NERA
ECONOMIC CONSULTING

RIIO-ED2 Financeability Assessment: Stochastic Risk Modelling

Prepared for WPD

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1 Introduction

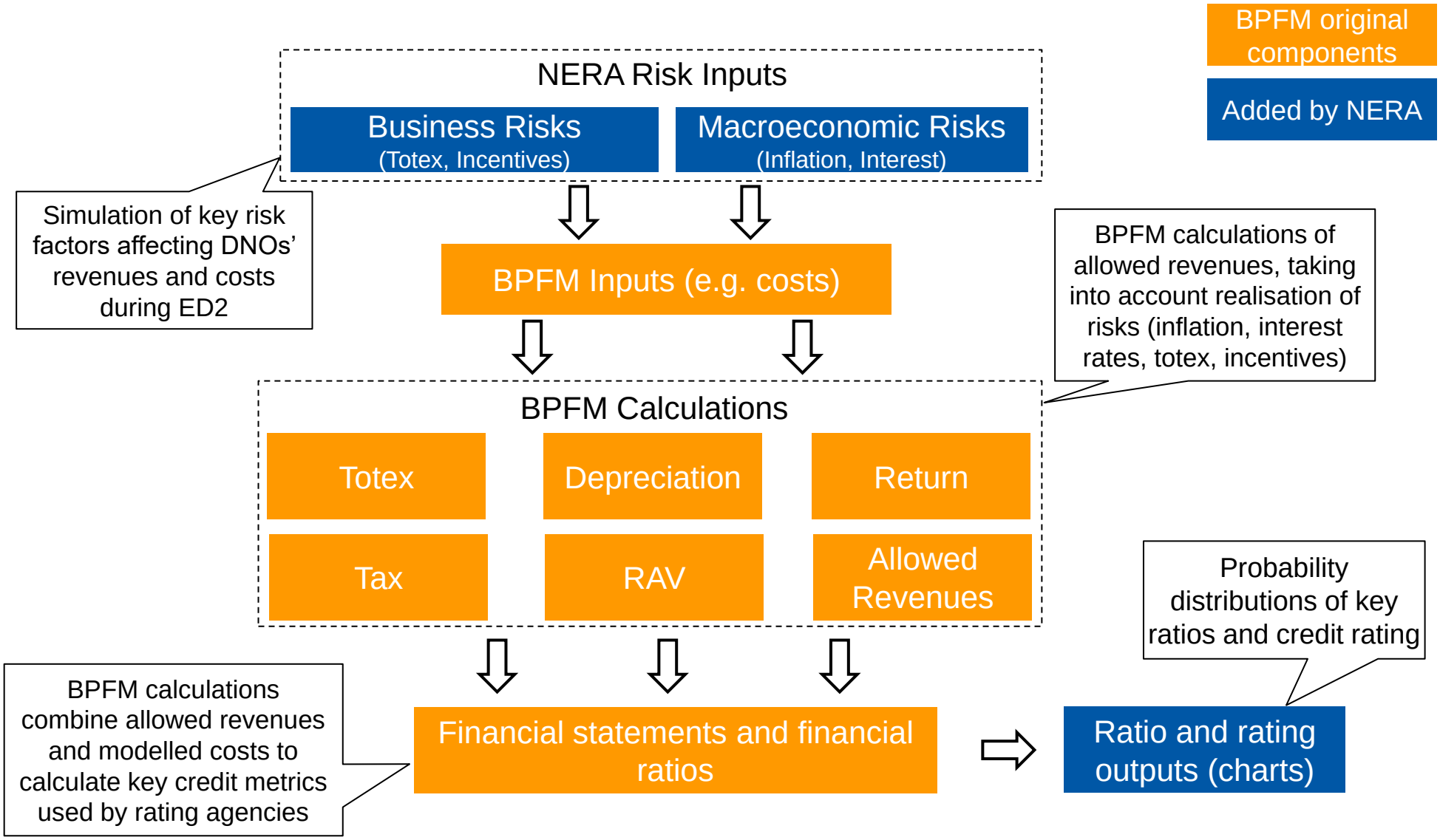
Introduction

- We have been commissioned by WPD to undertake risk modelling for its 1 December 2021 Business Plan submission to Ofgem
- The objective of the modelling is to assess the financeability of WPD's licensees (WMID, EMID, SWALES and SWEST) over the ED2 period, given the company's cost forecasts, the expected macroeconomic environment (interest rates, inflation) and assumptions regarding key regulatory parameters
- Ofgem has a duty to have regard to the need to secure that companies are able to the finance the activities which are the subject of obligations imposed by or under the relevant legislation
- We develop a risk model for WPD which allows us to test whether a given package of regulatory parameters enables WPD's DNOs to remain financeable, defined by having a sufficiently high probability of meeting the minimum levels of credit metrics required for an investment grade credit rating
- In this presentation, we set out i) the framework for our risk modelling, ii) the distributional assumptions we used for our modelled risk factors, and iii) our risk modelling results

