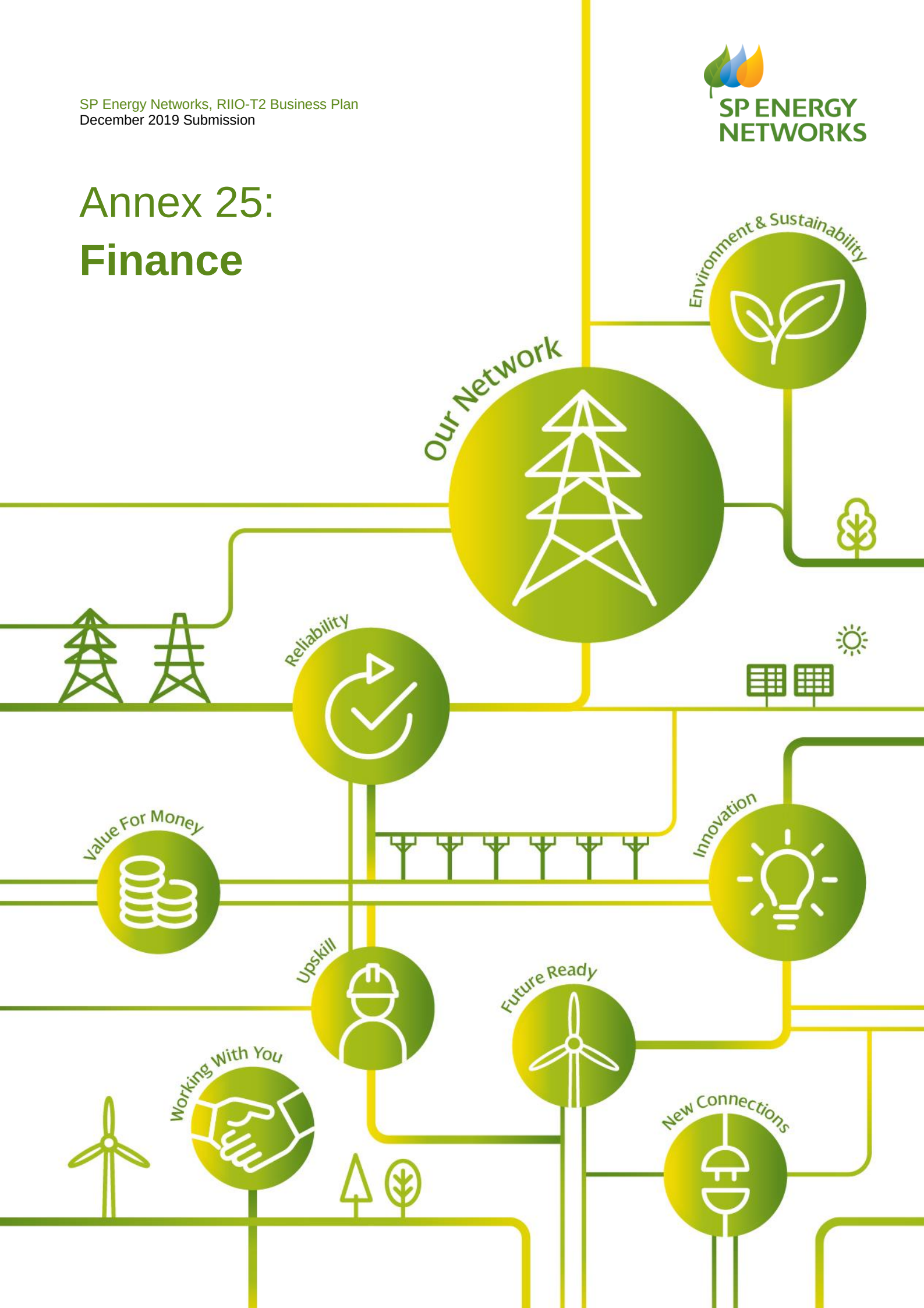
Annex 25:
Finance



CONTENTS

1.0 OVERVIEW

This section considers the overall financing arrangements within our plan, an overview of our revenue and then an insight into how we have approached our financing plan. Much of our evidence is highly technical. The following pages provides an accessible summary of this detail. We have performed a full review of all financial information requested in Ofgem guidance and Consumer Challenge Group correspondence.

This section also addresses questions on appropriate cash flow levels, and appropriate shareholder remuneration. We also explain our plan assumptions on capitalisation and regulatory depreciation, and how we adopted Ofgem's financial policies on the treatment of taxation and pension costs.

1.1 Key assumptions & headline proposals

Table 1.1: *Financial Parameter Assumptions over RIIO-T2*

Parameters	Assumptions	
	Ofgem	SPT
Cost of Equity	4.80%	6.50%
Cost of Debt	iBoxx 11-15 year Trombone	
Notional Gearing	60%	60%
Financeability adjustment	None	
Capitalisation rate	85%	85%
Dividend yield	3.0%	4.0%
Credit rating	Baa1 to A3	
Other policies	Per Ofgem	

We have also taken into consideration the views of customers, investors and other stakeholders in preparing our plan. In addition, to support the process of assessing financeability we have engaged economic consultants including NERA, First Economics, OXERA and clearly reference throughout the section the other guidance to which we have referred.

Ofgem has a statutory duty to ensure that Licensees can finance their licensed activities, meaning that they are allowed sufficient cash flow to pay interest and dividends to the providers of finance. It is the Network Operators' responsibility to demonstrate that their financing plan is 'efficient' i.e. requiring no greater cash flow than is necessary to be 'financeable'.

Our base financial plan (6.5% CoE) gives a credit rating of A3 consistent with previous Price Controls. We then considered further external risk which arguably yield one and two notches lower when considering the risk.

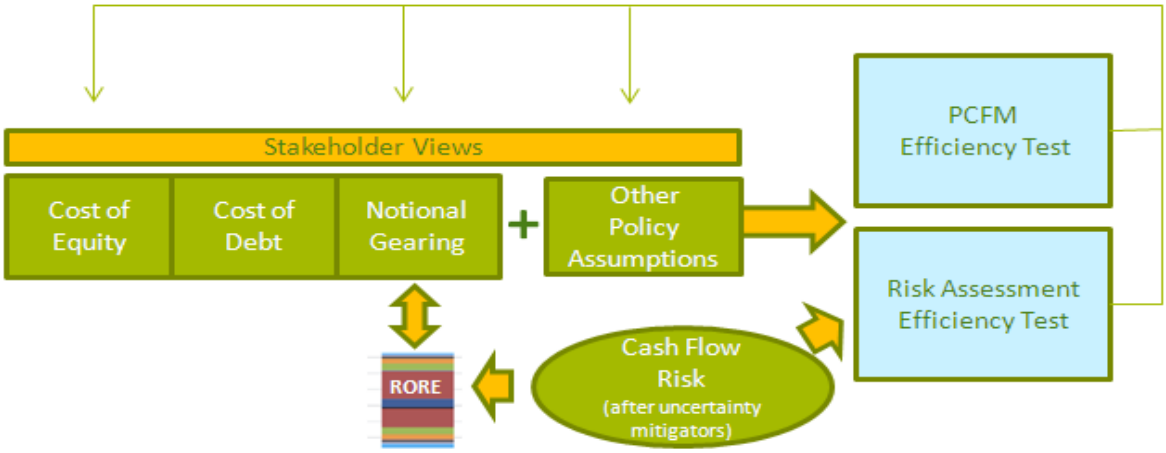
1.2 Structure & Objectives of this chapter:

- In ***Section 2*** we provide justification for the allowed return used in our business plan. This takes up the bulk of this chapter.
    - Firstly, we consider the Cost of Equity based on economic and financial principles.
    - On the Cost of Debt, we discuss how we have adopted Ofgem policy without alternative weighting or transition.
    - Next, we assess notional gearing. At this stage we introduce cash flow risk and test that our proposal delivers acceptable upside and downside potential from the price control package using Return on Regulatory Equity (RoRE) analysis.
- In ***Section 3*** *we consider the financeability of our plan.*

- We test that our plan is financeable. Here we present results from the Price Control Financial Model and carry out 'static' (or in other words non-probabilistic) testing to ensuring an expectation of a comfortable investment grade credit rating – but no higher.
- Finally, we further test the efficiency and financeability of our plan by conducting a comprehensive probabilistic risk analysis using a framework developed in conjunction with our advisers NERA to test our plan against external shocks.

- In ***Section 4*** we present our plan assumptions around capitalisation and regulatory depreciation.
- In ***Section 5*** *we* discuss how we have adopted Ofgem's financial policies concerning the treatment of taxation and pension costs.
- In ***Section 6*** we demonstrate our recommendation on the appropriate treatment for Real Price Effects (RPEs) and ongoing efficiency for RIIO-T2.

Our structured approach can be illustrated as follows:



2.0 ESTABLISHING FAIR ALLOWED RETURNS

In this section, we set out the key financing components of allowed return in our business plan. We then take these out alongside other financing assumptions and present the results alongside our efficiency tests. In other words, against a backdrop of stakeholder opinion we move in stages from economic and financial principles through to a full probabilistic risk assessment.

We have replicated Moody's approach to credit ratings to ensure that our overall proposal is financeable and efficiently so.

2.1 Key Conclusions

For Cost of Equity we examine Ofgem's methodology, and offer an evidenced alternative proposal based on economic and financial principles. The available range of evidence supports a Cost of Equity (CoE) within the range of around 6.5% real (CPIH), post-tax, which is lower than the 8.0% CPIH allowed in the current price control.

For Cost of Debt in our plan we have adopted Ofgem's policy of indexation, choosing to use a longer trailing average of the iBoxx indices (the 11-15 year 'Trombone'). The optimal Cost of Debt trailing average of the index should be set at a minimum of 15 years.

2.2 Stakeholder Views

Stakeholder engagement for financing our plan must account for the views of consumers, networks, companies and wider stakeholders to ensure all our funding decisions are efficient and always consider the potential impact on consumer bills. It is the network owner's responsibility to demonstrate that their financing plan is 'efficient', requiring no greater cash flow than is necessary to be 'financeable'.

We must ensure longer-term network investment funded through shareholder investment is sustainable. By this we mean making sure investors' rate-of return on their investment in our network is set at a level that takes account of the inherent risk associated with investing in the GB electricity sector at present. To achieve this, we use our dedicated investor engagement team to understand the rate of return investors require, and better understand the concerns of investors at a global scale including: the impacts of issues such as Brexit; and changes to funding proposed by the regulator.

Using workshops and online surveys we engaged with consumers about our investment plans for RIIO-T2 in respect to their priorities. This allows those stakeholders who are less familiar with how we are financed to better understand when and why we invest, and to have their say in these decisions. Engaging with consumers and consumer representatives, we have worked independently and in collaboration with SSE Transmission and National Grid to explain the key attributes of the transmission network. We then used various qualitative and quantitative workshops, interviews and online tools to establish the 'willingness-to-pay' of GB bill payers for delivering in these areas. We have engaged with investors and the regulator via meetings and conferences as well as having taken into account relevant guidance and publications from financial market experts. We are able to infer investor feedback by analysing financial market reaction to relevant events. We were also able to share the methodology and high-level calculations behind the financing of our plan with the Transmission User Group.

Consumers have told us that they find the way network companies are funded complicated and not something they value having detailed information on. What they do care about is the bill impact of our investment decisions and ensuring our investments represent value for money for them. Consumer representatives expressed that our overall bill impact is low given the amount of activities and investment it will enable us to deliver in RIIO-T2. A number of global utility investors have expressed concerns that Ofgem's proposed cost of capital does not accurately reflect the true risks which investors continue to take when financing electricity network operators in GB. Ofgem's working assumption of the Cost of Equity for RIIO-T2 is 4.8% (real, CPIH).

Our investors also informed us that they continuously review areas of investment opportunity and challenge, taking into account a number of different considerations. The stability of the geographical area within which they invest remains a key

factor, especially when those investments are recovered over a long period, such as 45 years, for transmission networks. Our Transmission User Group were particularly keen to understand how our financial methodology/breakdown compares to the other Transmission Operators and how lower rates of return for investors would impact our plan.

2.3 Establishing Cost of Equity

The Cost of Equity represents the return shareholders require for providing their capital to a company, proportionate to the risk faced by the company. It is the minimum return we need to attract and retain equity financing in our business, so that we're able to fund our investments. It is more important now than ever before to attract the sufficient investment to support GB's transition to Net Zero.

In contrast to the Cost of Debt, the Cost of Equity cannot be directly observed. Regulators routinely set a forward-looking allowance for the Cost of Equity using asset pricing models. Ofgem have relied primarily on the application of the Capital Asset Pricing Model (CAPM) framework for setting the Cost of Equity for the RIIO-2 price control, with forward-looking sources of evidence, such as the Dividend Growth Model (DGM) and infrastructure discount rates, used as a cross-check to the CAPM implied range. The Cost of Equity cannot be assessed based on a company's financeability. This is a cross-check to ensure the fair return delivers a financeable plan.

Under the CAPM framework, the return required by equity investors consists of the return on a risk-free investment (i.e. the risk-free rate (RFR)) and a risk premium that reflects the risk involved in a particular equity investment. This is estimated as the product of the risk premium on the equity market as a whole (i.e. equity risk premium (ERP)) and the equity beta, a measure of the riskiness of a particular equity investment relative to the equity market. By construction, the ERP is calculated as the residual between the total market return (TMR), which is the expected return on the market portfolio[1] , and the RFR. Formally, the CAPM equation for the Cost of Equity can be defined as:

Cost of Equity = risk-free rate + beta x equity risk premium

In their SSMD publication, Ofgem laid out their decision on the methodology for estimating the forward-looking real Cost of Equity for the RIIO-2 price controls, which produced a range of 4.00-5.60% (real, CPIH) for a notional gearing of 60% were price controls to be set under market conditions at that time. Ofgem use the mid-point of this range to arrive at their underlying Cost of Equity estimate of 4.8% (real, CPIH).

We do not agree with a number of aspects of Ofgem's approach in their assessment of the Cost of Equity for RIIO-T2 which we believe have not been based on all the available evidence and has been set at a level which may disrupt the efficient financing of the UK's network businesses, limiting the sector's ability to support the country's transition to Net Zero.

In this section we explain, in detail, why we disagree with Ofgem's approach for deriving the various CAPM parameters and present our alternative estimation proposals, which result in a Cost of Equity allowance that more adequately reflects the risks faced by equity investors when investing in the electricity transmission sector compared to Ofgem's working assumption. For full transparency and completeness, we have also presented a supplementary plan based on what we consider to be the appropriate Cost of Equity in Annex 34 of the Business Plan.

To inform our position, we have commissioned a third-party report (NERA) to provide us with an independent assessment of the Cost of Equity. The report is included in Appendix 9: Cost of Capital NERA report. Based on the findings presented in NERA's report, along with other industry commissioned reports, the available range of evidence supports an allowed Cost of Equity within the range of around 6.5% (real, CPIH), post-tax. This estimate is lower than the 8.0% (real, CPIH) allowed in the current control and is a conservative estimate that does not fully capture all the risks that are priced in by investors in their required returns when investing in the Scottish electricity sector, as presented in Figure 2.1. Ultimately Ofgem's proposal, contrary to our base assumption, does not adequately reflect the risks faced by equity investors when investing in the electricity transmission sector in Scotland.

[1] the market portfolio is a portfolio consisting of all stocks where the proportion invested in each stock corresponds to its relative market value. Measured by a broad market index such as the FTSE All-share

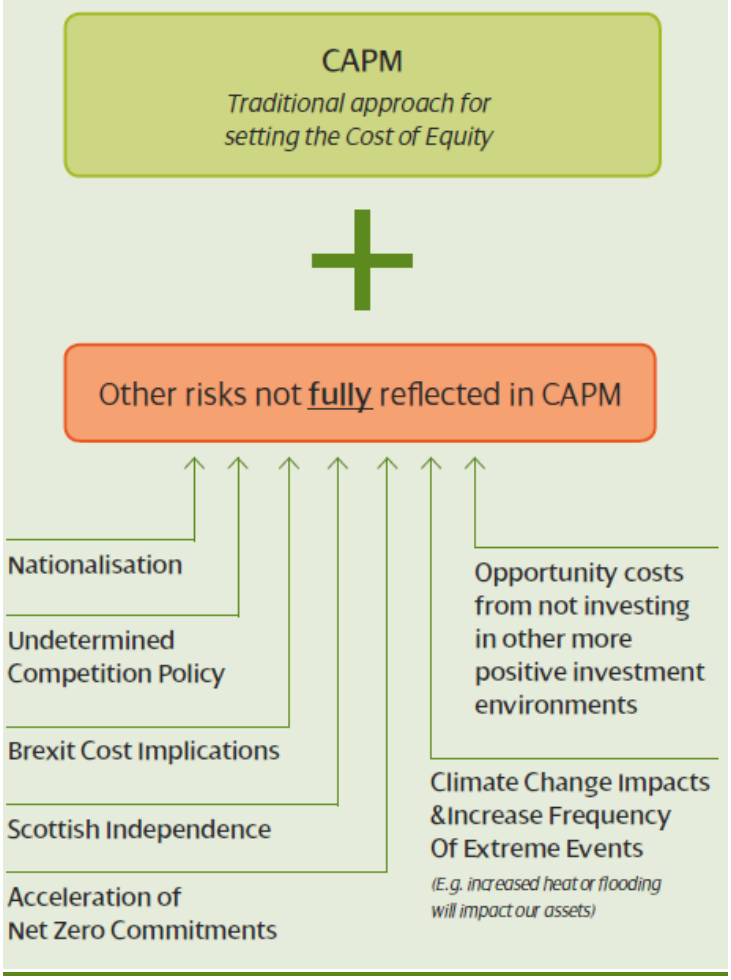


Figure 2.1: *Establishing the Required Return for Investors*

2.3.1 Risk-free Rate and Cost of Equity Indexation

The risk-free rate (RFR) is generally estimated with reference to yields on government issued bonds (or 'gilts') with strong credit ratings, as they are considered a suitable proxy for the RFR given their negligible default risk. In the past, Ofgem generally relied on a combination of long-run and short-run market evidence on yields from long-dated gilts when setting a fixed, forward-looking RFR. However, as we have adopted Ofgem's Cost of Equity indexation mechanism we instead rely exclusively on spot market evidence on long-dated UK gilt yields.

Ofgem's Cost of Equity indexation proposal will involve adjusting the allowed Cost of Equity annually based on changes to the RFR. This can be represented in the re-stated CAPM equation:

Cost of Equity = (1 – beta) x RFR + beta x TMR

The expected return on equity can therefore be viewed as a weighted average of the RFR and the TMR with the weights depending on the equity beta. As Ofgem intend to hold the TMR and beta constant over the price control, the degree of change to the Cost of Equity in any given year will depend on the RFR multiplied by 1 minus the beta factor.

Ofgem's approach to the risk-free rate

Ofgem have proposed to rely on the yields on the 20-year RPI-linked gilts (ILGs) and adjusted by the forecast RPI-CPI wedge as the basis for setting their average real RFR assumption, which they set at -0.75% in CPIH-terms. Ofgem have yet to determine the relevant period for averaging the yields, but it will be based on outturn rates prior to the regulatory year in question.

Although we agree with setting the allowed RFR with reference to yields on UK gilts with 20-year maturity, as this tenor is consistent with the investment horizon of energy networks and yields on longer term gilts have historically been less volatile than those of short-term gilts, we do not agree with Ofgem's use of yields on RPI-linked gilts for determining the real RFR directly. RPI-linked gilt yields have exhibited greater volatility than their nominal counterparts since 2010. Additionally, longer-dated RPI-linked gilt yields are depressed by the excess demand or "structural imbalance" from obligations coming from institutions such as pension funds.[2] This issue was considered relevant by the CMA during previous price control reviews.[3]

Ofgem's proposed deflationary method effectively incorporates a 20-year "breakeven" inflation measure, which may be a poor measure of inflation, particularly due to the aforementioned excess demand from pension funds for long-dated ILGs. Also, with the switch to CPIH indexation Ofgem's proposal requires the addition of an expected RPI-CPI wedge to RPI-linked gilt yields adds further complexity in the derivation of the real-CPIH allowance due to variations between forecast and outturn RPI-CPIH wedge, as well as differences between CPI and CPIH which could present NPV neutrality concerns. The approach also retains the use of RPI in a CPIH-based price control.

Our view on the risk-free rate

For a CPIH-based price control, we are of the view that setting the real RFR based on yields on 20 year nominal UK gilts and deflated by expected CPIH inflation would provide a more objective and stable measure of the real RFR, and thus the Cost of Equity index, compared to Ofgem's approach as ILGs, especially those with long maturities, may provide a distorted measure because of the excess demand or "structural imbalances" driven by pension funds demand. Nominal gilts do not have this issue and thus provide a more objective and stable measure of the RFR relative to ILGs.

The optimal deflationary approach for deriving the real RFR is to adjust the 20-year nominal gilt yields using CPI forecasts as a proxy for expected CPIH. This approach is preferable over Ofgem's 20-year breakeven inflation measure, which overstates expected inflation due to the "inflation risk premium" present in the nominal gilt yield. Additionally, the excess demand from pension funds for real gilts, particularly at the long-end, lead to a break-even measure of inflation which is biased. Our approach is also consistent with that suggested in section 2.4.1 for the Cost of Debt mechanism. Overall this approach would lead to a more objective, stable and less complex Cost of Equity index compared to Ofgem's.

Our approach produces a CPIH-real RFR average estimate of -0.21% for the RIIO-2 period, if using the same cut-off date as Ofgem's May 2019 decision. The most recent yields on UK gilts are low relative to historical observed yields, particularly due to investors being worried about the outlook of the UK economy in the ever more likely event of a no-deal Brexit which has resulted in gilt prices being pushed upwards. Updating the RFR evidence to the most recent data (cut-off date of 11 October 2019) produces an average RFR of -0.66% in real-CPIH terms for the RIIO-2 period. However, the forward curve for the 20-year nominal UK gilt is upward-sloping, see Figure 2.2, indicating that the market expects a moderate increase in yields during the price control period.

[2] See: Schroders, 2016, Pension funds and index-linked gilts – A supply/demand mis-match made in hell, London: Schroders
[3] CMA, 2008, Stansted Airport Ltd Q5 price control review, Appendix L – Cost of Capital, London: The CMA, para 51.

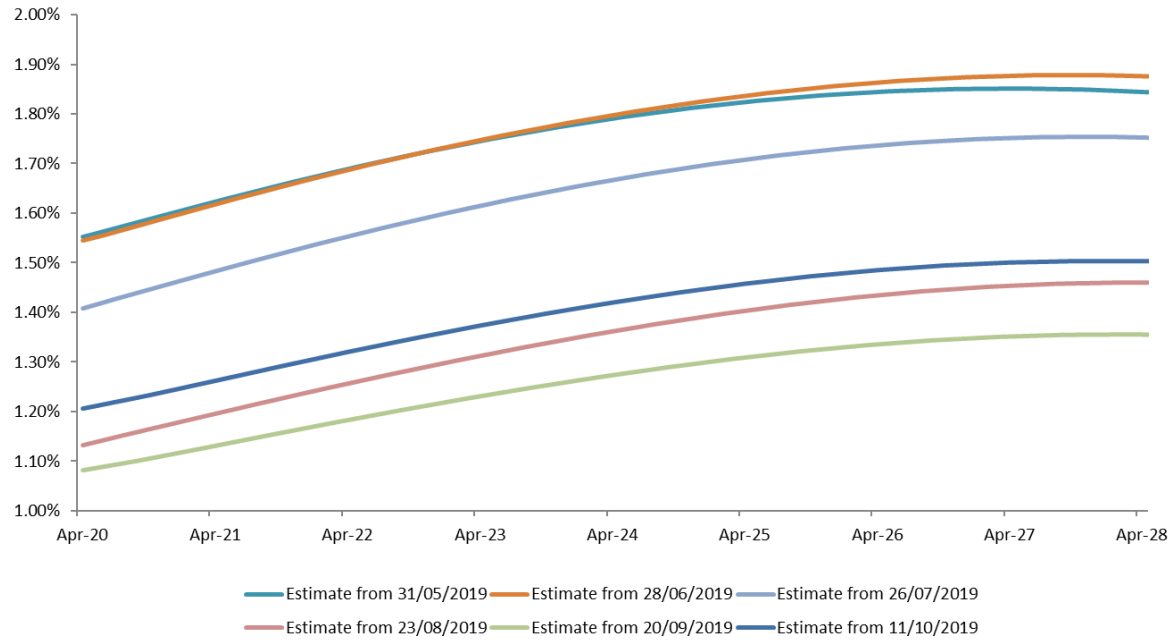


Figure 2.2: *Forward curve on UK 20 year nominal gilt*
Source: SPEN analysis using Bank of England data

2.3.2 Estimating Total Market Returns

The total market return (TMR) is the expected return available to investors for investing in the equity market as a whole. We consider that the TMR is the most appropriate basis on which to derive the allowed Cost of Equity, as it's the most stable component of the Cost of Equity. This approach, commonly referred to as the TMR approach, involves estimating the TMR and RFR directly, and calculating the equity risk premium (ERP) as the difference between the two.

The reason for adopting this approach is due to the TMR's dominance in the determination of the Cost of Equity and for its stability over time, implying an inverse relationship between the RFR and the ERP. Finance theory explains that the negative correlation between the RFR and the ERP is associated with increased risk aversion and the so called "flight to safety" effect during periods of economic and financial crisis. During these periods of economic uncertainty, investors dispose of risky assets such as equity, and hence the ERP, in favour of risk-free assets such as government bonds, which reduces their yields.[4] Empirically, a number of studies have suggested that the TMR has exhibited a stable mean over long timeframes, in contrast to the ERP and the RFR.[5] Consistent with the financial literature, prominent economic institutions such as the Bank of England and the German Bundesbank have noted a negative correlation between the ERP and the RFR, particularly during times of economic uncertainty.[6]

Ofgem's approach to the Total Market Return

In line with UK regulatory precedent, Ofgem in RIIO-2 have adopted the TMR approach, as opposed to directly estimating the ERP. A constant estimate of the ERP – assumed in previous determinations – mixed with a fluctuating RFR would therefore produce a volatile TMR value, and hence a more volatile Cost of Equity allowance. The CMA have also supported the TMR approach when determining the allowed return on equity, stating that it provides stable estimates.[7]

Ofgem's approach is to primarily base their real TMR estimate on long-run historical averages, as they consider that it is 'the best objective measure of TMR[8], and to use forward-looking approaches as a cross-check. This approach has led

[4] See: Campbell and Cochrane, 1999, By force of habit: A consumption-based explanation of aggregate of stock market behaviour, Journal of Political Economy, 107, 205-51 and Wright, S. et al., 2006, Report on the Cost of Capital – provided to Ofgem, Smithers & Co Ltd
[5] See: Siegel, J. J., 1998, Stocks for the Long Run, McGraw Hill, Second Edition p. 11 and 13; and Dimson, E., Marsh, P., and Staunton, M., 2001, Triumph of the Optimists
[6] See: Bank of England, 2016, August Inflation Report, p.2 and Deutsche Bundesbank, 2007, November Monthly Report.
[7] From CMA, 2014, NIE Limited price determination, p. 13-16, para. 13.82: "Our preferred approach is to deduct our estimate of the RFR from our estimate of the equity market return [TMR] to derive the ERP. […] the market return has tended to be less volatile than the ERP […], and there is some evidence of the ERP being negatively correlated with Treasury bill rates over the short term."
[8] Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision – Finance, London; Ofgem, para. 3.45.

Ofgem to setting a 6.25-6.75% (real, CPIH) TMR range, placing significant weight on the long-run realised average returns range of 6-7% (real, CPIH) cited in the 2018 UK Regulators Network (UKRN) report.

We agree with Ofgem's position of using long-run historical realised returns as the primary source of evidence for the TMR. They provide an unbiased and objective estimate of investors' future expectations of equity market returns due to the parameter's stability over time. However, Ofgem's substantively reduced proposals since RIIO-T1 contradicts the concept of a 'stable' real TMR, with their range being downwardly biased.

The reduction is due in part to the UKRN report authors applying an excessive 1% downward adjustment to the simple arithmetic mean return for alleged predictability of returns at long horizons. However, evidence on returns predictability is highly contentious and more established unbiased estimators, which support a relatively modest adjustment (40bps) to the simple arithmetic return averages, are ignored by the UKRN authors for their preferred 10-year investment horizon. Although, the reduction is mainly a result of the reliance on an upwardly biased measure of historical CPI inflation when deflating historical returns into real CPIH-terms. Ofgem place material weight on the 'backcast' CPI inflation series published in the Bank of England's (BoE's) 'Millennium dataset'. This series is an estimate of historical CPI inflation as no outturn data for CPI exists before 1989. The series methodology overstates the underlying CPI as it includes RPI data (which is higher than CPI) for a substantial portion of the period (1915-49) and data for other historical periods which are not reliable estimates of the underlying CPI inflation, particularly for the period of 1950–88[9].

Ofgem also present forward-looking evidence as a cross-check to the historic realised returns estimates. These include DGM estimates from their economics advisory firm, CEPA, as well as TMR forecasts published by investment managers, which all support a reduction in the TMR. We, however, do not agree with the evidence presented from these cross-checks.

Ofgem present forward-looking multi-stage DGM estimates from their economics advisory firm, CEPA, as well as investment managers' forecasts, which all support a reduction in the TMR. Investor expectations of returns are an unreliable source of evidence and should be attributed little weight as confirmed by academic research and precedent. Additionally, CEPA's DGM estimates of the TMR are understated as a result of undue reliance on UK GDP growth as a basis of dividend forecasts[10] for companies in the FTSE All-Share index. The assumption that UK GDP forecast growth rates are a good proxy for investors' expectations of dividend growth rates in the FTSE is incorrect, as FTSE All-share companies derive over 70% of their earnings from outside of the UK, which have higher forecasts of GDP growth than assumed by CEPA for the UK.

Ofgem use UK GDP forecasts from OBR as the basis for the short-term growth rate assumption. Short-term UK GDP forecasts, like the OBR's, are depressed, mainly due to Brexit implications and uncertainties, and are substantially lower than independent analyst forecasts of dividend growth rates for FTSE stocks. Regarding the long-term growth rate assumption, CEPA has considered three different measures for the long-term growth assumption:

- **Midpoint:** UK historic GDP growth (4.5%, calculated as the sum of the 2.5% real UK GDP growth since 1950 plus a CPIH inflation rate of 2%).
- **Lower bound:** UK historic dividend growth (3.1%, calculated as the sum of the 1.1% real dividend growth since 1950 plus a CPIH inflation rate of 2%).
- **Upper bound:** International GDP growth (5.3%, based on the weighted average of UK and International GDP growth considering that 70% of the revenues from UK FTSE companies come from overseas).

For the midpoint, CEPA incorrectly use the CPI to inflate real UK GDP growth which results in an understated expected nominal GDP growth rate. The historical real UK GDP growth would have been derived using outturn RPI inflation and therefore the forecast nominal growth should be derived based on an RPI forecast. The same issue exists for the lower bound assumption where the real historic dividend growth has been derived using RPI outturn inflation. Therefore, a RPI forecast, instead of CPI, should be applied to derive the nominal forecast. The incorrect use of CPI understates expected nominal growth for both assumptions by at least 80bps – the historical difference between RPI and CPI.[11]

[9] Based on the ONS modelled back series of CPI, which produced a significantly lower average annual RPI-CPI difference compared to that seen since the publication of the CPI as an official statistic in 1997 – 0.3% vs 0.8%. The difference likely lies in the modelling approach used by the ONS to back-cast CPI, which they acknowledge presents reliability concerns: *"The method provides only approximate results and there is no way to determine how accurate our method is as sufficient data to calculate the CPI do not exist prior to 1987."* Source: O'Neill, R. and Ralph, J., 2013, Modelling a Back Series for the Consumer Price index, London: ONS, p.4.
[10] See NERA, 2019, Cost of Equity for SPT in RIIO-T2, London: NERA, Appendix A.2
[11] Based on ONS' data since 1988.

The upper bound could be considered a reliable estimate of the TMR as it uses international growth rate figures. However, CEPA's methodology of taking the long-run UK GDP growth rate and uplifting it for the difference between the short-term international and UK GDP growth rates in order to calculate the international GDP growth appears to understate expected growth. Applying the Bank of England's more direct methodology is a more appropriate approach as it draws on global GDP growth forecasts in the long-run and weights them for the source of FTSE revenues. Applying this approach would increase the long-run international GDP growth assumption by 60bps.[12]

When correcting for CEPA's dividend growth assumptions, NERA show that their DGM implies a real forward-looking TMR of around 6.8% (mid-point), and a range of 6.5-7.1%, with the use of analyst forecasts increasing the estimate further by around 50 bps.[13]

As mentioned above, Ofgem considered TMR estimates published by investment managers and the rates of return prescribed by the FCA for the purposes of marketing retail financial products as a possible cross-check of the TMR estimates derived from historic realised returns and DGM models. As highlighted by NERA[14] and Oxera[15], we do not recommend placing any weight on this evidence when cross-checking the TMR due to this evidence being unreliable in informing investors' expected returns. Respondents' answers are highly sensitive to the framing of the question and how it's phrased. Respondents have been found to exhibit a tendency to extrapolate from recent realised returns. These issues make interpreting this evidence challenging. Ultimately the results are based purely on judgement, which can be heavily influenced by the respondent's own position or biases and are therefore less reliable than estimates based on market evidence.

