Finance Annex

RIIO-T3

December 2024

Scottish & Southern Electricity Networks

TRANSMISSION

Contents

Overview

A fair, flexible, transparent financial framework settlement for RIIO-T3 is incredibly important for all stakeholders. The unprecedented scale of capital investment underpins the delivery of the UK and Scottish Government climate change and energy security targets and the Clean Power by 2030 ambition. Therefore, ensuring these investments are financeable and investable is one of the largest risks to the delivery, and our proposed Financial Framework seeks to mitigate this risk. This Finance Annex sets out our detailed justification that underpins our proposed Financial Framework for RIIO-T3 as summarised, in the Main Business Plan ("T3 Business Plan Document"). We highlight where we differ from Ofgem's published position in the Sector Specific Methodology Decision (SSMD) July 2024.

Comparison of Ofgem's Working Assumptions Against SSE's Proposed Financial Parameters

Table 1 below sets out the financial parameters for RIIO-T3 based on Ofgem's SSMD compared to our proposed Financial Framework. Our proposals are broadly consistent with previous regulatory periods such as capitalisation rates in RIIO-T2, or in the case of returns only marginally higher than what Ofgem is proposing at the top end of their range in SSMD.

Table 1: Financial Framework for RIIO-T3

	Ofgem SSMD	RIIO-T3 Business Plan
Capitalisation Rate (slow: fast money)	Natural rate	No higher than 80%
Asset Lives	45 years for new assets	35 years for new assets
Cost of Debt	3.38% 14 year Utilities Index, RAV Weighted	3.38% 14 year Utilities Index, RAV Weighted + premium
Gearing	55%	60%
Cost of Equity	4.60% - 6.36%	6.50%
WACC	3.87% - 4.57%	4.63%

Note: The Cost of Debt, Cost of Equity and WACC are quoted in CPIH-real terms with the Cost of Equity quoted using 60% gearing whereas Ofgem has proposed 55% for Electricity Transmission. The Cost of Debt is based on what Ofgem published in SSMD. We believe an additional premium is required but we have not included it in this table but outlined it in detail in the relevant section below.

Setting the Right Cost of Capital

The Weighted Average Cost of Capital (WACC) is calculated combining the Cost of Debt (CoD), gearing (proportion of the company funded by debt) and the Cost of Equity (CoE). This constitutes the return on capital that is earned over the regulatory period on the Regulatory Asset Value (RAV) and is intended to fund debt interest costs, and the return required for equity investors.

The WACC should be set based on market evidence and calibrated to reflect an efficient level to ensure the notional company is financeable and investable. The use of robust and reliable market evidence when setting the components of the cost of capital is critical. If the allowed CoE, the return due to equity shareholders, is set too low then the notional company will struggle to be considered investable. It is important the CoE is set based on market evidence but also reflect forward-looking risks faced by Transmission Operators (TOs). If this is not reflected accurately in the CoE it will leave investors under-compensated for the risk that they are taking. Similarly, if the allowed CoD is not sufficient to cover interest costs due to debt holders, then the notional company will have financeability challenges.

The overall WACC must be set to ensure the company can raise the finance to deliver the scale of investment required over the forthcoming period. We also believe it is important that Ofgem considers long-term financeability and investability given the long-term nature of the investment and increasing capital investment in the coming decades. We have therefore summarised our view on the CoE and CoD on this basis.

The Importance of Setting the Right Cost of Equity

There are several factors which distinguish RIIO-3 from previous price controls and underpin the importance of an evidence based and risk reflective approach when setting the allowed CoE. The scale of required investment in RIIO-3 represents an unprecedented step change in the drive to achieving Net Zero. The need for a financial framework which can attract investors has never been more crucial. The notional company will need to attract a substantial amount of new equity beyond a level seen before to fund this scale of investment. This will be contingent on the relationship between allowed returns and forward-looking risk exposure, which will naturally increase in line with the delivery risks associated with the significant uplift in capital intensity. Equity investors will need to be adequately compensated for the level of risk while reflecting the competitiveness of other investments globally.

This section sets out our views on Ofgem's working assumptions in calibrating the CoE over the RIIO-3 period including market evidence for the Capital Asset Pricing Model (CAPM), cross checks, and accurately measuring forward-looking risks.

The Cost of Equity

Ofgem's proposed working assumption on the RIIO-3 CoE range significantly underestimates the required return on equity when considering the material shift in the macro-economic environment. There has been a material shift in macroeconomic conditions which is reflected by a marked increase in inflation, commodity price volatility, significant increases in interest rates, and geopolitical circumstances. Globally there has been a step change in the scale of investment in electricity systems where it is well documented that a large proportion of Europe and North America are investing heavily in their electricity infrastructure. It would therefore be inappropriate for Ofgem to rely upon CoE regulatory methodologies and guidance developed during periods of extremely low global and UK interest rates, inflation, and relatively stable market conditions. The CoE must reflect the current market environment such that interest rates now are at a level more in line with *normal* economic conditions i.e. pre-financial crisis. As a result, we have used evidence based on observable market conditions while considering data over this period of volatility.

Our view on setting the right CoE compared to Ofgem's proposed CoE approach is supported by evidence and analysis undertaken by Frontier and Oxera which has been updated since the time of the SSMC and conducted on behalf of the Energy Networks Association (ENA). The evidence highlights that a CoE approach which can achieve the policy objectives of the sector is a one which offers sufficient consideration to the market evidence and can determine the point estimate for RIIO-3. We also have further evidence in relation to the Costs of Issuing New Equity (Oxera, 2024[1]), Infrastructure Funds and Investment Manager Returns (Oxera, 2024[2]), and our own assessment of risks.

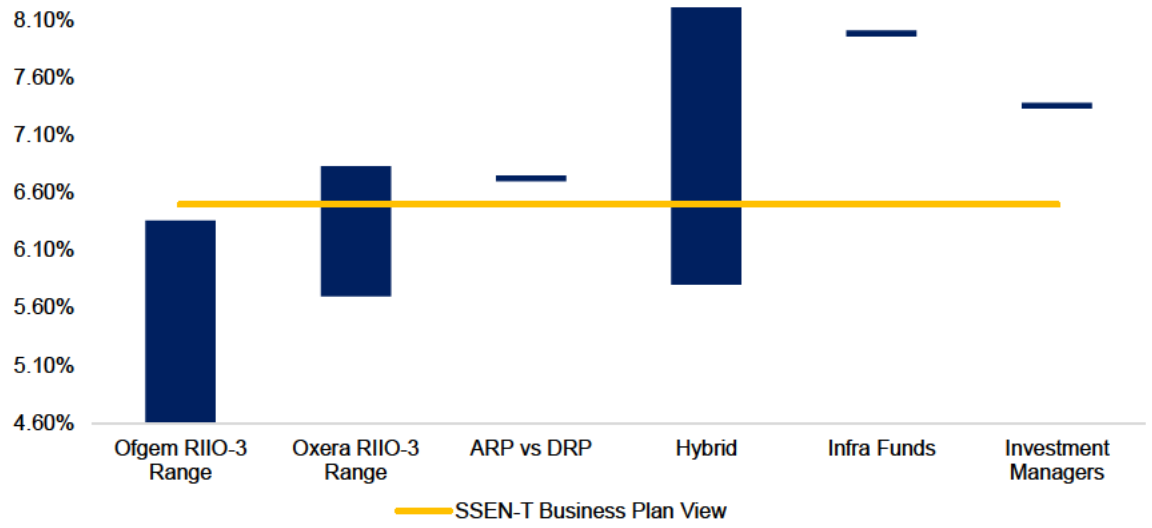
On the balance of both updated evidence and new evidence, we believe Ofgem's SSMD CoE range of 5.70%-6.36% with a midpoint of 5.45% is too low. We have set out why this is the case below with supporting evidence, including the adverse impact on our financeability over the period.

Based on current market evidence and our assessment of financeability and investability, we propose that the CoE is set at a minimum of 6.5% (at 60% gearing). On considering a balanced range of evidence including that from Oxera[3] and Frontier Economics[4], the CoE range should be between 5.70% and 6.83% which is materially higher than Ofgem's range. In essence, this is the base CoE range before considering cross checks and forward-looking risk which is set out in the proceeding sections.

A summary of our evidence is set out in Figure 1 below that compares the market evidence to Ofgem's proposed SSMD range which is based on rolling forward the RIIO-2 methodology. This demonstrates that the top of Ofgem's proposed range is insufficient to compensate equity investors. We have also reviewed the material change in risk profile between RIIO-2 and RIIO-3 which further supports a material change in the allowed return on equity.

[1] Oxera (2024), 'Estimating the appropriate allowance for new equity issuances for RIIO-3', Prepared for SSE, 1 March.
[2] Oxera (2024), 'Infrastructure fund and investment manager rates of return', prepared for SSE, 1 March.
[3] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Network Association, 8 November.
[4] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Network Association, 22 November.

Figure 1: Summary of Cost of Equity Evidence (CPIH real)



Source: Based on analysis of Frontier Economics[5], Oxera[6], and internal analysis

The weight and balance of evidence shows Ofgem's RIIO-3 methodology will be incorrect if it is simply based on a roll forward of the RIIO-2 methodology. The top end of the Ofgem potential range is too low as depicted by observable cross checks, even those used by Ofgem in RIIO-2.

Separately, we have evaluated the change in risk profile from RIIO-2 into RIIO-3 based on extensive analysis of activity, expenditure, regulatory mechanisms, and residual risk. This is set out in Section 1.9 and leads to similar conclusions that there is a break in the level of risk in RIIO-3 and that the forward-looking risk and return balance should reflect this material change.

The case for selecting a point estimate in the top half of the range is supported by academic evidence particularly to avoid consumer harm from underinvestment. For RIIO-T3, this principle clearly applies given the unprecedented scale of new investment required to mitigate the risk of delaying investment. Ofgem's SSMD range of 5.70%-6.36% with a midpoint of 5.45% is materially lower than robust observable market evidence even before considering company and sector specific forward-looking risk factors. It is critical that Ofgem consider the evidence of real-world cross checks including infrastructure fund returns, investment manager returns and a range of robust debt cross checks which inform the CoE beyond the base CAPM calibration.

We set out the results of market evidence in the sections below which demonstrate that a robust RIIO-T3 CoE point estimate which properly and appropriately reflects market conditions is materially higher than Ofgem's early view midpoint of 5.45%. We also set out forward-looking risk evidence which is based on a comprehensive assessment of the risk in RIIO-T2 compared to the risk in RIIO-T3. The use of forward-looking estimates of risk converted into equity risk also illustrates that Ofgem's SSMD midpoint of 5.45% does not reflect the change in risk profile from RIIO-T2 into RIIO-T3. We therefore advocate aiming up within a higher range that is robust against the latest market evidence and sector specific risk. Only a CoE which lies at the top end of the Oxera range of 5.70%-6.83% achieves this objective.

SSEN Transmission's proposed CoE point estimate of 6.5% (denoted by line in Figure 1 above) is evidently above Ofgem's SSMD range; however, it is important to highlight that 6.5% sits below the top end of other market evidence and the top end of Oxera's range. We believe 6.5% to be reasonable given it only represents a modest uplift above Ofgem's SSMD range whilst sufficiently reflecting latest market evidence and risk.

[5] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.
[6] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November.

Moreover, Ofgem must consider the returns available to investors in geographies such as the USA which can be in excess of a 10% nominal return on equity[7]. Our point estimate is based on obtaining a nominal return on equity of 10% and given the change in macro-economic conditions and increasing competition from other geographies across the globe for investment capital, we believe Ofgem should consider our proposal in the round.

Calculating CoE Using the CAPM

We are supportive of Ofgem's SSMD approach to apply the CAPM as the basis for their 'step 1' assessment in setting the CoE. The CAPM model aligns with UKRN Recommendation 2[8] while acknowledging that it is an imperfect yet appropriate model. We have also looked at Multi-Factor Models (MFMs) for their explanatory power compared to the CAPM. The use of the above cross checks (Figure 1) is also important when setting the right CoE for RIIO-3.

We believe several financial parameters within Ofgem's SSMD 'early view' CoE range of 4.57% - 6.36% require uplift in order to sufficiently address investment requirements. Analysis provided by Oxera[9], and supported by Frontier, suggests a higher CoE range of 5.70% - 6.83%. We have summarised the CoE range as calculated by Oxera and supported by Frontier in our discussion of each element of the CAPM below.

We have also summarised market based cross check data as analysed by Frontier and Oxera and detail why this meets the high evidential bar for moving away from any central point estimate of the allowed COE range. The cross-check analysis evidences that the CoE estimate for RIIO-3 lies at the upper bound of the Oxera estimated range at 60% gearing.

Table 2: Ofgem's SSMD 'early view' CoE range updated using 1 July 2024 as cut-off date compared to Oxera's estimate of the CoE range based on their view of the evidence

	Formula	Ofgem approach		Oxera approach	
		low-high	mid-point	low-high	mid-point
RFR	[A]	1.27%	1.27%	1.54%	1.54%
TMR	[B]	6.50%-7.00%	6.75%	6.50%-7.50%	7.00%
Asset beta	[C]	0.30-0.40	0.35	0.35-0.40	0.38
Re-levered equity beta at 60% gearing	[D] = {[C] – (gearing*beta debt)} / (1-gearing)	0.64-0.89	0.76	0.76-0.89	0.83
CAPM CoE	[Ke]=[A]+[C]*([B]-[A])	4.60–6.36%	5.45%	5.32–6.83%	6.04%

Source: Extract from Oxera (2024)[10]

Risk Free Rate

Ofgem's SSMD approach does not propose an appropriate proxy for the Risk-Free Rate (RFR) in the calculation of the CoE using the CAPM.

As outlined in our SSMC response, we agree that Index Linked Gilts (ILG) should be used in the calculation of the RFR per UKRN recommendation 3[11], however we disagree with Ofgem's proposal to rely solely on ILGs to determine the RFR. We believe that Ofgem's proposal to rely on ILG alone risks underestimating the RFR. We also believe that there is a need to review nominal gilts rather than completely dismissing their use due to the issues with breakeven inflation and associated different inflationary measures (i.e. RPI, CPI, and CPIH).

[7] Edison Electrical Institute, 2022 and 2023 reports
[8] UKRN (2022), 'UKRN guidance for regulators on the methodology for setting the cost of capital', pp. 10 - 11, Available at: https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance_22.03.23.pdf
[9] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November.
[10] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November.
[11] UKRN (2022), 'UKRN guidance for regulators on the methodology for setting the cost of capital', pp. 12 - 15, https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance_22.03.23.pdf

Using ILGs alone does not satisfy the CAPM definition of the RFR as the return on a zero-beta asset.

As outlined in our response to Ofgem's SSMC, and supported by Oxera's empirical analysis[10], using spot yields on government bonds underestimates the practical value of the RFR for use in the CAPM as gilts include a price premium which pushes the yields on government bonds below the required return for a risk free asset. The impact of this underestimation inadvertently violates the Modigliani Miller (MM)[12] proposition that the WACC should be invariant with respect to the level of gearing. Oxera proposes adding a premium adjustment to the calculation in the form of applying AAA-rated corporate bonds. They found including both ILG and 20-year AAA-rated corporate bond yields as an input to the calculation allows the MM theorem to hold while lowering variability in the WACC for a change in gearing.

This is further supported by recent academic evidence and regulatory precedence as outlined in Oxera (2024)[10] including literature from Diamond and Van tassel (2023)[13] who found an average convenience premium of 38bps for two-year UK ILGs. The paper also found a 1% increase in nominal interest rates equated to a 15bps increase in the convenience yield[13]

Ofgem justify their SSMD decision to exclude the convenience premium in their calculation of RFR on the basis that the CMA considered Ofgem's RIIO-2 approach to be 'not wrong'. We consider this justification to be insufficient for the following reasons:

- The CMA did not consider the use of ILGs as the sole proxy of the RFR to be a superior approach compared with the combination of ILG and AAA non-government bonds, which was the approach used by the CMA itself in the context of the PR19 redeterminations
- We consider that the regulatory objective should be to set the right CoE based on a balanced assessment of the evidence, rather than to set returns that are 'not wrong'.
- Recent regulatory precedent (CMA PR19 redeterminations, CAA H7 decision and UR NIE final determination) suggests that the exclusion of a convenience premium would be in contradiction to the UKRN's premise for regulatory consistency.

