decision - Finance', 24 May, Table 17.

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