In their review to the ENA[16], Oxera find that the TMR estimates produced by investment managers are prudent estimates of future returns, to ensure that their clients are managing their finances in a sensible manner. This is mainly a function of the FCA's regulatory framework, which states that the maximum rates of return that financial services companies must use in their calculations when providing retail customers with projections of future benefits.[17] This suggests that the rates published are more likely to lean to the lower end of the expected TMR range. Also, as many of these investment firms explicitly state that the figures presented in their publications cannot be used as estimates of future returns, it is unclear whether they actually represent robust evidence when 'advising clients and allocating funds'. Regardless, in their updated report for the ENA, Oxera estimate that the average nominal TMR projection is around 6.31%.[18]

Additionally, Oxera highlighted in their review that the published estimates correspond to a geometric mean expected market return and, as such, an upward adjustment must be made to the published discount rates to correct for the downward bias embedded within geometric average estimates. Academic literature suggests that the adjustment amounts to around 2%.

With the shortcomings listed above, we do not believe that this source of evidence on expected returns is appropriate in the context of a price control and do not recommend that any weight is attributed to this evidence. Such evidence has not been given much weight in any previous price controls. The CMA in the NIE 2014 determination criticised the use of consensus or survey-based approaches from investors, market participants and academics as a suitable evidence source for forward-looking estimates of equity market returns.[19] Prescribing weight to this evidence for RIIO-2 would be a significant break from precedent and would be inconsistent with more established and robust approaches (such as an assessment of historic realised returns and DGM estimates), which are likely to be the underlying methodologies used by survey respondents when forming their views on expected returns.

Our view on the Total Market Return

Despite the use of a similar methodology for estimating the TMR as Ofgem, we estimate a real TMR range of 6.9-7.8% in CPIH terms. The difference between our and Ofgem's estimates relates to how we have interpreted the evidence to inform the expected real TMR.

[12] As of October 2016, the long-run international GDP growth rate would be around 5.9% (nominal). See: Bank of England (2017), An improved model for understanding equity prices, Quarterly Bulletin 2017Q2, p.91, Chart 7
[13] NERA, 2019, Cost of Equity for SPT in RIIO-T2, London: NERA, Appendix A.3.3
[14] See NERA, 2019, Cost of Equity for SPT in RIIO-T2, London: NERA, Appendix B
[15] See Oxera, 2019, Review of RIIO-2 finance issues. Rates of return used by investment managers, report prepared for the Energy Networks Association, London: Energy Networks Association
[16] Oxera, 2019, Review of RIIO-2 finance issues. Rates of return used by investment managers, London: Energy Networks Association
[17] Financial Conduct Authority, 2017, Rates of return for FCA prescribed projections, p. 5: *"Firms are required to use rates of return in their projections that reflect the performance of the underlying investments, but the ceilings imposed by the FCA aim to prevent consumers being misled by inappropriately high rates."*
[18] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update, Prepared for the Energy Networks Association, London: Energy Networks Association
[19] Competition Commission, 2014, Northern Ireland Electricity Limited price determination, London: Competition Commission, paragraph 13.156

Our determination is based on an update of the evidence base considered by the CMA in its NIE 2014 determination, which primarily relied on long-run historical realised equity market returns as well as taking into account forward-looking approaches as a cross-check. The CMA drew on the Dimson, Marsh and Staunton (DMS) database as the basis for its long-run historical estimate. The DMS database provides long-term time series data on returns on stocks, bonds, bills as well as inflation over the period since 1900. It is the standard reference point for UK regulators, as well as financial practitioners.

There is debate around whether the arithmetic or geometric average is the most appropriate averaging method to use when estimating historical average realised returns. The arithmetic average is calculated as the sum of the historical annual returns divided by the number of years in the historical period, while the geometric average corresponds to a constant rate of return that an investor would receive each year to achieve the same asset value as generated by the variable annual returns by the end of the period. The academic literature and analytical studies are broadly supportive of placing greater weight on arithmetic rather than geometric averages for estimating historical realised returns to use when computing the expected TMR.[20]

Blume (1974) showed that if the investment horizon (or holding period) is less than the length of historical data, the arithmetic mean will provide an upward biased estimate of expected returns, whereas the geometric mean will provide a downward biased estimate. Blume suggested a number of unbiased measures of expected returns for holding periods longer than one year. One of which was an “adjusted unbiased” estimator which is a weighted average of arithmetic and geometric means.[21] This estimator places greater weight on the arithmetic mean relative to the geometric mean when the investment horizon is shorter than the historical estimation period. A similar weighted average estimator was also derived by Jacquier, Kane and Marcus (JKM, 2005).[22]

In its 2014 NIE decision, the CMA utilised a number of different unbiased measures of expected returns when arriving at its historical TMR estimate, which included simple and overlapping arithmetic averages, as well as ‘Blume’ and ‘JKM’ estimators mentioned above, differentiated by holding periods.[23]

We rely on the use of historical RPI inflation series as the basis for deflating historical nominal returns into real terms. The RPI series is a more accurate and reliable measure of UK historical inflation as it dates back to 1900 and is based on actual outturn data for the majority of the historical period since 1900[24], as opposed to the CPI series used by Ofgem which primarily relies on estimates for the same period.

NERA provide an update to the CMA calculations using the 2019 DMS publication data for UK equity market returns over the period 1900-2018 and using two alternative sources of historical RPI inflation to derive average returns in real-terms: (i) the RPI inflation reported in the DMS publication for the period 1900-1949 and official ONS RPI historical data for the period 1950 onwards; and (ii) the RPI inflation included in the Bank of England’s Millennium Dataset. Both sources are based on official RPI data from the ONS for the period after 1950.

Based on empirical evidence of typical investor holding periods which supports relatively short averaging periods[25], the TMR should be estimated on the basis of one to five year holding periods. No weight is placed on the simple average as the number of observations is relatively limited for holding periods of 1 to 5 years (e.g. for 5 years, the TMR is based on around 20 or so observations), making the estimates unstable over time as a result. Taking these considerations into account supports a historical RPI-real returns range of 6.4-7.0%, as seen in Table 2.1 below.

[20] See: Dimson, E., Marsh, P. and Staunton, M., 2015, Credit Suisse Investment Returns Sourcebook 2015, p. 34; Cooper, I., 1996, Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting, European Financial Management, 2:2, p. 157; and Jacquier, E., Kane, A. and Marcus, A. J., 2003, Geometric or Arithmetic Mean: A Reconsideration, Financial Analyst Journal, November/December.
[21] Blume, 1974, Unbiased Estimators of Long-Run Expected Rates of Returns, Journal of the American Statistical Association 69, p. 634–663.
[22] Jacquier, Kane, and Marcus, 2005, Optimal estimation of the risk premium for the long run and asset allocation: a case of compounded estimation risk, Journal of Financial Econometrics.
[23] CMA, 2014, NIE Limited price determination, London: The CMA, p. 13-27, Table 13.7.
[24] Outturn values of the RPI have been published since 1947 and estimates are for the period 1870–1947 are based on the 1947 definition of the RPI.
[25] See: Roberge M., Flaherty J., Almeida R., Boyd A., 2017, Lengthening the Investment Time Horizon, p.2; Kay Review of UK Equity Markets and Long-Term Decision Making, Interim Report, Feb 2012; CFA UK response to the Kay Review of UK Equity Markets and Long-Term Decision Making – Call for Evidence; and Helm and Tindall, 2009, The evolution of infrastructure and utility ownership and implications, Oxford Review of Economic Policy, Vol 25, pp 411 – 434.

Table 2.1: *Long-run DMS TMR estimates for different averaging methods and holding periods (real RPI)*

RPI index based on DMS (up to 1949) and ONS (1950 onwards) data

	Simple	Overlapping	Blume	JKM
1Y Holding (%)	7.0	7.0	7.0	7.0
1Y Holding (%)	7.3	6.9	6.9	6.9
1Y Holding (%)	6.5	6.9	6.9	6.8
10Y Holding (%)	7.1	6.7	6.8	6.6
20Y Holding (%)	7.4	6.7	6.7	6.1

Source: NERA, 2019, Cost of Capital for SPT in RIIO-2. NERA calculations using DMS (February 2019), Credit Suisse Global Investment Returns Yearbook 2019 (DMS data since 1949 converted to real RPI-deflated figures using ONS data).

RPI index based on Bank of England Millennium dataset

	Simple	Overlapping	Blume	JKM
1Y Holding (%)	6.6	6.6	6.6	6.6
1Y Holding (%)	6.9	6.6	6.6	6.6
1Y Holding (%)	6.2	6.5	6.5	6.4
10Y Holding (%)	6.8	6.4	6.5	6.2
20Y Holding (%)	7.0	6.4	6.3	5.8

Source: NERA, 2019, Cost of Capital for SPT in RIIO-2. NERA calculations using DMS (February 2019), Credit Suisse Global Investment Returns Yearbook 2019 (DMS nominal data converted to real RPI-deflated figures using BoE RPI Millennium data).

However, given that the RPI is no longer considered a reliable measure of inflation going forward[26], there is an issue with using historical real RPI-deflated returns as a basis of determining the expected TMR for RIIO-2. With the switch to a CPIH based price control, a CPIH historical returns equivalent can be determined by applying an estimate of historical RPI-CPIH wedge based on the difference between RPI and CPI (using CPI as a proxy for CPIH) to the derived historical RPI-real returns range. NERA estimate a historical RPI-CPI wedge of between 45bps[27] and 71bps[28] using available historical RPI and CPI data (actual and back-casted).

Applying this historical RPI-CPI wedge to the historical RPI-deflated returns range of 6.4-7.0% provides an equivalent CPI-deflated historical returns range of 6.92-7.76%[29]. This approach also addresses the concerns around structural changes to RPI in 2010, which is corrected for by effectively adjusting the historical real RPI returns to a CPI equivalent, which is unaffected by the ONS change in methodology for estimating RPI in 2010.

As an alternative to the long-run historical approach, the TMR can be calculated based on forward-looking evidence, as derived using the DGM. The DGM derives a discount rate which sets the present value of projected future dividends equal to the current share price. If applied to the entire market index, the discount rate implied by the DGM reflects the expected return on the whole market (i.e. the TMR). As utilised by regulators and practitioners at previous reviews, we use evidence from the DGM as a cross-check to the real TMR estimates derived from long-run historical data.

We have considered estimates from NERA's Bank of England DGM, which derives the TMR for the FTSE All Share index, using equity analyst estimates of short-term dividend growth, and a long-run dividend growth assumption based on long-run GDP growth estimates for the different regions from which FTSE All Share companies derive their earnings. Depending on the averaging period, NERA estimate forward-looking estimates of the real TMR that lie in the range of 8.4-9.3% in CPI-terms as seen in Table 2.2. This range is higher than the long-run historical average estimates and is in line with Oxera's DGM TMR estimate of 9.5% (real, CPIH), with Oxera's model being based on the BoE methodology.[30]

[26] The UK Statistics Authority (UKSA) de-designated the RPI as a national statistic given that it no longer meets international standards. Subsequently, in 2015, a UKSA commissioned review by Paul Johnson recommended that the RPI index was no longer a credible measure of price inflation and that it should be discontinued by Government and regulators as soon as practicable.
[27] Based on evidence over the period 1950 to 1988, drawing on the official RPI index and the back-casted CPI index from the ONS. Although the value of the CPI index over this period is less certain given the ONS series reflects a back-cast estimate based on available RPI data rather than a bottom-up derived CPI series from the underlying data.
[28] Based on the the most reliable evidence on the historical RPI-CPI wedge which is from the period 1989 onwards, as this is when both the RPI and CPI data exists as official indices published by the ONS.
[29] Inflation adjustments are calculated using the Fisher equation
[30] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update, Prepared for the Energy Networks Association, London: Energy Networks Association, section 2.3

Table 2.2: *Bank of England DGM (real CPI)*

	Spot (Mar 2017)	1yr Ave (Mar 2017)	5yr Ave (Mar 2017)
BoE TMR (average RfR) (%)	8.5	8.4	8.6
BoE TMR (LT RfR) (%)	8.7	8.5	9.3

Note: The Bank of England estimates the DGM using a time varying risk-free rate for all maturities (where available) and a long-run risk-free rate assumption. The TMR is estimated as the sum of the Bank of England's reported ERP and an i) average of the real risk-free rate for all available maturities and 2) the real risk-free rate at the longest maturity available.
Source: NERA, 2019, Cost of Capital for SPT in RIIO-2, Table 2.4

However, we consider that this evidence should be treated with caution, given the relative sensitivity of the results to the long-term dividend growth assumption. Considering there are no independent analyst forecasts for these, DGM estimates should only be used as a cross-check on the TMR estimated from long-run historical returns data.

In recognising the benefit of predictability and stability in a regulatory framework, it is appropriate to attribute more weight to evidence from historical realised returns than that of individual forward-looking projections. We therefore conclude that the evidence supports a real-CPIH expected TMR range of 6.92-7.76%, which is also in line with the 7.0-7.5% range recommended in Oxera's 2019 Cost of Equity report.[31]

2.3.3 Estimating Equity and Asset Beta

According to the CAPM, the return required by equity investors is a direct function of a company's exposure to systematic risk (that is, non-diversifiable risk[32]). The larger the level of systematic risk, the higher the return is required by equity investors. This is captured in the CAPM by the equity beta, which reflects the relative risk of a company or investment to the market as a whole.

Whilst the equity beta captures both the financial and overall business risk for a company or sector, it can be adjusted for the effects of leverage (i.e. financial risk) to estimate the asset beta. The asset beta is independent of the choice of capital structure and is therefore a more relevant measure of the fundamental business risk of a company or sector.[33] Obtaining the asset beta also requires an estimate of the debt beta which, analogous to the equity beta, captures the degree of correlation between the returns to debt-holders and the broader economy i.e. the risk borne by debt investors.

The estimation of the equity beta should ideally be forward-looking, but the estimation relies on the interpretation of historical market data. The equity beta is derived by estimating the correlation between the returns on a stock and a benchmark stock market index. This is generally done by using the ordinary least squares (OLS) econometric method[34]. However, for businesses that are not listed (such as SPT) it is not possible to calculate a direct estimate of its equity beta. The absence of stock market data is overcome by calculating the equity betas of listed companies with comparable operations and/or risk profiles. These are then adjusted by their respective capital structures ('de-levered') in order to obtain asset betas. The asset betas are then re-levered at the proposed notional gearing level to estimate the company's appropriate equity beta.

The beta estimation needs to take into consideration the frequency of the data and the time period over which betas are assessed, known as estimation windows. Both should be considered together to ensure sufficient observations in the regression, which lead to estimates with relatively low standard errors i.e. precise estimates. Using high frequency data (e.g. daily and weekly) and longer estimation periods can achieve this. However, longer time periods may be less relevant for assessing the forward-looking beta as they can lead to the inclusion of older data points in the estimation which may not be representative of a company's current, or future, exposure to risk. For the estimation window there is a trade-off between selecting a period that provides a sufficiently large sample size but is also recent enough to provide beta estimates that reflect the risks faced by investors over the control period.

[31] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update, Prepared for the Energy Networks Association, London: Energy Networks Association
[32] The degree of systematic risk associated with any particular investment depends on the relationship between movements in returns on that investment and returns on the market portfolio.
[33] The asset beta is calculated as: $\beta_A = \beta_E * (1 - gearing) + \beta_D * gearing$
[34] The traditional OLS approach involves regressing actual stock returns against market returns of a given benchmark market index (e.g. FTSE All-share index).

Ofgem's approach to beta estimation

In its SSMD publication, Ofgem have derived their beta estimate using high frequency outturn returns data for the five listed UK utility companies – SSE, NG, UU, SVT and PNN – over a period of 17.5 and 5 years using OLS regression analysis and cross-checked using the GARCH approach.[35]

Ofgem's approach is flawed as the use of very long-term estimation windows when deriving their lower-case beta estimate ignores the existence of structural breaks, and results in beta estimates that cannot be relied upon. In other words, these long estimation windows ignore the changes in the risk of a company, changes in regulatory regime and risk, as well as changes to market conditions, which result in equity beta estimates that fail to reflect the forward-looking risk faced by the regulated entity over the future price control period.

Ofgem provide further evidence which they consider supports a debt beta range of 0.1 to 0.15, citing regulatory determinations and academic evidence, as well as NERA's analysis and advice to Ofcom for a 0.1 debt beta assumption for the telecommunications sector.[36] The determinations cited by Ofgem are in the range of 0 to 0.15, but most are actually towards the lower end of this range, with the exception being the telecommunications sector decisions – which is a higher risk sector. Estimating debt betas is also prone to statistical errors which do not provide robust estimates. This is likely a result of the low trading frequency for bonds. Additionally, it is important to note that the beta risk borne by debtholders will be related to the business risk of the sector. As such, NERA's recommended 0.1 debt beta for Ofcom for telecoms regulation[37] is a result of the higher risk present in the telecommunications sector relative to the energy sector, thus warranting a lower debt assumption than 0.1 for the energy sector. It is of note that, as confirmed by the CMA, the assumed debt beta has a negligible impact on the equity beta and cost of capital, assuming de-leveraging and leveraging is undertaken correctly.[38]

Ofgem have also introduced adjustments for comparators' observed gearing based on estimates of Enterprise Value to RAV ratios (EV:RAV or MAR). Ofgem argue that it is inconsistent to de-gear raw betas using one definition of gearing (Net Debt / EV) and then re-gear equity betas using a different definition of gearing (Net debt / RAV). They argue that if the EV is larger than RAV, then by de-gearing and re-gearing, the notional equity beta may be overestimated. Ofgem estimate that the EV:RAV ratios of 'pure play' UK utility companies have been approximately 1.1x. The 1.1x MAR adjustment to comparators' gearing is conceptually incorrect, being based on a mis-conception of Indepen's MAR adjustment proposal. Indepen propose that the MAR adjustment is applied to notional gearing when re-levering betas, not in de-levering' comparators' gearing which Ofgem have done. The adjustments fixed value of 1.1 is also seemingly based on a subjective assessment of evidence from water and energy network comparators and that the value of the MARs have and do vary over time[39], making it inappropriate to apply a fixed factor of 1.1 – Ofgem itself even acknowledge this fact.[40] There is also no regulatory precedent in the UK for this type of gearing adjustment.

Ofgem's adjusted gearing approach ultimately overstates gearing, producing a hybrid asset beta that reflects an assumed level of financial risk combined with the actual level of market risk. This adjustment, thus has the effect of understating the asset and re-geared equity beta.

Ofgem also introduced a new adjustment to observed gearing in the SSMD whereby they apply a market value to book value factor (MVF) of debt of 1.03 to 1.06. The use of a market-to-book value Net Debt adjustment for assessing gearing may be appealing, but it is not conceptually correct in the context of a regulated entity because the regulator allows companies to recover their historical debt costs in their allowed revenues, albeit on a notional basis.

Our view on beta estimation

Overall Ofgem's proposed approach for estimating the beta has not been properly justified and is technically flawed – particularly in reference to the reliance on long term beta estimates and the new leveraging and de-leveraging adjustment to the equity beta values. We do not consider that there is sufficient rationale to adopt such a significantly different approach,

[35] Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision Annex Finance, London: Ofgem, para 3.176
[36] Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision Annex Finance, London: Ofgem, p. 51-52
[37] NERA, 2018, Cost of Capital: Beta and Gearing for 2019 BCMR, prepared for Ofcom, London: NERA
[38] The assumed debt beta affects the notional Cost of Equity only to the extent that leverage for the comparators differs from the notional assumption. If empirical leverage is the same as notional and consistent debt betas are used for un-levering and re-levering, there is no impact on the re-levered Cost of Equity. For example, at the BW 2015 appeal, the CMA assumed a debt beta of zero, noting that debt beta has very little impact on the overall cost of capital as BW's notional gearing level was similar to the comparators.
[39] See NERA, 2019, Cost of Equity for SPT in RIIO-2, London: NERA, Appendix H.2.3
[40] From Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision – Finance, London: Ofgem, p. 50: "[…] independent research [from Barclays] shows that the "Premium / Discount to RAV" (analogous to the EV:RAV ratio) can rise and fall […]"

and that the common regulatory practice of estimating betas – one that has also been adopted by other regulators in recent determinations and by NERA and Oxera in their empirical estimations – is a more appropriate and justified approach.

NERA have carried out empirical beta analysis for SPT in RIIO-T2 using the CMA approach from the Bristol Water appeal, where betas have been estimated on the five listed UK-regulated utility comparator companies, based on various data frequencies and estimation windows (spot to 5 year), with the CMA taking an average of the regression results over different periods. The CMA determine the beta range based on the interquartile range of estimates from the different approaches. In our view, considering estimates based on more recent estimation window (2 and 5 years windows) provides an appropriate balance between the number of observations and accounting for the possibility of structural breaks, ensuring that the beta estimation remains relevant on a forward-looking basis.

In their analysis, NERA assumes a debt beta of 0.05 which, as mentioned earlier, is appropriate as it is proportionate to the lower market risk faced by energy networks relative to the telecommunications sector, which was estimated to having a debt beta of 0.1. A 0.05 debt beta assumption has also been adopted by Oxera in their RIIO-2 Cost of Equity report for the ENA based on empirical regression analysis of regulated network companies' bond data, where they show that the average debt beta for their whole sample does not exceed 0.05.[41] This estimate is also in line with the CMA's most recent energy determination (NIE 2014).[42]

However, in selecting a relevant asset beta range for SPT, NERA focus on estimates using daily data as these provide estimates with the lowest standard errors. They also focus on estimates based on 2 and 5 year averaging periods over those based on recent averaging periods (i.e. spot or 1 year) in order to avoid placing undue weight on the time periods affected by increased political and regulatory events. In sectors facing heightened political and regulatory risks, like the energy sector, investor returns become less correlated with the market because the returns are affected by government and regulatory events rather than market movements, and these political and regulatory events do not typically co-vary with the market. The impact of an increase in political and regulatory risk will be depressed beta estimates. NERA show that recent UK energy network beta estimates could be depressed from the increased political risk seen over the past year (for more detail see Appendix C in Annex 9). It is therefore preferable to place less weight on the most recent periods which have exhibited these political risk effects rather than trying to control for these effects in the empirical beta estimation, as the political risk surrounding energy networks is expected to be resolved in the short-term.

Additionally, given the differences between the risks faced by UK water and energy networks, it is not appropriate to place equal weight on beta estimates from all UK listed utilities when selecting an asset beta for SPT as, in addition to differences in the regulatory frameworks, the fundamental risk of energy networks is greater than that faced by water networks. This is due to greater system operability risks, greater exposure to asset stranding risk due to the government's decarbonisation plans and rapid technological change.

TOs also face greater risks than most other energy networks from areas such as:

- **Higher relative investment programme complexity**: taking into account factors such as the size of the project, the number of projects and interlinkages with other projects, Ofgem concluded at T1 that electricity TOs' capital investment projects were more complex than those of GT and GD, in recent and had a greater number of major linked projects.

- **Higher competition risk:** the potential introduction of Ofgem's extended competition models, competition proxy model (CPM) and special purpose vehicle (SPV) model, would expose TOs to greater risk through higher construction and operational risks, as well as the difficulty in designing long-term contracts that accommodate all contingencies over the life of the contract.

- **Asset stranding:** the government's decarbonisation agenda is driving significant changes in the energy supply market with material uncertainty regarding the TOs future role due to the potential for increased levels of embedded generation and storage at the distribution level.

This above is also supported empirically from the lower beta estimates over time, as well as regulatory precedent.

We consider that NG is the most direct comparator for SPT and selecting an asset beta for SPT in line with that estimated for NG plc is appropriate. SSE may also provide a useful comparator as its asset beta has behaved broadly in line with NG

[41] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update, Prepared for the Energy Networks Association, London: Energy Networks Association, section 3.2.5
[42] CMA, 2014, Northern Ireland Electricity Limited price determination - A reference under Article 15 of the Electricity (Northern Ireland) Order 1992, London: The CMA, para 13.175

plc's and other comparators since June 2018 as a result of the intended sale of its GB household retail business, with investors now viewing the forward-looking risk profile of the business more akin to that of a regulated energy network. However, its asset beta has been high and volatile over recent years, in part because of the impact of Brexit. As the change in investors' expectations is fairly recent, using averages of beta estimation results over the last 2 to 5 years would capture substantial data from a time period when SSE's operations were not sufficiently similar to those of the other UK energy networks.

Based on their preferred beta estimation approach, NERA conclude on an asset beta of 0.38 for NG plc.

We note though that NG plc's asset beta is likely an underestimate of the true asset beta of NG plc's UK regulated business as its composite beta reflects the combined systematic risk faced by both its UK and US operations. Despite comprising a similar share of NG plc's overall regulated asset base (47%) and being subject to revenue caps similar to the UK regulated business, NG plc's US operations are subject to regulatory regimes which impose lower risks on investors compared to that of RIIO-T2. These include:

- Shorter regulatory periods (mostly 3-4 years, except gas businesses in Massachusetts which account for only 11% of regulated assets) which reduces the within-period volatility of returns with more frequent updating of revenues in line with costs;
- Greater objectivity in setting allowed costs: in most cases, cost allowances are set based on outturn costs for a base year and projected forward, without explicit efficiency factors that reduce allowances over time. By contrast, RIIO draws on more subjective comparative efficiency analysis and technical review of costs;
- Greater use of cost pass-through or true-ups, e.g. for commodity prices, commodity related bad debt, some mandated capex, and environmental remediation costs. By contrast, the true-ups or pass-through provisions for NG plc's UK operations are more limited, e.g. relating to security, network development, infrastructure enhancement, strategic wider works, and some environmental costs;
- Less stringent output and quality of service incentives in general (focusing mainly on reducing and preventing gas leakage and some efficiency incentives); and
- Greater investor security offered by court-based proceedings which have enshrined property rights and prudence standards, imposing a high evidentiary bar for the disallowance of costs. GB price controls, in contrast, have a more subjective approach and relatively weaker appeal mechanisms.

To obtain a measure of National Grid's true UK systematic risk, NERA have decomposed NG plc's group beta into a UK and US asset beta (more detail can be found in Appendix C of their report). This has been done through the following equation:

$$\beta_{NG} = \frac{Regulated\ assets\ in\ UK}{Total\ regulated\ assets} * \beta_{UK} + \frac{Regulated\ assets\ in\ US}{Total\ regulated\ assets} * \beta_{US}$$

To estimate the asset beta associated with NG plc's US operations NERA use a preliminary sample of 20 US network comparator companies whom were principally engaged in regulated energy network, retail, or generation activities. NERA decided to focus on three comparators – Consolidated Edison, Unitil Corp and Eversource Energy – as they were considered to provide a more accurate representation of the risks faced by NG plc's US assets, given that they operate in the same states and hence are exposed to similar regulatory regimes.

NERA's implied asset beta for NG's UK component based on the reduced comparator set is larger than that produced for the NG group. This result is consistent with the analysis produced by Indepen where they found that NG plc's US betas are 0.15 to 0.19 lower than NG plc's UK betas.[43]

In line with recommendations from NERA and Oxera, as well as UK and European regulatory precedent[44], we take into consideration empirically estimated betas from European comparators. These can provide a reasonable benchmark for a UK regulated network due to several European companies deriving a majority of their revenues largely from European

[43] Indepen, 2018, Ofgem Beta Study – RIIO-2 Main Report, p. 38-39.
[44] For example, the CAA in its 2014 price review for Heathrow and Gatwick estimated an asset beta by reviewing evidence from airports from countries such as Germany (Fraport) and France (ADP). See: CAA, 2014, Estimating the cost of capital: technical appendix for the economic regulation of Heathrow and Gatwick from April 2014: Notices granting the licenses, pp.39-43

regulated activities, as well as operating under similar incentive-based regulatory frameworks. Although this is dependent on conducting a relative risk assessment beforehand to understand the relative risks faced by these comparators relative to UK network companies. NERA, as well as Oxera[45], have found that the equity betas of comparator European energy networks closely track the equity beta of National Grid. This is consistent with investors' viewing these businesses as having similar systematic risk profiles.

NERA's evidence of estimated betas for Spanish and Italian network comparators, coupled with a relative risk assessment between the regimes which suggests that Italian and Spanish networks face broadly similar risks to SPT (see Appendix D in NERA's report), supports an asset beta of 0.42 based on 2 to 5 year estimation windows using high frequency data.

Taking into account the evidence mentioned above, we propose an asset beta range of 0.38-0.42 for SPT in RIIO-T2. The lower bound is informed from the empirically estimated asset beta for NG, considering that SPT's beta should be at least as high as NG plc's given the similar level of risk faced by both TOs. Although NG plc's composite beta is likely to understate UK energy network risk as it also reflects its lower risk regulated operations in the US.

The upper bound is informed by NERA's evidence from the empirical asset betas of European comparators. The relative risk assessment conducted by NERA show that SPT faces similar risks to Italian and Spanish networks, whose asset beta is around 0.42 when using the CMA beta estimation approach. Our view is that this is a conservative upper bound estimate given the evidence that NG plc's UK beta is higher than the upper bound.

The equity beta must be 're-levered' to be consistent with the notional gearing assumed for the price control. In line with Ofgem's point estimate, we have assumed a 60% notional gearing for SPT over RIIO-T2. This gearing level is in line with evidence from actual gearing levels observed in GB TOs and European energy markets and from regulatory precedent.[46] Re-levering for the notional gearing assumption results in a notional equity beta range of 0.88-0.98. This range is aligned with the 0.88-0.95 range estimated by Oxera in their 2019 Cost of Equity report.[47]

Given the differences between the risks faced by UK water and energy networks, we do not consider it appropriate to place equal weight on beta estimates from all UK listed utilities when selecting an asset beta for SPT. More weight should be placed on those estimated from other energy network companies over those of water companies.

2.3.4 CAPM Cross-checks

Taking a balanced consideration of the economic evidence outlined in the previous sections, we arrive at a CAPM-implied allowed Cost of Equity of 6.5% (real, CPIH) for the RIIO-2 price control. This sits within NERA's and Oxera's recommended ranges of 6.03-7.56% and 5.98-7.09% (real, CPIH).

It is prudent to cross-check the CAPM-implied Cost of Equity results against those produced by alternative forward-looking approaches, such as the DGM and investor forecasts, to assess whether the CAPM is appropriately capturing the return required by equity investors and is not being influenced by outside factors or uncertainties.

Ofgem have utilised a number of cross-checks for the RIIO-2 Cost of Equity, which include: CEPA's DGM, Market-to-Asset Ratios (MARs), forecasts from investment managers and advisors, Offshore Electricity Transmission asset (OFTO) bids, and infrastructure fund discount rates. Ofgem state that these cross-checks support the revised CAPM particularly around the 5% CPIH real level.[48]

In this section, we analyse the validity of the various cross-check methodologies proposed by Ofgem for RIIO-2. We find that the evidence from these cross-checks do not support a lower Cost of Equity compared to the CAPM estimates as Ofgem have indicated.

Market to Asset Ratios (MARs)

MARs are defined as the ratio of the market price to the underlying assets: the regulated asset value (the RAV). Ofgem use this ratio to assess whether investors are paying a premium to own network assets i.e. their expected return exceeds their cost of capital. This is indicated by a MAR greater than 1.

[45] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update - Prepared for the Energy Networks Association, London: Energy Networks Association, section 3.3.
[46] See: NERA, 2019, Cost of Equity for SPT in RIIO-2, London: NERA, section 4.
[47] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update, Prepared for the Energy Networks Association, London: Energy Networks Association.
[48] Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision Annex Finance, London: Ofgem, para 3.233

MARs for regulated networks can be observed either by looking at the Enterprise Value of public listed companies or through the transaction price paid to obtain (full or partial) ownership of a company. Both estimates of company value are then compared to the RAV. In their Sector Specific Methodology consultation, Ofgem present MAR values implied by the market values for three UK water companies – PNN, SvT, and UU – over the last 9 years and conclude from this analysis that investors' expected returns exceed their cost of capital given that the MARs are greater than 1 for the majority of the time period. They also present evidence of 'Transaction' MARs for a selection of network company corporate transactions since 2000.[49]

However, a divergence between the allowed and actual Cost of Equity is only one of the large number of potential drivers of these premia. As shown by Burns in Appendix J of the UKRN report[50], it is not possible to disaggregate any overall expected out-performance (or under-performance) between the areas of cost performance, incentives performance, Cost of Debt performance, and differences between the allowed and actual Cost of Equity. Any premium (or discount) to the RAV could therefore reflect any number of combinations of anticipated out- or under-performance in each of these separate areas, and for current and future price controls. Premia can also be affected by wider market 'noise' and other areas such as the 'control premium' and the risk of the 'winner's curse' (i.e. winners overvaluing the asset purchased), which, as recognised by Ofgem[51], may affect the price paid in an acquisition and thus make interpreting 'transaction' derived MARs difficult. It is therefore not possible to conclude that the existence of large premia is caused by the allowed equity return being set too high.