Furthermore, Ofgem's argument that a convenience premium is mainly visible at times of financial distress is contradicted by the empirical evidence confirming the existence of a positive convenience premium during both calm and agitated financial markets.

Oxera (2024)[14] provides robust, academic and empirically supported responses to Ofgem's methodological arguments surrounding the determination of the convenience premium. Based on the evidence we maintain our view that the convenience premium is incorporated within the Ofgem calculation subject to an updated average at the time of the final determinations for RIIO-3.

The proposed methodology for estimating the inflation wedge underestimates the true RPI-CPIH wedge by omitting the widening CPI-CPIH wedge

An adjustment is required to account for the CPI-CPIH wedge to ensure that the RPI-CPIH and RFR are not understated. In the absence of CPIH forecasts, Ofgem note that they consider CPI to be a close proxy for CPIH having found CPI to be on average 14bps higher than CPIH between June 2013 and June 2023. However, Oxera's analysis has identified greater differences in favour of CPI in recent years including 52bps in the last three years and 33bps in the last five years[15].

Despite the absence of available CPIH forecasts, it is appropriate to increase the RPI-CPIH wedge and the CPIH-real RFR to account for the spread between CPI and CPIH, as excluding any consideration of CPIH would be in contradiction to recent market data. Oxera propose a five-year average CPI–CPIH wedge of 33bps as an appropriate input in the calculation of the RFR estimate.

Additionally, Oxera presents a more robust alternative estimate of the wedge based on RPI swap rates, CPI swap rates, and the historical CPI-CPIH wedge. We support Oxera's methodology to consider an

[12] Oxera (2020), 'Are sovereign yields the risk-free rate for the CAPM?', prepared for the Energy Networks Association, 20 May, p.6, Available at: https://www.oxera.com/wp-content/uploads/2020/08/2020.05.20-RFR-and-gearing-1.pdf
[13] Diamond, W. and Van Tassel, P. (2023), 'Risk-Free Rates and Convenience Yields Around the World', Jacobs Levy Equity Management Center for Quantitative Financial Research Paper, 3 February, p.3
[14] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November.
[15] Oxera (2024), 'RIIO-3 cost of equity', prepared for the Energy Network Associated, 23 February

inflation swaps approach in addition to Ofgem's proposed 20 years ahead OBR forecast average (where a 20-year geometric average forecast wedge is calculated by combining five years of OBR forecasts with assumptions for the following 15 years). The UKRN guidance supports the use of inflation swap market data[16] and as such we see no clear reason to exclude swap data from the wedge calculation.

As noted above, the nominal gilts should be reviewed as they indicate a much higher real RFR compared to relying on ILGs. That evidence should not be dismissed and as such it indicates that the RFR should be materially higher than the ILGs currently being used by Ofgem in RIIO-2.

There is a disconnect between forward breakeven inflation and the upcoming RPI to CPIH transition in 2030. As a result, adding merely a RPI-CPIH wedge to Index-linked gilts without an upward adjustment may underestimate the relevant RFR required as an input to the CAPM-based CPIH-real CoE.

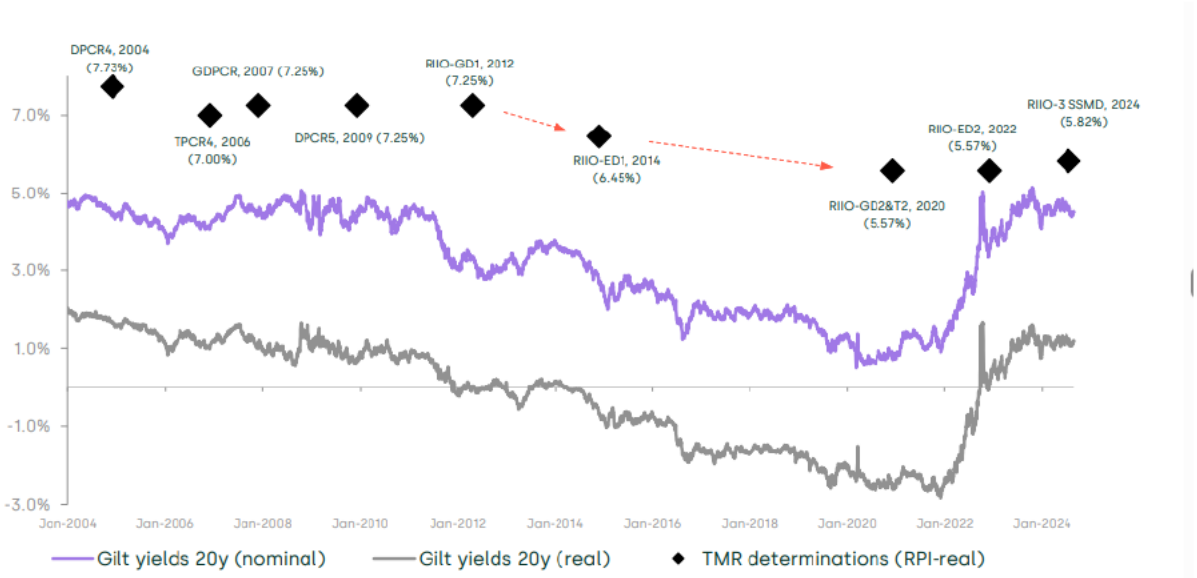
Total Market Returns (TMR)

The RIIO-3 TMR estimate should take account of the latest macroeconomic evidence.

The evidence suggests that Ofgem's current TMR working assumption range of 6.5% - 7.0% is too low. RIIO-3 will require a higher TMR range in respect of the marked increase in interest rates since RIIO-2. Ofgem's current SSMD working assumption of 6.75% denotes a "through the cycle" approach that ignores shifts in the latest market conditions. A TMR point estimate which does not reflect the higher interest rate environment underestimates the TMR and compromises the investability condition with regards to companies' ability to attract and retain new investment.

Oxera note that currently observed gilt yields are similar to rates last observed in the 2005-2011 period where the CPIH real equivalent TMR range was 8.07% to 8.32%[17]. As outlined in Oxera's SSMC response[18], the TMR allowance reduced in RPI real terms in the period from 2012 to 2020 in response to a fall in gilt yields. An uplift in the RIIO-3 TMR allowance to reflect the material increase in gilt yields last observed in 2020 would ensure the TMR calculation reflects macroeconomic consistency.

Figure 2: TMR determinations and gilt yields (RPI-real)



Source: Extract from Oxera (2024)[19]

Oxera's evidence shows that Ofgem's current RIIO-3 working assumption is too low and that a 25bps increase in the TMR range for RIIO-T3 compared to RIIO-T2 is not a sufficient increase in respect of the increase in gilt yields overtime. Oxera[20] also demonstrate that while the RPI-CPIH transition contributed to the lower RIIO-2 TMR (as Ofgem noted in the SSMD); market movements were also a material driver behind the overall reduction.

[16] UKRN (2022), 'UKRN guidance for regulators on the methodology for setting the cost of capital', p.15, https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance_22.03.23.pdf
[17] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November. p.38.
[18] Oxera (2024), 'RIIO-3 cost of equity', prepared for the Energy Networks Association, 23 February.
[19] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November. p.38.
[20] Ibid.

Macroeconomic evidence suggests a stable RIIO-3 TMR range of 7.0% - 7.5%.

Oxera[21] evidence that a TMR range of between 7.0%-7.5% (CPIH-real) satisfies both current market conditions and is representative of a stable TMR estimate. Oxera's higher proposed TMR range of 7.0%-7.5% only represents a small uplift in the range from RIIO-2 in comparison to the significant increase in gilt yields since RIIO-2 final determinations. We believe that an increase reflective of a return to normal interest rate levels would accommodate the principle of a stable TMR through price controls.

Further to this, Oxera[19] suggest that investors may require market returns of greater than 7.5% on current market conditions. We believe that Ofgem should reflect market conditions in the calculation of TMR consistently across price controls, for which the RIIO-3 TMR point estimate could justifiably lie above 7.5% CPIH-real. This would be in the spirit of the UKRN guidance which suggests a stable TMR is not equivalent to a fixed TMR. However, even if a stable TMR across price controls is one which is robust to fluctuations in interest rates; the evidence dictates that only a minimum TMR point estimate of 7.0% can represent stability through price control and market cycles.

Frontier have undertaken a series of further analysis on the relationship between the market TMR and gilt yields[22]. Specifically, Frontier have developed upon the TMR Glider presented at the time of the SSMC response, which showed that the relationship between the TMR and RFR was materially positive to a rate of less than 1 but more than 0.4 i.e. if there is a 1% increase in the RFR then the TMR would increase by approximately 0.4%. The glider runs in parallel to Frontier's Dividend Growth Model (DGM) which estimates a market-based measure of nominal TMR. Frontier have also studied the 124 year long-term historical average of TMR. Frontier's latest readings from the DGM and the TMR glider are 7.8%, while the 124 year historic average reads 7.0%, thereby supporting the low point of Oxera's proposed TMR range. It can therefore be concluded that the prevailing market conditions in the past two years would strongly suggest that Ofgem's current working assumption is too low.

A 'through the cycle' approach that offers no weight to changes in market conditions undermines the regulatory stability.

A 'through the cycle' approach does not take account of latest market conditions, whereas Ofgem have interpreted the concept of a 'stable' TMR which is much closer to a 'fixed' view of TMR. Ofgem's SSMD view is not consistent with the evidence and the pattern of past determinations. A 'through-the-cycle' view does not appear to have been present in Ofgem's determination in past price controls, where allowed returns have been calibrated to track the interest rate environment. In those price controls, regulators made decisions which included methodological changes to ensure alignment with the wider market conditions.

Ofgem's current 'through-the-cycle' approach falls short in addressing the investment requirements in RIIO-T3 which will create an unprecedented need to attract new finance in the electricity sector. Investors will be unwilling to provide the capital, including fresh equity, during the next five-year period on the premise that returns will balance out in the long run.

Adjusting the TMR to reflect the current interest rate environment would be consistent with previous regulatory determinations as well as with UKRN guidance. We agree with Oxera's assertion that whilst best practice in calculating TMR has arguably developed over time; the TMR values set prior to the publication of the 2018 UKRN paper are still relevant points of reference today, given those values will have inevitably informed investors' past decisions. On this point, there is a risk that Ofgem's decision of not adjusting the TMR upwards could be interpreted by investors as a signal to expect a different treatment in scenarios of increasing and decreasing interest rates. Ignoring the current high-interest rate environment could undermine investors' confidence and regulatory stability and this would be counterintuitive to the equity investability condition. Adopting a "through the cycle approach" would need to be enshrined into perpetuity rather than Ofgem using this approach as a way to "cap" returns when market circumstances require returns to increase. This would undermine a predictable and stable regulatory regime which is a core pillar of financeability and investability in the sector.

Oxera's proposed RIIO-3 TMR range of 7.0%–7.5% represents a 'stable but not fixed' TMR estimate reflective of latest market conditions on which Frontier's analysis supports a point estimate towards the top of this range. This range essentially moves with the cycle of evolving market conditions. A RIIO-T3 TMR which does not evolve to market conditions is more fixed in nature and to the extent that Ofgem do not reflect the increase in macroeconomic conditions for RIIO-T3; it can only hold true that the TMR cannot drop in future price controls should interest rate fall. In this case, only a minimum TMR of 7.0% can represent changing macroeconomic conditions.

[21] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November.
[22] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.

The TMR estimate should be derived primarily from an ex post arithmetic averaging approach.

Ofgem propose to place weight on both the historical ex post and historical ex ante approaches. As argued in our SSMC response, we believe that the TMR estimate should materially adopt an **ex-post only** approach with only very limited weight applied to the ex-ante approach due to the sensitivity and subjectivity of input assumptions associated with averaging for adjusted historical returns. An ex post only approach would also comply with UKRN recommendation 4 which allows for regulatory judgement. In this respect, we agree with Ofgem's approach of relying on the one-year arithmetic average approach in the estimation of ex post TMR within the SSMD.

However, we do not believe it appropriate to place 50% weight on historical ex ante approaches. To the extent that Ofgem decides to place any weight on historical ex ante approaches, we are aligned with the views expressed in Oxera's report regarding the downward adjustments Ofgem are proposing in respect of COLI-CED and serial correlation. We do not believe these downward adjustments are required.

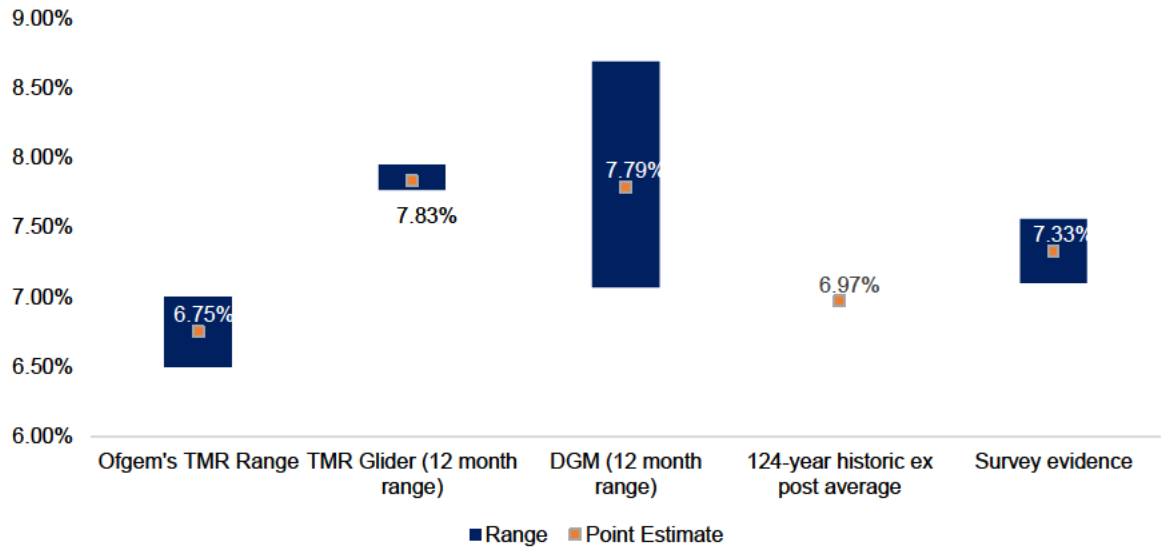
Oxera assert that whilst DMS data must be adjusted to reflect the CED inflation series for the 1900-49 period, it is no longer necessary to apply a separate adjustment in respect of COLI-CED given DMS data is provided on a nominal basis and can therefore be deflated using the same like for like historical inflation series used by Ofgem in the calculation of the ex post TMR estimate. Oxera show that deflating on the same basis reduces the downward adjustment on the ex-ante TMR.

Similarly, there is no basis for a downward adjustment for serial correlation. Oxera assert that little conclusion can be drawn from comparing average returns over ten and twenty year holding periods and have evidenced that there is no statistically significant serial correlation in returns.

We do not believe Ofgem should be applying a historical ex ante approach in the estimation of the RIIO-3 TMR, however in the case of an ex ante approach, Oxera estimate a historical ex ante TMR of 6.85% which is significantly higher than Ofgem's estimate of 6.50% and closer to Oxera's low point estimate of 7.0% on an ex post only basis. Oxera's range is also supported by the latest investment manager analysis which Ofgem previously relied upon at the time of RIIO-2 draft determinations.

Frontier (see Figure 3) have reperformed this cross check against five of the investment managers for which data is available for the period out to December 2023 and supplemented this with the results of the Fernandez et al[23]. study on risk free rates and market risk premium. The results show that market returns have increased between c.2% and c3% since the RIIO-2 determination, on average in nominal terms. Given the evidence is based on survey data, we do not believe this cross check carries as much as weight of those which rely on observable market evidence. However, the evidence does indicate a TMR point estimate of 7.33% which lies within the upper bound of the Oxera range.

Figure 3: Summary of TMR Evidence per Frontier Analysis



Source: Frontier (2024)[24]

[23] Fernandez et al. (2024), Survey: Market Risk Premium and Risk-Free Rate used for ninety-six countries in 2024.
[24] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.

Beta

Beta is an estimate of risk to equity investors, and it is used as an input into the CAPM. This section reviews the data and methodology for accurately calculating the Beta that reflects electricity networks risk. We have a separate section further below which reviews the forward-looking elements of risk based on quantitative analysis and review of RIIO-2 and RIIO-3 activity, expenditure, and regulatory framework. We believe that Beta should be reflective of forward-looking risks building upon a review of backward looking data. It is therefore critical that short term volatility around beta be viewed accordingly.

Timeframe

10-year Betas are most appropriate in the estimation of risk for energy network companies. Ofgem propose using 2-year, 5-year and 10-year estimation periods to reflect a balance between shorter and longer periods. However, Ofgem specified in their SSMD that they expect to rely most heavily on longer-term timeframes, i.e. ten years, when picking a point estimate for asset beta in the draft and final determinations. We believe the advantages with longer-term timeframes outweigh the disadvantages associated with inclusion of old data points, namely (Oxera (2024)[25];

- Assigning equal weight to all timeframes (two, five and ten years) would place unequal weight on the short-term data that would be included across all three time periods. Therefore, putting more weight on ten-year betas has the advantage of counterbalancing the unequal weight placed on the short-term data.
- Using longer-term timeframes can reduce the estimation noise and improve the stability of the estimates between price controls.
- A longer estimation window could be particularly beneficial in the context of RIIO-3 as National Grid's beta would still capture gas distribution and transmission activities over part of the measurement period, and hence better represent both gas and electricity asset risk.

We agree with Ofgem's proposal to continue focusing on daily data for raw beta estimation, noting this is in line with UKRN guidance. Additionally, we consider Ofgem's intention not to use rolling forecasts when estimating betas appropriate as this avoids skewing the resulting estimate.

Comparator group

We support UKRN recommendation 5 such that regulators should estimate the equity beta using comparable listed companies. As outlined in our SSMC response, Ofgem has historically relied on water companies to estimate the beta of energy networks and should consider broader international energy networks companies to reflect increased energy networks sector specific risk. Analysis by Oxera[26] found that '[Oxera] do not consider the difference in asset risk between UK and other European energy networks to be materially different from the difference in asset risk between UK energy and water sectors. We do not consider it appropriate to exclude Pennon from the sample. We therefore agree with Ofgem's SSMD proposal to include European utilities in their comparators sample. However, we disagree with Ofgem's intention to exclude Pennon plc (water) beta from the comparators sample due to the purported significant weight of historical non-water business, affecting Pennon plc beta. This approach contradicts both Ofgem's regulatory precedent and empirical evidence as:

- Pennon plc was part of Ofgem's comparators sample in RIIO-2
- Including Pennon plc would be aligned with UKRN guidance which states "*Currently, the suite of UK companies which are likely to be most relevant in the markets of interest are Severn Trent, United Utilities, National Grid, BT Group and, going forward, Pennon.'*
- Following the disposal of Viridor in 2020 and the acquisition of Bristol Water in 2021, by the time of the RIIO-3 final determinations there would be more years of water-only Pennon data which would make including Pennon even more relevant than it was during RIIO-2
- Ofgem's position is contradicted by analysis conducted by Oxera[26] which concluded that *'the inclusion of Pennon had the same impact on re-levered equity betas across two-, five- and ten-year estimation windows. If Ofwat's (and now Ofgem's) concerns in relation to Pennon's historical non-water business were correct, then we would expect to see a larger impact of including Pennon under longer-term estimation windows'*

[25] Oxera (2024), 'RIIO-3 cost of equity-CAPM parameters', prepared for the Energy Networks Association, 8 November.
[26] Ibid.

Taking the above points into account, we believe Pennon plc should be included within Ofgem's comparators sample for estimating the beta.

Beta range

We consider a narrower beta range of 0.35-0.40 to better reflect the challenges that energy networks will face during RIIO-3. This is before applying an upward adjustment to reflect increasing forward-looking risks.

Ofgem stated in their SSMD *'[…] improving our assessment of forward-looking risk exposure by including European utility comparators, would likely increase our estimate of beta into the upper half of the 0.30 - 0.40 range, and to a level in excess of the beta used in RIIO-2. This change explicitly addresses the potential for a different risk profile in RIIO-3 relative to RIIO-2.'*

The scale of the capital programme delivery for RIIO-3 and beyond is likely to be the primary driver of changes in systematic risk. The scale of the required investment is likely to exacerbate exposure to risk factors including higher complexity of capital activity, higher uncertainty in ex ante cost forecasts, supply chain risk, input price risk, delivery risk and increased risk exposure relative to returns. Additionally, the proposed design of regulatory mechanisms, in particular the calibration of ASTI targets and penalties and caps and collars will likely represent a key determinant of asymmetric exposure. When analysing that level of asymmetric exposure from RIIO-2 to RIIO-3 in our risk section, you will see that the combination of scale of activity plus the balance of incentives and penalties mean we are exposed to material downside risk of a scale never experienced before.

Additionally, as mentioned previously, the electricity sector is entering a period of unprecedented capital demand. The calculation of beta will play a significant role in the determination of equity returns and will need to be set at a level that ensures investability of the energy sector. We have set out the change in risk separately for RIIO-3 to provide a forward-looking basis of measured risk based on the scale of activity, expenditure, and the residual risk after adjusting for Ofgem's regulatory mechanisms. When taken into account, this shows a material break in the level of risk which is to be expected given the material change in scale and complexity of activity in particular the delivery of mega projects and operation of a complex electricity network. Factoring in these points, we believe it is appropriate to narrow the beta range of 0.35–0.40 even before accounting for an upward adjustment to reflect the increasing risks that energy networks will face during RIIO-3.

Cross Checks

The evidence from market based cross checks suggests that the CoE required by investors is higher than Ofgem's SSMD CoE range.

UKRN guidance recommendation 7 encourages market-based cross-checking to the CAPM derived point estimate and permits departing from the mid-point when market evidence provides compelling evidence that the required Return on Equity differs from the CAPM point estimate. The cross checks we consider to be primary are set out below where we have summarised our evaluation of the weighting that should be placed on each cross check. This is based on the reliability or observability of the evidence, availability of academic and market evidence and whether it is a methodological change or is subject to material judgement. In all respects, each of the cross checks outlined below indicate the required return has increased significantly from RIIO-T2 and further supports the higher bound of Oxera's RIIO-T3 estimated range.

We believe that there is superior market evidence through observable cross checks which Ofgem should consider as part of setting the right allowed CoE. These include the comparison of risk premium attached to debt instruments compared to equity instruments (termed ARP vs DRP) and hybrid debt instruments. We also review cross checks Ofgem relied upon in RIIO-2 such as investment manager returns, and infrastructure funds returns which also illustrate a significant increase in the required return on equity.

Table 3: Summary of CoE Cross-Checks

Cross check	Weighting and Reliability
ARP vs DRP	This is a superior cross check as it is based on market data. Oxera[27] have addressed the empirical robustness of the ARP-DRP framework within the report prepared on behalf of the ENA. We therefore place more weight on this cross check when comparing to the CAPM estimate of the CoE
Hybrid bonds	Hybrid bond yields are derived from observable market data and can serve to calculate a lower bound of the CoE allowance, since the risk premium on a company's most risky debt instrument must still be lower than the risk premium on equity. This cross check is supported by strong market base evidence[28] and therefore merits more weight.
Investment manager forecasts	Investment manager forecasts are survey based therefore this cross check does not carry the weight of observable market evidence. The forecasted TMR drawn from a sample of investment managers is supportive of the higher CoE range proposed by Oxera. **Referenced in TMR section above.**
Infrastructure funds cross-check	The asset composition of infrastructure funds does not necessarily reflect the risk exposure of a pure-play energy networks; however, the latest fund survey data further supports the COE range proposed by Oxera.
MARs	Frontier's assessment[24] includes several limitations in the estimation and interpretation of MARs. This is not a reliable cross check, and little weight should be placed upon this by Ofgem when setting a price control.
Long-term profitability	This cross check is long-term in nature and can be utilised as a benchmark when assessing the appropriateness of the judgements made within the CAPM calibration. We would suggest less weight should be placed upon this by Ofgem when setting a price control.

We previously, in RIIO-2, did not advocate for the use of investment manager forecasts or infrastructure funds as a cross check. Ofgem did however use those cross checks to support their estimate, and we have therefore presented the updated evidence on that basis.

ARP- DRP

The ARP (Asset Risk Premium) DRP (Debt Risk Premium) framework remains a robust and reliable cross-check with regards to the appropriate calibration of the COE. The cross check was originally developed at the time of the RIIO-2 price control was premised on actual market observed debt yields rather than built up from a theoretical asset pricing model. Due to the security ranking of debt over equity, the rule must hold that the premium to equity holders is higher than for debt holders[29].

We refer to Oxera's ARP-DRP report[30] on behalf of the ENA, including the report previously submitted at the time of the SSMC[25]. Ofgem noted agreement on the broad principles of the ARP-DRP cross check within the SSMD however, did raise their wider concern regarding any debt-based cross check's ability to definitively prove or 'back solve' to a required return on equity[31]. As Oxera assert[26], '*the level of the ARP suggested by the framework provides a lower bound rather than a point estimate of required equity returns for a price control'*. Therefore, while ARP-DRP cannot produce the optimal return on equity; it can robustly narrow the CAPM CoE range.

Oxera's latest paper further addresses criticisms on the framework in response to previous stakeholder concerns noted at the point of final determinations and subsequent CMA appeals. Oxera illustrate how observations regarding measurement errors are immaterial to the result of the framework, explaining that the quantum of any differences certainly does not exceed those apparent in the application of the CAPM calibration. Indeed, the ARP-DRP cross check cannot be dismissed on the grounds of not satisfying a 'through the cycle' approach as the cross check robustly informs whether the specific values used as part of Ofgem's CoE range are sufficient. Our view remains that Oxera's results indicate that the Ofgem SSMD CoE range is too low.

[27] Oxera (2024), 'Evaluation of the ARP-DRP framework, prepared for the Energy Networks Association, 8 November.
[28] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.
[29] Oxera (2024), 'RIIO-3 cost of equity', prepared for the Energy Network Associated, 23 February.
[30] Oxera (2024), 'Evaluation of the ARP-DRP framework, prepared for the Energy Networks Association, 8 November.
[31] Ofgem (2024), 'RIIO-3 Sector Specific Methodology Decision – Finance Annex', 18 July.

The application of the ARP–DRP framework, taking account of recent capital debt market conditions, suggests that the appropriate point estimate of the CoE in RIIO-3 should as a minimum be set close to the upper end of Oxera's CAPM range of 5.70% to 6.83%.

Hybrid Bonds

Similarly, to the ARP-DRP cross-check, the Hybrid Bond cross check is derived from observable market data which makes this a robust indicator when assessing the appropriate COE range. When considering other robust and reliable cross checks in calculating the CoE, Frontier has provided compelling empirical evidence[32] relating to Hybrid Bonds of regulated networks and how the associated data informs the COE estimate.

The test is premised on the theory that hybrid debt holders rank before equity holders given hybrid debt ranks higher than equity but lower than senior debt. Frontier assert that the principle of risk aversion in finance would be violated if the risk premium on hybrid debt were higher than the allowed CoE spread at a given gearing. As such, Frontier have used hybrid bonds to calculate a lower bound of the CoE estimate, on the basis that the risk premium on a company's highest risk debt instrument must still be lower than the risk premium applied to equity.

In our SSMC response we referenced analysis provided by Frontier which empirically reviewed evidence of Hybrid Bond issues by NGG Finance Plc (NGG), a financing subsidiary of National Grid Plc, and by SSE Plc. The analysis particularly considered a hybrid bond issue for NGG given it serves as the bond with the longest time to the next call date. It was concluded that even the lower bound of this range sits at the higher bound of Oxera's implied COE estimate range. This indicates that the Ofgem RIIO-2 roll forward range assumes a TMR that is too low, or a CAPM beta incapable of producing results consistent with the hybrid debt evidence. In its methodology decision, Ofgem welcomed the approach using hybrids, but expressed concerns regarding the evidence provided, for example:

- Ofgem stated that Frontier's analysis focused on evidence from the National Grid June 2073 hybrid bond and made assumptions that may not apply to regulated networks.
- Ofgem also stated that hybrid bond yields cannot be consistently used to infer the right level of equity returns due to changing levels or inaccuracies.

We note that Frontier's latest paper further strengthens their findings whilst addressing Ofgem's points by:

- extending their sample size of hybrid bonds to those issued by European utilities to further test the representativeness of the National Grid bonds used; and
- considering data from that sample over a number of years to explore the time consistency of hybrid bond spreads.
- Implementing additional checks to test the robustness of their findings.

Frontier's latest analysis indicates a CPIH-real CoE range of between 5.8% and 8.4% with a midpoint of 6.6%. This supports the need for a point estimate in the upper bound of Oxera's proposed range.

Infrastructure funds cross checks

Infrastructure funds are investment vehicles that pool capital to invest in infrastructure projects like utilities, transportation, and energy. These funds often have long-term investment horizons and aim to generate stable returns. The main goal of cross-checks is to ensure that financial estimates, such as those used in regulatory decisions, are aligned with actual market conditions. By comparing the estimated returns (like IRR) with those observed in infrastructure funds, regulators can validate their assumptions and ensure they are realistic.

In RIIO-2, Ofgem collected discount rates from various infrastructure funds that invest in private finance initiatives and utility assets. They then calculated an IRR for each fund by adjusting the discount rates with the premium-to-net asset value (NAV) to account for the outperformance of the underlying assets. Ofgem averaged these IRRs to arrive at a nominal point estimate of 6.3%, which was then converted to 4.2% in CPIH-real terms.

In our SSMC response we included analysis conducted by Oxera and Frontier which updated the infrastructure funds cross check applied by Ofgem in RIIO-2 for the period to December 2023. The analysis suggested that funds and investors are demanding a higher rate of return than at the time of the Ofgem RIIO-2 analysis, indicating the need to deviate to the upper bound of the CoE range. In real terms, the

[32] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.

infrastructure fund managers analysis indicated a CoE of 6.5%, CPIH-real. This compares to a range of 5.08% - 6.48% estimated by Oxera for a 60% geared energy network as at 20 December 2023.

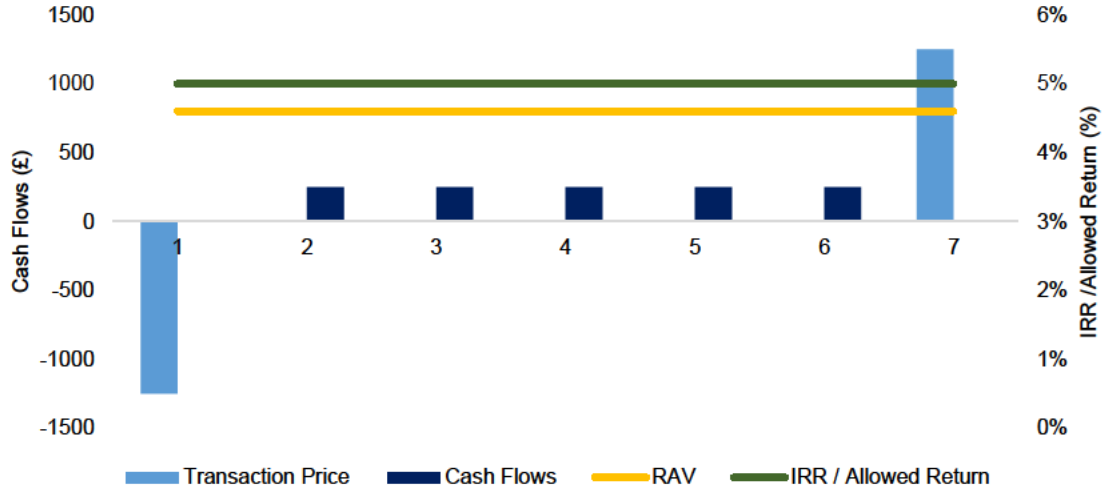
Frontier have subsequently updated their analysis[33] to reflect the latest data on discount rates for the relevant infrastructure funds. The monthly implied IRR for these funds increased from 6.0% in July 2020 to 10.1% in September 2024. Updated results drawn from infrastructure fund IRRs show a point estimate of 7.96%, which is also well above Ofgem's point estimate. We consider this cross-check most informative for informing on the potential scale of change in allowed returns over time, rather than the required level of CoE allowance. There has been a four-percentage point increase in this cross-check since Ofgem reviewed the evidence at RIIO-T2/GD2. This indicates that a more significant increase in the allowed CoE is likely to be required for RIIO-3 than Ofgem has so far been minded to provide.