NERA show in their report that sizeable and uncertain adjustments need to be made in order to be able to make any inferences about investors' cost of capital from market capitalisation data[52]. By adjusting NG's market capitalisation to exclude its US regulated and nonregulated assets, NERA derive a relevant MAR range of 0.35 to 1.46 that relates to NG's UK regulated T&D assets only. This broad range demonstrates the implausibility of drawing on MAR evidence for NG to inform investors' expected Cost of Equity. NERA also show that UU and SvT have a MAR of approximately 1 after adjusting for non-regulated, non-wholesale businesses, outperformance opportunities and pension deficit (surplus), suggesting that there is no evidence the investors' expected Cost of Equity is lower than the allowed returns for the water sector, and therefore providing no evidence that the returns are too high in energy.

Given that there is no strong evidence that adjusted MARs are significantly different from 1 and the presence of other drivers of transaction premia that affect MARs, we do not consider that the MAR values presented by Ofgem provide any reliable evidence on investors' cost of capital and little weight should therefore be attached to the inferred Cost of Equity values derived from both 'transaction' and 'market value' derived MARs.

Infrastructure Discount Rates

Ofgem draw on the discount rates used by five out of six infrastructure funds to value their equity investment as a cross-check to the CAPM-implied Cost of Equity range for RIIO-2. Ofgem conclude that the relative risks of the component investments in the funds, combined with the funds' shares trading at a premium to the NAV (which implies that investors are willing to pay more than the value of the assets in the fund i.e. the discount rate used by investors in the fund is lower than the discount rate used by the fund itself) support the use of the funds' discount rate as a cross-check and support a Cost of Equity value of 5.4% (real, CPIH). We are of the view that the justifications highlighted by Ofgem are incorrect and do not warrant the use of discount rates as an appropriate cross-check.

Ofgem have stated that the asset composition of the infrastructure funds include those with higher expected risks than energy networks, highlighting the inclusion of overseas investments or investments including greater volume of revenue risk. We do not agree that the selected infrastructure funds are riskier than energy networks. The funds' asset composition shows the opposite is the case. Oxera conducted a comprehensive review of the risk and return characteristics of the various infrastructure funds and found that the funds' asset composition instead points to portfolio risk that is likely lower than that of energy networks.[53] This is primarily due to the large proportion of several of the funds' portfolios being comprised of investments that are considered lower risk compared to regulated utilities, such as PPP projects, social housing and availability-based investments. Additionally, Oxera also found that where funds' portfolio investments face volume or revenue risks higher than those exposed to energy networks, these were generally hedged through long-term (or

[49] Ofgem, 2018, RIIO-2 Sector Specific Methodology Annex: Finance, London: Ofgem, para 3.122 – 3.125.
[50] Wright, Burns, Mason and Pickford, 2018, Estimating the cost of capital for implementation of price controls by UK Regulators", Appendix J
[51] Ofgem, 2018, RIIO-2 Sector Specific Methodology Annex: Finance, London: Ofgem, para 3.127.
[52] NERA, 2017, Implications of Observed Market to Asset Ratios for Cost of Equity at RIIO-2, London: NERA
[53] Oxera, 2019, Infrastructure fund discount rates – Prepared for Energy Networks Association, London: Energy Networks Association.

availability-based) contracts and some investments are supported via some form of government subsidies which reduces their risk e.g. renewable obligation certificates (ROCs).

We do not agree with Ofgem's methodology to estimate NAV premiums and note that more consistent approaches could instead be adopted to check for any divergence between the discount rate used by funds and investors of the fund. Oxera note that using the closing price on the date of the publication of the results, calculating a NAV and the NAV premium at the end of each trading day would be a more appropriate approach and is one that is generally used by closed-end mutual funds and exchange traded funds. Using this alternative approach, Oxera derive significantly lower NAV premia compared to Ofgem's. Oxera note that the premium to NAV has increased from 2.1% (based on the 2018 annual reports) to 6.5% (based on the 2019 annual reports), but highlight that a positive NAV premium may be caused by the discount rate used to appraise the value of assets in the fund being higher than the market discount rate for the same assets and/or the assumptions on the future cash flows of the fund, used to appraise the NAV, are more conservative than those implicitly used by the fund investors.[54]

Ofgem also use this evidence to demonstrate a decline in investors' expected returns over time, drawing specifically on HICL and 3i infrastructure. In a separate report for the ENA[55], NERA have considered the change in portfolio allocation by HICL over time to understand its effect on the discount rate. NERA's analysis shows that the change in the HICL portfolio is equally likely to explain the decline in required returns. Their review of the portfolio of assets held by HICL demonstrates that only two of the noted "ten largest investments" held in 2013 are in HICL's portfolio as of March 2018. In addition, the geographic location of the asset has greatly varied. The material changes in the HICL portfolio mean that reliable conclusions on the change in investors' expected returns cannot be made, thus the view that investors' expected returns has declined is unjustifiable.

OFTO Returns

Ofgem consider the implied equity IRRs for winning OFTO bids. Using the most recent OFTO tender round bids (round five), Ofgem cite a nominal equity IRR estimate of 7.2% (nominal), or 5.1% (real, CPIH).[56]

We consider that OFTO IRRs are an unreliable and unverified estimator for Cost of Equity. As highlighted by NERA[57], bidders for OFTO projects are evaluated based on their proposed bid's revenue stream over the OFTO licence period.[58] Even where equity IRRs targeted by investors for OFTO projects are stated in the bidding documents, the equity IRR is likely to understate the expected return given potential cost outperformance, tax, and financing outperformance over the operational life. In addition, the risk profile of OFTO operational asset will be lower than the risks faced by an energy network company which undertakes a portfolio of capital and replacement activities and operational activities. Any comparison will therefore be invalid and will likely significantly underestimate the Cost of Equity. As such OFTO bid IRRs cannot be used to infer the allowed Cost of Equity for networks under the RIIO-2 framework.

Investors forecasts

As stated in the TMR section above, when deriving its TMR estimate for RIIO-2 Ofgem considered the TMR estimates published by investment managers and advisors, as well as the rates of return prescribed by the FCA, as a cross-check against the TMR estimates derived from long-run historical realised returns. Ofgem use these TMR projections as a cross check of the CAPM-implied Cost of Equity by applying either their proposed beta values or a beta value of 1. We have already set out our reservations in relation to the use of this source of evidence on forward-looking equity market returns in section 2.1.2 above.

We note though that Ofgem have excluded citing evidence from the annual study carried out by Fernandez, Pershin and Acín, in where they report statistics around the ERP from annual surveys of finance and economics professors, analysts and company managers. The study also surveys evidence on estimates of the nominal TMR for 2015, 2017, 2018 and 2019 for almost 40 countries. Oxera find that the expected nominal return presented in the study for the UK and the USA is higher than the average of the investment advisor projections considered by Ofgem (8.3% vs Ofgem's 6.6%).[59]

[54] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update: Prepared for the Energy Networks Association, London: Energy Networks Association, section 5.4
[55] NERA, 2018, Further evidence on the TMR, a report for the ENA, London: Energy Networks Association.
[56] Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision', London: Ofgem, para. 3.186 and Table 2.
[57] NERA, 2018, Review of Ofgem proposed WACC for Competition Proxy Model of delivering new onshore capacity investments, London: NERA.
[58] The bidding criteria place a 60 per cent weight on the bidders proposed revenue stream and a 40 per cent weight on quality of the underlying assumptions. See e.g. Ofgem, 2014, Invitation to Tender Document for Tender Round 3 (TR3): Westermost Rough, London: Ofgem, p.60-62.
[59] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update: Prepared for the Energy Networks Association, London: Energy Networks Association, section 2.4

Regardless, our recommendation still stands that this evidence source does not provide a meaningful cross-check to the TMR. Ofgem's calculation does not provide a robust cross-check of the CAPM-implied Cost of Equity as it uses a less well justified input value for the TMR in the CAPM formula.

Dividend Growth Model (DGM)

A more direct forward-looking cross-check to the results derived from the CAPM are the Cost of Equity estimates based on DGMs applied to listed utilities. The DGM is a model for estimating the value of the equity of a company based on its expected dividends and growth. The DGM assumes that the share price of a company is equal to the present value of future expected dividend payments, discounted at the Cost of Equity. Since the equity value of a listed company can be observed by reference to the price at which its shares are traded, the DGM can also be used to calculate an implied Cost of Equity from the current market share price and future dividend growth expectations.

Although there are shortcomings in the DGM, particularly regarding the estimates sensitivities to the model inputs (especially the long-term growth rate assumption), we consider that it provides a useful cross-check to CAPM derived estimate of the Cost of Equity as it is an established and widely used model that is frequently applied in commercial contexts and regulatory determinations. It is often the primary cross-check used by UK regulators and it is also relied upon by regulators in the United States to directly estimate the allowed Cost of Equity.

Similar to the model used to estimate the ERP and TMR, Oxera apply DGM models on a single company basis to four of the listed UK utility companies to cross-check the Cost of Equity estimates implied by the CAPM. The results are seen in Table 2.3 below. Under this DGM approach, Oxera estimate a nominal Cost of Equity estimate of 9.3% for National Grid. National Grid's estimates are higher than those produced for the three water companies (an average of 8.8%), suggesting that the fundamental risk of energy networks is greater than that faced by water networks, which warrants a higher Cost of Equity for energy networks.

Additionally, as mentioned in our beta decomposition section, National Grid's UK operations would be expected to have a higher Cost of Equity compared to that of the overall group due to the inclusion of their US operations which have a lower risk profile. As Oxera's DGM is applied to the entire National Grid business, the DGM-implied Cost of Equity estimates are likely an underestimate of National Grid's regulated UK business.

Table 2.3: *Oxera DGM Cost of Equity estimates (nominal)*

Rating Sub-Factor	DGM-implied CoE (%)
National Grid	9.3
Pennon	9.2
United Utilities	8.9
Severn Trent	8.3
Average	**8.9**

Note: Cut-off date: 30 August 2019. Source: Oxera, 2.019, The Cost of Equity for RIIO-2 – Q4 2019 update, Table 5.1.

Asset risk premium

In addition, we recommend the use of the asset risk premium (ARP) and debt risk premium (DRP) differential (or ARP vs DRP) cross-check proposed by Oxera.[60] The cross-check tests whether the allowed Cost of Equity proposed by a regulator meets a required differential between the risk premium on energy network assets and the risk premium on the investment-grade bonds issued by network companies.[61] The test is based on the financial theoretical principle that an equity investment offers a higher risk premium than that of holding high-quality debt given that equity investors are residual claimants to the company's cash flows relative to debt investors i.e. the ARP should be larger than the DRP.

If the differential between the ARP and DRP is too low, then Ofgem need to revise upwards one or more of the proposed CAPM parameters (e.g. asset beta and/or TMR), to ensure that the allowed Cost of Equity estimate proposed for RIIO-2 passes this cross-check.

[60] For more detail on Oxera's methodology, please see Oxera, 2019, Risk premium on assets relative to debt. Benchmarking CAPM-implied equity returns, London: Oxera.
[61] The asset risk premium is the additional compensation over the RFR that investors require to invest in a company as a whole. This is the premium for equity risk assuming zero gearing. The asset risk premium is calculated using the formula: Asset risk premium = Asset beta × ERP.

Oxera conduct this ARP-DRP test for Ofgem's latest recommended CAPM parameters for RIIO-2.[62] Taking their asset beta range of 0.35–0.40 (assuming a debt beta range of 0.10–0.15) and an ERP range of 7.0-7.5%, which imply a ARP of 2.45–3.00%. This is then compared against the DRP of around 150bps for A and BBB rated bonds[63], which imply a ARP-DRP differential of around 0.95–1.50% if using Ofgem's debt beta assumption or 0.60–1.30% if assuming a more credible debt beta estimate of 0.05. Oxera benchmark the mid-point of this ARP-DRP differential range (as Ofgem's proposed Cost of Equity estimate falls in the middle of its CAPM range) and benchmark it against the ARP–DRP observed for bonds issued by UK utilities. When subjected to the test, Oxera find that Ofgem's working assumption ARP–DRP differential lies in the lower quartile of the empirically observed distribution of ARP–DRP differentials.

Clear inference from the above assessment is that Ofgem's current Cost of Equity allowance proposals for RIIO-2 is low relative to values observed in the market and thus Ofgem need to adjust their proposed CAPM parameter assumptions to ensure that proposed RIIO-2 Cost of Equity meets the aforementioned ARP–DRP test criteria. If looking instead at Oxera's revised Cost of Equity parameter values used in their updated Cost of Equity report, which are higher than Ofgem's, the implied ARP-DRP differential outcome falls within the 39th–74th percentile of the distribution.

2.3.5 Allowed vs Expected Returns

In its final step for setting the allowed Cost of Equity for the RIIO-2 price control, Ofgem apply a downwards Allowed vs Expected Return adjustment, or 'outperformance wedge', to the allowed Cost of Equity to reflect their assertion that investors' expect network companies to outperform the cost and output targets set at the price control, which supplements the base return. Ofgem arbitrarily set this downwards adjustment at 50bps, which results in the equity allowance lying towards the lower end of their CAPM range.

Ofgem base this proposal in part on the theoretical arguments and recommendations made by Mason, Pickford and Wright (MPW) in the 2018 UKRN report, and in part on the strong out-performance exhibited by network companies over the RIIO-1 price controls.

MPW recommend that a distinction be made between the allowed the "allowed return" (AR) and the "expected return" (ER)[64], arguing that both will naturally have different values due to the existence of information asymmetry between the regulator and the regulated company during the negotiation of the allowed price cap. They argue that that regulated companies have an "information advantage" over their regulators which will typically cause regulators to inadvertently set price caps too high and so set the average regulated firm up in such a way that it can expect to out-perform the price control and earn a return in excess of the allowed return for its shareholders. The authors recommend that the solution to this issue is for a regulator to consider setting the AR below its best estimate of the Cost of Capital so that the return that a regulated firm expects to earn from price controls, including profits from expected out-performance, does not get out of line with the cost of financing the firm.

Ofgem have embraced this suggestion and are of the view that investors' expectations of performance for the RIIO-2 price control will be positive, and thus the allowed return on equity should be set 50bps below its estimate of the Cost of Equity. Ofgem state that their justification is backed by the experience over the last ten years which has seen regulated energy networks typically out-performing the totex allowances and service quality benchmarks and that shareholders in regulated energy network companies will therefore expect to earn some of their RIIO-2 Cost of Capital via incentive payments rather the allowed return.

We disagree with the assertion that investors expect positive outperformance due to the presence of information asymmetry that is argued to automatically mean that a regulator will set a generous price control. Instead, asymmetry can just as easily cause a regulator to set price controls that underfund a company for its licensed activities. As demonstrated empirically by Frontier[65] and First Economics[66], the historical evidence of performance against previous price control decisions shows performance has varied widely by regulated sector. With no evidence of systematic outperformance regulation is therefore not a one-way bet.

[62] Oxera, 2019, The Cost of Equity for RIIO-2 – Q4 2019 Update – Prepared for the Energy Networks Association, London: Energy Networks Association, section 5.1
[63] Calculated as the average of the yield on the iBoxx A and BBB 10-year+ index, as of Ofgem's assumed SSMD cut-off date (29 March 2019), and then subtracting Ofgem's working RFR assumption of -0.75% (CPIH-deflated) after inflating for Ofgem's working CPIH assumption of 2.00%.
[64] **Allowed Return:** the rate of return that a regulator applies to a company's RAV in order to calculate the monetary profit entitlement that it factors into the company's price caps
Expected Return: the return that investors expect to earn on their investment after receiving a regulator's price control determination and assessing likely scenarios for expenditure and performance.
[65] Frontier Economics, 2019, Adjusting baseline returns for anticipated performance: An assessment of Ofgem's Proposals, London: Frontier Economics, section 3.2
[66] First Economics, 2019, Allowed and Expected Return - A report prepared for National Grid, Oxon: First Economics, section 5

First Economics[67] present possible reasons for expected outperformance. The first being that the regulator just gets its calculations wrong during a price review, resulting in a generous package to the companies purely due to the poor quality of assessments undertaken by the regulator and not due to the presence of information asymmetry. Although this reason can also work in the opposite way with the regulator mistakenly setting allowed revenues at too low a level for the company. The second reason being that although the framework may provide companies with a 'fair bet' at the onset of the price control, such that the company has a roughly equal opportunity of outperforming or underperforming against the package, the risks that take shape over the period, either positive or negative, will inevitably lead to a deviation between the ER and the AR (up or down). Lastly, and most importantly, incentive-based regulation is designed to provide companies with the possibility of outperformance to encourage them to make cost efficiency gains and make service quality improvements. A regulated company responding positively to these regulatory incentives and achieving an ER greater than the AR is the desirable outcome that a regulator should seek. This outcome will result in customers not only being passed down benefits during the price control, via sharing mechanisms, but will also benefit in the long-run from lower bills and better service quality due to the best practice efficiencies on cost and performance revealed by regulated companies which regulators then factor in when setting the new efficiency frontier for the subsequent price control.

Fundamentally, experience from previous controls is not a predictor of future performance, as the efficiencies revealed by the regulated company through their performance on the overall financial package of a price control will be shared with customers and the targets are re-based via the reset of the subsequent price control – the scope for outperformance will be different. Investors cannot make expectations of outperformance from a price control which has not yet been set, and one that has a significantly different risk and reward profile than that of the previous price control. Ofgem arbitrarily setting the outperformance wedge at 50bps based primarily on network's performance during RIIO-1 is therefore conceptually flawed as well as unjustified as the final outcomes of that price control are still unknown.

Overall, making an arbitrary adjustment to correct for the perception that expected outperformance is guaranteed based on the network companies achieving the outcomes which the RIIO framework was designed to encourage is unjustified and conceptually incorrect. Despite the challenges presented by information asymmetry, we do not believe there has been substantial justification given as to as to why regulators are not capable of setting a price control which provides the average regulated company with a 'fair bet' using the regulatory toolkit available to them. If Ofgem believe that the level of outperformance for RIIO-2 needs to be reduced, the correct approach would be to correctly calibrate the incentive and cost target mechanisms utilising the regulatory toolkit in place so as to reduce the scope for outperformance, and ensuring that outperformance is achieved when companies deliver efficient outputs in line with what stakeholders expect.

The introduction of this downwards adjustment to base returns could likely to a range of unintended and negative consequences that will ultimately harm consumers and the sector as a whole. Frontier[68] identify and outline some of the key implications being: the erosion of investor confidence and increased investor risk; weakened incentives for efficiency and innovation; the distortion of incentives to invest; and the loss of clarity over price control calibration.

It is ours, and other stakeholders, belief that Ofgem's proposed adjustment to baseline returns is arbitrary and is a policy that has been based on a flawed conceptual and evidential basis. The adoption of such an adjustment is unprecedented by any other regulator within a price control settlement and would have negative implications on companies' delivery incentives and financeability. It will distort investor's confidence in the sector and weaken incentives, ultimately leading to poor consumer outcomes.

2.3.6 Conclusions

Taking a balanced consideration of the economic evidence outlined in the sections above, we recommend the following CAPM parameter ranges:

- **RFR**: We propose to base the estimate of the RFR on current yields on 20-year nominal UK gilts and deflated to CPIH using OBR's forecasts of long-run CPI inflation. Based on Ofgem's data cut-off date in their SSMD and adjusted for an expected increase in yields over the RIIO-2 period, we propose a RFR estimate of -0.21% (real, CPIH) on average for RIIO-2. If using more up-to-date data on yields this estimate changes to -0.66%.

- **TMR**: We primarily base our assumption on the TMR with reference to estimates derived from UK long-run historical realised returns. We draw on evidence for equity market returns from the latest DMS publication, deflated using historical RPI inflation (DMS/ONS and BoE RPI inflation sets). The historical RPI-deflated expected TMR is

[67] First Economics, 2019, Allowed and Expected Return - A report prepared for National Grid, Oxon: First Economics, section 3
[68] Frontier Economics, 2019, Adjusting baseline returns for anticipated performance: An assessment of Ofgem's Proposals, London: Frontier Economics, section 4

derived using established unbiased estimators and is then converted to CPIH returns using a historical RPI-CPI wedge estimate from available data. Using this approach, we arrive at a TMR estimate of 6.92-7.76% (real, CPIH). The range is also supported by the cross-check DGM evidence from NERA and Oxera.

- **Beta**: We propose a forward-looking asset beta estimate of 0.38 to 0.42 (0.05 debt beta) for SPT in RIIO-2. The lower bound is informed form NG's asset beta (most direct comparator for SPT) for the preferred 2 year and 5 year estimation windows using high frequency data. We focus on 2 and 5 year averaging periods in order to avoid placing undue weight on current periods which are unduly affected by increased political and regulatory events. The upper bound is based on empirical betas for European networks, which is a conservative estimate in light of the evidence from the decomposition of NG plc's beta which supports a higher value.

Based on the CAPM framework evidence, we propose an allowed Cost of Equity estimate of 6.5% (real-CPIH, post-tax) for SPT over the RIIO-T2 price control. This is a sensible and appropriate market-based estimate which sits within the recommended ranges produced by NERA and Oxera, which have been sense-checked against various appropriate cross-checks. We believe this provides an appropriate return for shareholders considering the risks facing the transmission sector over the RIIO-T2 price control, thereby ensuring that the investment required to provide for a safe and reliable electricity supply to our customers from our networks can be met. Our proposal is made on the basis that our uncertainty mechanism proposals are accepted.

If network companies are expected to take on further risk over RIIO-T2 (e.g. 'no deal' Brexit and further political risk), then the level of returns that equity holders require would need to be reassessed. We are concerned that returns currently present in countries, such as the US and Brazil relative to the UK, could see investors unwilling to invest in UK network businesses when coupled with domestic political uncertainty.

2.4 Establishing Cost of Debt

Network companies need revenue to service their long-term debt, and this needs to reflect the actual costs of financing this efficiently incurred debt.

In RIIO-1 Ofgem adopted an indexation approach for determining the allowed Cost of Debt, whereby the allowance was benchmarked annually against a predefined index. The chosen index was a 10 year trailing average of the outturn yields of the iBoxx A and BBB rated sterling non-financial bond indices with a maturity of more than ten years. The two iBoxx indices track the market rate of interest charged for investing in the bonds of non-financial firms – including bonds issued by regulated utilities – and are calculated through a weighted average of all bonds with the relevant maturity (i.e. 10+ years).

The iBoxx index was chosen over the equivalent Bloomberg index (20 yr A and BBB indices) as Ofgem had noted the following benefits in support of the iBoxx index relative to Bloomberg: iBoxx has a more transparent and predictable methodology; it is calculated with reference to more regulated utility bonds; and the 10yr+ maturity reflects the long-term nature of bonds issued by utility companies.

In Ofgem's Sector Specific Methodology Decision (SSMD) publication, they revise their working assumption for GDNs and TOs, basing it on an 11-15 year Trombone trailing average[69] of the A/BBB iBoxx index, less the expectation of CPIH inflation by using the Office of Budget Responsibility's (OBR) long-term CPI forecast.

We support the recalibration of the RIIO-1 index. NERA's evaluation of Transmission Operators' debt performance over RIIO-2 under Ofgem's existing mechanisms shows that the transmission sector would be expected to underperform the debt allowance[70] (i.e. be 'out of pocket'), emphasising the need to re-calibrate the allowance mechanism in order to address expected under-recovery of the costs of efficiently incurred debt.

In our business plan we have based our financial modelling on an average Cost of Debt of 1.93% (CPIH) – this is the average value of the iBoxx 11-15 year Trombone over the RIIO-2 period, as can been seen in Table 2.4. Nevertheless, the allowed Cost of Debt index is expected to continue to fall up until the start of RIIO-2 and is forecast to remain below 2% throughout the price control period.

[69] The length of the trailing average will start at 11 years for the first year of RIIO-2 and advance by a year each year, trombone-like, until the end of RIIO-2 where the period length will reach 15 years.
[70] NERA, 2018, Cost of Debt at RIIO-2, a report for the ENA. London: NERA Economic Consulting

Table 2.4: *Implied Cost of Debt estimate over RIIO-T2*

	21/22	22/23	23/24	24/25	25/26	Average
iBoxx A/BBB Trombone, nominal %	4.07	4.00	3.95	3.92	3.89	3.97
iBoxx A/BBB Trombone, CPIH %	2.03	1.96	1.91	1.88	1.86	1.93

Source: Ofgem, 2019, Sector Specific Methodology Decision – Finance annex, Table 5.

The following sections address four issues which Ofgem are considering further for the Cost of Debt in RIIO-T2: (i) Cost of Debt trailing average; (ii) deflationary approach; (iii) the "halo" effect; and (iv) additional borrowing costs.

2.4.1 Cost of Debt index trailing average

We support a move to a longer trailing average period for the Cost of Debt index. Our position has been informed by an independent economic consultant (NERA) whom we have commissioned to provide us with an independent assessment of the Cost of Debt for RIIO-T2. Please see Annex 9: Cost of Capital NERA report. The optimal trailing average of the benchmark index should match the average tenor at issuance of network companies' debt. By doing so, an energy network that issues a bond in line with the average tenor will receive an allowance equal to the efficient cost of the bond in each year of the lifetime of the bond, thus ensuring a reasonable likelihood of servicing its debt costs.

Energy network bonds have an average tenor of issuance of around 19 years, with a range of 17 (GDNs) to 24 years (GTs), as can be seen in Figure 3.3. Ofgem have stated that the determination of the trailing average should take into account the approximately 14% variable debt that has an interest rate setting maturity of 6 months. However, when this proportion of variable debt in the industry is accounted for the average tenor of issuance remains almost unchanged, only falling slightly to 18 years. However, Ofgem should not adjust the average tenor for the proportion of variable debt as the decision to issue variable or fixed rate debt should be a risk borne by the company as part of their credit risk management. It should not fall on consumers.

The efficient tenor should be informed by evidence from other regulated sectors given the potential impact that the RIIO-1 regulatory framework has had on companies' debt issuances. There is a risk that energy networks in RIIO-1 have sought to match the 10-year trailing average of the index determined by Ofgem at RIIO-T1/GD1. The length was set due to the availability of the relevant iBoxx indices at the time (1998-99[71]), which placed a limit on the trailing average length.[72] There is a risk that this trailing average length has encouraged network companies to issue shorter debt tenors relative to the efficient tenor. The regulatory rules present in the most recent controls for both the water and aviation sectors have not incentivised shorter debt issuances due to the respective regulators' decision to not to index their Cost of Debt allowances to any benchmark. Average tenor at issuance is around 25 years for water companies and 20 years for London Heathrow Airport (LHR).

[71] The iBoxx GBP Benchmark Index was published on 1997/12/31, and the yield on the index start on 1998/1/1. See IHS Markit iBoxx GBP benchmark documentation, p.18.
[72] In addition, for GDNs, a substantive element of industry debt was issued post distribution network (DN) sales in 2005, and therefore the then 10Y trailing average captured the period of debt GDN debt issuance.

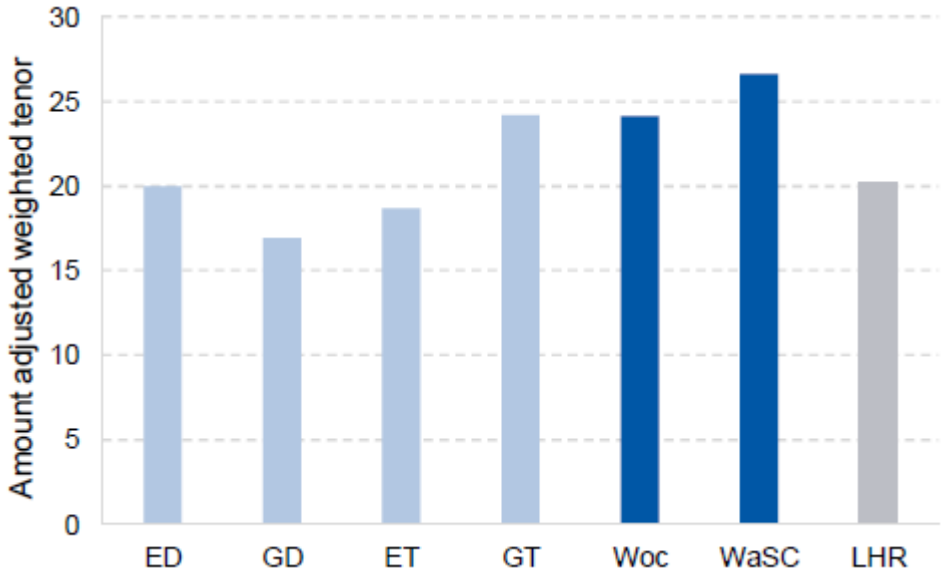


Figure 2.3: *Average tenor of issuance for regulated utility sectors.*
Source: NERA, 2019, Cost of Capital for SPT in RIIO-2, Figure 5.1

The profile of sector debt issuance should also inform the length of trailing index. As around 45% of debt issuance in the energy sector is pre-2011, Ofgem's Trombone starting trailing average of 11 years would therefore exclude almost half of the sector current outstanding debt if implemented in RIIO-2, whereas a 15 year or 20-year trailing average would provide coverage for 80% and up to 95% of companies' historical debt issuance respectively. This is represented in Figure 2.4. A similar decision has been made by Ofwat in their PR19 draft determination, where they concluded that a 15-year trailing average of the A/BBB iBoxx provided greater coverage of the sector's debt issuance profile compared to a 10-year average as c.80% of outstanding listed bonds were issued over the 2004-2018 period.[73]

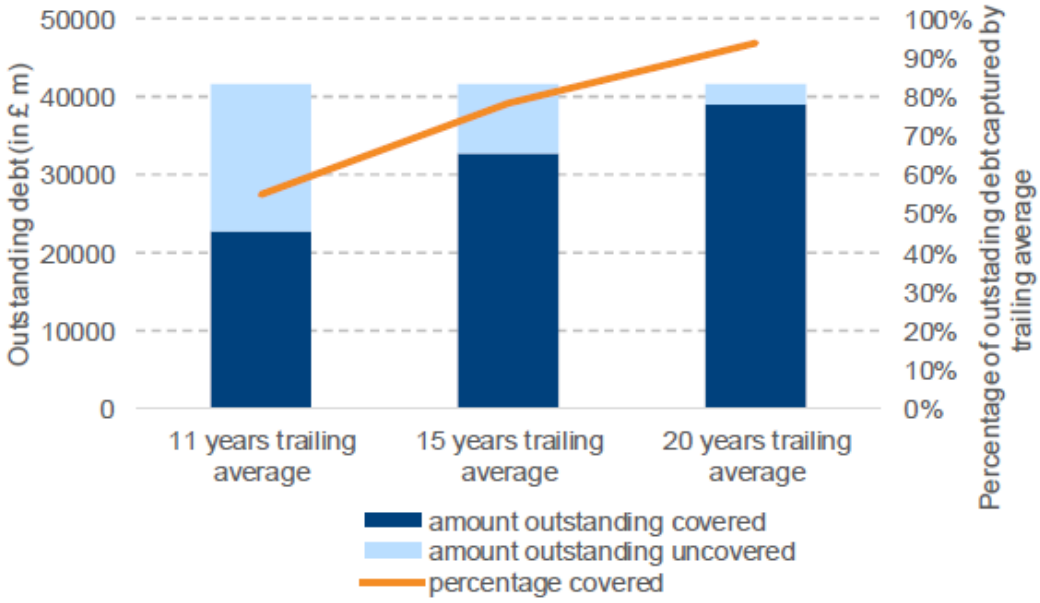


Figure 2.4: *Debt allowance coverage of energy sector's issuance profile.*
Source: NERA, 2019, Cost of Capital for SPT in RIIO-2, Figure 5.2

The market evidence on the efficient tenor at issuance in sectors supports a trailing average of at least 15 years, the (approximate) shortest tenor observed for any regulated sector. The evidence though more strongly supports an efficient tenor of around 20 years. We therefore recommend that that the Cost of Debt indexation should be based on a starting trailing average of a *minimum* 15 years. A longer trailing average period would provide network companies with an

[73] Ofwat, 2019, PR19 draft determinations – Cost of capital technical appendix, London: Ofwat, section 4, pp.76-77.

allowance that is more reflective of the actual cost of financing their efficiently incurred long-term debt as it would provide coverage for at least 80% of the sector's embedded debt issuances.

Additionally, we believe in a simple average approach to calibrating the Cost of Debt mechanism, as setting this based on a weighted average would be akin to a pass-through for the largest network in the sector[74] and would fail to treat the other companies' actual debt costs.