Other cross checks

Other cross checks include MARs and Long-term profitability benchmarking. We refer to Frontier's updated report[29] on behalf of the ENA for the detail on those cross checks. These cross checks indicate a broader CoE range, and we advise less weight should be placed on them compared to other robust debt based cross checks. We note that Ofgem set out in the SSMD, its intention to continue to consider the MAR as one of its CAPM cross-checks. We do not believe that the MARs cross check should carry as much weight as other market observable cross checks due to a number of limitations regarding the estimation and interpretation of MARs and specifically transaction MARs. In particular, we draw attention to Frontier's updated cross check report[29] for the specific reasons why we do not agree that significant weight should be placed on MARs as a cross check of the proposed allowed CoE.

We have also reviewed the MARs evidence and find that it has been misinterpreted consistently or misused to overstate the investability of regulated assets. In particular, transaction prices for acquiring stakes or the entire share capital of a regulated utility is often quoted as being primary evidence that regulators have set the CoE too high relative to the underlying expectations of investors. This is an overstatement or the reliability of this evidence but more importantly, it is a misunderstanding of the basis of these transactions. Simply put, Figure 4 below shows that the price paid above the RAV is not the relevant reference to understand the level of returns expected by investors compared to CoE set by a regulator.

Figure 4: Stylised Example of how MARs transactions are misinterpreted



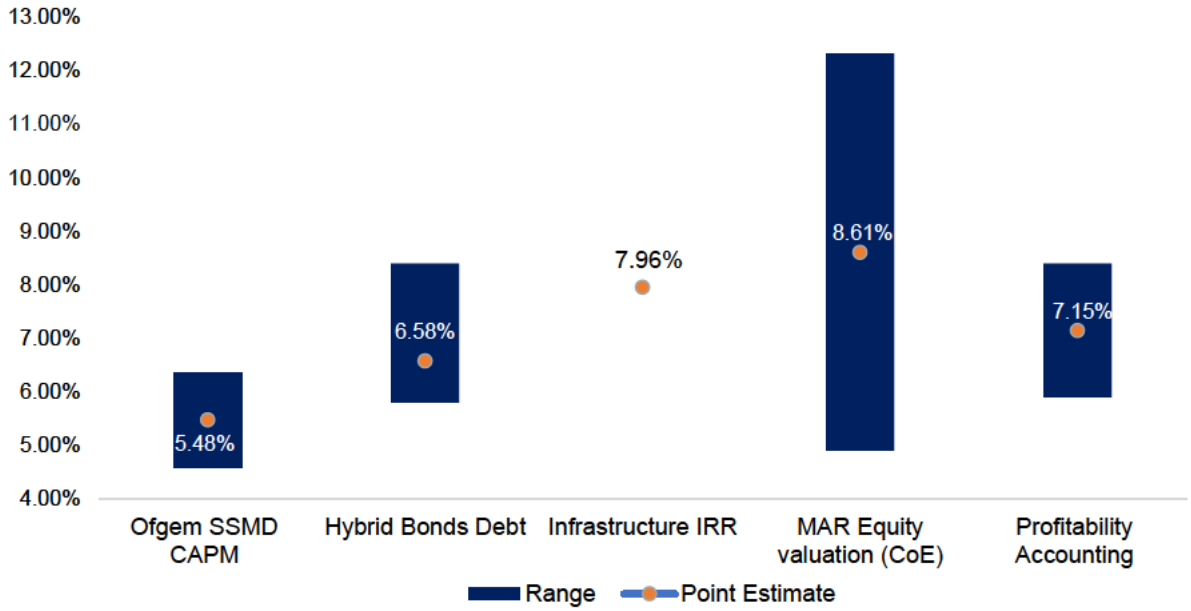
Source: SSE analysis

This graph shows that the relevant calculation to understand transactions for regulated utilities is in the purchase compared to the exit price. The graph illustrates the purchase price in year 1, annual cash flows, and then the exit price. This is then compared to the RAV on the graph and even though there is a premium paid above the RAV to acquire and exit for an investor, the IRR is equal to the allowed return over the period. Therefore, the fact there is a premium to RAV when acquiring or disposing of a regulated network is irrelevant whereby the full lifecycle of asset ownership and cash flows is required to understand if the historical CoE (not the future CoE) has been set too low or too high. Additionally, the MARs data points are only backward looking and not informative without assessing the lifecycle of the transaction, therefore is irrelevant as a cross check.

[33] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.

Summary of cross checks

Figure 5: Summary of CoE cross-checks (CPIH-real)



Source: Extract from Frontier (2024)[34]

The above figure clearly presents that a market informed CoE point estimate lies well above Ofgem's SSMD CoE range. The evidence wholistically illustrates a significant step change in the market environment since the RIIO-T2 price control was set. A material increase in allowed CoE is required for the RIIO-T3 price control.

The cross-check evidence that is considered in RIIO-3 needs to place due weight on a wider range of cross checks such as the debt-based cross-checks (specifically the enhanced ARP-DRP cross-check and Hybrid Bonds) and not simply rely on a roll forward of the RIIO-T2 approach to cross checks. Taken together, based on current evidence, the cross-checks considered above clearly show that Ofgem's SSMD CoE CAPM range would significantly underestimate the required CoE in RIIO-T3.

Additionally, each of the cross-checks previously considered by Ofgem suggest that the required CoE is now significantly higher than at the time of the RIIO-T2 final determination. This is evidenced by the infrastructure fund cross-check which now indicates a required CoE of over 3% higher (CPIH-real) than was indicated for RIIO-T2.

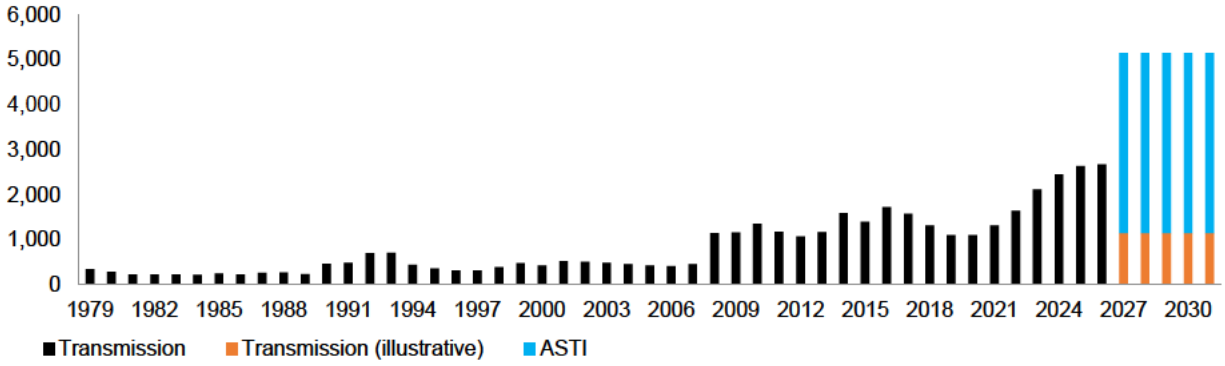
The overall finding of these updated cross-checks is that the CoE range proposed in Ofgem's SSMD step 1 CAPM estimation is too low. Furthermore, the midpoint of Ofgem's range will not satisfy the equity investability objective.

[34] Frontier (2024), 'Updated Cost of Equity Cross-Check Evidence', prepared for the Energy Networks Association, 22 November.

Measuring Forward-looking Risk

Ofgem has invited evidence to quantify forward-looking risk in their SSMD whereby they acknowledge that the CAPM is a backward-looking measure of risk that directly translates to changes in equity returns. Forward-looking evidence is therefore a key element to ensure that the risk-return relationship is appropriately calibrated whereby Beta is a base measure of risk. If it is deemed that the future mirrors the past, then the beta could be used as the core measure of future risk. However, this is not the case for electricity transmission and RIIO-T3, which requires unprecedented investment and the simultaneous delivery of mega projects. To assess forward-looking risk, we compared the risks in RIIO-T2 with those in RIIO-T3 primarily focused on the type and scale of capital projects being undertaken. Figure 6 below shows the material break in investment levels towards the end of T2 but particularly into T3.

Figure 6: Investment expenditure in GB electricity networks, historical data and forecast (in £m)



Source: Oxera analysis based on Ofgem publications.

Given the scale and complexity of the capital investment programme, we reviewed evidence of Mega Project delivery, and its associated risks compared to traditional capital projects. To fully assess the impact of this change in activity on risk, we have also evaluated the RIIO-2 regulatory mechanisms against the capital projects in delivery over RIIO-T3. We also considered, qualitatively, the evolving risks including the change in the complexity of network operations, such as new technology, and concurrent delivery and commissioning of multiple projects[35]. This comprehensive assessment highlights the increased risks in RIIO-T3 and quantifies the change in equity returns required to capture the increase in forward-looking risks that the backward-looking Beta does not.

SSEN Transmission will deliver a minimum of 10 Megaprojects under the ASTI and LOTI Regulatory regimes by 2030. This represents a significant step change in the types of projects being delivered in RIIO-T3.

The well-cited report by Flyvbjerg[36], a leading international expert within the field of programme management and planning, characterises a Mega Project as "*large-scale, complex ventures that typically cost more than 1 billion US Dollars, take many years to build, involve multiple public and private stakeholders, are transformational, and impact millions of people. They are a completely different breed of project in terms of their objectives, lead times, complexity, and stakeholder involvement*".

Evidence shows that mega projects are highly risky endeavours with the following characteristics:

- Cost overruns, time delays, and benefit shortfalls have remained high and constant for the 70-year period for which comparable data exist.
- Nine out of ten mega projects exceed their budget, with overruns above 50% not uncommon[37].

An independent review of the SSEN Transmission portfolio of ASTI and LOTI projects by Gardiner & Theobold confirmed that these projects display the characteristics of a Mega Project with SSEN Transmission delivering a minimum of **10 accelerated interdependent mega projects** under the ASTI and LOTI Regulatory regimes by 2030. These types of projects represent a **step change** in the type

[35] When considering the qualitative factors there is data and evidence available which demonstrates the increasing complexity of network operations such as the number of outages, change in technology, and other network operability challenges.
[36] Flyvbjerg, B. (2014). What you Should Know about Megaprojects and Why: An Overview. Project Management Journal, 45(2)
[37] Flyvbjerg, B. (2014). What you Should Know about Megaprojects and Why: An Overview. Project Management Journal, 45(2)

of projects being delivered by SSEN Transmission in comparison to those previously delivered in RIIO-T1 and RIIO-T2.

The considerable scale and complexity of the ASTI and LOTI projects result in a significant scarcity of applicable historical data for an accurate forecast using traditional Risk Forecasting Methodologies[38]. A base case project that was representative of this scale and complexity was required to build a view of risk from a bottom-up, quantitative assessment of individual risk items that could be used to extrapolate across the ASTI/LOTI portfolio.

This is based on industry best practice to measure project risk and EGL2 was identified as the most suitable base case project to build the assessment of risk across RIIO-T3. EGL2 is the first UK Transmission Infrastructure 'Megaproject' to be delivered by SSEN Transmission over the RIIO-T3 period. There was extensive engagement with Ofgem during the Project Assessment process including reviewing the approach and estimation of risk for the project including the Quantitative Cost Risk Assessment[39] (QCRA) output which was accepted by Ofgem through the Project Assessment Determination[40].

Gardiner & Theobald's independent benchmarking demonstrated EGL2 is well correlated to the size, scale and complexity of the ASTI and LOTI programme and its risk profile correlated well both onshore and offshore projects. Gardiner & Theobald's report also indicated the insights derived from EGL2 are not only project-specific but also representative of other projects. Gardiner & Theobald conclude *"EGL2 QCRA data's alignment with industry trends and insights from other projects solidifies its role as a practical standard within the ASTI framework."*[41]

Figure 7: Illustration of quantitative forward-looking risk methodology

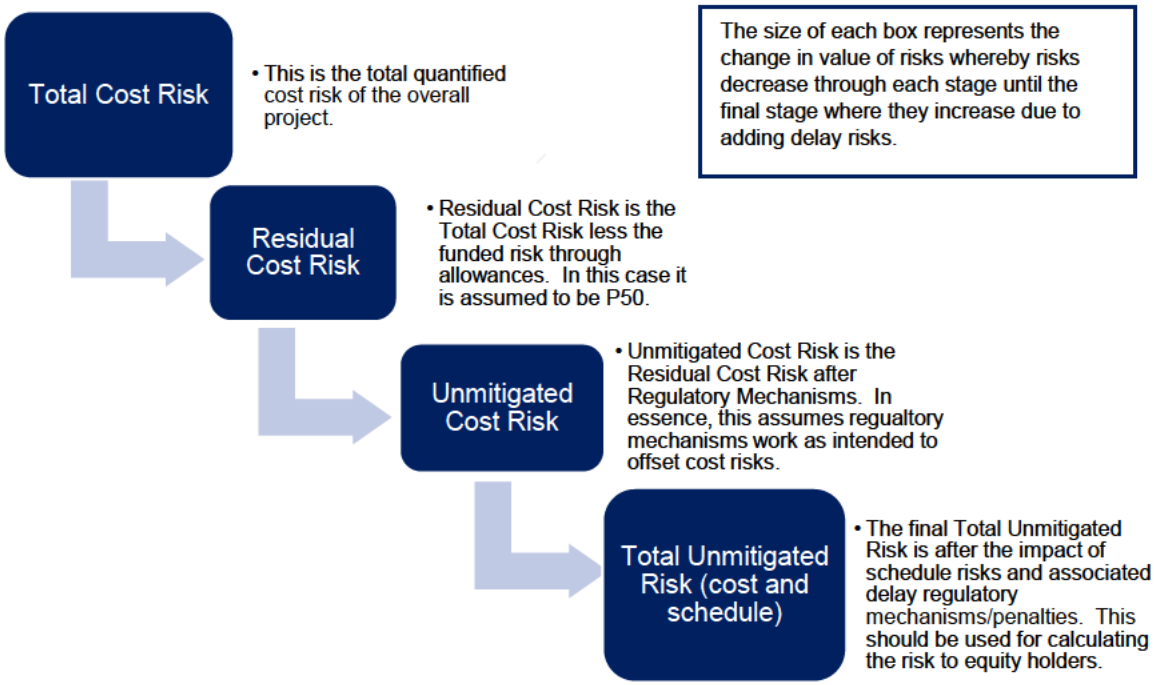


Figure 7 above sets out at a high level the methodology we have developed to quantify the Total Risk faced by a mega project and how this risk is mitigated through Regulatory cost protections and the overlay of Regulatory delay risks introduced through ASTI. We have utilised the EGL2 QCRA to develop a methodology. The components of the methodology are expanded on below:

- **Total Cost Risk** – Total Risk has been defined as the total modelled unmitigated risk faced by a standalone project. Total Risk has been modelled using the following components:

[38] Gardiner & Theobald (2024), SSENT Total Cost Risk Exposure Methodology Report, prepared for SSEN Transmission, November 2024
[39] QCRA's are industry standard best practice where the QCRA output is an assessment of uncertainty and risk as a 'modelled risk forecast.'
[40] Ofgem, EGL2 Project Assessment Final Determination (2024)
[41] Gardiner & Theobald (2024), SSENT Total Cost Risk Exposure Methodology Report, prepared for SSEN Transmission, November 2024

- **Residual QCRA** – The P50 ex ante residual risk is a statistical metric designed to estimate the median level of risk in a project prior to the application of any risk reduction measures. It provides a probabilistic assessment, indicating a 50% chance that actual risks may either exceed or fall below the estimated risks, thereby offering a balanced perspective on potential risk outcomes. In modelling the unmitigated risk exposure for the P50 ex ante residual risk, the analysis strategically employs only the most likely and maximum scenarios concerning both cost and probability. This selective approach purposefully omits the minimum value estimates to focus more critically on scenarios where unmitigated risks could emerge, particularly if risk mitigation strategies underperform[42]. This methodological choice gears towards preparing for less optimistic scenarios and is aimed at quantifying the risk exposure that surpasses the coverage agreed with Ofgem. The use of the Monte Carlo[43] approach is well-supported by both academic research and industry practices. "Risk Analysis: A Quantitative Guide" by David Vose who underscores the effectiveness of the Monte Carlo method in integrating diverse risk scenarios, from the most probable to the extreme[44].
- **Residual QCRA - Risks not included in P50** - Risks lower than 10% probability under £50m were excluded from the P50 ex ante risk provision but are still risks on the projects risk register. Monte Carlo scenario analysis provided a range of outcomes of these risks for inclusion in this.
- **Currency Exposure** - Uncertain costs risks were costed at a net GBP rate during project assessment. Whilst EGL2 currency risk is partially mitigated by a hedge option, this only partially limits the downside but does not remove the risk of movements or imperfect alignment of the option and the cost occurrence. It is also uncertain whether this approach will be adopted for the rest of the portfolio. Significant currency movement are more likely due to the length of time the ASTI and LOTI projects are under construction. The residual risk is quantified by linear interpolation of a three scenarios P0:1%. P50: 5%, P100: 20% unfavourable currency movement.
- **Commodity Risk Exposure**. - Standard contract terms where commodity risk is being passed to the Employer introduces risk to the TOs in the event there is no regulatory mechanism to recover increased costs.

- **Residual Cost Risk** – Is defined as the risk that remains after accounting for the allowances awarded as ex ante risk.
- **Unmitigated Cost Risk** – Residual Cost Risk is further mitigated by regulatory cost protections as follows: Price Adjustment Mechanisms (PAMs) which are intended to cover cost escalations stemming from input price pressure on commodities and we have assumed this mechanism will be available for all future ASTI and LOTI projects; the cap and collar on over and underspends which was introduced at 5% of approved totex for EGL2 and we have assumed in this analysis will be part of all future ASTI and LOTI projects; cost reopener mechanisms; and lastly the Totex Incentive Mechanism (TIM) which shares any overspend with consumers. This analysis assumes 36% TIM for RIIO-T2 and 25% TIM for RIIO-T3.
- **Total Unmitigated Risk** - Unmitigated Cost Risk is further refined by adjusting for regulatory delay mechanisms which expose investors to cost risk. These are Output Delivery Incentives (ODIs) to account for delivering ASTI on time. There is also the additional risk associated with licence breach for late delivery defined as the Licence Obligation (LO) date. This leaves the Total Unmitigated Risk investors are exposed to on projects covering both cost and schedule risk after accounting for regulatory mechanisms. This analysis assumes the following:
  - **ODI penalties** - ASTI introduced for the first time the potential for incentive and penalty linked to delivery dates. Late delivery in line with the regulatory regime have been modelled where P0 is the maximum incentive and P100 is the maximum penalty available across the portfolio.
  - **Licence Breach** - The ASTI regime has introduced tighter conditions that make a licence breach more likely and easily enforced. Licence breach to its fullest extent has been excluded from the base modelling due to modelling limitations and the extreme impact it would have. However, the

[42] Gardiner & Theobald (2024), SSENT Total Cost Risk Exposure Methodology Report, prepared for SSEN Transmission, November 2024
[43] Monte Carlo modelling is an analytical process which evaluates a range of potential outcomes by incorporating scenarios based on the project team's assessments of the most likely, minimum, and maximum cost estimates along with their probabilities. This method ensures a comprehensive capture of the broad spectrum of potential project risks.
[44] Gardiner & Theobald (2024), SSENT Total Cost Risk Exposure Methodology Report, prepared for SSEN Transmission, November 2024

risk of a potential licence breach determination introduces further asymmetric uplift of risk to Equity Investors.

Findings on Impact of T3 Regulatory Mechanisms

Analysis of the impact on Unmitigated Cost Risk of regulatory mechanisms does demonstrate that the steps taken by Ofgem as part of ASTI have the effect of reducing the risk TOs are exposed to on a like-for-like comparison to the RIIO-T2 regulatory mechanisms. This leads to a lower proportionate residual risk in RIIO-T3. This is driven by a reduction in cost risk exposure due to various new regulatory mechanisms, which has been substantially offset by the introduction of significant exposure to delay risk through the new ODI regime for ASTI for late delivery of projects and licence obligation enforcement conditions.

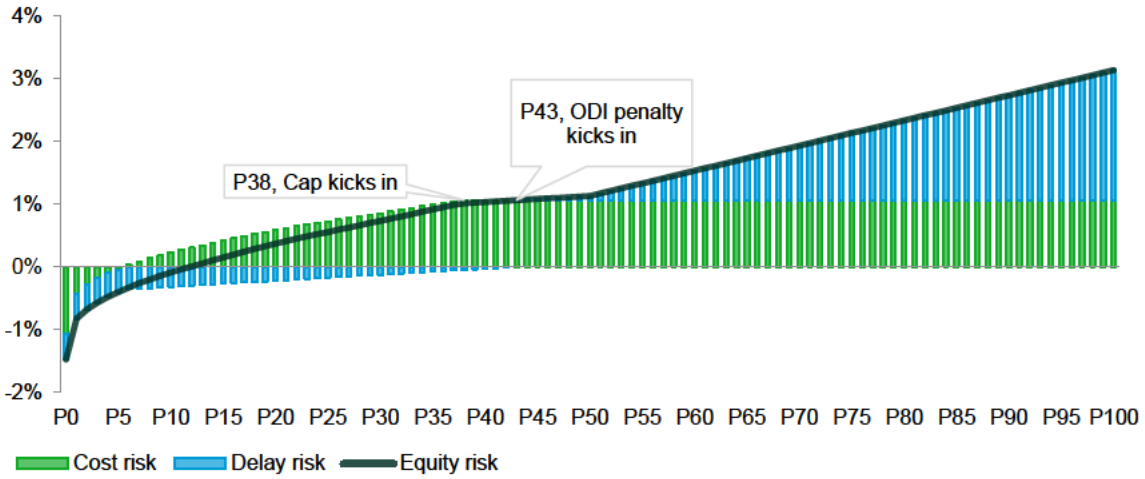
Forward-looking Risk Expressed as Equity Risk

The value of the Total Unmitigated Risk under each price control period can be estimated as a value by multiplying the Total Unmitigated Risk percentages by the corresponding amount of capital expenditure relating to large strategic projects which will be subject to ASTI/LOTI regulatory mechanisms. Due to the significant value of expenditure in the RIIO-T3 period, the level of risk exponentially increases meaning that while the RIIO-T3 mechanisms have had a desired effect of reducing risk compared to RIIO-T2 mechanisms the scale and complexity of activity leads to an absolute increase in risk. Equity investors are therefore exposed to additional risks introduced by ASTI and LOTI as they are not covered by the RIIO-T3 price control through regulatory mechanisms[45].

To quantify the impact of Total Unmitigated Risk on required equity returns the Total Unmitigated Risk value is divided by the portion of RAV which is financed by equity (i.e. Total Unmitigated Risk / (RAV x (1 – gearing) = Equity RAV)). Figure 8 illustrate how the RIIO-T3 mechanisms impact the equity risk. Figure 8 represents the distribution of potential outcomes following this methodology which utilises best practice in risk management for project delivery. This quantifies the contribution given by each risk and regulatory mechanism to RIIO-T3 equity risk over the full modelled range of probability.

Although Figure 8 demonstrate the reduction in risk that has been achieved by Ofgem's introduction of new regulatory mechanisms assuming they work as expected, the equity risk remains significantly asymmetrically skewed to the downside. Equity investors would only earn the required level of return if there is a less than 12% chance of these risks occurring. In essence, equity investors are bearing significantly greater equity risk over the RIIO-T3 period and in 90% of occurrences they are materially undercompensated[46].

Figure 8: Decomposition of T3 equity risk over the 5 year RIIO-T3 period



Source: Oxera Analysis[47]

[45] This assumes that the relative risk of RIIO-T2 and RIIO-T3 projects exhibit same probability of risks occurring. We believe this is a prudent assumption as the RIIO-T2 projects are not of the size or complexity of ASTI and LOTI projects in the RIIO-T3 period.
[46] Oxera (2024). RIIO-T3 risks and implications for return on equity allowance, prepared for SSEN Transmission, December 2024.
[47] Oxera (2024). RIIO-T3 risks and implications for return on equity allowance, prepared for SSEN Transmission, December 2024.

The modelling in Figure 8 above has not accounted for the risk associated with a licence breach if projects are delivered later than planned for reasons outside of the TO's control. It is straightforward to quantify the maximum risk exposure of licence breach as the maximum penalty is known. However, it is challenging to estimate the probability with which such scenarios would occur which would require mapping of the full probability distribution curve associated with extreme delay risk. However, such events clearly have the scope to materially increase project risk, and ultimately to influence the risk exposure that equity investors face, as well as the risk of undermining investability and financeability over the period.

[redacted]

[48] Ibid.

[redacted]

[redacted]

[redacted]

The modelled risk Equity investors are exposed to does not capture the full extent of the interdependent portfolio risks and modelling limitations which could increase the top end of the range further. Delivering the ASTI and LOTI projects introduces additional complexities and portfolio challenges not captured by the Flyvbjerg report:

- **Concurrent mega project delivery with significant interdependencies** alongside regional smaller projects with complex interfaces and interdependencies.
- **Accelerated** design and delivery, with delivery and commissioning at a scale and pace that has never been done before. There are no comparable portfolio examples globally of mega projects being delivered on the same scale or accelerated pace.
- **Emergent system and grid stability requirements** due to the move from stable base generation to highly variable and intermittent generation.
- Utilisation of **novel technologies not yet in service anywhere in the world**.
- High dependency on **limited global supply** chain with significant intellectual dilution and resource constraints.
- **Portfolio wide risks** that cannot be adequately accounted for, nor managed by, individual projects
- **Fundamental network design/operation change of the transmission network in Scotland;** delivery and **co-ordination of planned outages** whilst ensuring uninterrupted energy supply to the UK.

SSEN Transmission are facing a significantly increased portfolio exposure to cost overruns that would not be captured in individual project QCRA's and therefore the portfolio risk borne by equity investors requires compensation through higher returns.

Limitations

The following limitations of the modelling have not been included:

- Licence breach has not been included in its fullest extent. The ASTI regime has introduced tighter conditions that make a licence breach more likely and easily enforced. As licence breach would be per licence condition, each ASTI project has the risk of licence breach up to the maximum 10% of annual turnover. Including licence breach to the fullest extent would have such an extreme impact that was felt to be highly unlikely a single licence breach of 10% annual turnover at P100 was included.
- The assumption of a 1% Cost and Output Adjusting Events project threshold potentially understates the exposure to scenarios where significant events occur that satisfy the conditions of a COAE but falls under the financial threshold. There is provision within the ASTI licence condition for cumulative events to be recovered under a single COAE at Ofgem discretion, however this provision has not been tested in practice.

[49] Oxera (2024). RIIO-T3 risks and implications for return on equity allowance, prepared for SSEN Transmission, December 2024.

- Efficient expenditure challenge ex post presents additional risk not currently modelled. There is reasonable evidence in the sector where c4% of project cost has been disallowed. This poses a significant risk to the TO's that expenditure incurred could be challenged ex post. An example of this could be where expenditure has been incurred to mitigate a risk, but the risk still occurs, with the benefit of hindsight this could be deemed as inefficient and disallowed.

Conclusions

The context of the concurrent delivery of a minimum of 10 interdependent mega projects is essential for RIIO-T3. Furthermore, Flyvbjerg[50] recognises the impact of mega projects in terms of scale relative to business size where 'some projects are now so big and **consequential to individual businesses** and agencies, that cost overruns, benefit shortfalls, or risks may bring down executives and whole corporations'. Flyvbjerg[51] concludes 'The 'iron law' of Mega Projects: Over budget, over time, over and over'.

We recognise that not all projects will incur the full modelled outturn for cost and/or time delay. However, taking into account the statistical evidence that 90% of projects are likely to incur difficulties and therefore there is a need to increase equity returns to compensate for that additional risk. Alternatively, Ofgem would need to introduce new mechanisms or refine existing mechanisms in RIIO-T3 to protect TOs from the heightened risks. The evidence for measuring forward-looking risk and its impact on equity returns is comprehensive, underpinned by best practice, and factors in regulatory protections.

We have quantitatively assessed the risk and return in the regulatory framework for RIIO-T3. Our analysis shows that Ofgem will need to significantly increase its CoE range and point estimate to reflect forward-looking risk, by at least 1-3%, especially when considering the concurrent delivery of multiple mega projects and associated operational, commissioning, and outage management risks.

It would therefore be reasonable for Ofgem to increase the allowed return on equity (CoE) by at least 1%-3% compared to a rolled forward RIIO-T2 baseline. This can be translated as being at least 1% above the mid-point of Ofgem's CAPM range of 5.5%[52] and therefore our proposed 6.5% is the absolute minimum requirement to compensate for risk.

[50] Flyvbjerg, B. (2014). What you Should Know about Megaprojects and Why: An Overview. Project Management Journal, 45(2)
[51] Flyvbjerg, B. (2014). What you Should Know about Megaprojects and Why: An Overview. Project Management Journal, 45(2)
[52] We do not accept Ofgem's CAPM methodology or CoE range as set out in SSMD. This is simply for illustration that if one were to agree with the mid-point estimate CoE set out in SSMD then when factoring robust evidence on forward looking equity risks, this should be at least 6.5%.

Cost of Debt (CoD)

Debt forms a larger proportion of the capital structure of an energy network. The CoD must be remunerated as an allowance (i.e. interest cost) covering efficient financing costs of both embedded and new debt. Ofgem has provided its minded to methodology for the calibration of the CoD allowance in its SSMD, with certain aspects to be decided at Draft Determination (DD) and Final Determination (FD). This section provides our updated view on these working assumptions. Our position essentially remains same as our response to SSMC, however, we elaborate on the following areas that we believe, if not treated properly, create a risk of calibrating an insufficient CoD allowance, affecting the financeability of the industry.

- **Trailing Average and Calibration Premium:** We have presented strong evidence that Ofgem need to add a premium to the trailing average of the index, similar to ED2, to ensure the financeability of investments. The RAV weighted methodology should only be based on individual company RAV profiles.
- **Calibration Design:** The calibration of CoD should not be skewed towards the largest TO. Any sector that is different in nature and amount of capital investment needed should not be considered in the calibration. We also see no reason to remove intercompany loans from the calibration when licence conditions prohibit cross subsidy, and all of our loans are at arm's length based on market rates.
- **Additional Borrowing Cost**: Transaction cost for the sector is higher than current 25bsp and should be compensated appropriately. There is no proof that a negative halo effect does not exists, especially given the abundance of evidence to the contrary.
- **Inflation Treatment**: Notional company Indexed Linked Debt (ILD) assumption should be aligned to the actual company ILD portions to fully eliminate the leverage effect and to avoid the assumption being skewed towards the largest TO.

This response is based on our own analysis, independent study conducted by Oxera[53] on CoD calibration, and a study undertaken by NERA[54] on behalf of ENA on additional borrowing costs.