2.4.2 Deflationary approach

For deriving the real debt allowance we disagree with a continuation of the RIIO-1 break-even approach[75] for deflating the nominal iBoxx indices. It is a biased measure of inflation which habitually overstates expected inflation due to the "inflation risk premium" present in the nominal gilt yield. This may lead to network companies not recovering their actual nominal debt costs in any given year. As a result of the switch from RPI to CPIH, retaining this approach would also require an additional adjustment for the expected RPI-CPI wedge as index linked gilts are linked to the RPI, which adds further complexity.

Ofgem's other approach of using an expected value of CPIH to deflate the nominal iBoxx indices using the OBR's 5-year forecast is preferable over the break-even approach as it is a more reflective of the long-term inflation expectation embedded in long-dated debt instruments. It would also remove the reliance of RPI in a CPIH-based price control and would align with our approach of deriving the real risk-free rate (as detailed in section 2.1). However, we raise concerns that using CPI forecasts as a proxy for expected CPIH, given the absence of credible independent forecasts for CPIH, may lead to under/over recovery issues given potential differences between CPI and CPIH. We therefore consider that the use of outturn inflation, as used to index the asset base, is a viable alternative for determining the real allowed Cost of Debt.

The approach has the advantage of largely mitigating risk for investors in recovering their nominal debt cost as the inflation element of the Cost of Debt is recovered as a capital gain on the RAV, and the remaining real element is recovered as a return on the RAV. The approach also avoids forecasting errors. Although it does risk introducing volatility in the allowed real debt component of revenues, this could be mitigated by utilising a suitable trailing average of outturn inflation.

2.4.3 Halo Effect

We are of the position that no adjustments should be made to account for the so called 'halo effect'[76]. In its SSMD, Ofgem re-estimated their 'halo effect' figure, measuring it as the difference between the credit spread of the iBoxx index and the credit spread of companies' bond. Using a sample of fixed rate bonds exceeding 10-years maturity at issue, Ofgem conclude on a 'halo effect' size of is 14bps when all network bonds are compared to the average A/BBB index spread, or 7bps when network bonds were compared to the index matching the rating at issue.[77]

In section 6 of Annex 9, NERA critique Ofgem's approach and demonstrate evidence there is no 'halo effect'.

2.4.4 Additional borrowing costs

With no evidence of a 'halo effect', an explicit allowance for debt transaction, liquidity and cost-of-carry should therefore be provided to companies to compensate for the unavoidable costs associated with raising debt financing. Such an allowance has been supported by regulatory precedent. NERA provide analysis in section 7 of Annex 9 where they draw on company data and market evidence to estimate additional borrowing costs of 7bps for transaction costs, which draw on company public bond issuance; 4.5bps, for liquidity cost or 9 bps if facility half-drawn; and Cost-of-carry of 16 to 45bps based on companies meeting sufficiency of resource and rating agency requirements to meet obligations for 12 to 24 month periods. Overall, this equates to a range of 28- 57bps. When including the new issue premium (NIP)[78] estimate of 13bps, and costs of switching to CPI indexation of 12 bps, the overall additional borrowing costs lie in a range of 53-82bps.

[74] Which in the case of the Transmission sector would be NGET.
[75] Break-even inflation is derived by taking the difference between nominal and index linked 10 year gilt yields for the relevant index date which is to be deflated.
[76] The assumption that regulated utility companies can raise debt at rates less than the iBoxx benchmark as a result of the quality of the regulatory regime.
[77] Ofgem, 2019, RIIO-2 Sector Specific Methodology Decision Annex: Finance, London: Ofgem, p.21
[78] the company's yield at issue is higher than secondary traded yields, as represented by the iBoxx index.

2.5 Notional Gearing & RoRE

Table 2.5: *Notional Gearing Summary by Period*

SP Transmission	RIIO-T2	RIIO-T1
Notional Gearing	60%	55%

In this section we assess notional gearing in the context of the financial benefits and penalties that are available to the network companies in RIIO-T2 from outperforming or underperforming the price control assumptions.

Notional gearing represents the assumed percentage of Net Debt to RAV for the notional company. This in turn impacts the percentages of RAV that attract debt and equity allowances.

The issues and interactions in setting notional gearing are many. The diagram below shows the wider range of interactions.

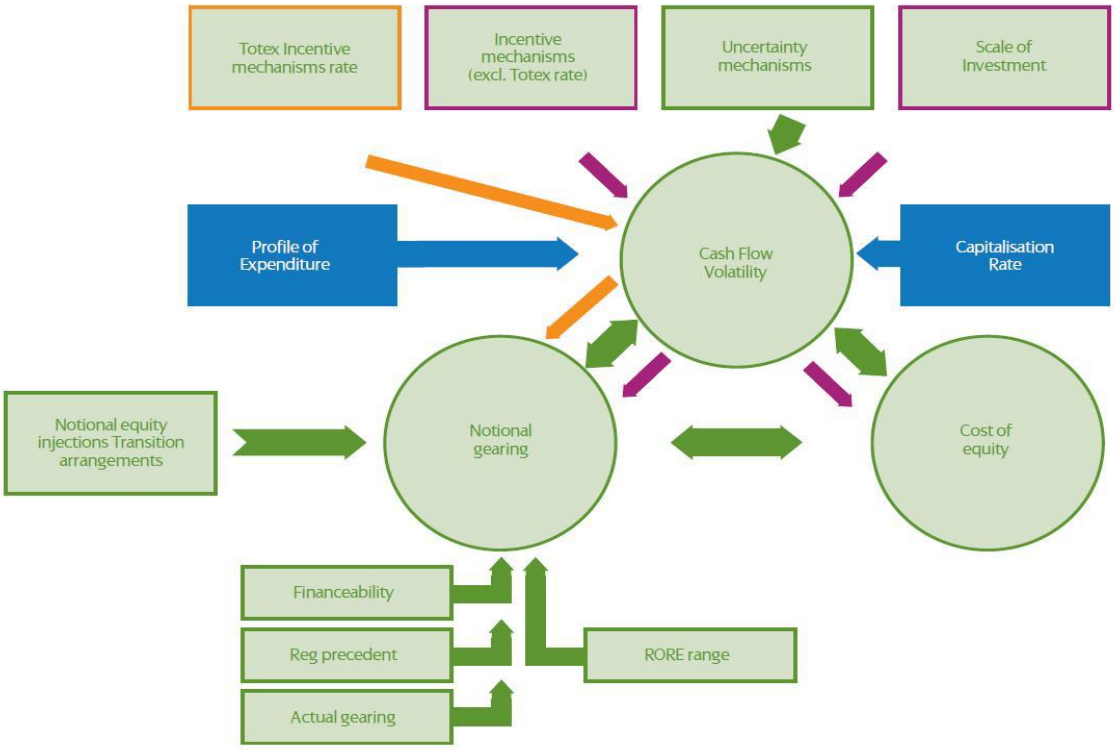


Figure 2.5: *Setting notional gearing*

2.5.1 Cash Flow Volatility

Cash flow volatility is affected by:

• Scale of investment

• Capitalisation rate

• Profile of expenditure

• Totex incentive rate (Sharing Factor)

• Other incentive mechanisms and rates

• Uncertainty mechanisms

Scale and profile of expenditure is largely determined externally by the requirement to meet present and anticipated outputs – to deliver a secure and efficient network.

The RIIO-T2 uncertainty mechanisms and incentive characteristics are yet to be finalised however in general we have not sought to adjust cash flow risk by departing from the overall framework set out by Ofgem.

We have however proposed a drop from the current RIIO-T1 capitalisation rate of 90% to a rate of 85% for RIIO-T2 as this more closely aligns with the mix of capital and operational expenditure that will be delivered in the RIIO-T2 period. This currently aligns with the working assumptions provided as part of the RIIO-2 Sector Specific Methodology Decision (SSMD).

Capitalisation rate can provide a short-term lever to address financeability issues. In the longer term, a notional capitalisation rate which differs from the actual capitalisation policy can lead to an accounting mis-match. As a result, we prefer not to use the capitalisation rate as a financeability lever.

2.5.2 Cost of Equity

The extent to which the Cost of Equity can be flexed is externally limited by the minimum expected return required by the market to secure investment. We have identified what we believe to be the current market Cost of Equity of 6.5% (CPIH) as detailed in section 2.3. This Cost of Equity is dependent on the systematic (non-diversifiable) risk as reflected (under CAPM) in the asset beta. This differs from the current assumption of 4.8% (CPIH) that Ofgem have proposed within the SSMD.

2.5.3 Notional Gearing

It therefore remains to ensure that given the above externally determined factors, the idiosyncratic risk for a notional average network business at a given level of gearing will, when exposed to the full range of RIIO-T2 incentives and external risk, lead neither to excessive returns for shareholders nor to financial distress.

In this section we introduce a central base scenario for gearing of 60% as set out in Ofgem's SSMD along with two alternatives of ±5% (i.e. 55% and 65% gearing).

The current proposal of 60% gearing for all RIIO-2 sectors would represent an increase for Electricity Transmission but a decrease for Gas Distribution and Transmission as notional gearing of 55% was accepted by both Scottish TO's at RIIO-T1. While 65% was the level that was accepted by GD/T companies. Therefore, the current proposals would represent an increase of 5% for SPT. This, as well as the lower Cost of Equity assumptions of 4.8%, would reduce cash flows and adversely impact credit metrics when compared with RIIO-T1.

Ofgem have suggested that a sector specific notional gearing may be adopted as part of RIIO-T2 if it would enable the maintenance of appropriate credit metrics under a wide range of market conditions. We explore this further in our financeability and risk assessments sections. Given that scale of investment during RIIO-T2 will not materially differ to that at RIIO-T1 on average, greater emphasis should be placed on this proposal.

Taking these factors into account, 60% gearing with a ±5% variation is the base scenario to carry out our detailed overall financeability testing in section 3.

Having identified a starting range for our gearing assessment, we then introduce a range of plausible out or underperformance outcomes arising from the most material of the package of RIIO-T2 incentives.

This allows us to stress test our proposed level of notional gearing by examining the overall range of returns to which SPT will be exposed. As per the SSMD on regulatory adjustment mechanisms (RAMs), we aim to calibrate the RoRE within the 300bps range as a maximum and returns around the level of the Cost of Debt index at the minimum.

We later further validate our conclusion on Notional Gearing by simulating the external risks to cash flows and the resulting impact on business financeability (by Monte Carlo using Moody's credit rating methodology). This further credit rating testing is described fully in section 3.0 Financeability.

2.5.4 Return on Regulatory Equity (RoRE)

At this stage we conduct RoRE analysis to estimate the financial benefits and penalties that are available to the notional network company in RIIO-T2 from outperforming or underperforming the price control assumptions.

In accordance with Ofgem's SSMD for RIIO-T2 and the RIIO principle, the overall financial package should ensure a fair return for shareholders (as measured by the return on the notional proportion of the RAV that is financed by equity), with a minimum return around the Cost of Debt.

The RoRE calculated is forward-looking. We use RIIO-T2 average RAV values and average allowed revenue determined by Ofgem's Business Plan Financial Model (BPFM) in our calculation.

We recognise the draft nature of the incentive assumptions due to the ongoing price control refinements and expect that these inputs will be revised as we approach the draft and final determinations in 2020.

The assumptions underlying our RoRE analysis are summarised below for both a 6.5% and 4.8% CoE scenario as some incentives are derived from allowed base revenue:

Table 2.6: *Summary of RoRE Assumptions*

RoRE Assumptions @ 6.5% CoE	SP Transmission	Source
Base Revenue (Annual Average)	£360m	Calculated by BPFM (18/19 Prices)
Equity RAV (Annual Average)	£1,097m	Calculated by BPFM (18/19 Prices)
Gearing	60.00%	Per Ofgem SSMD (May 19)
Sharing Factor	67.5%	Per Ofgem SSMD (May 19)
Totex (Annual Average)	£275m	BP Totex (18/19 Prices)
BP Incentive	±2% of Totex	Per Ofgem SSMD (May 19)
Totex Uncertainty	±10% of Totex	Per Ofgem SSMD (May 19)
Energy Not Supplied Incentive	+£2.0m/ - £6.4m p.a.	Per SPT Proposal
Customer Satisfaction	±1% of Base Revenue	Per SPT Proposal
SF6 Emissions	±£1.1m p.a	Per SPT Proposal
Environmental Impact	+£1.8m p.a	Per SPT Proposal
Performance re offers of timely connection	-0.5% of Base Revenue	Per SPT Proposal
Network Reliability and Resilience	£4.8m p.a	Per SPT Proposal
Consumer and Network Users	±1.8m p.a	Per SPT Proposal

RoRE Assumptions @ 4.8% CoE	SP Transmission	Source
Base Revenue (Annual Average)	£333m	Calculated by BPFM (18/19 Prices)
Equity RAV (Annual Average)	£1,102m	Calculated by BPFM (18/19 Prices)
Gearing	60.00%	Per Ofgem SSMD (May 19)
Sharing Factor	67.5%	Per Ofgem SSMD (May 19)
Totex (Annual Average)	£275m	BP Totex (18/19 Prices)
BP Incentive	±2% of Totex	Per Ofgem SSMD (May 19)
Totex Uncertainty	±10% of Totex	Per Ofgem SSMD (May 19)
Energy Not Supplied Incentive	+£2.0m/ - £6.4m p.a.	Per SPT Proposal
Customer Satisfaction	±1% of Base Revenue	Per SPT Proposal
SF6 Emissions	±£1.1m p.a	Per SPT Proposal
Environmental Impact	+£1.7m p.a	Per SPT Proposal
Performance re offers of timely connection	-0.5% of Base Revenue	Per SPT Proposal
Network Reliability and Resilience	£4.8m p.a	Per SPT Proposal
Consumer and Network Users	±1.7m p.a	Per SPT Proposal

As per the SSMD document, the BP incentive value is removed from the calculation of the RoRE. If included this would have increased/decreased RoRE by circa 43bps / 42bps respectively.

We show the relative impact of the most material RIIO-T2 risks as basis points of RoRE in Tornado Charts in Figure 2.6

2.5.5 RoRE at SPT assumptions 6.5% CoE

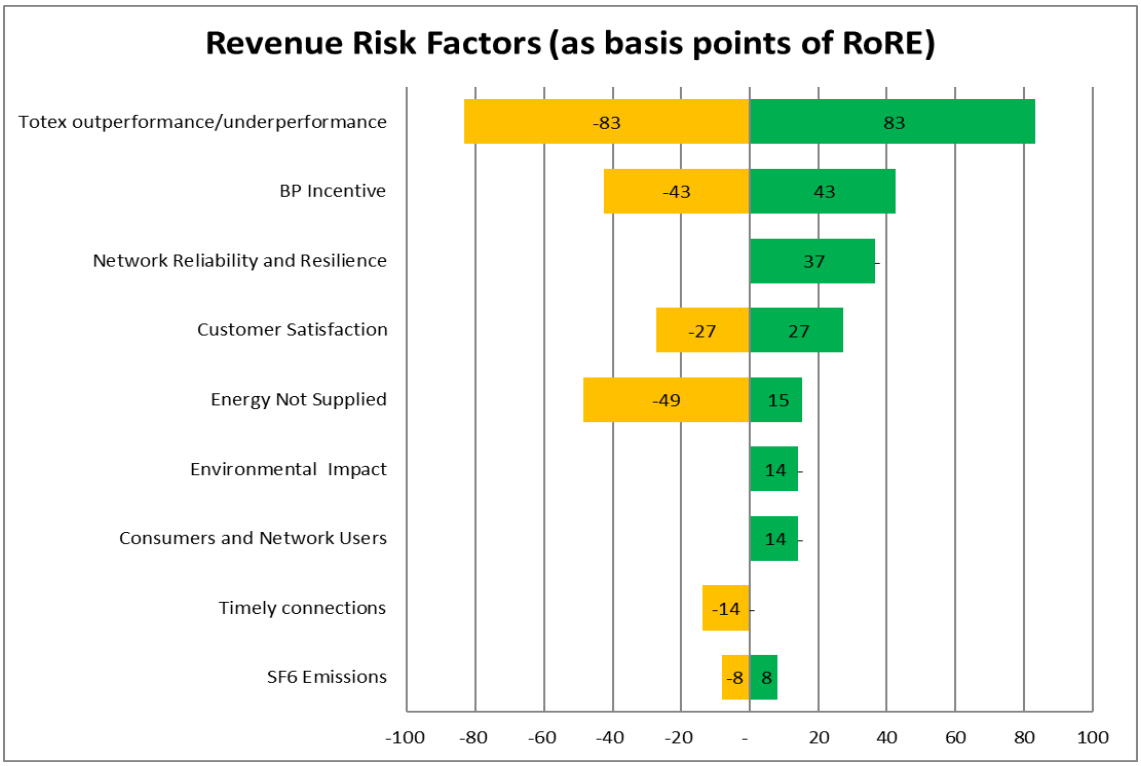


Figure 2.6: *Tornado charts for risk factors @ 6.5% CoE*

In aggregate these individual risks determine the overall range of feasible RoRE performance in RIIO-T2. We present this as a 'layer cake' in figure 2.5. (for a range of gearing).

The analysis above shows that the current outperformance range will peak at 199bps whereas underperformance could reach a reduction of 181bps.
The range of feasible RoRE at 60% gearing extends from a maximum of 8.49% down to a minimum of 4.69% (compared with a Cost of Debt likely to fall from a starting point of 2.03% in RIIO-T2.) These values exclude the Business Plan Incentive as per Ofgem's working assumptions.
This indicates that our working assumption for Cost of Equity and Gearing (6.5% and 60%) are within an acceptable range for the level of revenue risk factors currently embedded within our RIIO-T2 Business Plan. However, this also indicates that the proposed price control RoRE range is far below the 300bps set via the RAM's methodology which would allow a return of 9.5% before adjustment. This also represents a substantial decrease in the total RoRE achievable when compared with the RIIO-T1 period when the RoRE was originally set at circa 11%.

To determine whether the draft gearing assumptions are set at an optimal level we have examined the effect of varying the gearing either upwards or downwards. We adjust the gearing in increments of 5%. The impact of these changes in gearing shown in Figure 2.7.

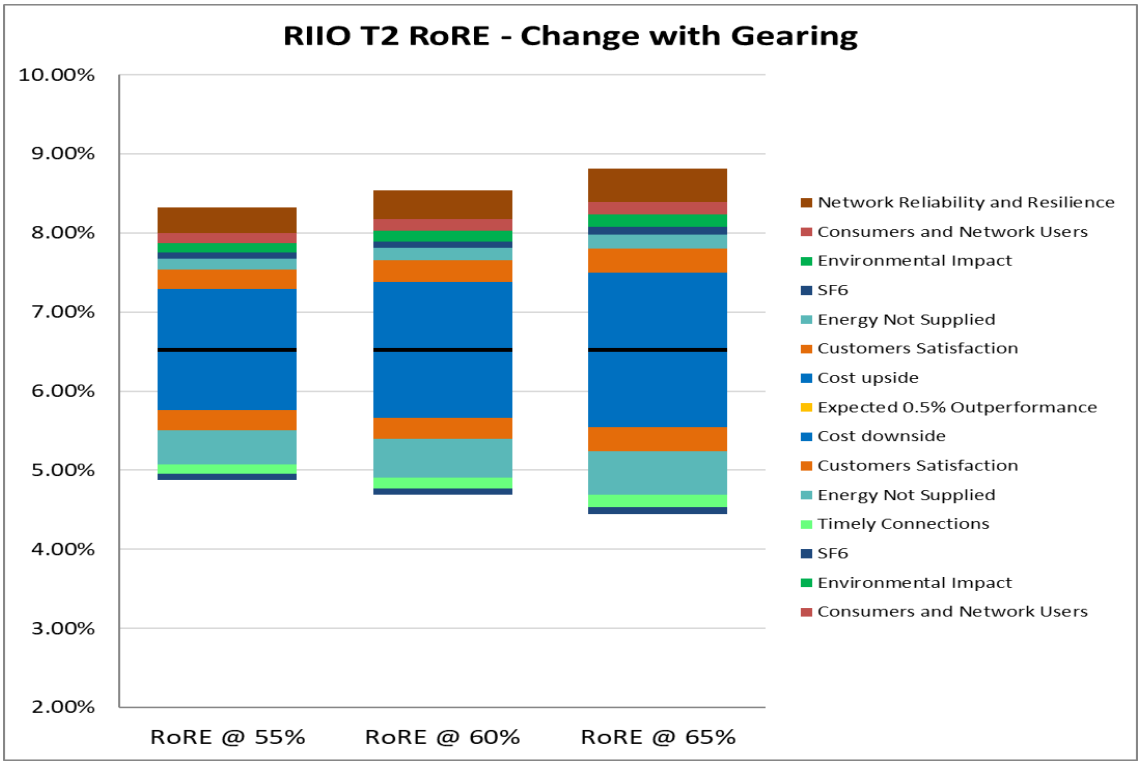


Figure 2.7: *RoRE Range at 5% intervals of Gearing @ 6.5% CoE*

The conclusions are as follows; At 55% gearing, the potential for RoRE outperformance/underperformance is constrained. The absolute maximum achievable decreases by c. 20bps to 8.27% while the minimum increases by c. 20bps to 4.88%. At 65% gearing, the minimum of the RoRE range is at 4.44% with a maximum of 8.76%.

Results are summarised in the table below:

Table 2.7: *RoRE results @ 6.5% CoE per intervals of Gearing*

Gearing	Outperformance RoRE	Downside Cover
55%	8.27%	4.88%
60%	8.49%	4.69%
65%	8.76%	4.44%

Should it be impossible to set the gearing to provide a satisfactory range of returns we would be forced to re-examine our starting Cost of Equity and set of cash flow risks (incentive calibration), and then repeat this analysis.

From this analysis we can conclude (operating in 5% increments) that 60% represents the optimal level of gearing based on the draft assumptions outlined above and is consistent with a financeable Business Plan. Future analysis is required after the incentive package is agreed which should allow the possibility of reasonable returns without excessive downside risk and at the lowest overall cost to consumers.

2.5.6 RoRE at SPT assumptions 4.8% CoE

We have also undertaken further analysis to calculate the RoRE ranges for increments of gearing based on Ofgem's view of CoE (4.8%). The results of which are below:

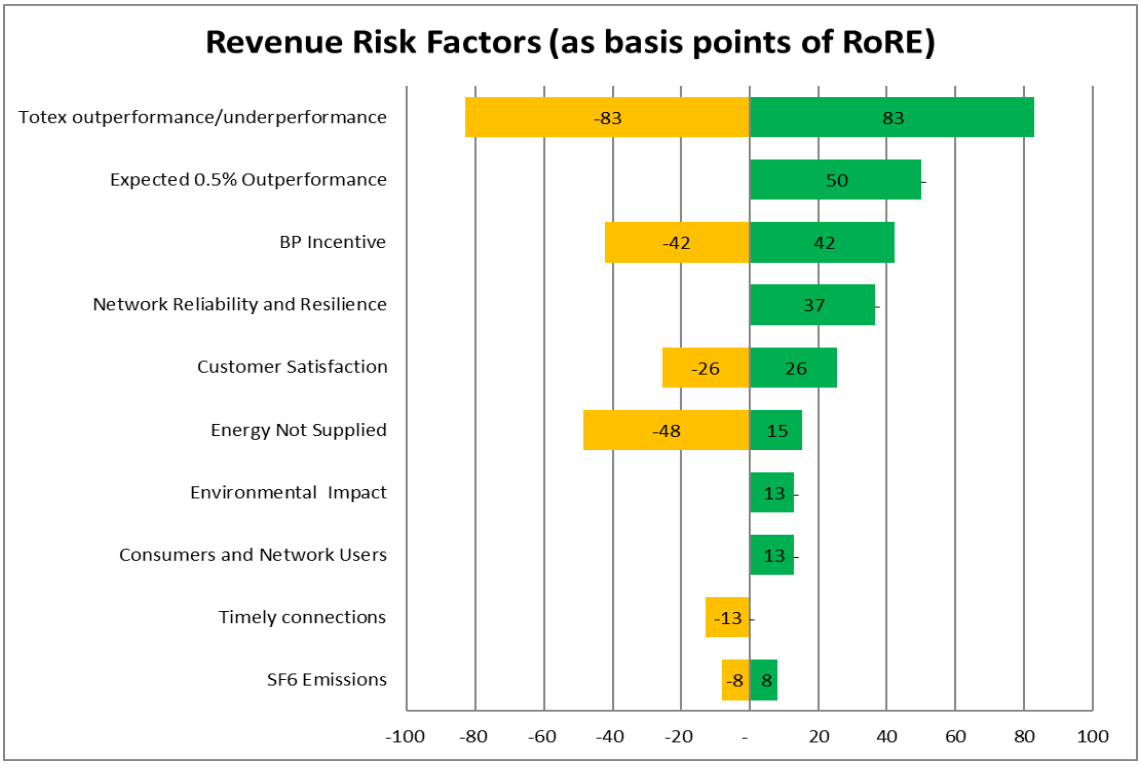


Figure 2.8: *Tornado charts for risk factors @ 4.8% CoE*

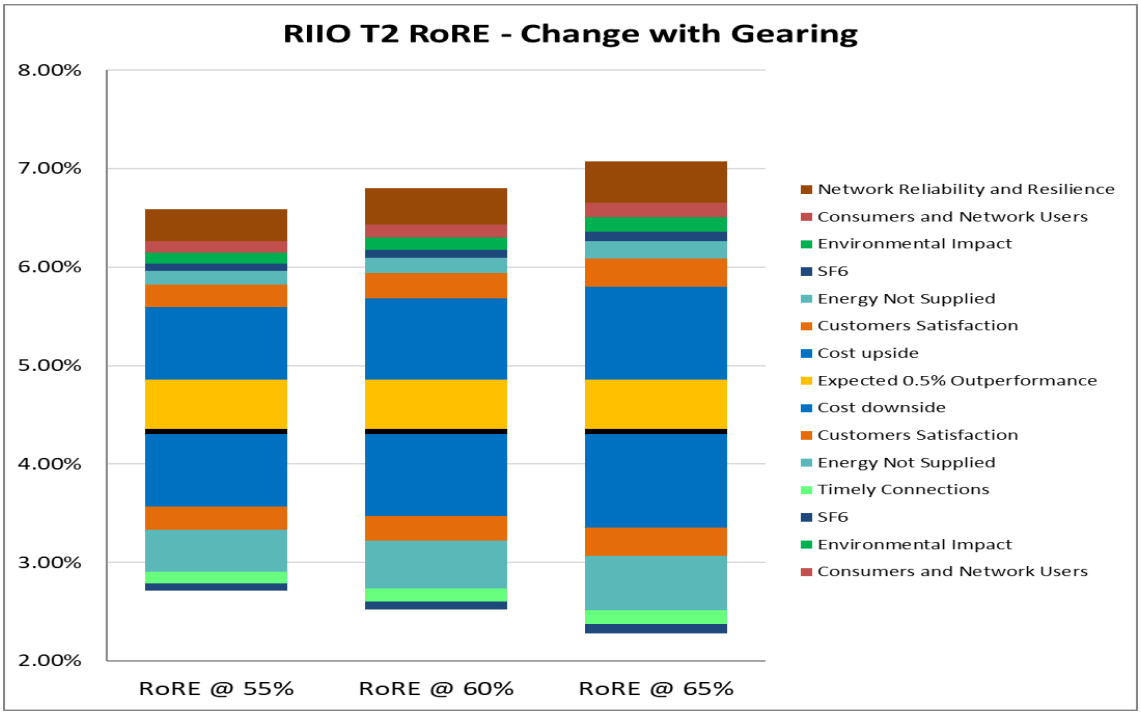


Figure 2.9: *RoRE Range at 5% intervals of Gearing @ 4.8% CoE*

The analysis above shows the outperformance range for the 4.8% CoE will peak at 195bps whereas underperformance could reach a reduction of 178bp. These ranges as expected are not materially different from the scenario above. The results for each increment of gearing are outlined below.

Table 2.8: *RoRE results @ 4.8% CoE per intervals of Gearing*

Gearing	Outperformance RoRE	Downside Cover
55%	6.53%	2.71%
60%	6.75%	2.52%
65%	7.02%	2.28%

The range of feasible RoRE at 60% gearing extends from a maximum of 6.75% (6.25% if the expected outperformance element of 50bps is removed) down to a minimum of 2.52% consistent with the forecast Cost of Debt starting point of 2.03% in RIIO-T2. These values exclude the Business Plan Incentive as per Ofgem's working assumptions. It should also be stated that if the expected outperformance of 50bps is to be achieved through the incentive mechanisms above then each outperformance range should be reduced by 50bps accordingly giving a range from 6.5% to 6.0%. This does not impact the downside range.

3.0 FINANCEABILITY

3.1 Target Credit Rating

We have assessed the credit ratings for SPT on both a notional and actual basis against our target overall rating of A3/ Baa1 before risk. This makes sure that our financeability criteria are fully consistent with credit quality underpinning the allowed Cost of Debt index, which equally weights A and BBB (S&P) rated non-financial sterling bonds. This is also consistent with our licence obligation to maintain an investment grade credit rating.

As explained in sections 3.1.2 to 3.1.10, we have considered the full range of credit rating factors and not just the key credit metrics. Consequently, the scores for individual sub factors may be outside A3 or Baa1 and indeed could be out with the wider investment grade range of A1 to Baa3 (A to BBB range per S&P ratings).

Ofgem's economic model assesses an individual standalone company and Ofgem have a statutory duty to have regard to the need to ensure that Network Operators are financeable, meaning that they are allowed sufficient cash flow to pay interest and dividends to the providers of finance. Financeable also means that a company needs to be able to raise the required financing in the financial markets to deliver its licence commitments and expected expenditure resulting from the RIIO-2 price control settlement.

SPT is competing in the financial markets with other electricity and gas network companies; in order to be able to compete on equal terms it needs to be ensured that the implied credit ratings for SPT as part of the final proposals are no worse than the implied credit ratings afforded to other networks in the previous RIIO-1 price control settlements, which were set using a similar Cost of Debt index.

Based on Moody's rating methodology[79] for regulated electric and gas networks the RIIO-1 price control resulted in an implied rating of A3/Baa1 – this is explained in section 3.1.5 on RIIO regulatory precedent; therefore, the RIIO-2 final proposals for electricity transmission need to achieve an implied credit rating of at least a strong Baa1.

One of the main impacts within the move to the RIIO-T2 methodology was Ofgem's decision to transition the measure of inflation from the Retail Price Index (RPI) to the Consumer Price Index including owner occupiers' housing costs (CPIH). This move has been deemed appropriate due to RPI no longer representing the official measure of inflation in the UK.

In principle any change in the inflation index used for price setting purposes should in theory be revenue neutral, as long as the same inflation index is used to calculate the real cost of capital and to index the RAV over time, the choice of inflation index used for regulatory purposes has no impact on the present value of revenues charged to consumers. However, the inflation index determines the balance between the amounts recovered within period versus those deferred into the future and as a result affects the profile of bills over time. This is currently referred to as the intergenerational fairness issue.

This impact will be of significant interest to a wide variety of stakeholders and it is of vital importance that they understand the full impact of the move to CPIH and are fully briefed on its NPV neutral nature.

[79] Rating Methodology – Regulated Electricity and Gas Networks – March 2017.

3.1.1 Financeability Summary

Table 3.1 *Financial Parameters for analysis*

Financial Parameters	Ofgem Assumptions	SPT Assumptions
Cost of Equity	4.80%*	6.50%
Cost of Debt	1.93%	1.93%
Gearing	60.00%	60.00%
Vanilla WACC	3.08%	3.76%
Asset Lives	Held at 45	Held at 45
Capitalisation Rate	85%	85%
Additional Income (BP Incentive)	N/A	N/A
Equity Injection Threshold	5.0%	5.0%
Dividend % of Notional Equity	3.0%	4.0%

**Including outperformance assumption of 0.5%*

Above is a summary of the financial parameters that have been assumed as part of the financeability analysis which have been set by Ofgem as part of the SSMD released in May 2019. We have been instructed by Ofgem to use Ofgem's assumed parameters for both our notional and actual financeability analysis which is contained in the sections below. It should be noted however that these assumptions do not represent the company's views, particularly on the Cost of Equity. We therefore also set out a notional and actual financability analysis based on our own assumptions. Furthermore, due to the draft nature of these assumptions and with a weakening of the ratios for both the notional and actual company, additional financial levers may need to be considered at final proposals e.g. gearing or the capitalisation rate.

3.1.2 Ensuring Efficient Financing Costs – Business Plan Financial Model ('Static') Analysis

In this section we present our financing plan based on the working assumptions above and primary analysis; we refer to this as our 'static' analysis in contrast to our further 'probabilistic' risk assessment, presented later in this section, which evaluates the likely impact of external risks upon our financeability ratios by applying Monte Carlo analysis to the model. In this section we generate and test our regulatory credit ratios.

By 'static' we mean that we introduce several financing components and assumptions and test the outcomes to ensure that an efficient, financeable plan can be demonstrated using Ofgem's Business Plan Financial Model (BPFM). We will submit the BPFM alongside our Business Plan submission in line with Ofgem's guidelines.