Trailing Average and Calibration Premium

We believe that a 14-year trailing average of the iBoxx GBP Utilities 10+ index weighted by individual company RAV additions and refinancing is an appropriate matrix to calculate the CoD allowance. But the evidence indicates that the trailing average of the index alone will not fully fund the cost of embedded and new debts under varying interest rates scenarios.

Ofgem should add a premium to the trailing average to fairly compensate the CoD in addition to the borrowing cost.

Oxera conducted an analysis on behalf of SSEN Transmission comparing the CoD allowance of Ofgem's proposed T3 methodology with the estimated CoD of the notional company. This comparison was made by applying the actual company debt issuance profile to the notional company working assumptions given by Ofgem in its SSMD. This analysis excluded the benefits of the actual company from the embedded debt, which resulted from our own financing decisions. It also aligned the timing of the notional company's debt issuance and refinancing in RIIO-T3 with that of the actual company. The forecasted CoD allowance was calculated based on a forward curve for 10-year UK gilts (with a cut-off date of end-of-June 2024) and a three-year historical spread between 10-year gilts and iBoxx Utilities index.

[53] Oxera (2024), 'RIIO-3 allowed return on debt and financeability', prepared for SSEN Transmission, 9 December.
[54] NERA (2024), 'Additional Cost of Borrowing for the RIIO-3 Price Control', prepared for Energy Network Association, 22 February.

[redacted]

[redacted]

RAV-weighted indexation should be based on individual company RAV and RAV additions.

Using a CoD weighted by anything other than the individual company RAV would not accurately reflect a licensee's financing profile. This is due to the varying sizes of the existing networks, geographical considerations, and individual investment needs related to the energy transition. Given the composition of the Electricity Transmission (ET) sector and the size of respective TOs, a sector total/average could skew any allowance towards the largest TO. A methodology weighted on individual company is consistent with the methodology used for SSEN Transmission in RIIO-1 and RIIO-2.

The assumed refinancing period should be based on the trailing average length at the time at which the original debt was raised. For example, given the RIIO-1 trailing average length of 10 years, RAV additions from RIIO-1 should be refinanced after 10 years (i.e. RAV additions in 2014 should be refinanced in 2024, and so on). This alignment ensures that the CoD allowance is consistent with the historical requirements set on the notional company.

Calibration Design

The calibration determines the average actual CoD of licensees and acts as a cross check. It verifies whether the trailing average of the index is sufficient to fund the cost of both embedded and new debt, and whether a calibration premium is necessary. But this will only be the case if Ofgem accurately calibrates the average CoD. The trailing average cannot be reliably cross-checked against any CoD that is biased in favour of the largest TO, that excludes vital debt instruments essential to the financing structure of a TO or includes operators other than ET that vary in risk and the extent of their capital commitments.

An ET-only cohort disregards varying RAV growth rates and disproportionate sizes of individual TOs, thereby skewing the CoD allowance towards the largest TO.

By the end of RIIO-T3, the largest TO will be 2.4 times bigger than SSEN Transmission and 5 times bigger than the smallest TO in terms of Regulated Asset Value[56]. An average of such a cohort with substantial disparities in size, is unfair and biased. We therefore believe that Ofgem must be careful when assessing the CoD for ET on a pooled basis. There may be a need for different financial parameters across TOs

[55] Oxera (2024), 'RIIO-3 allowed return on debt and financeability', prepared for SSEN Transmission, 9 December 2024.
[56] Based on individual licensee RFPR submissions in September 2024

which would give rise to different RAV growth rates in addition to the varying sizes and existing debt profile of TOs.

Including Electricity Distribution (ED) companies is not appropriate given the disparity of RAV growth and the size of capital investments in two sectors.

ET companies are set for exponential growth with larger capital investments. While ED companies are also a key part of the value chain, the amount of risks each sector will take in terms of investments differ significantly. Including ED companies in the ET cohort appears to be an attempt to artificially lower the CoD allowance rather than to remove outliers. The ED subsector has a size disparity similar to the ET subsector. Therefore, including ED companies will not result in a debt pool that is more efficient than one that includes only ET companies.

We continue to believe that intercompany loans should be limited to short term intercompany trade balances.

Licence condition "B5: Prohibition of Cross-Subsidies" ensures that any intercompany debt is issued at arm's length and with competitive costs, terms and conditions. Any debt issued otherwise is potential breach of this licence condition. These conditions are clearly stated and audited during annual cross subsidy return fillings. We, therefore, see no reason for Ofgem to remove them from the calibration due to financial ring fencing.

Additional Borrowing Cost

Our view on the additional borrowing cost remains consistent with our SSMC response, where we have based our position on an analysis carried out by NERA on behalf of the ENA[57], which reviewed Ofgem's RIIO-2 methodology on additional cost of borrowing. The summary of our position is presented in the Table 4.

Table 4: NERA summary of Ofgem analysis compared its own (bps)

	Ofgem RIIO GD/T2 & ED2	NERA (Feb 2024)
Transaction Costs	6	6
Liquidity/RCF costs	4	13
Cost of carry	10	12
CPIH premium	5	18-23 (21)
New Issue Premium	0	5
Additional Cost of Borrowing	**25**	**54-59 (57)**
Small Company/Infrequent Issuer Premia	6	10-18 (14)
Total	**31**	**64-77 (71)**

Source: NERA's Analysis on Additional Borrowing Cost

Detailed explanation on the points mentioned in Table 4 is included in our SSMC response and NERA's report submitted alongside it. We have highlighted below the key points that we still wish to emphasise on additional borrowing cost.

Ofgem's decision to disregard NERA's analysis of the negative halo effect is unjust when there is ample evidence in the market that indicates the existence of a New Issue Premium (NIP).

Similar to previous price controls, Ofgem has stated that NERA's halo effect analysis is unreliable and Ofgem intend to conduct its own analysis. Ofgem's analysis of the halo effect in previous price controls was flawed as it was based on an incorrect methodology. As stated in NERA's report, these issues include Ofgem's spreads not being precisely controlled for tenor, the exclusion of relevant bonds issued by SSE from its sample, and the inclusion of callable bonds. Conversely NERA's analysis on the existence of negative halo effect aligns with other prevailing market evidence:

- The Civil Aviation Authority (CAA) allowed a 15bps p.a. NIP during the H7 price control for Heathrow, in line with the midpoint of Heathrow Airport Limited's submitted NIP range (10-20bps)

[57] NERA (2024), 'Additional Cost of Borrowing for the RIIO-3 Price Control', Prepared for Energy network Association, 22 February 2024.

and CAA's own analysis. The CAA stated that "*The use of secondary market yields means that we must also consider whether it is appropriate to apply a New Issue Premium*"[58]

- Recent macro-economic developments indicate a premium for primary markets. Factors include central banks reducing demand for corporate bond purchases, private bond investors reducing participation in primary markets due to an increased cash holding requirements, and investors demanding higher NIP to compensate for greater market volatility.
- Price breaks for significantly sized tranches have been observed in a number of recent European bond issues[59], where a price break based on the size of the bond was baked into the NIP. For example, two corporate green bonds issued by EnBW worth EUR 1.5b in Nov 2024 included a 9psp NIP. A EUR 3bn senior green multi-tranche bond issue by Electricite' de France in June 2024 included 20bps NIP. Both these bond issues included price breaks for the size of the bond issued, despite them being multi-tranche deals.

We therefore strongly believe that Ofgem should reconsider its approach and include a NIP in line with evidence prevailing in the market.

Ruling out additional costs for increased financial resilience measures without analysing their actual impact is not appropriate.

Ofgem has implemented additional financial resilience measures, including an extended commitment on funding under Availability of Resources. Although Ofgem claims that the increased funding requirements are based solely on assumptions, asking for funding far in advance alters Going Concern assessments and puts undue strain on financial ring-fencing. This may result in earlier funding requirements, increasing the Cost of Carry. Therefore, transaction costs need to be increased to account for such commitments.

Inflation Treatment

Ofgem proposed three options to remedy an alleged leveraging effect caused by a potential mismatch between outturn inflation used for indexing the RAV and forecast inflation embedded in the CoD allowance. Out of three options, Ofgem decided to implement Option 1, which involves switching from a real allowed return to a nominal allowance for the fixed-rate debt portion of the RAV. However, this implementation will align with notional assumption of Indexed Linked Debt (ILD) portions, which currently stands at 30%.

Notional company ILD assumption need to be aligned to the actual company ILD portions.

Two of the TOs hold either zero or negligible amounts of ILDs. Although the largest TO holds ILDs closer to notional assumption, it is reducing its estimations to c.20% for future periods. Therefore, the actual average within the TO cohort is significantly lower than the notional ILD assumption and Ofgem's decision not to change it is wrong. Moreover, using the average of the TOs as the notional assumption is also inappropriate because it will be significantly skewed towards the largest TO. It will indicate that Ofgem expects other TOs to match their ILD portions to the largest TO. Aligning the ILD assumption with the actual company ILD portions will enable a smooth transition to the notional allowance for fixed rate debt (FRD). This will avoid skewing the assumption towards the largest TO and allow flexibility for TOs to make their own financing decisions.

Ofgem's decision to implement Option 1 in line with the notional capital structure contradicts the purpose of the inflation treatment.

The actual portions of ILDs vary significantly across TOs and are materially different to the current notional assumption. The leverage effect is not fully eliminated when the actual company ILD portion significantly differs from the notional assumption. For example, over 95% of SSEN Transmission's RAV is currently funded by FRDs without any ILDs. When implemented with the notional capital structure 16.5% of SSEN Transmission's RAV (30% * 55%) will still be indexed for inflation, even though the relevant debt portion remains fixed. Therefore, the mechanism will still result in excess RAV growth, leading to what Ofgem has defined in the SSMD an "unearned return" that consumers have not paid a fair price for. The implementation contradicts with the sole objective of the remedy, as it leaves room for a leverage effect and thereby generates potential out/under performance for equity.

58 CAA (March 2023), H7 Final Decision, Section 3: Financial issues and implementation, CAP2524D, para 9.176.
59 Internal analysis supported by Morgan Stanley

Other Financial Parameters

This section sets out our views on Asset Lives, Treatment of Tax, Return Adjustment Mechanisms (RAMs), and Pension Costs.

Asset Lives

Ofgem's SSMD highlights two key areas of concern regarding asset lives: intergenerational fairness and the need to reflect annual and economic investments. We discuss these points along with evidence to support our belief that asset lives for new RIIO-T3 onwards additions should be reduced from 45 years (SSMD proposal) to 35 years (SSEN Transmission proposal). With the key themes being:

- Average technical lives are lower for new assets due to increasing proportion of offshore and near shore assets
- Fairer intergenerational balance of charges and NPV value to consumers
- Supports financeability and investability requirements and is reflective of investor expectations of payback periods
- Consistent with Ofgem recent decision for onshore competition which set a revenue period of 35 years for investability reasons.

Average technical lives are lower for new assets due to increasing proportion of offshore and near shore assets

A key driver for the need to reduce asset lives is due to the make-up of the RIIO-T3 capex profile. The proportion of offshore assets in the RIIO-T2 period was circa 35% and this is expected to increase to circa 65% over the RIIO-T3 period based on our latest forecasted capex profile. The reasoning for this reduction in asset lives is that offshore assets naturally have shorter assets lives in comparison to onshore assets due to their proximity to the coast. This results in higher corrosion rates reducing the asset life considerably. Our SSEN Transmission analysis shows the correlation between assets with a proximity to the coast-driven from the altitude of the assets and the corrosion zone per the UK galvanisation map against the expected life of these assets. This has been performed over the current transformer assets pool with the expected average life calculated using the formula below:

Figure 12: Expected Average Life Calculation

$$L_E = \frac{L_A}{F_{LSE} \times F_{DY}}$$

$L_E = Expected\ Life$

$L_A = Expected\ Average\ Life$

$F_{LSE} = Location, Situation\ \&\ Environment\ factors$

$F_{DY} = Duty\ Factor$

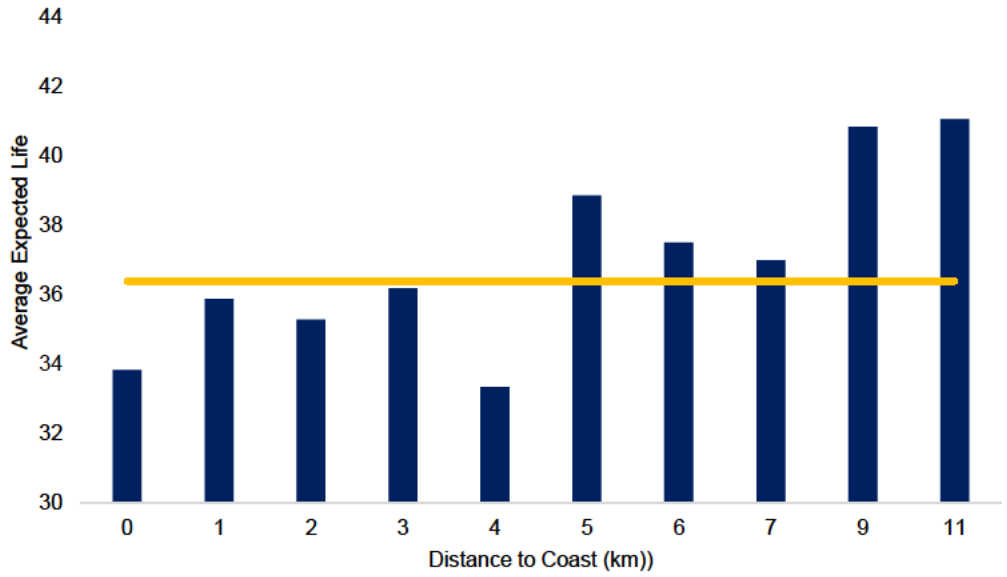
The Expected Asset Life is the time (in years) in an asset's life when it would be expected to such deterioration that it is likely to exhibit functional failure. The determination of the LA considers factors such as original specification and manufacturer data.

Source: Network Asset Risk Matric (NARM) Methodology

This formula calculates the expected asset life based on the aforementioned altitude of the asset location and the corrosion zone factor from the UK galvanisation map. According to the galvanisation map, areas closest to the coast have the highest corrosion levels, resulting in shorter asset lives that the designed specifications.

The graph below shows the expected lives of SSEN Transmission's current transformer assets in relation to proximity to the coast. This highlights the life of offshore assets is lower than onshore assets, indicating the need for a shorter regulatory asset life for these assets.

Figure 13: Expected Average life of Existing SSEN-T Transformer Assets within 11KM of Coast



The above data shows a clear trend; assets closer to the coast have shorter expected lives due to higher risks of corrosion and deterioration.. During the RIIO-T2 period, the average life of transformers within 11km of the shore was out-turned at 37 years. This reinforces the point that offshore assets will have shorter asset lives compared to onshore assets, and therefore, this should be a key area for Ofgem's review.

This analysis is limited to the metrics mentioned in the formula above. However, working closely with our investment replacement team, we are aware of additional conditions and metrics that further deteriorate these assets, reducing the asset life even more. From previous price controls, we have observed assets being replaced at a quicker rate than that specified as the design life, often earlier than the 35 years calculated above. The table below shows a list of assets which have been replaced due to the aforementioned environmental impacts and their ages at the time of replacement.

[redacted]

In the periods that these assets were replaced at a faster rate, consumers benefited from cheaper bills, that generations would pay for due to Ofgem's notional asset life not aligning with the actual asset life for these projects. With more offshore projects coming in RIIO-T3 than ever before, now is the time for Ofgem to review the policy and submitted evidence submitted, rather than assuming a roll forward from the previous price control is sufficient.

Based on real-world examples of offshore asset replacements, it is evident that asset lives are significantly shorter than the 45-year regulatory asset life set in RIIO-T2 period and lower than the expected life calculation above. The average asset life is closer to 30-35 years for offshore assets. Using the proportional split stated above, with offshore assets at 30-years useful life and onshore assets at a useful life of 45-years, the average asset life would be closer to 35 years.

Therefore, based on the evidence above, supported by Ofgem's RIIO-T2 decision, the asset lives for new additions should be 35 years. This reflects the useful lives of the assets, considering the split between onshore and offshore projects for the RIIO-T3 period.

Response to CEPA areas of consideration

Ofgem's proposal in the SSMD for asset lives to remain at 45 years is based on the analysis provided by CEPA, who have raised areas for further consideration.

The first area for consideration is the technologies which will be widely deployed during the RIIO-T3 period and beyond, which have a shorter asset life than traditional network assets. These include subsea cables, digital equipment, and HVDC converters. The RIIO-T3 period is unlike anything previously seen in the Transmission sector, marked by the different types of assets required to improve the network and meet the Net Zero targets. SSEN Transmission differs from the other TOs due to its extensive use of subsea cables to connect to the Scottish Islands especially at the North of the country.

HVDC cables are one example of the new type of asset being used in the RIIO-T3 period. These assets have a specified design life of 40 years in line with industry standards and guidelines (CIGRE TB 852). Therefore, CEPA must consider these asset types at the stated design life which is lower than the average life of 55 years determined in the CEPA analysis.

The second point for consideration is assigning different asset lives across TO's due to proportion of different types of assets. As previously stated, the assets being built in RIIO-T3 vary significantly from those in RIIO-T2 for SSEN Transmission. There is a larger proportion of offshore assets required and given their location to the coast compared to the other TOs, the assets will have shorter lives based on the evidence provided above. These assets located on the coasts in the northern parts of Scotland are subject to more adverse weather conditions and higher corrosion levels which reduce their asset life. **CEPA's data does not take account for this in their analysis and considers the collective data from all TOs.**

Previously we have seen Ofgem allow different treatment for TOs regarding asset lives, and we believe RIIO-T3 should be no different, as evidenced by the facts stated above. This would allow asset lives to align with the actual company, creating a more accurate treatment for RAV depreciation. To gain the benefits of a reduced asset life quicker, Ofgem should allow TOs to move to a 35-year treatment immediately instead of a gradual step-down effect as seen previously. This would help alleviate financeability pressures at the earliest opportunity.

Fairer intergenerational balance of charges and NPV value to consumers

The reduction in asset lives will provide intergenerational fairness, due to a reduced RAV netting off the impact of reduced asset lives. Based on the scenarios tested in the SSEN Transmission model of asset lives at 35-years compared to 45-years, there is a positive impact on consumers due to the time value of money when using the Green Book approach by HM Treasury. The model output shows consumers will pay more initially but over the span of 17 years will have an overall saving, creating the best value for consumers.

Supports financeability and investability requirements

The near-term benefit to companies' earnings will also help maintain strong investment grade credit ratings and reduce the equity burden. Therefore, the change in asset lives benefits both consumers and our financing requirements.

Reducing asset lives for new additions will also provide a financeability benefit for the RIIO-T3 period. Given the significant investment required over the period, TOs will face greater risks arising from cashflow and credit rating metrics due to high levels of debt required to finance the capex profile to hit net zero targets. Reducing asset lives can be used as a lever to improve revenue (income) in the short-term, by increasing the release of slow money (RAV depreciation) within the year. This means that in the early years of the new additions we receive greater revenue through the RAV depreciation when the investment requirements are at their highest. This will positively impact cashflow requirements improving the closing cash position and reducing the debt/equity requirement to fund the growth. This would also create greater value for consumers through improving intergenerational fairness.

This improved cashflow from the reduction in asset lives will simultaneously improve credit metric ratios (FFO/Net Debt and AICR ratio). Therefore, aiding TOs to maintain a strong investment grade credit rating and meeting the Ofgem requirements of a BBB status. Using reduced asset lives as a mechanism to improve credit metrics will allow TOs the opportunity to source better debt arrangements to fund the significant investment and support the long-term investability of the company. Through sourcing better debt arrangements, the savings made from a lower cost of borrowing will be passed on to consumers through lower interest costs.

Consistent with Ofgem's recent regulatory policy for similar assets in onshore transmission

In Ofgem's recent consultation on the Early Competition Model[60] it recommends that asset lives for this class of Transmission assets to be 35 years to cover project lifecycles and create an investable vehicle. Given the scale of investment required in incumbent TOs, the need to reduce asset lives to a more "investable level" would be even more appropriate than for competition models. The decision on what is the appropriate asset lives is therefore not simply down to the technical lives of assets, as demonstrated by Ofgem's policy proposals for the onshore electricity transmission competition commercial framework. We believe there should be consistency across the industry, with incumbent TOs asset lives being aligned to this.

Capitalisation Rates

The capitalisation rate for RIIO-T3 should be consistent with the process used at RIIO-T2, using the existing ex ante approach. This approach should be continued into RIIO-T3 given the significant investment required to meet net zero and Governmental targets. The capitalisation rate is a material cash lever that will allow for SSEN Transmission to remain financeable, which is essential for funding the level of investment. In RIIO-T2 Ofgem decided on a rate below the natural rate to aid cashflow and financeability. Ofgem set this at 77% for ex ante totex and 85% for Uncertainty Mechanisms, resulting in an average of around 80% over the price control. Our total expenditure in RIIO-T2 is now expected to be in excess of c.£7bn.

In RIIO-T2 Ofgem stated they set a lower capitalisation as part of:

"Avoiding over capitalisation, as this could result in less fast money than might be reasonable, which could hamper company investment and consumer interests." Para 11.8, RIIO-T2 Finance Annex. Ofgem also state that "The precise capex/opex mix for uncertainty mechanism totex is uncertain ex ante and over-capitalisation could put pressure on some credit metrics. We therefore consider it appropriate to set the capitalisation rate for uncertainty mechanisms at the lower end of the range of possible capex/opex assessments under different scenarios." Para 5.32, RIIO-T2 Finance Annex.

Therefore, because of the increased investment requirements, the RIIO-T3 capitalisation rates should be on the lower end of the estimates. This will promote greater fast money to fund upfront costs of investments whist reducing the debt requirements, positively impacting the company's credit metrics. The resulting higher credit rating will lead to lower borrowing costs. Similarly, with lower capitalisation rates the increased cash inflows will result in less equity requirements so the costs of sourcing the equity will be reduced. Cost savings in sourcing both debt and equity funding will be reflected in consumer bills.

The greater fast money portion received will be offset over time by the reduced RAV balance (slow money portion) that will result in lower returns and depreciation. This offset is required in order to fund the significant investment levels and shows over the period the impact will benefit consumers through lower bills.

A single capitalisation rate of 80% throughout the RIIO-T3 period would be required in order to fund the large investment requirements whilst allowing SSEN Transmission to remain financeable and investable.

Return Adjustment Mechanisms (RAM's)

As mentioned in our SSMC response, we did not support the introduction of the Return on Adjustment Mechanism as part of RIIO-2 and recommend it is reviewed for its effectiveness in RIIO-3. We do not believe this has been required in RIIO-2 and adds unnecessary regulatory complexity. However, as it currently stands, there is a significant negative skew on downward penalties on the RoRE and unless that is adjusted, there will be need for a downside protection through a RAM.

Corporation Tax

Tax should be treated as a pass through albeit a transition period may be required. Inclusion of the Fair Tax Mark certification helps to improve the credibility of the sector, demonstrating the proactive approach companies are taking to ensure the correct tax is paid. The Fair Tax Mark also ensures companies are not benefiting from the recovery of tax paid whilst contributing fairly to the cost of providing the public services we rely on. This should mitigate Ofgem's concern about moving to tax as a pass through

[60] Ofgem, Onshore electricity transmission Early Competition: Consultation on the first project to be competitively tendered (Dec 2024), and Consultation on the onshore electricity transmission Early Competition commercial framework (Oct 2024)

as per their SSMD publication. Treating tax as a pass-through cost would streamline the reporting and reconciliation requirements that would be required for RIIO-T3.

We welcome clarity from Ofgem on the reporting requirements for tax throughout the next price control in models such as the Price Control Financial Model (PCFM) and Regulatory Financial Performance Report (RFPR). Due to the changing complexity of taxation arrangements, it may be that transitioning to a pass through treatment of corporation tax requires a period of time. Changing to pass through treatment would provide better value for the consumer as it would simplify the current reporting so consumers could better understand. Though operators have requested several times, the current tax reconciliations lack detailed and clear guidance impairing consumers' ability to understand the notional tax regime. Ofgem should instead spend their time looking at the tax treatment for the price control as a whole instead of focusing on smaller things like the glide path.

If the current treatment of tax is kept, modifications are required in regulatory reporting models and the calculation of Tax Trigger Event (TTE) value for RIIO-3. The country has seen a large shift in tax treatment since the Autumn 23' budget was announced, which will have a material impact on the sector's forecast tax allowances compared to what the industry has previously seen. The regulatory models that are used in the Annual Iteration Process therefore need to be updated to account for government policy changes to ensure transparency for consumers when reviewing published models. With such a change in tax legislation, if the current treatment was kept, as a minimum, modifications to the models are required using the TTE calculation as an example. We welcome Ofgem consulting on this as a separate consultation.

If Ofgem decide to keep the current tax treatment, capital allowance opening balances should be trued up to align with actual company tax return closing balances. In reference to paragraph 7.4 within the SSMC finance annex and RIIO-2 licence conditions, capital allowance opening balances must be rolled forward from closing balances on a notional basis as opposed to resetting them based on actual tax computations. In line with the points we have noted above, the changes to the capital allowances regime driven by government require Ofgem to look at this again. If the models are left as is, companies will see material variances within the tax reconciliation tab of the RFPR. With totex profiles increasing due to the growth of the networks, this issue will only materialise the longer the pools aren't trued up. The tax reconciliation included within the RFPR and Board Assurance Statement were brought in to help bridge the gap between the notional and actual company and we believe the treatment of tax pools should be the same.

Pensions

From Ofgem's SSMD publication it is assumed that allowances for the portion of Pension Scheme Established Deficits (PSEDs) during RIIO-T3 will reflect the recent triennial review and there will be no change to the existing policy throughout the RIIO-T3 period. We agree that the current policy of consumers funding any deficits that arise in relation to the benefit schemes is still applicable for RIIO-T3. We welcome Ofgem's consultation as to the funding of PSED's in the future, sooner rather than later. Although Ofgem have noted this would not take place until 1st April 2027 this is still within the RIIO-T3 period, and this is something that needs to be considered appropriately as part of the price control as a whole.

Asset Disposals

As discussed in our SSMC response, we support the existing approach to net the proceeds from the disposal of assets off against totex from the year in which the proceeds occur, such that the RIIO-2 financial arrangements and incentivisation intentions remain. We agree with the downside concerns regarding credit metrics and cashflow as highlighted within the SSMC. Changing this to fast money rather than deducting it from totex removes the matching of where the original asset cost has likely been attributed to. It would therefore be preferable the existing treatment is retained i.e. it is offset against totex to ensure the disposal matches the regulatory accounting of the original capex or RAV addition.

Financeability and Investability Assessment

Network operators must have sufficient operational resources available to deliver our licence obligations across the price control period and long-term, with a focus on maintaining a strong investment grade credit rating to reassure both debt and equity investors. Financeability has been central to price control decisions historically, and for RIIO-T3 it has never been more important. Financeability has typically been based on credit metrics that underpin credit ratings from the respective credit rating agencies. However, in previous price controls, equity financeability was used as a core element to the financial framework through topics such as the balance of risk and return through Return on Regulatory Equity (RoRE) ranges, dividend yields, and funding requirements. The introduction of the term *Investability* is reflective of the themes in equity financeability but has not been defined by Ofgem specifically. As a result, we propose it reflects the following factors:

- Equity returns reflecting market evidence and macro-economic factors such as higher interest rates.
- Risk-adjusted equity returns to account for forward-looking risk.
- Globally competitive returns to attract and retain investors.
- Efficient and fully financed debt costs, including transaction costs, to withstand higher interest rates particularly given the scale of debt capital required over RIIO-T3.
- Appropriately funded costs of issuing equity of at least 5%.
- Strong investment grade credit rating (i.e. at least Baa1/BBB+).
- Cashflow measures that do not overburden funding requirements similar to previous price control measures.

We believe that this objective, if properly reflected, will ensure returns and cashflows are sufficient for both new and existing equity investors as well as supporting key investability measures. We have therefore assessed credit financeability (simply termed financeability) but importantly investability too against this overall set of factors. We have also stress tested these key elements based on the scenarios proposed by Ofgem in the Business Plan Guidance and utilising the maximum potential totex expenditure as set out in our Business Plan.

Table 6 and 7 summarises our credit or debt financeability assessment based on two key credit metrics: Funds From Operations (FFO) to Net Debt (S&P) and Adjusted Interest Cover Ratio (AICR) (Moody's). In our Business Plan, we utilised a Red Amber Green (RAG)[61] status in the table and the trajectory of the metric over the price control period. The tables below, however, summarise the credit metrics based on the central case whereby the sensitivities are included in the appendix to this annex. This includes varying the quantum and timing of capital expenditure, financial parameter movements and the subsequent impact to gearing ratios.

Ofgem's Business Plan Financial Model (BPFM) has been used for modelling purposes in line with the Business Plan Guidance. We have presented the results based on this in the appendix to this annex as there are calculations that we believe are incorrect and would inaccurately calculate the credit metrics across the RIIO-T3 period and subsequent stress tests. We have outlined in our appendix to this annex what those calculation changes were to calculate the credit metrics over the period. Note Table 6 below is based on Ofgem's Financial Framework whereby we provide an alternative view of the Financial Framework in Table 7 below.

[61] Green indicates the metric is above the threshold, Red indicates that the metric is below the threshold. Amber indicates the metric is close to the threshold.

[redacted]

Table 7: Credit ratios under Specification 3: SSEN-T–Notional under the base case, with dividend of 3%

SSEN-T–Notional, base case, 3% dividend	2026/27	2027/28	2028/29	2029/30	2030/31	Average
Net Debt/RAV	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
AICR (or PMICR)	3.65	3.20	2.82	2.32	2.34	2.87
FFO/net debt	16.12%	15.46%	14.46%	12.61%	12.54%	14.24%
RCF/net debt	14.12%	13.46%	12.46%	10.61%	1.054%	12.24%
Equity issuance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Equity issuance for 2026/27 is inclusive of the start of price control equity issuance. [1] total equity injection over the period.
Source: Oxera analysis based on SSEN-T Bespoke version of Ofgem BPFM.

When we undertake the stress testing scenarios (see Appendix) as set out by Ofgem, the analysis does not improve materially under Ofgem's Financial Framework. We do not believe that based on our risk assessment and balance of incentives/penalties that the opportunity for 10% underspend and 2% upside on RoRE is possible. This is due to the asymmetric nature of the risk being taken to deliver mega projects as we set out in our assessment of forward-looking risk. There is also an asymmetry in incentives/penalties, where the maximum upside potential is materially less than 2%, while the maximum downside is in excess of 2% over the period. This is particularly evident when considering the impact of the ASTI Output Deliver Incentive (ODI), which applies in the event of material unapproved delays.

We also recommend that Ofgem ensure the Financial Framework, in particular interest costs, are robust to higher interest rates movements as set out in our CoD section. Overall, the asymmetric nature of the price control and material change in business risk profile, alongside wider macro-economic conditions means that our RIIO-T3 Financial Parameters proposals will enable a robust platform to deliver the unprecedented levels of investment required from capital markets.

Our proposed Financial Framework will ensure financial robustness over the period, protect from macro-economic factors, while ensuring incentives to perform are retained. The credit metrics assume that we

can maintain gearing at the notional level. However, our proposed CoE is intended to ensure it is possible to compete for global equity capital to ensure the gearing can be maintained, support a more appropriate dividend yield, and achieve the balance required to be investable based on proposed factors above. Our Investability Assessment, detailed below, considers the core elements required over RIIO-T3 to support the funding of our Business Plan, and the scale of investment required.

Investability Assessment

An investible RIIO-T3 financial package is critical to ensuring we can raise the necessary financial capital from debt and equity markets at the best possible rates, at the right time, and the right amounts to deliver the major investment required. Table 8 below is our summary of our investability analysis considering both credit or debt financeability and the core elements of attracting and retaining equity investment.