Our allowed return financing components were explained in detail in sections 2.1 to 2.4. Further explanation of other assumptions and policies are contained later in the document in section 4.

Our over-riding objective has been to deliver an efficient financeable plan that will offer an adequate return to investors at the lowest possible cost to consumers. This results in the following credit rating based on Moody's 2017 rating methodology for regulated electric and gas networks.

Table 3.2: *Credit Rating Results*

	Notional	Actual
Moody's Credit Rating using SPT assumptions (6.5% CoE)	A3	A2
Moody's Credit Rating using Ofgem assumptions (4.8% CoE)	Baa1	A3

The key ratios forming these results are detailed below in tables 3.8– 3.10 in Section 3.1.7-10 in the comparison of credit ratios to RIIO-T1.

For the above 'static' analysis that informed the credit rating above we have assumed Business Plan Incentive additional income of zero.

There is a possibility that Ofgem's view of the efficiency of our Totex proposals may result in a penalty with a resultant risk to our financeability (in addition to the penalty applying under the Totex incentive mechanism if we do have to spend in excess of the allowance in order to deliver our outputs and, importantly, ensure that we meet our licence obligations regarding continuity of electricity supply).

3.1.3 Capitalisation rate

Consistent with Ofgem's guidelines the capitalisation rate that we have adopted in our business plan of 85% is in line with expected statutory capex over the RIIO-T2 period (more detail on this is set out in the "Evolution of the Regulatory Asset Value (RAV)" in Section 4.1).

3.1.4 Asset lives and depreciation

Under our business plan proposals, we currently can deliver an efficient financing plan for SPT and maintain an investment grade credit rating without the need to employ additional financial levers i.e. without the need for any transitional arrangements in respect of RAV asset lives or other financeability adjustments. This assumption may need to be reviewed in the event of a change to revenue assumptions and is also subject to the final determination of an appropriate Cost of Equity

3.1.5 RIIO Regulatory Precedent

As stated in section 3.1 above "target credit rating", the recent RIIO price control proposals for regulated electricity and gas network companies result in an implied rating of A3/Baa1 based on Moody's rating methodology. In the sections below, we set out in detail how we have followed Moody's rating methodology for SPT and have mainly assumed that the qualitative factors applied in recent RIIO-T1 price control proposals are the same.

Implied credit ratings for RIIO price control proposals:

Table 3.3: *Historic Rating Results for Transmission Companies*

Company	Cost of Equity	Gearing	Credit Rating Score	Implied Credit Rating
SPT	7.0%	55%	6.85	A3
SHETL	7.0%	55%	7.32	A3
NGET	7.0%	60%	7.41	A3
NGGT	6.8%	63%	6.61	A3

From the table above, it can be seen that the notional Electricity and Gas Transmission companies have an implied credit rating of A3; hence our justification that the RIIO-T2 final proposals for SPT need to achieve an implied credit rating of at least A3/Baa1.

As noted above we have mainly assumed, in our assessment of the implied credit ratings, that the qualitative factors are the same as those that we have applied to SPT. These qualitative factors have a weighting of 60% and contribute broadly the same score for all companies to the overall credit rating score. The remaining factors that will influence the final credit rating score are the four key credit metrics used in Moody's rating methodology which have a weighting of 40% towards the overall score and therefore could have a significant impact.

3.1.6 Financeability Assessment

We have primarily followed Moody's rating methodology for regulated electric and gas networks due to the empirical guidance that is available for this methodology. This approach considers both credit metrics and qualitative factors, for example business risk and regulatory environment. Moody's stated objective is for users of this methodology to be able to estimate a company's rating within two alpha-numeric notches. The overall scores and their corresponding ratings are listed below:

Rating	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3
≤	0	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
<	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5

Rating	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3
≤	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5
<	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5

Moody's analysis focuses on four key rating factors. These four factors are as follows:

1. Regulatory Environment and Asset Ownership Model

2. Efficiency and Execution Risk

3. Stability of Business Model and Financial Structure

4. Key Credit Metrics

A fifth factor also focuses on structural considerations of debt and is assessed on features that contribute to likelihood of default such as complexity and creditor influence. These qualitative features are used as an overlay against any score that may be derived from the first four factors. As such we assume that these would have no material impact on the overall credit score derived from our analysis.

Each of these factors is made up of several sub-factors, to each of which Moody's assigns a weighting.

Firstly, we set out in the table below, our assessment of sub-factors 1 to 3. Our assessment of the key credit metrics is set out later in this section following on from our financial modelling.

In arriving at our Moody's notional credit rating score we have maintained the non-credit metric ratio factors at the same level as our RIIO-ET1 assumptions in line with the updated methodology published in 2017. Recent events may influence a reduction in the future assessment of the qualitative factors for example due to the risks outlined in our Cost of Equity section 2.3 above.

The tables below summarise our assessment of the qualitative sub-factors.

Table 3.4*: Rating factors for SPT*

Regulated Electric and Gas Networks	Aaa	Aa	A	Baa	Ba	B
Factor 1: Regulatory Environment & Asset Ownership Model (40%)						
a) Stability and Predictability of Regulatory Regime	X					
b) Asset Ownership Model		X				
c) Cost and Investment Recovery			X			
d) Revenue Risk		X				
Factor 2: Scale & Complexity (10%)						
a) Scale and Complexity of Capital Programme				X		
Factor 3: Financial Policy (10%)						
a) Financial Policy & Behaviours				X		

N.B. The values for the key credit metrics that comprise factor 4 are calculated as part of the financeability assessment later in this section.

Regulatory Environment and Asset Ownership Model

The first factor that Moody's assesses is the Regulatory Environment and Asset Ownership Model, which is assigned weighting of 40%.

To measure this factor, Moody's examines the following four sub-factors:

a) Stability and Predictability of Regulatory Regime

b) Asset Ownership Model

c) Cost and Investment Recovery (Ability and Timeliness)

d) Revenue Risk

In line with recently published credit ratings of Ofgem regulated networks, we have assessed these sub-factors as follows:

Table 3.5*: Moody's Sub Rating Scores*

Rating Sub-Factor	Rating	Sub-weighting
Stability and Predictability of Regulatory Regime	Aaa	15%
Asset Ownership Model	Aa	5%
Cost and Investment Recovery (Ability and Timeliness)	A	15%
Revenue Risk	Aa	5%

Historically Moody's has assessed the RIIO approach as broadly supportive of our Aaa assessment of the stability and predictability of the regulatory framework. We have maintained this for our analysis however depending on the outcome of the RIIO-2 process this rating may change.

In Moody's view, Network Operators map to the Aa category for the "Asset Ownership Model" sub-factor, reflecting the licensing regime.

Network Operators will continue to be subject to efficiency targets for the RIIO-2 price control and so map to the A category for the "Cost and Investment Recovery" sub-factor.

We assume that "Revenue Risk" will continue to be scored at Aa for RIIO-2 reflecting the limited exposure to volumes and the ability to carry forward under- and over-recovery of charges.

We will continue to monitor the rating for these sub factors as the price control process develops.

Scale & Complexity

The second factor is risk relating to scale and complexity, to which Moody's assigns a weighting of 10%. This is measured by Moody's in relation to the capital program by examining features such as size/scope, complexity and management ability.

Again, in line with recently published credit ratings of Ofgem regulated networks, we have assessed these sub-factors as follows:

Table 3.6: *Scale and Complexity Moody's Rating*

Rating Sub-Factor	Rating	Sub-weighting
Scale and Complexity of Capital Programme	Baa	10%

As average annual additions to RAV as a percentage of the RAV lie within the range of 8% to 12% of the RAV, we have assumed we score Baa for the "Scale and Complexity of Capital Programme" sub-factor. This differs from RIIO-T1 when a score of Ba was applied due to the size of required investment against a smaller overall RAV.

Financial Policy
The third factor is Financial Policy, to which Moody's assigns a weighting of 10%.

To measure this factor, Moody's examines the track record in relation to leverage & financial decisions as well as required returns of owners.

We have assessed these sub-factors as follows:

Table 3.7*: Financial Policy Moody's Rating*

Rating Sub-Factor	Rating	Sub-weighting
Financial Policy Behaviours	Baa	10%

Moody's typically maps Network Operators to the Baa rating based on conservative financial policy prevalent in the industry. Using Ofgem's working assumptions of setting of notional gearing at 60%, 5% higher than in RIIO-1 we believe this is consistent with a Moody's score of Baa.

We now develop our assessment of credit ratios using the Business Plan Financial Model (BPFM).

Key Credit Ratios
The credit metric ratios account for 40% of rating agencies' rating assessment therefore these will have a significant impact on the overall rating. It is worth noting that Moody's rating methodology takes the average of the worst three consecutive years in assessing an overall rating for a particular ratio.

3.1.7 Notional Company with Ofgem's Draft Assumptions

Table 3.8: *Rating Results at 4.8% CoE*

Factor 4: Key Credit Metrics	Weighting	SPT - T2		SPT - T1	
a) Adjusted Interest Cover	10.0%	1.47x	Baa	1.69x	Baa
b) Net Debt / RAV	12.5%	61.4%	Baa	57.1%	A
c) FFO / Net Debt	12.5%	10.8%	Ba	14.3%	Baa
d) RCF / Net Debt	5.0%	8.9%	Baa	10.4%	Baa
Rating Including Rating from Grid Factors 1-4		7.75	Baa1	7.25	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	1.58x	1.47x	1.47x	1.48x	1.49x	1.47x
Net Debt to Closing RAV	60.58%	61.43%	61.60%	61.12%	60.74%	61.38%
FFO/Net Debt	12.08%	11.37%	11.32%	11.21%	10.02%	10.85%
RCF/Net Debt	10.10%	9.42%	9.37%	9.24%	8.04%	8.88%

We found that these ratios have significantly weakened when compared against RIIO-T1 with the major causes of movement due to less favourable Cost of Capital (CoC) assumptions (Gearing and Cost of Equity). These assumptions have a material impact on the levels of cash flows that will be available to SPT over the RIIO-T2 period which is a major contributor to the deterioration. This has been partially mitigated by the NPV neutral move to CPIH inflation which increases cash flow in early years at the expense of current consumers.

It should be noted that the values in the table above assume that 25% of debt is index linked (ILD). This has the effect of strengthening the AICR ratio and the overall rating. If the assumption was that none of the notional company's debt was index linked, the AICR would drop to 1.29x and would also drop outside of investment grade. This weakens the overall rating to a score of 8.30 which is just above the Baa1/Baa2 divide.

Further to this if the CPIH switch had not occurred the resulting ratios would have been significantly weaker as explained in the previous section. Under this scenario the overall rating would shift to a Ba1 due to significantly weaker AICR and FFO/Net Debt as a result of reduced cash flows.

When compared with RIIO-T1, the Adjusted Interest Cover ratio (AICR), ratio (a) above weakens significantly to the extent that it barely represents an investment grade credit rating albeit this is not enough on its own to degrade the overall rating outside of investment grade. Furthermore FFO/Net Debt ratio (c) above weakens across the period against RIIO-T1 to fall outside of investment grade. This is important as it is an indicator of the financial strength of the notional company.

A further consideration is required in regard to the long term financeability of SPT based on the draft assumptions provided by Ofgem. The move to CPIH for example may provide a boost to short term metrics but will weaken any long-term outlook based on the reduction in the growth of the RAV in future periods. Ofgem have stated the long-term outlook should be addressed at a future price control, however, we believe that it should not be completely discounted when reviewing financeability. It is imperative that Ofgem need to signal their longer-term intentions in support of maintaining investor confidence over the current 45-year payback period for RIIO-T2 investment. Regulatory policy on longer term credit rating stability and maintenance of an investment grade are pillars of the regulatory contract and investor confidence.

3.1.8 Actual Company with Ofgem's Draft Assumptions

The main difference between the results below and those of the notional company are due to the assumption around the transition of gearing between the RIIO-T1 and RIIO-T2 periods.

Table 3.9: *Rating Results at 4.8% CoE*

Factor 4: Key Credit Metrics	Weighting	SPT - T2		SPT - T1	
a) Adjusted Interest Cover	10.0%	1.74x	Baa	1.69x	Baa
b) Net Debt / RAV	12.5%	57.8%	A	57.1%	A
c) FFO / Net Debt	12.5%	12.1%	Baa	14.3%	Baa
d) RCF / Net Debt	5.0%	8.8%	Baa	10.4%	Baa
Rating Including Rating from Grid Factors 1-4		6.55	A3	7.25	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	2.17x	2.07x	1.99x	1.64x	1.60x	1.74x
Net Debt to Closing RAV	56.25%	57.61%	58.01%	57.78%	57.63%	57.81%
FFO/Net Debt	14.16%	13.42%	13.13%	12.31%	10.82%	12.09%
RCF/Net Debt	10.37%	9.97%	9.80%	9.02%	7.54%	8.79%

Once the parameters have been updated to reflect the actual capital structure of SPT the rating improves.

It should be noted that the "actual company" view above is in line with the inputs supplied by Ofgem in terms of forecast Cost of Debt costs. The gradual increase in gearing from the RIIO-T1 position of 55% to the working assumption of 60% allows for lower interest payments over the RIIO-T2 period which improves the suite of ratios and leads to an improved overall rating of A3 when compared to the notional company at Ofgem's draft assumptions.

These ratios are consistent with the T1 notional position however 3 of the 4 ratios are weaker with the greatest deterioration seen in the AICR. Furthermore, the FFO/Net Debt and RCF/Net Debt both weaken but remain above the investment grade rating floor of 11% and 7% respectively. The impact of the strength of these metrics in relation to external shocks will be examined as part of our Risk assessment analysis in the section 3.5. It is worth noting that the inclusion of items such as incentives and RIIO-T1 legacy adjustments positively impact the overall rating of when compared to notional company and these factors are also not present in the RIIO-T1 comparator. As discussed above, the RIIO-T2 view is on a CPIH basis which provides a short-term cash flow improvement when compared against the RPI based RIIO-T1 view.

3.1.9 Notional Company with SPT's Assumptions

We have also undertaken the static analysis using our own assumptions as detailed in table 3.1 with section 3.1.2. The results of which can be seen below:

Table 3.10: *Rating Results at 6.5% CoE*

Factor 4: Key Credit Metrics	Weighting	SPT - T2		SPT - T1	
a) Adjusted Interest Cover	10.0%	1.58x	Baa	1.69x	Baa
b) Net Debt / RAV	12.5%	60.7%	Baa	57.1%	A
c) FFO / Net Debt	12.5%	12.2%	Baa	14.3%	Baa
d) RCF / Net Debt	5.0%	9.5%	Baa	10.4%	Baa
Rating Including Rating from Grid Factors 1-4		6.94	A3	7.25	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	1.66x	1.57x	1.57x	1.59x	1.61x	1.58x
Net Debt to Closing RAV	60.36%	60.96%	60.87%	60.14%	59.49%	60.73%
FFO/Net Debt	13.16%	12.54%	12.55%	12.53%	11.39%	12.15%
RCF/Net Debt	10.51%	9.92%	9.92%	9.87%	8.70%	9.50%

The notional company with SPT's assumptions results in an overall rating of A3. Further to this the overall grade is in line with the notional company at RIIO-T1. However, the individual ratings are again weaker than those in RIIO-T1 but with enough head room to maintain a similar overall rating. The only area that registers an improvement is the rating for Scale & Complexity of capital program. This is due to the fact that although the investment program for both periods is similar, the RAV is larger in RIIO-T2 as a result of the investment undertaken in RIIO-T1. This improves this sub factor from Ba in RIIO-T1 to Baa in RIIO-T2 which uplifts the overall rating for the RIIO-T2 period. We believe that with the higher CoE proposed above the credit ratios will be in a relatively stronger position to absorb potential external macro-economic shocks when compared with those proposed under Ofgem's assumptions which is explored later in the chapter.

3.1.10 Actual Company with SPT's Assumptions

We have also undertaken the static analysis using our own assumptions as detailed in table 3.1 with section 3.1.2. The results of which can be seen below:

Table 3.11: *Rating Results at 6.5% CoE*

Factor 4: Key Credit Metrics	Weighting	SPT - T2		SPT - T1	
a) Adjusted Interest Cover	10.0%	2.36x	A	1.69x	Baa
b) Net Debt / RAV	12.5%	55.8%	A	57.1%	A
c) FFO / Net Debt	12.5%	14.0%	Baa	14.3%	Baa
d) RCF / Net Debt	5.0%	10.4%	Baa	10.4%	Baa
Rating Including Rating from Grid Factors 1-4		6.23	A2	7.25	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	2.78x	2.77x	2.64x	2.25x	2.20x	2.36x
Net Debt to Closing RAV	55.49%	56.10%	55.90%	55.08%	54.38%	55.83%
FFO/Net Debt	15.78%	15.29%	14.97%	14.30%	12.84%	14.04%
RCF/Net Debt	11.88%	11.64%	11.36%	10.64%	9.12%	10.37%

Again, an improvement is registered against the notional company results due to the gradual increase in gearing from the RIIO-T1 position of 55% to 60% due to lower interest payments over the RIIO-T2 period. Furthermore, the ratios outperform the RIIO-T1 outturn view with an improvement recognised for both the AICR and Gearing ratios and FFO/Net Debt & RCF/Net Debt scoring similar. However, as stated these ratios are not comparable due to the inclusion of additional revenue factors within the actual scenario as instructed by Ofgem through the SSMD.

3.2 Ratio Analysis

To complete our "Static" analysis we have listed out the individual ratios along with the rating agencies threshold for investment grade for each ratio. We have listed the resulting ratios based on the parameters listed in the chapter so far .

Table 3.11: *Credit Rating Agencies Methodology*

Ratio	Fitch		Moody's		Standard & Poor's	
Debt Metrics	A	BBB	A	BAA	A	BBB
Capex to RAV (%)			<4%	>12%		
FFO Interest Cover [Incl accretions] (x)	4.50x	3.50x	5.5 - 4.0x	4.0 - 2.8x	>3.5x	3.5-2.5x
FFO Interest Cover [excl accretions] (x)	4.50x	3.50x	5.5 - 4.0x	4.0 - 2.8x	>3.5x	3.5-2.5x
Adjusted Interest Cover Ratio (x)	1.75x	1.50x	3.5 - 2.0x	2.0 - 1.4x		
Net Debt to Closing RAV (%)	60%	70%	45-60%	60-75%	<70%	>70%
FFO/Net Debt (%)			26-18%	18-11%	>12%	12-8%
RCF/Net Debt (%)			21-14%	14-7%		

Per the table above we have listed out the scoring framework for each of the major rating agencies for completeness. However as stated earlier we will focus on the Moody's scores as this methodology is the most transparent of the three.

Table 3.12: *Ratio Results Summary*

Key Credit Metrics	SPT's Own View (Notional)	Ofgem's View (Notional)	SPT's Own View (Actual)	Ofgem's View (Actual)	RIIO T1 (Notional)
Capex to RAV (%)	10.1%	10.1%	10.1%	10.1%	18.2%
FFO Interest Cover [Incl accretions] (x)	4.20x	3.86x	6.90x	6.03x	3.98x
FFO Interest Cover [excl accretions] (x)	4.20x	4.42x	6.90x	6.03x	3.98x
Adjusted Interest Cover Ratio (x)	1.58x	1.47x	2.36x	1.74x	1.69x
Net Debt to Closing RAV (%)	60.7%	61.4%	55.8%	57.8%	57.1%
FFO/Net Debt (%)	12.2%	10.8%	14.0%	12.1%	14.3%
RCF/Net Debt (%)	9.5%	8.9%	10.4%	8.8%	10.4%
Overall Rating	A3	Baa1	A3	A3	A3

Above are the average RIIO-T2 period ratios based on the parameters of the following views:

- SPT's own assumptions (6.5% CoE) on a notional basis
- Ofgem's assumptions (4.8% CoE) on a notional basis
- SPT's own assumptions (6.5% CoE) on an actual basis
- Ofgem's assumptions (4.8% CoE) on an actual basis
- SPT T1 ratios for comparison.

From table 3.12, it can be seen that these individual credit ratios (4-7) for the notional companies are weaker when compared to the overall RIIO-T1 position due to the weakening of the Cost of Capital assumptions for the RIIO-T2 period especially for the two notional views. The only 'outlier' is the Capex to RAV ratio due to the comparative size of the RAV between the RIIO-T1 and RIIO-T2 periods. These ratios are examined in greater detail in the next section.

It should be stated that we are not targeting any individual credit ratio to be higher than a Baa1 for the notional company with several close to the Baa3/Ba1 threshold. Companies achieve an investment grade rating over a multitude of factors and are not necessarily deemed to be non-investment grade if all factors do not achieve the guideline criteria. Although weaker scoring ratios will apply more strain to the overall score due to their weighting.

Particular attention must be paid to the AICR as a close measure of how easily a company can repay interest on their debt. This ratio will weaken across the T2 period across all notional scenarios when compared to RIIO-T1 due to the impact on the levels of cash flows that will be available to SPT over the RIIO-T2 period.

The next section contains a more detailed commentary on the individual ratios for each scenario.

3.3 Individual Ratios

Below we have explored each individual ratios in turn for the 4 scenarios above. Although we have focused on the overall rating of our plan, individual ratios are important because a network that is substantially weaker than its peers in terms of cash flow generated or debt relative to the value of its asset base will generally have a higher probability of default. However, when examining leverage and coverage, there is no single measure that can predict the likelihood of default.

Therefore, the metrics below are designed to measure the absolute capacity of the issuer to service its debt and the size of its debt burden relative to those of its peers are taken into account. Leverage ratios aim to capture different measures of how easily an issuer can repay its debt; coverage ratios focus more on the ability to service the debt prior to repayment but also need to consider the peculiarities of different regulatory frameworks.

It should be noted that the RIIO-T1 values have been restated to an equivalent 5 year basis to allow direct comparison between the scenarios. This has been achieved by taking the RIIO-T1 period and restating on a 5 year basis by taking a 3 year average for each set of years. For example, year 1 (21/22) values are a result of taking the average of the first 3 year values of RIIO T1 (13/14, 14/15,15/16). Also, the graphs below are colour coded to show which investment grade score each particular ratio represents. This is summarised in the table below:

Table 3.12: *Moody's Rating per Ratio*

Key:	Capex to RAV ratio	Adjusted interest cover ratio	Net Debt / Total closing RAV	FFO / Net Debt	RCF / Net Debt
Aaa	<4%	>=5.5x	<30%	>=35%	>=30%
Aa	4%	5.5x	30%	35%	30%
A	6%	3.5x	45%	26%	21%
Baa	8%	2.0x	60%	18%	14%
Ba	12%	1.4x	75%	11%	7%
B	20%	1.1x	90%	5%	1%

3.3.1 Adjusted Interest Cover Ratio

Interest coverage is used as an indicator of a regulated network's ability to cover the cost of its debt. This is a very important measure of liquidity and therefore is commonly viewed as an indicator of risk by investors.

The interest coverage ratio measures how many times a company can cover its current interest payment with its available earnings. In other words, it measures the margin of safety a company has for paying interest on its debt during a given period.

A company's ability to meet its interest obligations is an aspect of its solvency. Interpretation is key when it comes to using ratios in company analysis. While looking at a single interest coverage ratio may tell a good deal about a company's current financial position, analysing interest coverage ratios over time will often give a much clearer picture about a company's position and trajectory. Overall, the interest coverage ratio is a very good assessment of a company's short-term financial health.

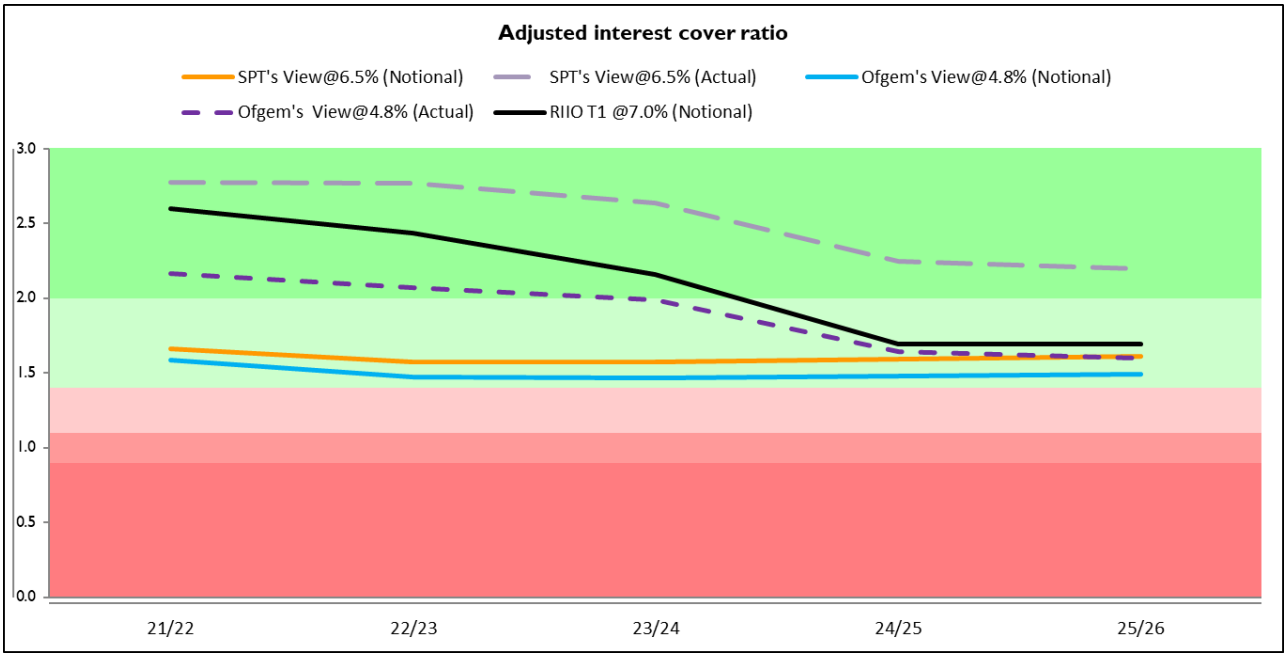


Figure 3.1*: AICR Ratio by Scenario*

AICR	21/22	22/23	23/24	24/25	25/26	T2 Ave
SPT's View@6.5% CoE (Notional)	1.66x	1.57x	1.57x	1.59x	1.61x	1.58x
SPT's View@6.5% CoE (Actual)	2.78x	2.77x	2.64x	2.25x	2.20x	2.36x
Ofgem's View@4.8% CoE (Notional)	1.58x	1.47x	1.47x	1.48x	1.49x	1.47x
Ofgem's View@4.8% CoE (Actual)	2.17x	2.07x	1.99x	1.64x	1.60x	1.74x
RIIO-T1@7.0% CoE(Notional)	2.60x	2.44x	2.16x	1.69x	1.69x	1.69x

From above it can be observed that all T2 scenarios are weaker when compared to the T1 5 year equivalent (with exception of the SPT actual view) with the worst rating observed under Ofgem's notional view. Further to this across all T2 scenarios the ratio is a concern with both the SPT and Ofgem notional view resulting in a Baa3 score. As explained, as this ratio is an assessment of the short term financial health of a company, this ratio is of particular concern. Ofgem's notional view is arrived at by using the assumption that SPT has 25% inflation linked debt (ILD) which in reality is not the case. This was also not an assumption used during RIIO-T1. This has the effect of assuming that part of the interest payment is inflation linked and therefore reduces the interest expense. This has the impact of improving the AICR by approximately 0.2. If this assumption is not included, the AICR for Ofgem's view would be 1.29x and would fall below the investment grade floor of 1.4x.

In terms of the actual company, the higher AICR is due to the fact that unlike under the notional scenario, the Net Debt value is not reset to 60% at the beginning of RIIO-T2 but transitions across the period. This leads to a lower Net Debt figure which in turn reduces required interest payments while receiving relatively similar revenues. This leads to a higher AICR as observed. Also it should be noted that the actual view above is in line with the inputs supplied by Ofgem in terms of forecast Cost of Debt costs.

Further to this, the transition from RPI to CPIH as the measure of inflation provides a boost from an increase in revenues in the short term that will be offset by lower RAV growth in the future (and therefore lower future revenues) as explained in the static analysis section above.

3.3.2 Capex to RAV

Moody's makes an assessment of a regulated network's capital expenditure program by considering (i) its size and scope, (ii) the complexity of this capex program, (iii) management's ability to deliver the plan without material cost over-runs, and (iv) whether the program will introduce financing challenges.

Therefore, Moody's consider the size of the total annual capex plan as a percentage of its Regulatory Asset Base (RAV), as a measure of the above. As the size of a network's capital expenditure plans can be correlated to the complexity of the program, particularly for material capacity increases or technically challenging projects.

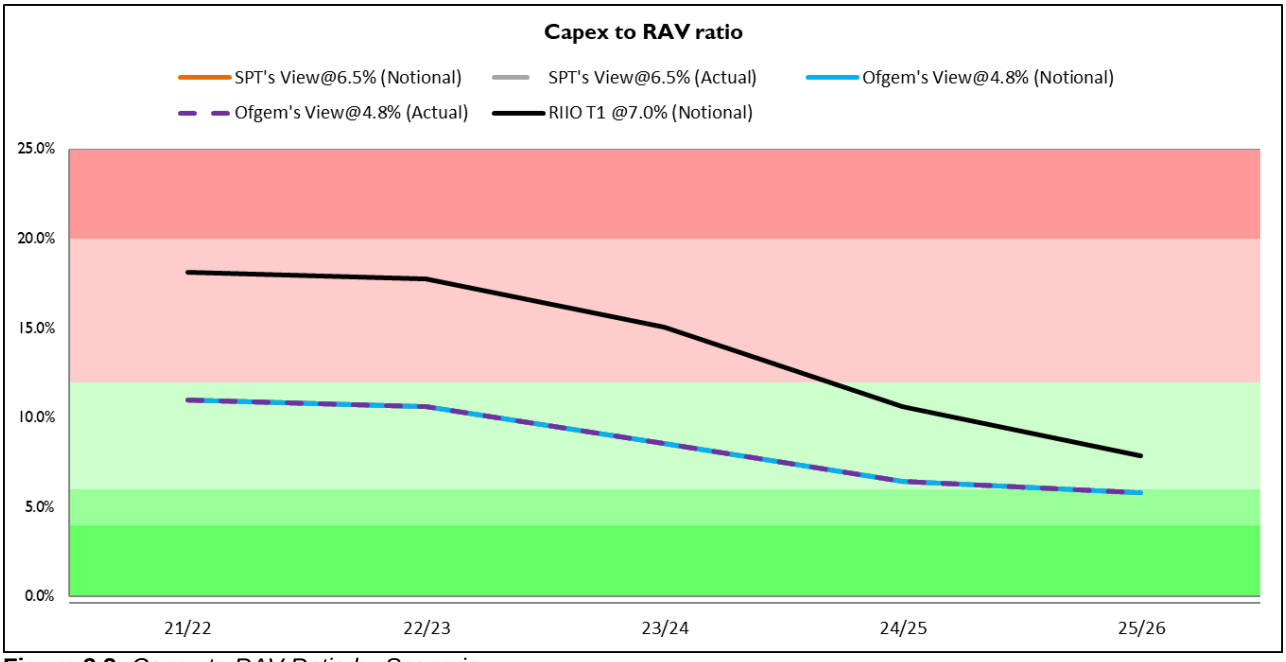


Figure 3.2: *Capex to RAV Ratio by Scenario*

Capex to RAV	21/22	22/23	23/24	24/25	25/26	T2 Ave
SPT's View@6.5% CoE (Notional)	11.0%	10.6%	8.6%	6.5%	5.8%	10.1%
SPT's View@6.5% CoE (Actual)	11.0%	10.6%	8.6%	6.5%	5.8%	10.1%
Ofgem's View@4.8% CoE (Notional)	11.0%	10.6%	8.6%	6.5%	5.8%	10.1%
Ofgem's View@4.8% CoE (Actual)	11.0%	10.6%	8.6%	6.5%	5.8%	10.1%
RIIO-T1@7.0% CoE (Notional)	18.2%	17.8%	15.1%	10.6%	7.9%	18.2%

From above it can be observed that the Capex to RAV ratio does not vary across the listed T2 scenarios due to the fact that the key input of expenditure does not vary. The T2 average represents a mid-range Baa1 rating. The comparison to the T1 period highlights the growth in RAV and therefore level of investment that has been undertaken across RIIO-1 and as a consequence of the fact that investment levels will remain fairly static between periods the Capex to RAV ratio will improve. This highlights that SPT does not face excessive risk in delivery of the proposed level of investment. This will be beneficial to the overall credit rating in the T2 period when compared to T1.

3.3.3 Net Debt to RAV

Net Debt / RAV or Gearing is a key leverage ratio that is a measure of the indebtedness of network and by extension the probability of financial distress. Higher gearing ratios indicate that a company has a higher degree of financial leverage and is more susceptible to downturns in the economy and the business cycle. A high gearing ratio typically indicates a high degree of leverage, although this does not always indicate a company is in poor financial condition but does suggest a riskier financing structure.