Table 8: Investability Assessment

Investability Factor	Ofgem Financial Framework	SSEN Transmission Financial Framework
Equity returns reflecting market evidence and macro-economic factors such as higher interest rates		
Risk-adjusted equity returns to account for forward-looking risk		
Globally competitive returns to attract and retain investors		
Efficient and fully financed debt costs, including transaction costs, to withstand higher interest rates particularly given the scale of debt capital required over RIIO-T3		
Appropriately funded costs of issuing equity of at least 5%		
Strong investment grade credit rating (i.e. at least Baa1/BBB+)		
Cashflow measures that do not overburden funding requirements similar to previous price control measures.		

We have detailed the basis of our assessment below on each factor grouped accordingly.

Equity Returns

We have set out our view of equity returns in particular where we have provided evidence that underpins a CoE return which satisfies the core factors above:

- **Equity returns reflecting market evidence and macro-economic factors such as higher interest rates:** Our CAPM estimates, and use of cross checks demonstrates that Ofgem's CoE range is too low and a point estimate in the mid-point would be insufficient based on market evidence.
- **Risk-adjusted equity returns to account for forward-looking risk**: our evidence on measuring forward-looking risk covers the new risks emerging from the scale of capital investment and its complexity. This shows that equity risk has increased by at least 1-3% above historical estimates meaning that Ofgem's point estimate is not reflective of forward-looking risk as well as the macro-economic evidence noted.
- **Globally competitive returns to attract and retain investors**: the market expects returns to be higher than Ofgem proposes as set out by market analysts and investor surveys. In essence, investors are expecting the CoE to increase in energy networks whereby nominal returns on equity are quoted of at least 10% to be globally competitive for capital.

This covers the core return on equity elements of investability. Debt funding and credit rating requirements is covered in the following section before we review the cash requirements in particular the profile of equity funding required compared to dividend yields, asset growth, and earnings growth over RIIO-T3.

Debt Funding

The scale of debt funding alongside interest rates at pre financial crisis levels, means there is more volatility to interest rate and funding shocks. As a result, our analysis shows that to ensure there is adequate funding over the RIIO-T3 period to support debt financing, Ofgem should add an additional premium to the CoD mechanism. This could take the form of additional transaction costs as supported by evidence provided to Ofgem or by an uplift to account for higher interests expected in the future that the 14 year Utilities Index trailing average does not capture (where the weighting mechanism does not adequately fund interest costs).

Equity Investment Factors

We have reviewed the appropriateness of the dividend yield and equity issuance cost as well as reviewed cash flow requirements as part of our proposed Financial Framework. In particular, we have proposed certain cashflow measures that are consistent with previous regulatory decisions and will reduce the burden of equity funding required over RIIO-T3. This will also provide create an appropriate asset and earnings growth ratio which will be supportive of investability. We outline our view on dividend yields below followed by equity issuance costs before outlining our equity financing requirements.

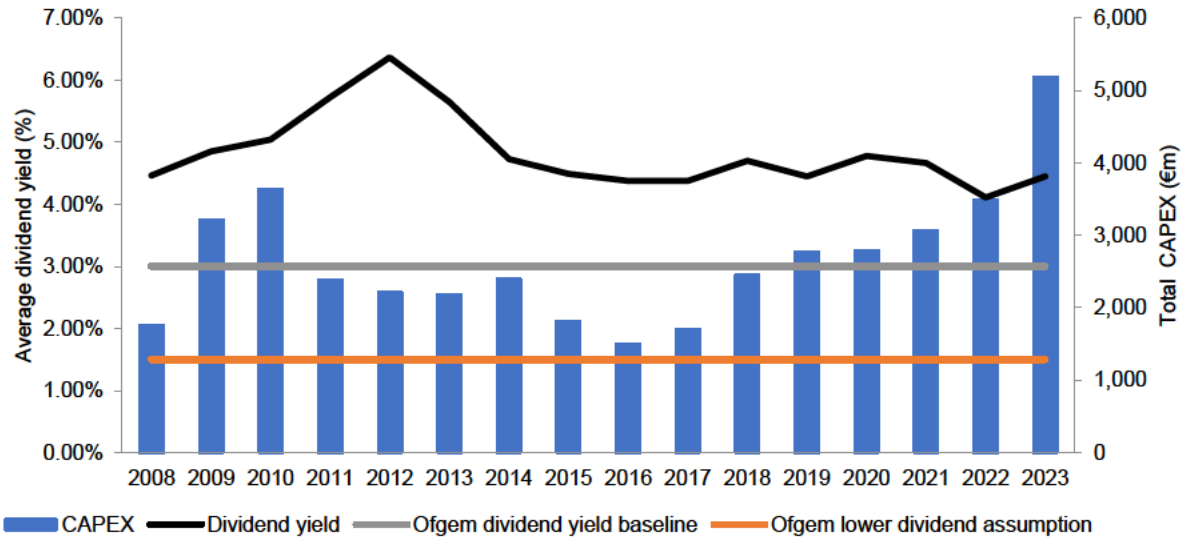
Dividend Yields

SSEN Transmission's dividend policy is a Reserved Matter decided upon by the SSEN Transmission Board of Directors and takes into account multiple considerations including:

- Financing our extensive investment plan, considering planned and committed capital investment
- Availability of Resources for operating in the coming 12 months
- Company Viability over the forthcoming three years in line with the UK Corporate Governance Code
- Maintaining our strong investment grade credit rating including raising external borrowings at an appropriate credit rating
- The impact on consumers of paying a dividend; and
- Meeting the returns required by shareholders to attract and retain investment in order to deliver our Business Plan.

TOs need to maintain high and stable dividend yields to attract and retain equity investors, with the balance of consistent dividend payments over share price appreciation having to be carefully managed. In line with Ofgem parameters, we have modelled a 3% dividend yield per annum in our Business Plan albeit there is evidence this should be higher i.e. between 4-5% for similar investments globally as analysed by Oxera[62]. Figure 14 below shows the average of European comparators dividend yield[63].

Figure 14: Average dividend yield and total CAPEX investment by European comparators, relative to Ofgem's SSMD assumptions[64]



Source: Extract from Oxera analysis and Ofgem's SSMD finance annex[65]

[62] Oxera (2024), '*RIIO-3 risks and investability topics, prepared for the electricity transmission operators*', 2024
[63] ibid
[64] Note: The average dividend yield is calculated from the annual averages of the sample companies: Terna, Red Eléctrica de España, Redes Energéticas Nacionais, and Elia. Total CAPEX is the sum of all yearly CAPEX for these companies. The two grey lines represent dividend yields of 3% and 1.5%. The 3% yield is the current working assumption set by Ofgem for the RIIO-2 price control period, while 1.5% reflects a business plan scenario Ofgem has requested TOs to include in their business plans.
[65] Oxera analysis based on Refinitiv data; and Ofgem (2024), 'RIIO-3 Sector Specific Methodology Decision – Finance Annex', 18 July, paras 3.282 and 5.11.

As Oxera evidence shows, if investors were truly indifferent to reductions in dividend yields, the comparator set of companies would have been expected to reduce their dividends to fund investment programmes over recent years. Evidently, they have not done so, nor do they intend to, despite their investment needs. Oxera's analysis of dividend yields demonstrates why Ofgem's proposed 3% is insufficient to be competitive, never mind the suggested sensitivity of 1.5% as a dividend yield. As Oxera conclude, "*UK TOs reducing their dividends would not align with the investors' expectations and might undermine their investability*".

Therefore, we do not believe Ofgem has adequately considered market evidence when requesting that dividends be set at 1.5%, which is halve the level in RIIO-T2. Investability is critical to delivering unprecedented levels of capital investment and therefore setting a dividend assumption of 1.5% is inconsistent with that policy position. Modelling even 3% appears low compared to what investors expect and therefore Ofgem must consider revising its assumption upwards to closer to the average point of the comparator set. We have modelled 3% as for our Financial Framework but this is no acceptance of that level and is simply used for modelling purposes. An increase in the dividend yield increases the equity requirement over the period stressing equity financeability and cash requirements even further.

Cost of Issuing Equity

We consider equity investment where other funding options are considered unsuitable, such as managing annual cash flows, adjusting borrowings (including short and long-term debt) and restricting dividends. The cost of issuing new equity can be material and Ofgem have adopted a policy of the CoE issuance to be 5% of any equity issued. There is evidence that when including direct and indirect costs associated with issuing equity that this could be as high as 7-10%[66]. Therefore, we believe the 5% to be the absolute minimum for direct costs and we have excluded indirect costs on the basis our proposed Financial Framework would ensure these indirect costs are kept to a minimum.

Cash Flow Requirements

The profile of cashflows over RIIO-T3 will be critical to fund the unprecedented level of capital investment required to deliver government targets. Debt markets will only provide a proportion of funding requirements where the balance will come from operating cash flows and equity investors. As part of creating an investable proposition to attract and retain the necessary equity investment, we have considered the following factors comparing Ofgem and our proposed Financial Frameworks:

- Earnings and Asset Growth
- Equity Cash Flows

We have considered investor requirements based on market analyst commentary and evidence for raising equity. This is best presented based on Figure 15 below which shows the Compound Annual Growth Rate (CAGR) of earnings vs asset growth over the period. Investors expect to see reasonable forms of earnings growth following significant asset growth and is a key tenet of investment. With Ofgem's Financial Framework, there is a material difference which contradicts the need for reasonable earnings or payback period for investors.

[66] Oxera (2024), 'Estimating the appropriate allowance for new equity issuances for RIIO-3', Prepared for SSEN Transmission, 1 March.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[67] This assumes a 3% dividend yield in both Financial Frameworks for consistency.
[68] Oxera (2024), *Benchmarking UK equity issuance*, prepared for SSEN Transmission, December 2024

Conclusions

Overall, our proposed Financial Framework is underpinned by robust evidence and creates a fair and balanced framework that will attract and retain the necessary debt and equity capital to deliver the unprecedented level of capital investment over RIIO-T3. The substantial change in risk profile over RIIO-T3 compared to previous price controls due to the delivery of multiple concurrent mega projects, heighted operating risks, and the material change in macro-economic circumstances demonstrates that the allowed return on equity needs to increase from RIIO-T2 levels.

There is a drag on our credit financeability due to the scale and complexity of our capital programme as defined by credit rating agencies. Under Ofgem's Financial Framework, there would likely be at least a one notch downgrade. Our proposals will ensure we are both financeable on a debt basis at strong investment grade credit rating (BBB+/Baa1) and provide a platform for investability. Our framework for assessing investability considers setting a reasonable dividend yield, providing cash flow support that underpins earnings growth i.e. a suitable payback period for investors, and deriving a suitable yet unprecedented level of equity funding required over the period.

Appendix 1: BPFM Financeability Scenario Outputs

[redacted]

As discussed in our main annex, we have identified numerous features in the baseline Ofgem BPFM calculations for which we are not in agreement on; particularly features which increase the pressure on the financeability of the notional company. Under the BPFM, where net debt is used in financeability ratios, it is defined as the closing net debt of the applicable year. This effectively fails to include the equity injections which are calculated to be necessary for that same year (which in the BPFM is assumed to take place in the first day of the subsequent year, rather than at the end of the current year, i.e. injection is assumed to occur one day after the metric is net debt is calculated). This disproportionately overstates net debt in the FFO/ Net Debt and RCV/ Net Debt ratios, thus leading to stretched metrics.

By estimating credit metrics based on year-end net debt and assuming that equity injections occur in the beginning of each regulatory year, the Ofgem BPFM effectively measures financeability metrics at the worst point of the implied performance.

Accordingly, we consider that it would be more accurate to calculate net debt (for the purposes of financeability testing) by accounting for the timing of these equity issuances—in other words, for onward testing we define net debt as closing net debt of the applicable year, plus the equity injections pertaining to the applicable year (to return gearing levels to the target), but which is recognised only in the following year.

Specifically – our bespoke models entails adjustments for:

1. Adjustment for SSEN Transmission Business Plan financial parameters as outlined in our main finance annex.
2. Adjustment for the timing of equity issuances with closing net debt for each year incorporating the equity injection for the start of the following regulatory year (last year of the price control remains unadjusted due to lack of equity injection forecast beyond RIIO-T3).
3. Adjustment to the equity issuance threshold from 5% over the notional gearing in a year to 0%.
4. We adjust the bespoke SSEN Transmission model using the scenario lever adjustment for the definition of OPEX and depreciation. This entails adjusting the notional model cost specification from the fast/slow money definition to the SSEN Transmission forecast of CAPEX and OPEX, and depreciation basis from regulatory depreciation to statutory depreciation. This adjustment is made to capture fully the effect of the proposed reduction of the new asset lives and capitalisation rate on financeability of the notional company.

Appendix 2: Financeability Tables

Table 1: Credit ratios under Ofgem–Notional specification under the base case, with dividend of 3%

Ofgem–Notional, base case, 3% dividend	2026/27	2027/28	2028/29	2029/30	2030/31	Average
Net Debt/RAV	72.23%	68.51%	65.23%	60.63%	59.88%	65.30%
AICR (or PMICR)	1.70	1.66	1.66	1.71	1.71	1.69
FFO/net debt	5.64%	5.86%	6.30%	7.37%	7.50%	6.54%
RCF/net debt	3.77%	3.89%	4.23%	5.14%	5.24%	4.46%
Equity issuance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Equity issuance for 2026/27 is inclusive of the start of price control equity issuance .[1] Total equity injection over the period.
Source: Oxera analysis based on Ofgem BPFM.

[redacted]

Table 3: Credit ratios under Ofgem–Notional specification under the base case, with dividend of 1.5%

Ofgem–Notional, base case, 1.5% dividend	2026/27	2027/28	2028/29	2029/30	2030/31	Average
Net Debt/RAV	71.54%	67.82%	64.54%	59.93%	59.19%	64.60%
AICR (or PMICR)	1.71	1.67	1.67	1.72	1.72	1.70
FFO/net debt	5.72%	5.94%	6.40%	7.48%	7.62%	6.63%
RCF/net debt	4.77%	4.95%	5.35%	6.36%	6.48%	5.58%
Equity issuance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Equity issuance for 2026/27 is inclusive of the start of price control equity issuance. [1] total equity injection over the period.
Source: Oxera analysis.

Resulting from these two model sets, the financeability results we present in the following sections focus on these four primary model specifications:

1. Specification 1: Ofgem (Adjusted)–Notional. Adjusted Ofgem model set with methodological adjustments as highlighted and no parameter assumption changes from the BPFM, applied to the notional company.
2. Specification 2: Ofgem (Adjusted)–Actual. Adjusted Ofgem model set with methodological adjustments as highlighted and no parameter assumption changes from the BPFM, applied to the actual company.
3. Specification 3: SSEN-T–Notional. SSEN-T model set based on Ofgem's BPFM but with methodological and assumption changes as highlighted, applied to the notional company.
4. Specification 4: SSEN-T–Actual. SSEN-T model set based on Ofgem's BPFM but with methodological and assumption changes as highlighted, applied to the actual company.

It is our view that the BPFM does not accurately calculate the actual company financeability for any iteration of the model. As a result, we have disclosed the results of each specification of the model to comply with Ofgem's Business Plan Guidance. The notional company financeability is broadly similar to the actual company financeability since the only differential is the embedded debt compared to the cost of notional debt.

[redacted]

[redacted]

[redacted]

Table 7: Credit ratios under Specification 3: SSEN-T–Notional under the base case, with dividend of 3%

SSEN-T–Notional, base case, 3% dividend	2026/27	2027/28	2028/29	2029/30	2030/31	Average
Net Debt/RAV	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
AICR (or PMICR)	3.65	3.20	2.82	2.32	2.34	2.87
FFO/net debt	16.12%	15.46%	14.46%	12.61%	12.54%	14.24%
RCF/net debt	14.12%	13.46%	12.46%	10.61%	1.054%	12.24%
Equity issuance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Equity issuance for 2026/27 is inclusive of the start of price control equity issuance. [1] total equity injection over the period.
Source: Oxera analysis based on SSEN-T Bespoke version of Ofgem BPFM.

[redacted]

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