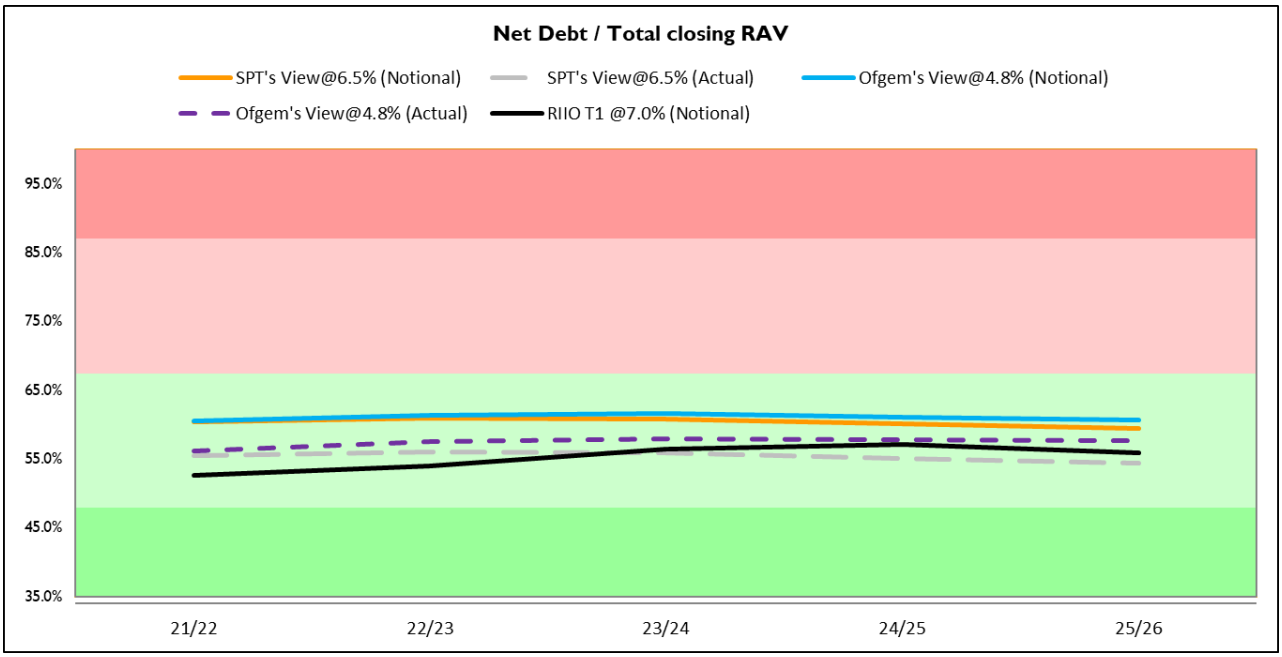


Figure 3.3: *Net Debt / RAV Ratio by Scenario*

Net Debt / RAV	21/22	22/23	23/24	24/25	25/26	T2 Ave
SPT's View@6.5% CoE (Notional)	60.4%	61.0%	60.9%	60.1%	59.5%	60.7%
SPT's View@6.5% CoE (Actual)	55.5%	56.1%	55.9%	55.1%	54.4%	55.8%
Ofgem's View@4.8% CoE (Notional)	60.6%	61.4%	61.6%	61.1%	60.7%	61.4%
Ofgem's View@4.8% CoE (Actual)	56.2%	57.6%	58.0%	57.8%	57.6%	57.8%
RIIO-T1@7.0% CoE (Notional)	52.6%	54.0%	56.5%	57.1%	55.9%	57.1%

The main difference in the notional scenarios compared to the actual is that the Net Debt value is reset to 60% at the start of RIIO-T2 compared to transitioning under the actual scenario. Therefore the notional scenarios stay relatively close to the 60% assumption while the actual slowly grows across the period and close to the A3/Baa1 threshold which is 60%. As no equity injections are required for any of the above base scenarios and the gearing ratio remains fairly constant across the period it can be deduced that the levels of investment and risk are calibrated correctly.

3.3.4 Funds from Operations / Net Debt

This ratio is one of Moody's most commonly used dynamic leverage measures to measure cash flow in comparison to its indebtedness. This ratio may be useful in comparing the ability of a company to generate sufficient cash flow to cover future debt repayments. More specifically, a higher level of FFO / Net Debt may not be a sign of financial strength when it is driven by a higher level of regulatory depreciation. Nevertheless, in comparing two companies that maintain a similar Net Debt / RAV ratio over a period of time, a higher level of FFO / Net Debt is usually indicative of greater financial strength.

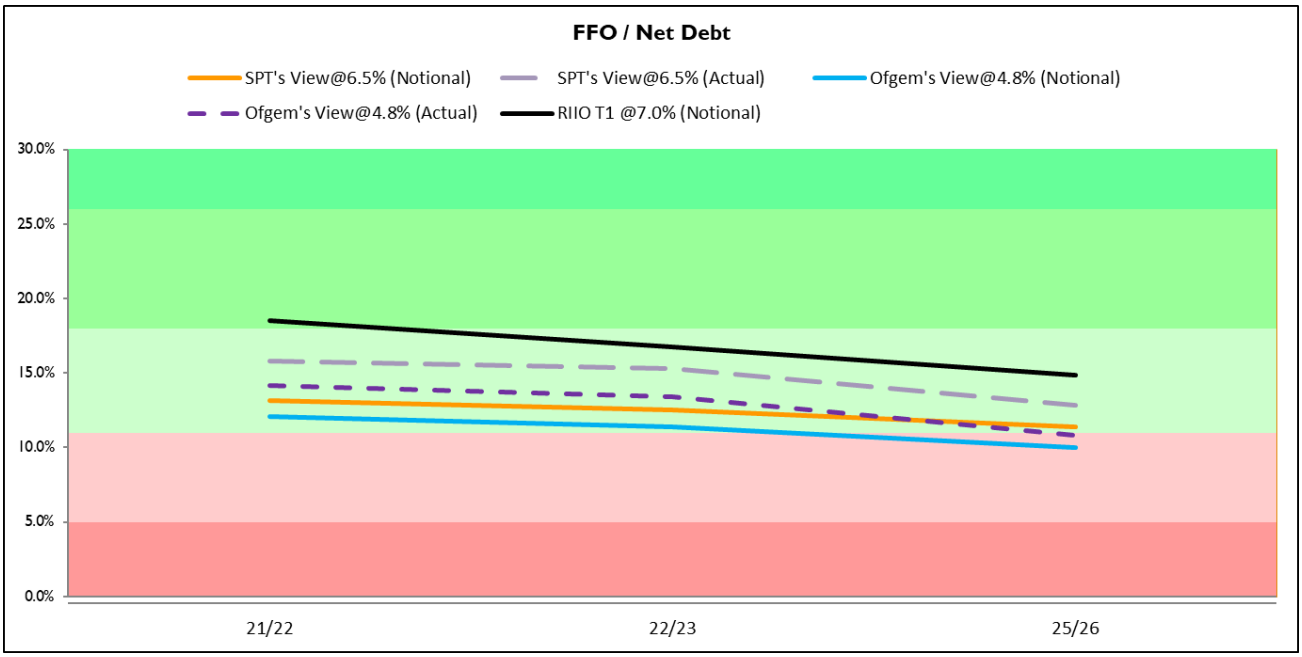


Figure 3.4: *FFO / Net Debt Ratio by Scenario*

FFO / Net Debt	21/22	22/23	23/24	24/25	25/26	T2 Ave
SPT's View@6.5% CoE (Notional)	13.2%	12.5%	12.6%	12.5%	11.4%	12.2%
SPT's View@6.5% CoE (Actual)	15.8%	15.3%	15.0%	14.3%	12.8%	14.0%
Ofgem's View@4.8% CoE (Notional)	12.1%	11.4%	11.3%	11.2%	10.0%	10.8%
Ofgem's View@4.8% CoE (Actual)	14.2%	13.4%	13.1%	12.3%	10.8%	12.1%
RIIO-T1@7.0% CoE (Notional)	18.5%	16.8%	15.4%	14.3%	14.8%	14.3%

The FFO/Net Debt ratio, much like the AICR, declines across the RIIO-T2 period for all scenarios above and in the Ofgem views drops below the investment grade floor (Ba rating), of 11% towards the end of the RIIO-T2 period. This will make the company less resilient to external financial shocks. The scenarios above represent the base case view of investment(Totex), in our further scenarios section on page 64 we examine a possible alternative investment level which would require equity injections to support financeability.

As a consequence of the weakening CoC assumptions for the RIIO-T2 period the FFO/Net Debt materially weakens when compared to RIIO-T1, which stays around the Baa1 score for the adjusted sample period. Again the "transition" impact can be observed for the actual scenario with Net Debt remaining lower across the period, with a knock-on impact to this ratio. When comparing the Ofgem actual to RIIO-T1, as both have a similar gearing value (around 57-58%), the weakening in financial strength can be observed with the "headroom" above investment grade eroded.

3.3.5 Retained Cash flows / Net Debt

This ratio is an indicator for financial leverage as well as an indicator of the strength of a network's cash flow after dividend payments are made. The higher the level of retained cash flow relative to a network's debt, the more cash it has to support its capital expenditure program.

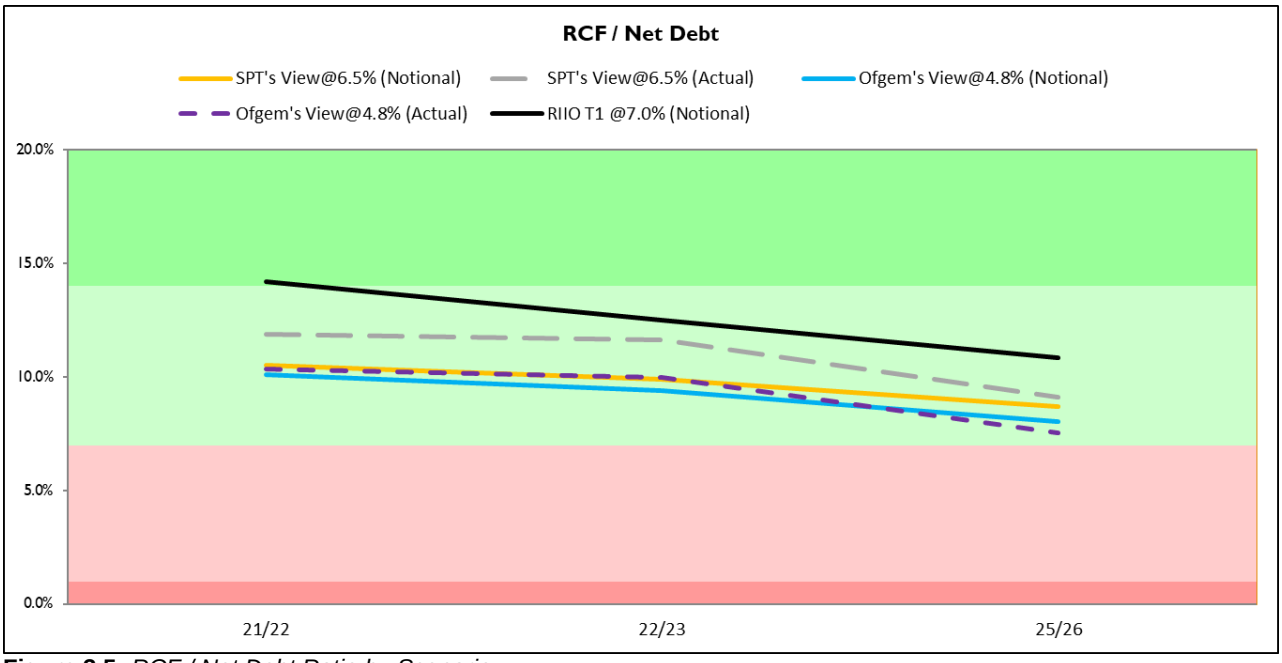


Figure 3.5*: RCF / Net Debt Ratio by Scenario*

RCF / Net Debt	21/22	22/23	23/24	24/25	25/26	T2 Ave
SPT's View@6.5% CoE (Notional)	10.5%	9.9%	9.9%	9.9%	8.7%	9.5%
SPT's View@6.5% CoE (Actual)	11.9%	11.6%	11.4%	10.6%	9.1%	10.4%
Ofgem's View@4.8% CoE (Notional)	10.1%	9.4%	9.4%	9.2%	8.0%	8.9%
Ofgem's View@4.8% CoE (Actual)	10.4%	10.0%	9.8%	9.0%	7.5%	8.8%
RIIO-T1@7.0% CoE (Notional)	14.2%	12.5%	11.4%	10.4%	10.8%	10.4%

All T2 scenarios remain above the investment grade floor of 7% with a relatively flat profile across the period with a slight stretching observed towards the end of T2. All scenarios are weaker against the RIIO-T1 equivalent as expected due to changes in the overall financial parameters. It can be deduced that the proposed dividend policy embedded in each scenario supports a RCF/Net Debt ratio in the investment grade range across the RIIO-T2 period.

3.3.6 Conclusion

Therefore, in conclusion, the individual ratio analysis shows an overall weakening of the credit position of SPT in RIIO-T2 when compared with RIIO-T1. This is of interest as the overall risk has not materially changed across periods with similar levels of investment required. Coupled with uncertainty that remains due to the move for greater decarbonisation of our energy networks, it is imperative that sufficient headroom is afforded to the network to absorb adverse shocks from external risks to the extent that these do not lead to financial distress. This is explored further within our Risk Assessment section below.

3.4 Notional Gearing Impact

We further modelled the static analysis on a notional basis at a gearing level of 5% higher or 5% lower as with our RoRE analysis in section 2.5. The movements in financeability are quite significant at both 55% and 65% with the result in the table below.

Table 3.13: *Moody's Rating per Intervals of Gearing*

	@ 60 %	@ 55%	@ 65%
Moody's notional Credit Rating at SPT's assumption of 6.5% CoE	A3	A3	Baa1
Moody's notional Credit Rating at Ofgem's assumption of 4.8% CoE	Baa1	A3	Baa1

Further deterioration in the AICR and increased gearing leads to a weaker overall rating at 65% gearing with the opposite true for gearing of 55%. We believe that this highlights that setting a notional gearing at 65% would not be appropriate due to the weak credit rating as explained in the analysis above which under our probabilistic analysis would lead to greater risk to the implied investment credit rating. However, the working assumption of 60% or 55% as with RIIO-T1 would provide a stable investment grade credit rating that aligns with regulatory precedent. Further detail on each outcome can be found in the tables below

Table 3.14: *Gearing @ 65% - SPT Assumptions (6.5% CoE)*

Factor 4: Key Credit Metrics	Weighting	SPT - T2	
a) Adjusted Interest Cover	10.0%	1.37x	Ba
b) Net Debt / RAV	12.5%	65.6%	Baa
c) FFO / Net Debt	12.5%	10.6%	Ba
d) RCF / Net Debt	5.0%	8.5%	Baa
Rating Including Rating from Grid Factors 1-4		8.30	Baa1

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	1.45x	1.37x	1.37x	1.38x	1.40x	1.37x
Net Debt to Closing RAV	65.28%	65.81%	65.73%	65.08%	64.51%	65.61%
FFO/Net Debt	11.57%	11.01%	11.01%	10.95%	9.86%	10.61%
RCF/Net Debt	9.42%	8.88%	8.88%	8.80%	7.69%	8.46%

Table 3.15: *Gearing @ 55% - SPT Assumptions (6.5% CoE)*

Factor 4: Key Credit Metrics	Weighting	SPT - T2	
a) Adjusted Interest Cover	10.0%	1.82x	Baa
b) Net Debt / RAV	12.5%	55.9%	A
c) FFO / Net Debt	12.5%	14.0%	Baa
d) RCF / Net Debt	5.0%	10.7%	Baa
Rating Including Rating from Grid Factors 1-4		6.55	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	1.90x	1.81x	1.81x	1.84x	1.87x	1.82x
Net Debt to Closing RAV	55.44%	56.11%	56.02%	55.19%	54.47%	55.86%
FFO/Net Debt	15.04%	14.34%	14.36%	14.39%	13.19%	13.98%
RCF/Net Debt	11.79%	11.13%	11.14%	11.13%	9.89%	10.72%

For SPT's assumptions the overall rating for 65% gearing is a very weak Baa1 (threshold for Baa2 is 8.50) due to a weakening of both AICR and FFO/Net Debt to outside investment grade. This is a result of higher interest payments due to a higher level of Net Debt under the 65% scenario. This also leads to lower cash flows due to the impact of the WACC with a greater percentage coming from the debt than equity component. The converse is true for 55% gearing with the overall rating improved due to a step change in rating in Net Debt/RAV (Gearing) to A3 from Baa1.

Table 3.16: *Gearing @ 65% - Ofgem Assumptions (4.8% CoE)*

Factor 4: Key Credit Metrics	Weighting	SPT - T2	
a) Adjusted Interest Cover	10.0%	1.30x	Ba
b) Net Debt / RAV	12.5%	66.2%	Baa
c) FFO / Net Debt	12.5%	9.6%	Ba
d) RCF / Net Debt	5.0%	8.0%	Baa
Rating Including Rating from Grid Factors 1-4		8.30	Baa1

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	1.41x	1.30x	1.30x	1.31x	1.32x	1.30x
Net Debt to Closing RAV	65.48%	66.22%	66.37%	65.95%	65.61%	66.18%
FFO/Net Debt	10.69%	10.07%	10.02%	9.89%	8.78%	9.56%
RCF/Net Debt	9.09%	8.48%	8.44%	8.30%	7.18%	7.97%

Table 3.17: *Gearing @ 55% - Ofgem Assumptions (4.8% CoE)*

Factor 4: Key Credit Metrics	Weighting	SPT - T2	
a) Adjusted Interest Cover	10.0%	1.67x	Baa
b) Net Debt / RAV	12.5%	56.6%	A
c) FFO / Net Debt	12.5%	12.4%	Baa
d) RCF / Net Debt	5.0%	10.0%	Baa
Rating Including Rating from Grid Factors 1-4		6.55	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	10.97%	10.64%	8.57%	6.45%	5.80%	10.06%
Adjusted Interest Cover Ratio	1.79x	1.67x	1.67x	1.68x	1.70x	1.67x
Net Debt to Closing RAV	55.69%	56.64%	56.83%	56.30%	55.87%	56.59%
FFO/Net Debt	13.71%	12.90%	12.83%	12.74%	11.48%	12.35%
RCF/Net Debt	11.28%	10.51%	10.45%	10.35%	9.06%	9.95%

For Ofgem's assumptions the story is very similar with all ratios weakening under a 65% scenario and improving under a 55% scenario. Due to the weaker starting point under Ofgem's assumptions the stretch applied to the ratios is greater under a 65% scenario however not enough to tip the overall rating to Baa2. However it should be noted that with the weaker ratios the ability of the company to absorb external shocks is further limited.

3.5 Risk Assessment

As part of our justification that our proposed financing package is not just efficient, but robust, we have worked with economic consultants (NERA) to develop a financeability risk model. This model is based on the Ofgem Business Plan Financial Model. We have extended the base model to incorporate the calculation of credit metrics and overall score (using the Moody's Methodology previously described). We attach a paper by NERA describing their modelling methodology as Annex 16: NERA - Risk Modelling for RIIO-T2.

We have used this Risk Model to assess whether the Ofgem and SPT scenarios deliver an efficient financeable plan that will offer an adequate return to investors at the lowest possible cost to consumers. In order to demonstrate efficient but robust financeability, our model simulates (by Monte Carlo) the individual and aggregate credit metrics over the full range of plausible outcomes for each of the individual risks we have identified.

The model considers the risk to cash flows from external risks only. For each of these, we have (where possible) identified what we believe to be the plausible distribution of outcomes for an average network business. In conjunction with our RoRE analysis, this should ensure that the business is sufficiently and securely funded that the normal operation of RIIO-T2 incentives is unlikely to lead to financial distress when coupled with adverse shocks from external risks.

We interpret a robust plan as one that ensures that the expected overall credit rating ('overall' meaning including non-financial ratio components) for a notional average transmission business will be solidly within the A to Baa (Moody's) range of credit rating, with only a small probability that under any realistic adverse combination of external outcomes this rating might drop to a level inconsistent with the allowed Cost of Debt. More specifically we target an overall credit rating of Baa1/A3. This is also consistent with SPT's licence obligation to maintain an investment grade credit rating. We have undertaken this analysis for the three-scenarios identified below:

- SPT's own assumptions (6.5% CoE) on a notional basis
- Ofgem's assumptions (4.8% CoE) on a notional basis
- Ofgem's assumptions (4.3% CoE) on a notional basis

3.5.1 Initial Assumptions

Before conducting our financeability testing we have considered each of the components of the allowed return to provide *opening* parameters for our risk and financeability testing established earlier.

Table 3.18: *Financial parameters for Risk Assessment*

Risk Assessment Inputs (SPT Assumptions 6.5%)	
Cost of Equity	6.5%
Cost of Debt	1.93%
Gearing	60.00%
Dividend Yield	4.0%
Capitalisation Ratio	85.00%
Sharing Factor	67.5%
Proportion of Index-Linked Debt (ILD)	0%
Asset Lives	Held at 45

Risk Assessment Inputs (Ofgem Assumptions 4.8%)	
Cost of Equity	4.8%
Cost of Debt	1.93%
Gearing	60.00%
Dividend Yield	3.0%
Capitalisation Ratio	85.00%
Sharing Factor	67.5%
Proportion of Index-Linked Debt (ILD)	25%
Asset Lives	Held at 45

Risk Assessment Inputs (Ofgem Assumptions 4.3%)	
Cost of Equity	4.3%
Cost of Debt	1.93%
Gearing	60.00%
Dividend Yield	3.0%
Capitalisation Ratio	85.00%
Sharing Factor	67.5%
Proportion of Index-Linked Debt (ILD)	25%
Asset Lives	Held at 45

We have followed Ofgem's guidance for RIIO-2 as per the SSMD in respect of the notional inputs above with exception of the SPT 6.5% scenario.

For this scenario as well as a CoE of 6.5% we have assumed a dividend yield of 4% on the notional equity proportion of the RAV. This is consistent with the view provided within the business plan document based on current market evidence but is lower than past price control settlements (Ofgem's assumptions for TPCR4 and RIIO-1 were 5%). Further to this we have not assumed any ILD for the notional company as this aligns with the current debt structure for SPT.

Each unique combination of these inputs constitutes a single scenario. For each scenario, a Network Business will be exposed to a range of financial risks. Some of these risks will be external to the business, and some will arise from regulatory mechanisms specific to the price control (incentive/output mechanisms and residual risk which may be only partly mitigated by uncertainty mechanisms).

3.5.2 Our Financeability Assessment

We test the robustness of our financial plan only to those external risks which are not directly within the control of SPT.

The external risks considered are:

Table 3.19: *Modelled Risk inputs*

Risk	Modelling approach
Totex Uncertainty	±10% of base assumption for 10-90th percentile applying a triangular distribution.
Non Controllable Opex Uncertainty	±10% of base assumption for 10-90th percentile assuming a triangular distribution.
CPIH Uncertainty	Simulated based on OBR forecast uncertainty ranges.
Taxation	Actual and allowed tax modelled bottom-up.
Cost of Debt Indexation	Based on modelled uncertainty in the real RFR given historical variation and relationship between RFR and debt spread. We use Ofgem's trombone approach.
Cost of Equity Indexation	Based on modelled uncertainty in the real RFR given historical variation and Ofgem base Cost of Equity parameters.
Incentive Uncertainty	±1% (max/min) of RoRE based on triangular distribution (calibrated such that RoRE max/min is ±300bps together with Totex uncertainty assuming a triangular distribution).

We simulate a set of outcomes by Monte Carlo. For each iteration of the Monte Carlo Model we calculate the credit metrics and use these to derive an overall credit rating using Moody's' methodology. We calculate the ratings for the individual credit metrics based on a three year (backward looking) average of the individual annual metrics.

These are then combined with the wider rating criteria in accordance with the Moody's methodology to produce an overall numeric score and to infer from this a final Credit Rating for each year for that model iteration. We then consider the distribution of outcomes from all iterations under the full range of plausible input scenarios.

In assessing the overall risk to financeability we consider the distribution of outcomes for all years of the price control rather than focussing on individual years.

The individual credit metrics calculated within the model may take continuous values. The Moody's methodology places these into rating bands in the later stages of the calculation. It then assigns scores according to these individual sub-ratings. For this reason, the final numeric scores take a set of discrete values, rather than generate a continuous distribution.

In considering this distribution, we attach weight both to the range of outcomes and to the median (50th percentile) rating score. The median will, by its construction, take one of the discrete numeric values leading to a final rating.

The median can therefore be taken to indicate a "central "and actual rating score but may mask the fact that the financeability position is very close to a jump between discrete values (and possibly rating bands).

Moody's methodology applies significantly greater weights to components of the overall calculation which are towards the low rating end than to components at A or above. This means that the distribution of rating outcomes is strongly asymmetric. This skew towards outcomes on the downside is clear in the following analysis.

3.5.3 SPT – Notional Basis @ 6.5%

The distribution of credit rating outcomes generated by simulation is shown as a fan chart in Figure 3.6

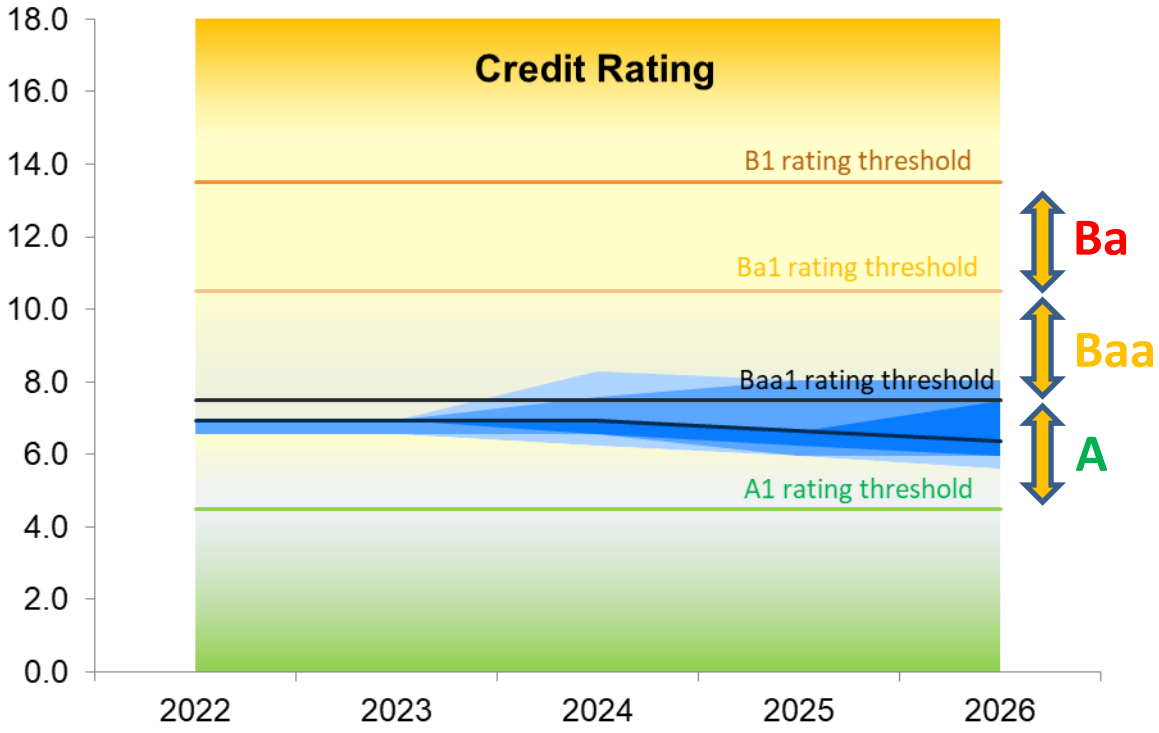


Figure 3.6: *Fan Chart Showing SPT credit rating including External Risk*

The distribution of credit rating outcomes generated by simulation is shown as a fan chart above using SPT's assumptions (6.5% CoE). The central path (the median) is shown as a dark line which using Moody's methodology commences at an A3 rating and retains this level for the period. At the median position (50% percentile) we are therefore forecasting we will maintain an investment grade-credit rating consistent with the allowed Cost of Debt.

After calculating the overall score for the period using the 3 year period average method as in our static analysis above, this would result in an overall score of 6.94/A3 at the median. As per the graph, the distribution in the early years is quite narrow as the impact of any potential Totex under/overspends are limited due to the Annual Iteration Process (AIP) mechanisms, however this starts to widen as we progress through the period, peaking at its widest in the final year. This final year has a potential scoring of between 8.05/Baa1 at the 95% percentile and 5.61/A2 at the 5% percentile.

This distribution of the graph shows that there is no material risk at any point of the range that a combination of adverse outcomes could lead to a credit rating inconsistent with the allowed Cost of Debt. Therefore, under SPT's assumptions the business would be sufficiently and securely funded that the normal operation of RIIO-T2 incentives is unlikely to lead to financial distress when coupled with adverse shocks from our modelled inputs.

Reviewing the ratios that underpin this overall score, the AICR and RCF/Net Debt show the widest range with both showing the potential to score below investment grade towards the end of the period.

The Business Plan Incentive reward or penalty has the potential to impact all the main credit ratios, however, it is the AICR that is most materially impacted especially in the penalty situation. This has the potential to have a material impact on the overall rating of the company and will need to be factored into Ofgem's assessment of financeability. After the Business Plan Incentive has been decided this analysis should be repeated to assess the overall impact and potential for refinements to our underlying assumptions.

3.5.4 SPT – Notional Basis @ 4.8%

The distribution of credit rating outcomes generated by simulation is shown as a fan chart in Figure 3.7

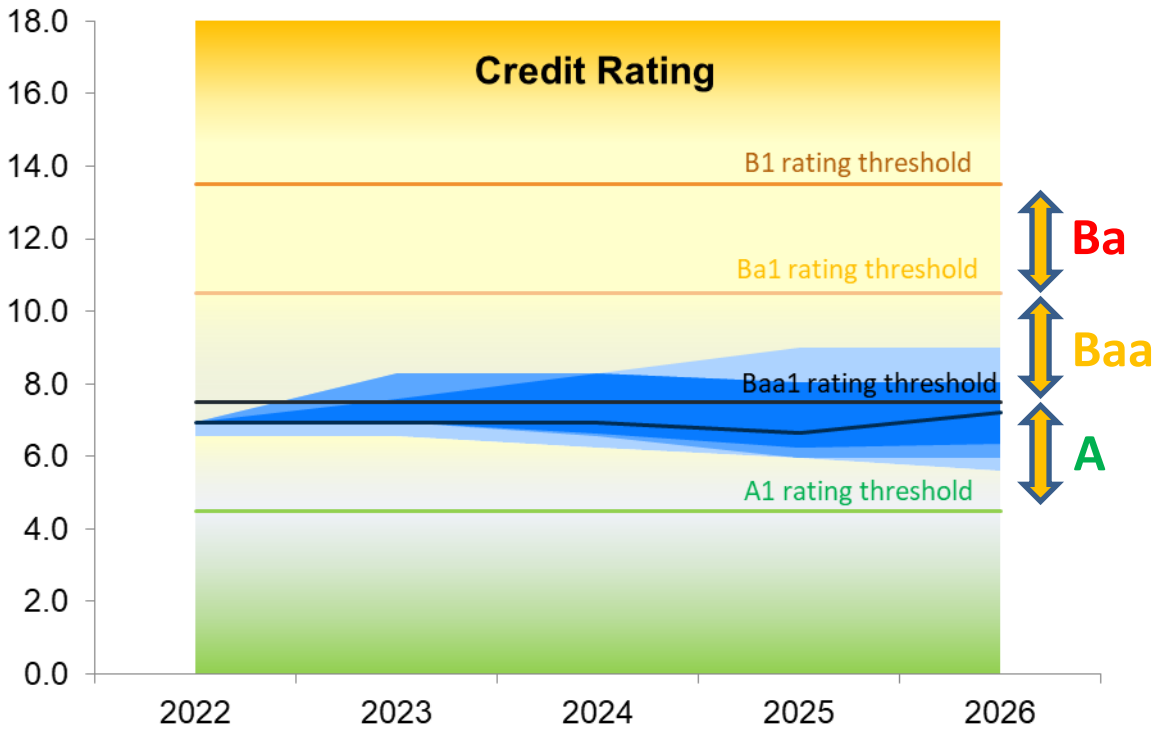


Figure 3.7: *Fan Chart Showing SPT credit rating including External Risk*

The distribution of credit rating outcomes generated by simulation is shown as a fan chart above using Ofgem's assumptions (4.8% CoE). The central path (the median) is shown as a dark line which using Moody's methodology commences at an A3 rating and retains this level for the period however deteriorating towards the Baa1/A3 threshold as we approach the final year. At the median position (50% percentile) we are therefore forecasting we will maintain an investment grade-credit rating consistent with the allowed Cost of Debt.

After calculating the overall score for the period using the 3 year period average method as in our static analysis above, this would result in an overall score of 7.75/Baa1 at the median. As with the previous scenario, the distribution in the graph in the early years is quite narrow as the impact of any potential Totex under/overspends are limited due to the AIP mechanisms, however this starts to widen as we progress through the period, peaking for the final two years (2025/2026) and at its widest in the final year. This final year has a potential scoring of between 9.00/Baa2 at the 95% percentile and 5.61/A2 at the 5% percentile.

However as indicated in the graph above, our modelling predicts that there is a prospect that the overall rating will decline across the period to a rating of 9.00 (Baa2) for the final years. This indicates that the current parameters may lead to an outcome, at a low probability, which would see the rating for SPT that is inconsistent with the CoD index as explained in the sections above.

3.5.5 SPT – Notional Basis @ 4.3%

The distribution of credit rating outcomes generated by simulation is shown as a fan chart in Figure 3.8

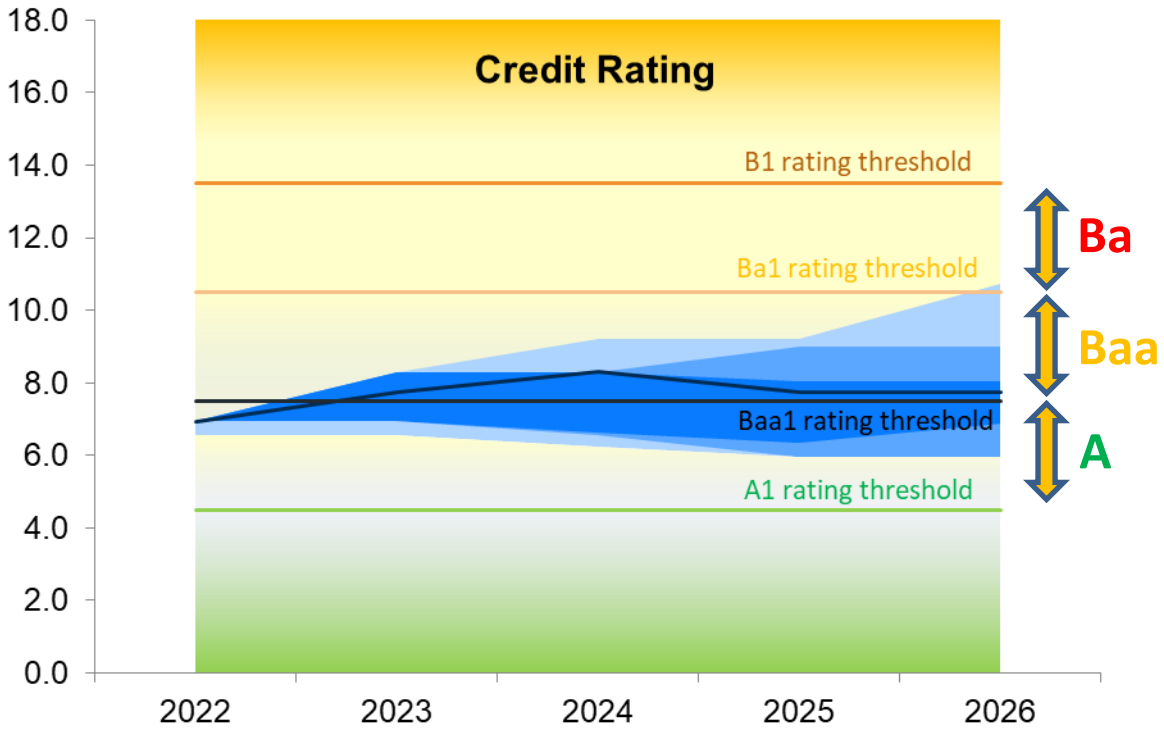


Figure 3.8: *Fan Chart Showing SPT credit rating including External Risk*

The distribution of credit rating outcomes generated by simulation is shown as a fan chart above using Ofgem's assumptions but excluding the allowed versus expected 50 bps adjustment (4.3% CoE). The central path (the median) is shown as a dark line which using Moody's methodology commences at an A3 rating but degrades to a Baa1 in 2023 and remains at this score for the rest of the period. At the median position we are therefore forecasting we will maintain an investment grade-credit rating consistent with the allowed Cost of Debt.

After calculating the overall score for the period using the 3 year period average method as in our static analysis above, this would result in an overall score of 8.30/Baa1 at the median which is close to the Baa1/Baa2 threshold score of 8.50. As with the scenarios above, the distribution in the graph in the early years is narrow due to limited impact of Totex volatility/ Incentive performance through the AIP mechanisms, however this starts to widen as we progress through the period, accelerating from 2024 onwards and peaking at its widest in the final year. This final year has a potential scoring of between 10.72/Ba1(Non-investment grade) at the 95% percentile and 5.95/A2 at the 5% percentile.

Therefore, the analysis above at a CoE of 4.3% show a higher probability of a non-compliant investment grade of Baa2 throughout the period with a Baa2 rating in the latter years at both an 88% and 95% percentile and even the low possibility of a non-investment grade rating of Ba1 for the final year.

If SPT was at risk of a non-investment-grade credit rating, SPT would have to raise equity. Ofgem's proposed Cost of Equity does not adequately compensate existing equity holders of SPT for bearing this higher level of risk. Further the proposed Cost of Equity does not reflect market rates and is likely to be insufficient to attract additional equity to maintain an investment grade credit rating.

3.6 Deterministic Analysis

Furthermore, we have also undertaken the prescribed deterministic analysis of financeability for the notional and actual company to demonstrate the movement in our credit ratios and the overall credit rating per Moody's methodology set out earlier as per the desired Ofgem scenarios. The 6 scenarios are:

- ± 1% move in Interest rates
- ± 1% move in inflation rates (CPIH)
- ±0.5% movement in the RPI-CPIH Wedge
- ±10% move in Totex
- ±2% move in RoRE
- ±5% inflation linked Debt (ILD)

The Interest Scenario in Ofgem's model measures the impact on revenues (especially return & tax) and movements in Net Debt (Interest payments due) as a result of interest rate movements. This impacts on cash flows and Net Debt and so will vary the key credit ratios.

The Inflation Scenario measures the impact to a company's Net Debt and cash flows based on movements in the inflation rate. This impacts the Interest and tax payments due to both being calculated on a nominal basis (Inclusive of Inflation) as well as impacting the value of the inflation element of the interest under the 25% ILD scenario (which is present under Ofgem's notional assumptions)

The RPI-CPIH Wedge Scenario is a further inflation-based measure, however with the added complexity to measure that impact of a variance in the differing measures of inflation (RPI & CPIH). This scenario will be more applicable to companies who have RPI linked debt but will be remunerated on a CPIH basis. As this is not the case for SPT, and the notional company assumes that the ILD is CPIH based, this scenario is a mirror of the one above however will only have half the impact i.e. 50 bps vs 100bps.

The Totex Scenario models the impact of potential out/under performance against the allowances set out in our base case above. These values are then applied to the sharing factors with consumers to highlight the impact the gain/shortfall will have on cash flows and the overall ratios.

The RoRE Scenario is like the Totex one above in that it models potential increase/decrease to cash flows resulting from out/under performance in incentives available during the RIIO-T2 period. It should be noted that the 50bps addition that is modelled under the Ofgem view of 4.8% CoE is included under this scenario. Therefore a 2% outperformance in RoRE would show an overall 2.5% addition to performance whereas a 2% reduction would result in a 1.5% reduction to RoRE performance. Under the SPT and CCG view this is not the case and the scenario parameters are based on a straight ±2% return on equity of 6.5% and 4.3% respectively.

The ILD scenario models the impact on cash flows and ratios resulting from a movement in the % of ILD a company holds. An increase would result in more of the interest payment due to be inflation linked and therefore not included under the AICR with the opposite true for a decrease. As stated in the business plan we do not believe this scenario is very relevant for SPT as we currently do not have any inflation linked debt and are not forecasting for this to change.

We have undertaken this analysis on a variety of Cost of Capital assumptions to show the impact that these have on the overall credit rating.

The analysis has been undertaken on the following set of parameters:

- SPT's view of assumptions on a Notional & Actual company basis
- Ofgem's view of assumptions on a Notional & Actual company basis
- A scenario which looks at the Ofgem view but with no assumed outperformance (i.e. at 4.3% CoE) on a notional basis. This is in line with the Business Plan Guidance as well as a requested view from the Consumer Challenge Group.

3.6.1 Ofgem Deterministic analysis – SPT View (Notional 6.5% CoE)

The outcomes of the 6 scenarios used are listed in the table below:

Table 3.21: *Output of Scenario Analysis for SPT View (Notional 6.5% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	10.06%	1.58	60.73%	12.15%	9.50%	A3
Interest Rate +1%	10.06%	1.56	60.68%	12.23%	9.56%	A3
Interest Rate -1%	10.06%	1.60	60.78%	12.09%	9.43%	A3
CPIH +1%	10.06%	1.63	59.59%	12.79%	10.02%	A3
CPIH -1%	10.06%	1.53	62.60%	11.54%	8.98%	A3
RPI-CPIH wedge +.5%	10.06%	1.56	61.54%	11.85%	9.24%	A3
RPI-CPIH wedge -.5%	10.06%	1.60	60.16%	12.47%	9.76%	A3
Totex +10%	11.00%	1.52	62.44%	11.39%	8.83%	A3
Totex -10%	9.11%	1.64	59.44%	13.02%	10.25%	A3
RoRE (through incentives) +2%	10.06%	1.90	59.46%	13.95%	11.17%	A3
RoRE (through incentives) -2%	10.06%	1.27	62.75%	10.51%	7.96%	Baa1
Proportion of inflation linked debt +5%	10.06%	1.58	60.73%	12.15%	9.50%	A3
Proportion of inflation linked debt -5%	10.06%	1.58	60.73%	12.15%	9.50%	A3

Our analysis indicates that after testing against these potential scenarios the overall rating for SPT remains consistent with the base case static view of A3 in most cases. However, that does not mean that these scenarios do not impact the individual ratios and the strength of the overall rating. As explained before none of the individual ratios above achieve higher than a Baa metric in our base scenario. We will focus on the scenarios that have the most material impact.

For the CPIH low scenario, the ratios are weaker when compared against the base case due to the impact the nominal interest payments have when compared with the Cost of Debt allowance, which is set on a real basis (excluded inflation). It should be noted that for the RPI-CPIH Wedge movement the outcome as explained above has a similar impact but not to the same degree.

For Totex the impact is starker as all ratios will be impacted by movements in expenditure. For 10% underperformance all ratios weaken against the base view due to the fact not all additional expenditure will be funded through the sharing factor mechanism. The FFO ratio for example is just on the Ba threshold (Investment grade) with both the AICR and RCF ratios moving closer to this threshold. As expected for a 10% outperformance all ratios improve versus the base case. Overall our plan would remain financeable under these scenarios.

Under the RoRE scenario we see the greatest movement in ratios from our base position. As expected all ratios improve under the 2% outperformance. However, for the 2% underperformance the inverse is true as the reduction in revenues results in RCF moving towards a sub investment grade level and the FFO & AICR ratio no longer investment grade. This pushes the overall company rating into Baa1 which is one notch lower than in the base case.

Finally, the inflation linked debt scenario measures the impact of a movement of ±5% on the base assumption of 25% of company debt of which the interest related payment is linked to inflation. The only real impact of this would be observed via the AICR which weakens with any decrease in proportion of inflation linked debt. This scenario is not relevant for SPT as under our own assumptions we do not include any inflation linked debt and therefore the results mirror those of the Base case.

3.6.2 Ofgem Deterministic analysis – Ofgem View (notional 4.8% CoE)

The outcomes of the 6 scenarios used are listed in the table below:

Table 3.20: *Output of Scenario Analysis for Ofgem View (Notional 4.8% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	10.06%	1.47	61.38%	10.85%	8.88%	Baa1
Interest Rate +1%	10.06%	1.49	61.10%	11.09%	9.12%	A3
Interest Rate -1%	10.06%	1.45	61.67%	10.61%	8.66%	Baa1
CPIH +1%	10.06%	1.51	60.35%	11.04%	9.02%	A3
CPIH -1%	10.06%	1.44	62.98%	10.67%	8.76%	Baa1
RPI-CPIH wedge +.5%	10.06%	1.46	62.06%	10.75%	8.82%	Baa1
RPI-CPIH wedge -.5%	10.06%	1.49	60.77%	10.94%	8.95%	Baa1
Totex +10%	11.00%	1.41	63.37%	10.15%	8.25%	Baa1
Totex -10%	9.11%	1.54	59.92%	11.64%	9.60%	A3
RoRE (through incentives) +2%	10.06%	1.92	59.67%	12.97%	10.90%	A3
RoRE (through incentives) -2%	10.06%	1.05	64.31%	8.94%	7.07%	Baa2
Proportion of inflation linked debt +5%	10.06%	1.52	61.38%	10.85%	8.88%	Baa1
Proportion of inflation linked debt -5%	10.06%	1.43	61.38%	10.85%	8.88%	Baa1

Under Ofgem's parameters the analysis indicates that after testing against the scenarios above the overall rating for SPT remains consistent with the Base case static view of Baa1 in most cases. However that does not mean that these scenarios do not impact the individual ratios and the strength of the overall rating. Of particular concern is the AICR which weakens in several scenarios to just above the investment grade threshold.

The greatest variation is observed under the Totex & RoRE scenarios with an overall Baa2 rating for the latter due to both the AICR and FFO/Net Debt moving outside of investment grade (Ba rated). These would be areas of concern and would result in ratios that are inconsistent with the allowed Cost of Debt index. As explained in the section 3.5 Risk Assessment above, under such outcomes equity holders will be required to inject equity and the 4.8% CoE assumption may not be sufficient to compensate equity holders for bearing this higher level of risk.

What can be deduced from this simple analysis is that no one individual scenario will impact the credit metrics in such a way to move SPT to a non-investment grade credit rating. However it should be noted that the RoRE underperformance scenario would result in a rating that is inconsistency with the credit quality underpinning the proposed CoD index.

The drawback to this analysis is that the risks are modelled in isolation and so the impact of multiple risk factors at any given time is not measured. Our own probabilistic risk modelling in the section 3.5 Risk Assessment above is more sophisticated and address this inherent limitation in the deterministic modelling.

3.6.3 Ofgem Deterministic analysis – Consumer Challenge Group Requested View (Notional 4.3% CoE)

The outcomes of the 6 scenarios used are listed in the table below:

Table 3.22: *Output of Scenario Analysis for Ofgem View (Notional 4.3% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	10.06%	1.37	61.97%	10.35%	8.41%	Baa1
Interest Rate +1%	10.06%	1.39	61.69%	10.59%	8.64%	Baa1
Interest Rate -1%	10.06%	1.34	62.32%	10.12%	8.20%	Baa1
CPIH +1%	10.06%	1.40	60.73%	10.52%	8.53%	Baa1
CPIH -1%	10.06%	1.33	63.77%	10.19%	8.30%	Baa1
RPI-CPIH wedge +.5%	10.06%	1.35	62.85%	10.27%	8.36%	Baa1
RPI-CPIH wedge -.5%	10.06%	1.38	61.31%	10.44%	8.47%	Baa1
Totex +10%	11.00%	1.31	64.15%	9.68%	7.81%	Baa1
Totex -10%	9.11%	1.43	60.31%	11.11%	9.09%	A3
RoRE (through incentives) +2%	10.06%	1.72	60.32%	12.02%	10.00%	A3
RoRE (through incentives) -2%	10.06%	1.02	64.54%	8.82%	6.96%	Baa2
Proportion of inflation linked debt +5%	10.06%	1.41	61.97%	10.35%	8.41%	Baa1
Proportion of inflation linked debt -5%	10.06%	1.33	61.97%	10.35%	8.41%	Baa1

After reflecting the removal of the 0.5% outperformance in the scenarios above the overall rating for SPT remains consistent with the base case static view of Baa1 in most cases. However, it should be noted that the overall score for most scenarios above that return a Baa1 are at a score of 8.30, which is just above the Baa1/Baa2 threshold of 8.50. Again, the AICR and FFO/Net Debt ratios perform the worst as they are out-with Investment grade rating (Ba) for the base static scenario in all but 4 of the 12 scenarios above. These weak ratios mean there is greater volatility under the 4.3% view and there are scenarios where we would no longer be consistent with the assumptions around the CoD allowance.

After reviewing the impact of these scenarios our conclusion is that our overall plan would face serious challenges under a 4.3% assumption to ensure that we are sufficiently securely funded that we can absorb potential external shocks. We would need to revisit our financial parameters to ensure that we have the appropriate cash flows to ensure delivery of our plan (such as depreciation / capitalisation rates). These interventions would not be sustainable in the longer term. Again, as explained above this analysis measures the impact of these risks in isolation, therefore it can be assumed that under a scenario with multiple risk variables the credit status of SPT would be considerably weaker as demonstrated in the section 3.5 Risk Assessment above A combination of these scenarios is not unlikely therefore a possible outcome is that SPT would have to raise equity. Ofgem's proposed Cost of Equity does not adequately compensate existing equity holders of SPT for bearing this higher level of risk. Further the proposed Cost of Equity does not reflect market rates and is likely to be insufficient to attract additional equity to maintain an investment grade credit rating.

3.6.4 Ofgem Deterministic analysis – SPT View (Actual 6.5% CoE)

The outcomes of the 6 scenarios used are listed in the table below:

Table 3.23: *Output of Scenario Analysis for SPT View (Actual 6.5% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	10.06%	2.36	55.83%	14.04%	10.37%	A2
Interest Rate +1%	10.06%	1.87	56.38%	13.40%	9.79%	A3
Interest Rate -1%	10.06%	3.42	55.35%	14.69%	10.97%	A2
CPIH +1%	10.06%	2.50	53.71%	15.08%	11.40%	A2
CPIH -1%	10.06%	2.23	58.67%	13.06%	9.41%	A2
RPI-CPIH wedge +.5%	10.06%	2.31	56.55%	13.70%	10.04%	A2
RPI-CPIH wedge -.5%	10.06%	2.41	55.29%	14.38%	10.71%	A2
Totex +10%	11.00%	2.35	57.35%	13.31%	9.85%	A2
Totex -10%	9.11%	2.37	54.57%	14.86%	10.96%	A2
RoRE (through incentives) +2%	10.06%	2.92	55.59%	15.86%	12.12%	A2
RoRE (through incentives) -2%	10.06%	1.76	56.64%	12.28%	8.71%	A3
Proportion of inflation linked debt +5%	10.06%	2.36	55.83%	14.04%	10.37%	A2
Proportion of inflation linked debt -5%	10.06%	2.36	55.83%	14.04%	10.37%	A2

When we switch to the actual company view (still on a Ofgem Business Plan Financial Model basis) our analysis indicates that the overall rating for SPT remains consistent with the base case static view of A2 in most cases. However, that does not mean that these scenarios do not impact the individual ratios and the strength of the overall rating.

As explained earlier, the actual company view scored better than the notional due to the assumptions around the evolution of gearing across the period, with a gradual increase from 55% under the actual scenario compared with the 5% adjustment to 60% gearing at the beginning of the period for the notional company. This allows for stronger base ratios which as expected will improve the outlook for the 6 test scenarios. Further to this the inclusion of items such as incentives and RIIO-T1 legacy adjustments positively impact the overall rating of when compared to the notional company further improving the scenario performance.

As with the notional company, with SPT's assumptions the biggest impact can be found under RoRE scenario. With the downside outturn lowering the overall rating by one notch to A3. Under this scenario most ratios are healthily within the Baa1 range with gearing scoring an A3. Under the remaining five scenarios the ratios are not materially impacted to shift the overall rating from A2.

After reviewing the impact of these scenarios our conclusion is in line with those from our own scenario modelling above in that our overall plan is sufficiently securely funded that it can absorb potential external shocks.

3.6.5 Ofgem Deterministic analysis – Ofgem View (Actual 4.8% CoE)

The outcomes of the 6 scenarios used are listed in the table below:
Table 3.24: *Output of Scenario Analysis for Ofgem View (Actual 4.8% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	10.06%	1.74	57.81%	12.09%	8.79%	A3
Interest Rate +1%	10.06%	1.46	58.44%	11.68%	8.41%	A3
Interest Rate -1%	10.06%	2.32	57.32%	12.50%	9.16%	A2
CPIH +1%	10.06%	1.83	55.20%	12.89%	9.59%	A3
CPIH -1%	10.06%	1.67	61.29%	11.32%	8.02%	A3
RPI-CPIH wedge +.5%	10.06%	1.72	58.94%	11.83%	8.53%	A3
RPI-CPIH wedge -.5%	10.06%	1.77	56.99%	12.34%	9.04%	A3
Totex +10%	11.00%	1.72	59.78%	11.47%	8.34%	A3
Totex -10%	9.11%	1.76	56.10%	12.78%	9.28%	A3
RoRE (through incentives) +2%	10.06%	2.26	57.06%	13.78%	10.39%	A2
RoRE (through incentives) -2%	10.06%	1.19	59.31%	10.48%	7.26%	Baa1
Proportion of inflation linked debt +5%	10.06%	1.74	57.81%	12.09%	8.79%	A3
Proportion of inflation linked debt -5%	10.06%	1.74	57.81%	12.09%	8.79%	A3

We have repeated the analysis on the actual company basis but using Ofgem's assumptions of CoE (4.8%) with the results above. This indicates that after testing against these potential scenarios the overall rating for SPT remains consistent with the base case static view of A3 in most cases. However, that does not mean that these scenarios do not impact the individual ratios and the strength of the overall rating.

As stated in the business plan document, the actual company view above has been provided to match Ofgem's prescribed inputs including for the forecast Cost of Debt costs.

Due to the high starting position under the "static" scenario a few of the scenarios such as Interest rate result in a rating one notch higher of A2 due to the AICR moving up to an A3. However, attention should again be drawn to the RoRE scenarios with the movement of 2% up or down leading to large swings in the overall ratios and potential rating of the company which highlights the importance the calibration of incentives will play in the overall financial package for RIIO-T2.

The drawback to this analysis is that the risks are modelled in isolation and so the impact of multiple risk factors at any given time is not measured. Our own probabilistic risk modelling in the section 3.5 Risk Assessment above is more sophisticated and address this inherent limitation in the deterministic modelling.

3.6.6 Further Scenarios

We have also undertaken analysis on the impact of delivery of our current contracted connections and other uncertain costs which would result in an increase in Totex from the base case of £1374.8m to £2626.8m in 18/19 prices. The variance that makes up these numbers are explained in the "managing uncertainty" section of the core business plan document on pages 138 to 146 as well as in Annex 20: Uncertainty Mechanisms. We have modelled the impact on our ratios below based on both our view of cost of capital assumptions (6.5% CoE) and on Ofgem's view (4.8% CoE).

It is our view under Ofgem's assumptions that the business is not sufficiently and securely funded to be resilient to funding all its contracted connections. Disconcertingly, our modelling of this scenario shows our credit rating will drop to Baa2 with most ratios not achieving investment grade metrics before other risks are considered. Using SPT's assumptions under this scenario a rating on the Baa1/Baa2 threshold can be maintained with certain ratios achieving investment grade metrics.

Table 3.25: *Additional Totex View (£2,627m) - SPT's Assumptions* (6.5% CoE)

Factor 4: Key Credit Metrics	Weighting	SPT - T2		SPT - T1	
a) Adjusted Interest Cover	10.0%	1.43x	Baa	1.69x	Baa
b) Net Debt / RAV	12.5%	68.2%	Baa	57.1%	A
c) FFO / Net Debt	12.5%	9.0%	Ba	14.3%	Baa
d) RCF / Net Debt	5.0%	6.7%	Ba	10.4%	Baa
Rating Including rating from Grid Factors 1-4		8.55	Baa2	7.25	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	15.48%	14.29%	16.36%	17.49%	15.37%	16.41%
Adjusted Interest Cover Ratio	1.64x	1.52x	1.48x	1.43x	1.39x	1.43x
Net Debt to Closing RAV	61.77%	63.53%	65.83%	68.38%	70.47%	68.23%
FFO/Net Debt	12.41%	11.37%	10.36%	9.13%	7.62%	9.04%
RCF/Net Debt	9.82%	8.85%	7.93%	6.79%	5.35%	6.69%

As expected the increase in required investment will increase the required issuance of debt and increase pressure on the cash flows of SPT. This will without additional investment increase the company's Net Debt levels and weaken all ratios above with the FFO/Net Debt and RCF/Net Debt no longer representing investment grade and the overall rating dropping to a Baa2. This would be inconsistent with the overall Cost of Debt allowance (Based on a A3/Baa1 index) which would therefore require additional measures to ensure a Baa1 rating is maintained. As this would be the equivalent "static view" there would not be sufficient headroom to absorb any of the potential external downside scenarios above. Therefore, the financial levers will have to be revised to improve the cash flows available. An equity injection may also be required to improve the overall financeability.

Table 3.26: *Additional Totex View (£2,627m) - Ofgem's Assumptions (4.8% CoE)*

Factor 4: Key Credit Metrics	Weighting	SPT - T2		SPT - T1	
a) Adjusted Interest Cover	10.0%	1.34x	Ba	1.69x	Baa
b) Net Debt / RAV	12.5%	69.0%	Baa	57.1%	A
c) FFO / Net Debt	12.5%	8.0%	Ba	14.3%	Baa
d) RCF / Net Debt	5.0%	6.3%	Ba	10.4%	Baa
Rating Including rating from Grid Factors 1-4		9.00	Baa2	7.25	A3

Key Credit Metrics	21/22	22/23	23/24	24/25	25/26	T2 Ave
Capex to RAV	15.48%	14.29%	16.36%	17.49%	15.37%	16.41%
Adjusted Interest Cover Ratio	1.56x	1.42x	1.38x	1.33x	1.29x	1.34x
Net Debt to Closing RAV	61.99%	63.98%	66.48%	69.21%	71.46%	69.05%
FFO/Net Debt	11.38%	10.27%	9.28%	8.09%	6.60%	7.99%
RCF/Net Debt	9.44%	8.40%	7.48%	6.36%	4.92%	6.25%

Furthermore, when modelled on Ofgem's view the position is weaker due to the lower cash flows available to the company through lower Cost of Capital assumptions. The impact would be such that all ratios except the gearing ratio would no longer represent an investment grade credit rating. The overall rating would be a mid-range Baa2 and again not consistent with the Cost of Debt allowances. This would require further changes to the financial levers available to increase the cash flows available to the company and most likely require an equity injection to reduce the level of Net Debt modelled. The appetite for such an injection would be dependent on the Cost of Capital assumptions determined by Ofgem.

Furthermore, we have also undertaken the prescribed deterministic analysis of financeability for the notional company based on this higher level of Totex as per the desired Ofgem scenarios. The 6 scenarios are listed above.

Table 3.27: *Output of Scenario Analysis for Additional Totex View (£2,627m) - SPT's Assumptions (Notional 6.5% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	16.41%	1.43	68.23%	9.04%	6.69%	Baa2
Interest Rate +1%	16.41%	1.41	68.17%	9.06%	6.71%	Baa2
Interest Rate -1%	16.41%	1.46	68.28%	9.02%	6.67%	Baa2
CPIH +1%	16.41%	1.48	66.18%	9.43%	7.01%	Baa1
CPIH -1%	16.41%	1.39	70.38%	8.65%	6.38%	Baa2
RPI-CPIH wedge +.5%	16.41%	1.41	69.29%	8.84%	6.53%	Baa2
RPI-CPIH wedge -.5%	16.41%	1.46	67.19%	9.23%	6.85%	Baa2
Totex +10%	17.63%	1.35	71.03%	8.30%	6.05%	Baa2
Totex -10%	15.13%	1.53	65.24%	9.89%	7.43%	Baa1
RoRE (through incentives) +2%	16.41%	1.74	65.97%	10.38%	7.95%	Baa1
RoRE (through incentives) -2%	16.41%	1.15	70.49%	7.78%	5.51%	Baa2
Proportion of inflation linked debt +5%	16.41%	1.43	68.23%	9.04%	6.69%	Baa2
Proportion of inflation linked debt -5%	16.41%	1.43	68.23%	9.04%	6.69%	Baa2

As expected due to the poor ratios in the base view with both the RCF & FFO ratios representing non-investment grade credit ratings the scenarios outcomes do not generally deviate from this. However, under the RoRE and Totex underperformance scenarios the rating weakens further to 9.00 which is the midpoint of the Baa2 score. Furthermore, under the RoRE and Totex outperformance scenarios as well as the inflation increase scenario an overall rating of Baa1 can be achieved as a result of the RCF/Net Debt ratio achieving an investment grade rating.

Therefore, as stated in the base view above, the majority of scenarios would result in a credit rating that is not consistent with the credit quality that underpins the chosen CoD index and therefore additional measures would be required to ensure additional cashflows to the company by reviewing the available financial levers.

Table 3.28: *Output of Scenario Analysis for Additional Totex View (£2,627m) - Ofgem's Assumptions (Notional 4.8% CoE)*

Key Credit Metrics	Capex to RAV (%)	AICR (x)	Net Debt to Closing RAV (%)	FFO/Net Debt (%)	RCF/Net Debt (%)	Overall Rating
Static Values	16.41%	1.34	69.05%	7.99%	6.25%	Baa2
Interest Rate +1%	16.41%	1.35	68.75%	8.15%	6.40%	Baa2
Interest Rate -1%	16.41%	1.33	69.35%	7.84%	6.11%	Baa2
CPIH +1%	16.41%	1.37	67.53%	8.03%	6.25%	Baa2
CPIH -1%	16.41%	1.30	70.64%	7.96%	6.26%	Baa2
RPI-CPIH wedge +.5%	16.41%	1.32	69.84%	7.97%	6.25%	Baa2
RPI-CPIH wedge -.5%	16.41%	1.35	68.28%	8.01%	6.25%	Baa2
Totex +10%	17.63%	1.25	71.84%	7.31%	5.64%	Baa2
Totex -10%	15.13%	1.43	66.08%	8.78%	6.96%	Baa2
RoRE (through incentives) +2%	16.41%	1.67	66.78%	9.29%	7.49%	Baa1
RoRE (through incentives) -2%	16.41%	1.02	71.32%	6.78%	5.09%	Baa3
Proportion of inflation linked debt +5%	16.41%	1.34	69.05%	7.99%	6.25%	Baa2
Proportion of inflation linked debt -5%	16.41%	1.34	69.05%	7.99%	6.25%	Baa2

As the base view for this scenario using Ofgem's assumptions was weaker than the previous view, the ratios and scenarios in general result in an overall weaker credit outlook. For example, only one scenario results in a Baa1 rating due to the RoRE outperformance with the underperformance scenario resulting in a rating of Baa3. As stated above these results would require corrective action to ensure that the ratios and overall rating can be improved and would most likely require an equity injection as a result. Although no one scenario has resulted in the loss of investment grade, if we were to test the outcome by applying more than one scenario at a given time this would compound the impact on the ratios and result in a non-investment grade rating of Ba2 for SPT.

3.6.7 Conclusion

In having regard to the impact of its decisions on existing and future consumers, as well as financeability, Ofgem will have to consider a range of evidence and perform cross checks, for example, by looking at proxies of rating agencies' assessments.

When examining our base view of Totex, the impact of Ofgem's deterministic scenarios our conclusion is in line with those from our own scenario modelling above in that our overall plan is sufficiently and securely funded that it can absorb potential external shocks and at a notional gearing of 60% the proposed RIIO-T2 incentives mechanisms are unlikely to lead to financial distress. However as previously stated the drawback to this analysis is that the risks are modelled in isolation and so the impact of multiple risk factors at any given time is not measured. Our own probabilistic risk modelling in the section 3.5 Risk Assessment above is more sophisticated and address this inherent limitation in the deterministic modelling.

However, the deterministic analysis does not assess the impact of uncertain costs and the associate mechanisms. As stated in section 3.6.6 it is our view, under Ofgem's financial assumptions, that the business is not sufficiently and securely funded to be resilient to funding all its contracted connections. Disconcertingly our modelling of the uncertainty scenario shows our credit rating will drop to Baa2 with no ratios achieving investment grade metrics before other risks are considered. Using SPT's financial assumptions a rating on the Baa1/ Baa2 threshold can be maintained with certain ratios achieving investment grade metrics.

4.0 EVOLUTION OF THE RAV

This section sets out our business plan assumptions which inform the evolution of the Regulatory Asset Value (RAV). In all cases, our assumptions are consistent with RIIO principles and fully adhere to Ofgem's strategy decisions.

Whilst the RAV is a very important building block in the calculation of regulatory revenues it is not related to the Net Book Value of assets that would appear in a TO's Regulatory Accounts. The RAV evolves according to various assumptions discussed here, which are not necessarily reflective of accounting rules and conventions.

The forecast RAV table below reflects the impact of the forecast total expenditure, regulatory capitalisation assumption and regulatory asset lives amortisation assumption which are explained below.

Table 4.1: *RIIO-T1 forecast RAV and forecast RIIO-T2 RAV*

£m 2018/19 Prices	RIIO-T1		RIIO-T2				
	Yr1*	Yr8	Yr1	Yr2	Yr3	Yr4	Yr5
Closing RAV	1,625	2,619	2,716	2,820	2,880	2,895	2,918
RAV Growth		**61%**					**11%**

* *Yr1 represents the opening RAV for RIIO-T1*

Growth in the RAV through RIIO-T1 is evident, increasing from £1.6bn to £2.6bn – an increase of 61% compared to the forecast increase over RIIO-T2 of 11% to £2.9bn.

4.1 Total Expenditure and Capitalisation

Our total expenditure (totex) include the categories prescribed by Ofgem. These are mainly direct expenditure, non-system capex and indirect costs. Totex does not include business rates or pension deficit funding. Within our business plan a fixed 85% of totex is allocated to the RAV for SPT which is consistent with Ofgem's guidance and reflects our forecast average annual statutory capitalisation.

This was calculated with reference to the expenditure projections over the RIIO-T2 period and applying an asset life threshold to distinguish between 'slow' and 'fast' money.

Table 4.2: *RIIO-T2 Expenditure Projections and Inferred Capitalisation Rate*

£m 2018/19 prices	21/22	22/23	23/24	24/25	25/26	RIIO-T2
Totex	318.5	332.4	284.4	228.2	211.3	1374.8
Capex	275.0	288.9	241.8	185.8	167.9	1159.4
Inferred Capitalisation Rate	**86.3%**	**86.9%**	**85.0%**	**81.4%**	**79.5%**	**84.3%**

This RIIO-T2 period inferred capitalisation rate compares to those experienced in the first 6 years of RIIO-T1 from 2013/14 through to 2018/19. These are shown in the table below:

Table 4.3: *RIIO-T1 Inferred Capitalisation Rate*

	13/14	14/15	15/16	16/17	17/18	18/19	6 year Average
Regulatory Reporting Inferred Capitalisation Rate	91.5%	90.5%	93.4%	89.8%	88.1%	81.3%	89.8%

Table 4.2 demonstrates that the forecast capitalisation rate is lower than the current price control period due to the proportionately higher levels of capex during the RIIO-T1 period.

We have no evidence that the results would materially alter after adjusting for assets associated with technical innovation. Our financial proposals do not use an adjustment of capitalisation rates as a means to manage financeability issues. In our view where a financeability issue exists it is preferable to address this either by equity injection or by using a single alternative lever and to use a means for which there is regulatory precedent.

We have considered all of the above information and have adopted a capitalisation rate of 85% of totex because this is the average rate inferred in the Expenditure Projections table.

4.2 Asset lives and depreciation

Consistent with Ofgem guidance, our base assumption is to model regulatory depreciation using average economic asset lives of 45 years for new assets with straight line depreciation.

Assets existing at 31 March 2013 continue to be depreciated over 20 years, consistent with Ofgem's decision as set out in the March 2011 RIIO-T1 Strategy. During the RIIO-1 period, asset lives increase linearly from 20 years in 2012/13 to 45 in 2020/21 as shown in the table below:

Table 4.4: *RIIO-T1 Inferred Capitalisation Rate*

Asset life applied to RAV additions acquired in each year of RIIO-T1							
13/14	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
23.125	26.25	29.375	32.5	35.625	38.75	41.875	45.0

Our plan does not seek to adjust asset lives as a source of financeability adjustments. This preserves the intended equitable inter-generational amortisation of the RAV. In the longer term, a notional capitalisation rate which differs from the actual capitalisation policy can lead to an accounting mis-match. As a result, we prefer not to use the capitalisation rate as a financeability lever.

5.0 FINANCIAL POLICIES

5.1 Pensions

Our business plans fully reflect Ofgem's pensions methodology as set out in various documents and consultations since 2009. Our pension costs are calculated on the basis of the decisions set out in section 7 of the RIIO-2 Sector Specific Methodology Decision, Finance Annex (24 May 2019).

5.1.1 Established deficit

For the ScottishPower Pension Scheme (SPPS) a roll-forward valuation to 31 March 2016 has been produced from the previous formal triennial valuation dated 31 March 2015 reflecting the requirements set out in the Decision on Ofgem's policy for funding Pension Scheme Established Deficits (7 April 2017). We have used the method set out in the Pension Deficit Allocation Methodology (PDAM) to determine the split of liabilities and assets between pre (Established) and post (Incremental) cut-off date of 31 March 2012. The PDAM was prepared by the Scheme Actuary. Approximately 90% of the pension deficit, relevant to SPT company's share, related to the Established Deficit which will be funded through the regulatory mechanism according to the agreed regulatory fraction of 4.8% for SPT. The funding allowance of the regulatory portion of the established deficit reflects a 0.2% discount rate spread evenly over 8.6 years from 1 April 2016. The pension principles are subject to ongoing review by Ofgem to make sure they continue to meet the interests of current and future consumers. The following table is a summary of the calculation of the Established Deficit annual funding allowance included in the Price Control Financial Model noting that these allowances will be reset at 1 April 2021 (and triennially thereafter) on completion of the reasonableness review of the actual 31st March 2019 roll-forward valuations (and triennially thereafter) and in accordance with the annual iteration process.

Table 5.1: *Established Deficit Annual Allowance*

Established Deficit Annual Allowance	SPPS	Manweb Scheme
Liabilities at 31/3/2016	£3,778.5m	£1,443.6m
Assets at 31/3/2016	£3,311.1m	£1,099.6m
Deficit at 31/3/2016	-£467.4m	-£344m
PDAM - pre 31/3/2012 pensionable service	-£426.1m	-£326.8m
PDAM - post 31/3/2012 pensionable service	-£41.3m	-£17.2m
Regulatory fraction	4.80%	
Regulatory proportion of pre 31/3/2012 deficit	-£20.5m	
SPT annual allowance 8.6 years from 1 April 2016 at discount rate of 0.2% (18/19 Prices)	£3.3m p.a.	

5.1.2 Incremental Deficit

The incremental deficit is included in totex and benchmarked as part of total totex. Consistent with the calculation of the established deficit, this has been calculated based on a roll forward of the 31 March 2015 triennial valuation to 31 March 2016. The following table is a summary of the calculation of the Incremental Deficit included in totex in the Price Control Financial Model.

Table 5.2: *Incremental Deficit Payments*

Incremental Deficit Payments for 2018/19	SPPS	Manweb Scheme
Annual deficit reduction contributions for 2018/19	£51.95m p.a.	£40.52m p.a.
pre 31/3/2012 deficit	£47.4m p.a.	£38.5m p.a.
post 31/3/2012 deficit	£4.6m p.a.	£2.0m p.a
SPT post 2012 regulated proportions	5.60%	9.50%
SPT incremental deficit payments for 2018/19 payable until 2027/28	£0.26m p.a.	£0.19m p.a.

The annual deficit reduction contributions required from the company are based on a 10 year recovery plan and have been calculated using the 31st March 2018 valuation assumptions as set out in the schemes' statement of funding principles. The post 2012 regulated proportion is based on labour cost information, employer history (i.e. who the employee worked for, post 31st March 2012) and applying the PDAM methodology. The two schemes are then split by licensee.

5.1.3 Ongoing future service costs (Employer Contribution rates) – Defined benefit schemes

Our defined benefit pension schemes closed to new members in 2006. The contribution rates for future service accrual for 2019/20 (based on the 31 March 2018 triennial valuation) are shown below:

Table 5.3: *Ongoing future service costs – Defined benefit schemes*

Scheme	SPPS	Manweb Scheme
Pension and death benefits (excluding expenses)	56.0%	53.4%
Employee	5.0%	5.5%
Employer	51.0%	47.9%

Projections of defined benefit scheme employer contribution rates (excluding expenses) are set out below:

Table 5.4: *Defined benefit schemes employer contribution rates*

	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26
SPPS %	48%	51%	51%	51%	55%	55%	55%	60%
Manweb %	45%	48%	48%	48%	51%	51%	51%	56%

The increases in rates over the period are as a result of the actuarial methods adopted.

The rates increase due to a change between the proportion of pre/post 2028 discount rates. There is a lower rate post 2028, so increasing costs. Additionally, based on the projected unit calculation methodology, the rates are expected to increase over time due to increases in the average age of the membership.

5.1.4 Ongoing future service costs (Employer Contribution rates) – Defined contribution schemes

Projections of defined contribution scheme employer contribution rates (excluding expenses) are set out below:

Table 5.5: *Defined contribution scheme employer contribution rates*

	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26
Average	9.9%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

These rates are an average. Employees have a choice as to how much they can contribute. Choosing a lower contribution rate results in a lower matching employer rate. However, new employees are auto enrolled at 5%, with a maximum matching employer contribution of 10%. The majority of employees choose to contribute at least 5% to maximise the employer contribution.

5.1.5 Pension scheme administration costs

These are in addition to the employer ongoing future service contribution rates.

Both SPPS and Manweb are now paying fixed flat administration expenses of £1.7m p.a. and £1.3m p.a. respectively, of which SPT's share is £0.2m and £0.1m respectively.

5.1.6 Pension Protection Fund (PPF) levy costs

Our forecast PPF levies for SPPS and Manweb combined are £1m, of which SPT share is £0.1m.

It is assumed that levies increase at least in line with RPI. Actual levies will vary subject to changes in market conditions and also PPF scaling factors etc. which are set so that the PPF collects the total levies it requires based on the funding position of the PPF.

5.2 Taxation

The Ofgem policy decisions effecting taxation is, in the main, modelled automatically in the Price Control Financial Model. Our business plans fully reflect all policies that are well established and understood.

5.2.1 Tax Transparency

We feel very strongly that it's important for us to not simply respect the letter of the UK's tax laws, but to be completely transparent in how we are taxed. The two main tenets of our tax policy are:

- Respect legislation – we stay strictly within the boundaries of law
- No artificial structures – we take a conservative and prudent approach to planning.

Our ultimate parent company, Iberdrola S.A, has published a full report on tax transparency and the company's commitment to society[80].

CSR Europe, the leading European business network for Corporate Sustainability and Responsibility, released a Blueprint on Responsible and Transparent Tax behaviour and recently featured Iberdrola endorsing its approach[81].

5.2.2 Taxation Allowances

For the current RIIO-T1 price control, the tax allowance is calculated in the Price Control Financial Model (PCFM) on a notional company basis and is, in the main, modelled automatically. However, there are specific inputs to the PCFM which are required in respect of the attribution of qualifying expenditure to capital allowances pools and the determination of the opening capital allowances pools; the calculation of these is discussed in the following paragraphs.

For RIIO-T2 we continue to support a notional tax allowance as the most appropriate taxation mechanism to provide funding for network companies' corporation tax costs. We agree with greater transparency of tax allowances and taxes actually paid to HMRC. However, in determining the tax allowance, this should not solely be based on the review of one price control period but should cover the total tax allowances obtained for the cost of network assets over their life.

[80] The Iberdrola Report can be found online here

[81] The CRS Report can be found online here

5.2.3 Attribution of costs to capital allowances pools

The following table shows the allocation of costs between the capital allowances pools during the RIIO-T2 period:

Table 5.6: *RIIO-T2 capital allowance pools*

Category	General	Special Rate	Structures and Buildings	Revenue	Non-qualifying
Load	0.00%	99.51%	0.41%	0.00%	0.08%
Non-load Asset Replacement	0.00%	95.79%	1.90%	0.00%	2.31%
Non-load Other	0.00%	95.79%	1.90%	0.00%	2.31%
Controllable Opex	0.00%	0.00%	0.00%	100.00%	0.00%
Non-operational Capex	82.49%	0.00%	16.84%	0.00%	0.67%

The following table compares the above allocations of capex to the pools with the average allocations in the most recent four years submitted HMRC tax computations i.e. for the periods ending 31st December 2014 to 2017:

Table 5.7: *Allocation of capex to the pools*

£m 2018/19 Prices	General	Special Rate	Structures and Buildings	Non-qualifying
Capex allocations (£m)	12.32	1116.39	16.17	14.53
Capex allocations %	1.06%	96.29%	1.40%	1.25%
Average HMRC %	0.01%	93.65%	0.00%	6.34%
Variance%	1.05%	2.64%	1.40%	-5.09%

The RIIO-T2 forecast tax pool allocations to the general pool are higher than the HMRC average due to the accounting treatment of Non-operational Capex costs between the notional company (capex) and statutory company (opex). Non-operational Capex costs are incurred in SP Power Systems (capex) and the depreciation of these assets is recharged to SPT (opex).

HMRC introduced a new capital allowance for Structures and Buildings, with qualifying expenditure receiving an annual writing down allowance of 2% applicable from 29th October 2018. Previously such expenditure was treated as non-qualifying for capital allowances. The non-qualifying allocation is lower in the RIIO-T2 forecast partly due to expenditure on buildings now receiving a capital allowance and also higher non-qualifying spend during RIIO-T1, mostly for the large scale Western HVDC sub-sea cable investment (e.g capitalised interest costs).

5.2.4 Opening capital allowance pool balances

In RIIO-T1, the opening capital allowance pool balances for the PCFM was determined by a regulatory re-set taking in to account the statutory view of capital allowance pool balances at the start of the price control. During the RIIO-ED1 Final Determinations for the slow-track companies, Ofgem implemented a financial policy change with respect to capital allowances[82] to "roll forward regulatory tax pool calculations at the end of the RIIO-ED1 period. This ensures that consumers benefit from the capital allowances attributable to expenditure they are funding". We are supportive of aligning the methodology of opening capital allowance pool balances with the financial policy for the distribution companies, thus maintaining a fair and consistent approach to the taxation calculation over the total life of the asset.

[82] Ofgem, RIIO-ED1: Final determinations for the slow-track electricity distribution companies, Overview p. 47

6.0 REAL PRICE EFFECTS & ONGOING EFFICIENCY

Real Price Effects (RPEs) are the difference between the index that is used to update our revenues each year (the CPIH) and the movements in the costs of the inputs we use to construct and operate our transmission network.

As stated in the main body of our Business Plan, we consider RPEs to be an imperfect way of reflecting the external input price pressures we and other network companies face in the short-run and indexing RPE allowances may therefore be fundamentally problematic. The range of input price indices used for setting RPE allowances do not exactly capture the inputs used by network companies[83] and have also been found to be extremely volatile year-on-year[84], unlike network companies actual costs within a price control. Indeed, many network companies procure fixed-priced, or inflation-linked deals, with contractors shortly after a price control settlement is agreed upon, reflecting the economic conditions at the time of the determination[85].

Taken together, the above factors mean that the relevant indices do not track the short-term movements in network companies' input costs. In this case, an indexation of RPEs, which Ofgem have suggested for RIIO-2, may not be the best solution. It would increase risk for both customers and companies as a fluctuating RPE index would lead to increased volatility in customer charges and would result in a disparity between allowances and companies' actual input costs in the short-term. The relevant RPE indices are instead better used for observing the long-term input inflationary pressures that companies face, supporting the use of long-term average growth rates as the basis for setting ex-ante RPE allowances.

We engaged with NERA to advise us on the appropriate treatment of RPEs and ongoing productivity improvement over the RIIO-T2 control period. In their commissioned report (Annex 10: Real Price Effects NERA Report), NERA have provided forecast for RPEs over the RIIO-T2 price control period based on three sets of indices used to produce RPE forecasts:

1. Ofgem's input price indices applied to National Grid Electricity Transmission at RIIO-T1;
2. Ofgem's input price indices applied to the slow track companies at RIIO-ED1; and
3. The indices underpinning SP Distribution and SP Manweb's business plan RPE forecasts at RIIO-ED1.

NERA rely on reputable third-party forecasts where available, and otherwise extrapolate long-run trends in the price indices relative to CPIH in order to forecast how the selected indices will change over the coming control period. For futher detail on NERA's approach please see section 3 of Annex 10: Real Price Effects NERA Report. NERA's RPEs forecasts for the individual categories, separately based on the Ofgem RIIO-T1, the Ofgem RIIO-ED1 and the SP RIIO-ED1 set of price indices, are summarised in the following table:

Table 9.1: *NERA RPE forecasts (growth above CPIH)*

Category	21/22	22/23	23/24	24/25	25/26	T2 Ave
Ofgem RIIO-T1						
Labour (%)	1.2	1.2	1.4	1.0	1.0	1.2
Materials (opex) (%)	2.2	2.2	2.2	2.2	2.2	2.2
Materials (capex) (%)	1.9	1.9	1.9	1.9	1.9	1.9
P&E (%)	0.1	0.1	0.1	0.1	0.1	0.1
Other (%)	0.0	0.0	0.0	0.0	0.0	0.0
Ofgem RIIO-ED1						
Labour (%)	1.2	1.2	1.4	1.4	1.4	1.3
Materials (opex) (%)	2.2	2.2	2.2	2.2	2.2	2.2
Materials (capex) (%)	1.4	1.4	1.4	1.4	1.4	1.4
P&E (%)	0.1	0.1	0.1	0.1	0.1	0.1
Other (%)	0.0	0.0	0.0	0.0	0.0	0.0
Ofgem RIIO-ED1						
Labour (%)	1.2	1.2	1.4	1.6	1.6	1.4
Materials (opex) (%)	0.6	0.6	0.6	0.6	0.6	0.6
P&E (%)	0.1	0.1	0.1	0.1	0.1	0.1

[83] The various price indices capture input prices for broad categories of inputs, rather than input prices of the exact inputs used by ourselves. For example, BEAMA's "basic electrical materials" has recently indicated a significant fall in costs. However, our analysis of the cost of the most frequently purchased transformers, by contrast, shows significant rises in recent years.
[84] See chapter 3: of Oxera (February 2019), "Real Price Effects for Electricity Networks: prepared for the Energy Networks Association".
[85] This would mean that fluctuations in RPEs may not reflect a significant part of network companies input costs in the short term if setting fixed contracts.

Other (%)	0.0	0.0	0.0	0.0	0.0	0.0

NERA aggregate their RPE forecasts to form a single RPE index for SPT for opex, capex and total totex, based on data provided by SPT on the share of the various cost categories within its opex, capex and totex. The average of the three aggregated RPE forecasts for opex, capex and totex can be seen in Table 9.2 below. The average RPE forecasts suggests that capex and totex will increase by around 1% on average per annum in real terms over the RIIO-T2 control period. While the average opex RPE forecast is slightly lower at 0.7% per annum on average over the forecast period.

NERA's forecasts show a consistent, real increase in costs above CPIH, suggesting a systematic tendency for electricity transmission companies' input costs to rise faster than general inflation in the long-run.

Table 9.2: *NERA average aggregate RPE forecasts*

	21/22	22/23	23/24	24/25	25/26	T2 Ave
Combined Opex (%)	0.68	0.71	0.77	0.77	0.77	**0.74**
Combined Capex (%)	0.94	0.96	1.00	1.00	1.00	**0.98**
Combined Totex (%)	0.93	0.94	0.99	0.99	0.99	**0.97**

If we were to apply the totex RPE forecasts indicated in the above table to our baseline RIIO-T2 totex values, we would arrive at an assumed RPE figure of c.£62m over the RIIO-T2 period.

Table 9.3: *Totex RPE profile over RIIO-T2*

	21/22	22/23	23/24	24/25	25/26	T2 Ave
RPEs (£m)	8.7	12.3	13.5	13.2	14.4	**62.0**

As stated in the main body of our Business Plan, our costs of delivery will also be affected by the productivity improvements we can realistically achieve over the price control period. To ensure that Ofgem's allowances in RIIO-T2 reflect the tendency for companies' efficient costs to change over time, its assessment on RPEs also needs to be taken alongside its decision on ongoing efficiency. Regulators, including Ofgem in RIIO-1, have recognised the link between the two components of cost delivery, assessing them in a consistent manner by basing both on long-term evidence.

Regulatory precedent has been to set ongoing efficiency assumptions on the analysis of long-term historic trends in productivity growth from comparative industries (generally using the EU KLEMS database). As demonstrated in NERA's report, the long-term evidence of changes in productivity indices which underpin relevant regulatory decisions on ongoing efficiency are circa 1% per annum (see Table 2.3 & 2.4 in Annex 10: Real Price Effects NERA Report). NERA's RPE forecasts, which are predominantly composed from growth in historical RPE indices, are also in the order of 1% i.e. closely match estimates of long-term productivity improvement.

However, current evidence from the Bank of England is that total factor productivity growth (TFP)[86] exhibited in the UK has been near zero since the financial crisis in 2008 and is forecast to remain that way in the coming years, as indicated by their reduced TFP forecasts which are at levels markedly less than those seen before the financial crisis. This outlook is also likely to remain sensitive to the form of the UK's withdrawal agreement with the EU. It is therefore bold to assume that network companies can achieve productivity growth throughout RIIO-2 in line with historic levels seen before 2008.

Table 9.4: *Bank of England estimates of annual total factor productivity growth*

	98/07	08/10	11/14	15/19	20/22
TFP growth (%)	1.0	-0.6	-0.1	0.2	0.3

Since current long-term average RPE forecasts match the long-term evidence of ongoing productivity improvement, we have recommended that Ofgem index RPE allowances to CPIH for the RIIO-T2 price control i.e. setting a zero RPE allowance and a zero ongoing efficiency target across all categories. Our ambition is to offset the circa 1% level of forecast RIIO-T2 RPEs through the ambitious achievement of an ongoing efficiency target that is greater than what the current evidence supports.

Should Ofgem decide to reject our evidenced proposal to offset RPEs against ongoing efficiency, an ex-ante allowance for labour costs must be implemented, given that these can be determined against recognised indices unlike our other costs

[86] Total factor productivity growth refers to improvements in the efficiency with which both capital and labour are used to produce output.

which are related to commodities. NERA forecast labour RPEs over the RIIO-T2 control period applying the same forecast methodology in the aggregate RPE approach. If Ofgem decides to set a specific labour RPE allowance for SPT over the RIIO-T2 control period, we recommend using the unweighted average of NERA's three forecasts, as shown in Table 9.5.

This labour RPE allowance would need to be accompanied with a corresponding labour productivity target. We recognise that there has been a fairly strong link between wage growth and productivity, at the economy-wide level. To ensure consistency, any forecast of labour productivity growth should also be based on long-term evidence, using reputable evidence sources, such as the OBR, ONS or Bank of England.

Table 9.5: *NERA average aggregate labour RPE forecasts*

	21/22	22/23	23/24	24/25	25/26	T2 Ave
Combined Opex (%)	0.59	0.61	0.67	0.68	0.68	**0.64**
Combined Capex (%)	0.43	0.45	0.49	0.50	0.50	**0.47**
Combined Totex (%)	0.45	0.46	0.51	0.51	0.51	**0.49**

7.0 GLOSSARY

A

Allowed revenue
The amount of money we can earn on our regulated business.

Annual iteration Process
The annual iteration process is the process of annually updating the variable (blue box) values in the price control financial model and running the model in order to provide updated MOD values.

B

Base revenue
The amount of revenue we are allowed to recover, as agreed up-front with Ofgem.

Beta
The beta is a measure of the or systematic risk of a company in comparison to the unsystematic risk of the entire market.

Business Plan Financial Model (BPFM)
The model that will be used by the authority to determine ex ante base revenues.

Business Plan Incentive
This incentive encourages TOs to forecast their costs accurately and maximises long-term value for money for their customers. This incentive applies to the RIIO-2 price control and replaces the previous IQI incentive utilised for the RIIO-1 period.

C

Capital Asset Pricing Model (CAPM)
A theoretical model that is widely used to estimate the cost of equity. This derives the cost of equity by adding the company or sector risk premium to the risk-free rate. The risk premium is calculated by applying a measure of relative risk, known as the “beta” factor to the risk premium for the stock market as a whole.

Capital Expenditure (Capex)
Expenditure on investment in long–lived distribution assets, such as underground cables, overhead electricity lines and substations.

Capitalisation policy
The approach the regulator follows in deciding the percentage of total expenditure added to the Regulatory Asset Value and the percentage of expenditure remunerated in the year it’s incurred.

Consumers
Users of network services (for example generators, shippers) as well as domestic and business end consumers, and their representatives.

Cost of capital
The minimum acceptable rate of return on capital investment. Includes the cost of debt to a firm and the cost of equity.

Cost of debt
The interest rate that a company pays for its loans.

Cost of equity
The rate of return on investment required by a company’s shareholders.

D

Defined Benefit Scheme
A pension scheme where the benefits that accrue to members are normally based on a set formula taking into account the final salary and accrual of service in the scheme. It is also known as a final salary pension scheme.

Defined Contribution Scheme
A pension scheme where the benefits that accrue to members are based on the level of cash contributions made to an individual account; the returns on those funds are used to provide a cash amount to purchase an annuity on retirement.

Depreciation
Depreciation is a measure of the consumption, use or wearing out of an asset over the period of its economic life.

Distribution Network Operators (DNOs)
DNOs are the organisations that look after the networks transporting electricity to end users such as homes and businesses.

Dividend Growth Model (DGM)
A theoretical model that is widely used, in the United States and elsewhere, to estimate the cost of equity. This derives the cost of equity as the discount rate which sets the present value of projected future dividends equal to the current share price.

E

Equity beta
Measures the co-variance of the returns on a stock with the market return.

Equity risk premium (ERP)
The market Equity Risk Premium (ERP) measures the additional return required by investors to compensate them for the risk of holding a widely diversified portfolio of equities over and above the risk-free rate.

F

Fast money
The proportion of Totex which is not added to the licensee's RAV balance and is effectively included in the licensee's revenue allowance for the year of expenditure

Financeability
We use financial models to determine whether we are capable of financing our necessary activities and earning a return on our regulated asset value (RAV). This financeability is assessed using a range of different financial ratios.

G

Gearing
Gearing measures a company's financial leverage i.e. the extent to which a firm's operations are funded by lenders instead of shareholders.

I

iBoxx indices
The iBoxx bond market indices are benchmarks comprised of liquid investment grade bond issues. They enable investors to analyse and select benchmarks that reflect their investment profile.

The incentive strength represents the percentage that a licensee bears in respect of an overspend against allowances or retains in respect of an underspend against allowances.

Indexation
The adjustment of an economic variable so that the variable rises or falls in accordance with the rate of inflation.

Inflation index
This is a measure of the changes in given price levels over time. A common example is the Retail Prices Index (RPI), which measures the aggregate change in consumer prices over time.

M

Market-to-Asset Ratio (MAR)
MARs are the ratio of the market price to the underlying regulated assets i.e. Enterprise Value divided by RAV.

N

National Grid Electricity Transmission (NGET)
The electricity transmission licensee in England & Wales.

Net Present Value (NPV)
Net present value is the discounted sum of future cash flows, whether positive or negative, minus any initial investment.

O

Office of Gas and Electricity Markets (Ofgem)
The Office of the Gas and Electricity Markets Authority.

Operating Expenditure (Opex)
The costs of the day to day operation of the network such as engineering and support costs, repairs and maintenance expenditures.

OFTO
Offshore transmission owner. An OFTO is competitively appointed by Ofgem through a tender process and is awarded an OFTO licence.

P

Pension Protection Fund
The fund, established under the provisions of the Pensions Act 2004, to provide compensation to members of eligible defined benefit pension schemes, when there is a qualifying insolvency event in relation to the employer, and where there are insufficient assets in the pension scheme to cover the Pension Protection Fund level of compensation.

Pension Scheme Administration
The range of activities that pension scheme trustees are required by legislation to undertake or commission in running the pension scheme.

Pension scheme established deficit
The difference between assets and liabilities, determined at any point in time, attributable to pensionable service up to the end of the respective Cut-Off Dates and relating to Regulated Business Activities under Pension Principle 2. The term applies equally if there is a subsequent surplus.

Pension scheme incremental deficit
The difference between the assets and liabilities, determined at any point in time, attributable to post Cut-Off Date pensionable service and relating to Regulated Business Activities. The term also applies equally where there is a surplus for the post cut-off date regulated Notional incremental deficit sub-fund.

Price control (control)
The control developed by the regulator to set targets and allowed revenues for network companies. The characteristics and mechanisms of this price control are developed by the regulator in the price control review period depending on network company performance over the last control period and predicted expenditure in the next.

Price Control Financial Model (PCFM)
The model of that name**:**

(a) that the Authority will use to determine ex ante base revenues; and

(b) that the Authority will use to calculate appropriate changes to the licensee's base revenue through an Annual Iteration Process that will determine the value of the term MOD.

R

RAV – Regulatory Asset Value
A financial balance representing expenditure by the licensee which has been capitalised under regulatory rules. The licensee receives a return and depreciation on its RAV in its price control allowed revenues.

Real Price Effects (RPE)
Increase in prices, of materials, direct staff or contract labour, over and above increases in the Retail Price Index.

Return on Regulatory Equity (RoRE)
The financial return achieved by shareholders in a licensee during a price control period from its out-turn performance under the price control. The return is measured using income and cost definitions contained in the price control regime (as opposed to accounting conventions) and is expressed as a percentage of (share) equity in the business. Importantly, in the calculation the gearing (proportions of share equity and debt financing in the RAV) and cost of debt figures used are those given as the 'assumed' levels in the relevant price control final proposals. The aim of the RoRE measure is to provide an indication of the return achieved by the owners of a licensee which can be compared to the cost of equity originally allowed in the price control settlement and to the return achieved by other licensees on an equivalent basis.

RIIO
Revenue = Incentives + Innovation + Outputs.
Ofgem's framework for the economic regulation of energy networks.

RIIO-ED1 (Electricity Distribution)
The price control arrangements which will apply to Electricity Distribution licensees from 1 April 2015 until 31 March 2023.

RIIO-T1 (Electricity Transmission)
The price control arrangements which will apply to Electricity Transmission licensees from 1 April 2014 until 31 March 2021.

RIIO-T2 (Electricity Transmission)
The price control arrangements which will apply to Electricity Transmission licensees from 1 April 2021 until 31 March 2026

Risk-free Rate
The return on a risk-free investment. Generally proxied to yields on government issued bonds from government's with strong credit ratings.

S

Scottish Hydro-Electric Transmission Limited (SHETL)
The electricity transmission licensee in northern Scotland.

Sharing Factor
See 'Totex Incentive Mechanism'.

Slow money
The proportion of Totex which is added to the licensee's RAV balance on which the licensee receives a revenue allowance to cover finance (WACC) and depreciation costs.

Stakeholder
Anyone with an interested in, or affected by our operations.

Straight line depreciation
Depreciates the asset value in a linear fashion throughout its useful life.
Calculated by dividing the Gross Book Value of an asset by its expected useful life.

T

Transmission Investment for Renewable Generation (TIRG)
A mechanism designed to fund transmission projects specific to connecting renewable generation outside of the price control allowance to minimise delays.

Total Market Return (TMR)
The expected return available to investors for investing in the equity market as a whole.

Totex Incentive Mechanism (TIM)
TIM is the financial reward (or penalty) that companies are given in allowances for under or over spend on Totex. Opening base revenues will be modelled on the basis that actual Totex expenditure levels are expected to equal allowed Totex expenditure levels (allowances). If actual (outturn) expenditure differs from allowances, for any relevant year during the price control period, the TIM provides for an appropriate sharing of the incremental amount (whether an overspend or underspend) between consumers and licensees. The Totex Incentive Strength Rate represents the licensees' share; the Sharing Factor represents the consumers' share.

Totex Incentive Strength
The incentive strength represents the percentage that a licensee bears in respect of an overspend against allowances or retains in respect of an underspend against allowances.

Totex
The aggregate net network investment, net network operating costs and indirect costs.

Totex Capitalisation Rate
The percentage of Totex which is added to RAV (slow money)

Transmission Price Control Review 4 (TPCR4)
TPCR4 established the price controls for the transmission licensees covering the years 2007-2012.

Triennial Valuation
An actuarial valuation of a pension scheme which has been carried out to meet the requirements of Section 224(2)(a) of the Pensions Act 2004 and which details in a written report, prepared and signed by the Scheme Actuary, the value of the scheme's assets and Technical Provisions. Actuarial valuations are usually produced triennially but the term may also refer equally to any full actuarial valuation that is not an Updated Valuation.

U

Uncertainty mechanisms
Uncertainty mechanisms allow changes to the base revenue during the price control period to reflect significant cost changes that are expected to be outside the company's control. Examples include revenue triggers and volume drivers.

V

Vanilla WACC
See WACC.

W

WACC
The Vanilla Weighted Average Cost of Capital is Ofgem's preferred way of expressing the rate of return allowed on the Regulatory Asset Values (RAV) of price controlled network companies. The use of Vanilla WACC means that the company's tax cost is separately calculated as a discrete allowance so that only the following have to be factored in:

- the pre-tax cost of debt – i.e. the percentage charge levied by lenders, and
- the post-tax cost of equity – i.e. the percentage return equity investors expect to actually receive,

weighted according to the price control gearing assumption.

"Real Vanilla WACC" is used which gives a lower percentage than "Nominal Vanilla WACC" would (when inflation is positive). This is because inflation isn't taken into account in the determination of the Real Vanilla WACC percentage since revenue allowances (which include the Vanilla WACC return) are separately RPI indexed.