Our overall risk modelling approach

- We have identified key risk factors for WPD over the RIIO-ED2 period, e.g. totex, incentives, interest rates or inflation, that have an impact on the DNOs' financial performance during ED2
- For each of the risk factors, we have defined probability distributions or uncertainty ranges, drawing on our own analysis (for macroeconomic risk factors) as well as WPD's expert judgment (for business risks such as totex and incentives)
- We have modified the deterministic business plan financial model (BPFM) into a stochastic model capable of running thousands of simulations based on the probability distributions identified for the key risk factors
- To do this, we have integrated the BPFM with a simulation software "Crystal Ball", which allows the simulation of risk factor inputs and recording of simulated outputs
- We have also made a number of changes to the BPFM model to make it compatible with stochastic modelling (see slide 8)
- We developed infrastructure to capture probability distributions around credit metrics and the implied credit rating arising from these distributions (based on Moody's rating methodology)

Illustration of our risk modelling framework



Assumptions for key risk distributions

Risk Factor	Distributional Assumption
Interest rate risk – RFR and COE	• Scenario 1 (see slide 9): We assume a normal distribution for the RFR, using Ofgem's March 2021 SSMD RFR forecasts (based on 20Y ILG yields) as mean and an annual standard deviation of 0.54 per cent derived from historical volatility of 20Y ILG yields. • Scenario 2 (see slide 9): We assume a normal distribution for the RFR, using WPD's RFR forecasts (based on average of 20Y ILG yields and 10+/10-15 AAA corporate bond yields) as mean and an annual standard deviation of 0.68 per cent derived from historical volatility of 20Y ILG and 10+/10-15 AAA corporate bond yields. • In both scenarios, we simulate the RFR for the last year of ED2 based on the above distribution and calculate the corresponding simulated path for each preceding year to match the profile of the central forecast. • We update allowed COE in line with changes in the modelled RFR under Ofgem's proposed COE indexation.
Interest rate risk - COD	• We assume a normal distribution for the iBoxx Utilities index yield, using Ofgem's March 2021 SSMD iBoxx Utilities forecasts as mean, and an annual standard deviation of 0.90 per cent derived from historical volatility of the iBoxx Utilities index. • We assume a 100% correlation between the simulated iBoxx yields and the simulated RFR to ensure consistency in the interest rate scenarios for each of the simulations. • We calculate the allowed cost of debt assuming a 17 year trailing average of the benchmark iBoxx Utilities index and a 25bps transaction cost allowance. In Scenario 2 (WPD view), we add an additional 13bps based on WPD's view of additional costs of borrowing.
Inflation risk – CPIH and RPI-CPIH wedge	• We assume a normal distribution for CPIH, using the August 2021 HMT forecast for CPI (as used by Ofgem in the BPFM) as mean and an annual standard deviation of 0.90 per cent derived from historical volatility of CPI. We correlate annual CPIH simulations over time to model high and low CPIH paths over ED2. • We assume a normal distribution for the RPI-CPIH wedge, using the August 2021 HMT forecast for the RPI-CPI wedge (as used by Ofgem in the BFPM) as mean and an annual standard deviation of 1.02 per cent based on historical volatility of the RPI-CPI wedge.
Totex Risk	• We assume a triangular distribution around WPD's business plan totex forecasts, assuming +/-10 per cent range corresponding to the 90th and 10th percentiles of the distribution. The distribution has been informed by WPD's expert judgment. We model risk as increasing over time, with the +/- 10 per cent range applying to totex over the whole of ED2. • Allowed totex is updated taking into account simulated actual totex and applying the totex incentive mechanism (TIM).
Incentives Risk	• We assume a triangular distribution around WPD's incentive performance (+/-0.6% for the business plan incentive, +/-2.5% for the interruption incentive scheme, +/-0.4% for the broad measure of customer satisfaction and +/-0.16% for the time to connect incentive), where the range reflects the 95th and 5th percentiles of the distribution. • In Scenario 1 (Ofgem SSMD), we also include Ofgem's assumed 25bps expected outperformance to the modelled incentive revenue/penalties.

To enable our risk modelling, we have made a number of changes to Ofgem's Business Plan Financial Model (BPFM)

Modelling Area	BPFM approach	NERA change
Calculation of credit rating	The BPFM calculates credit rating based on 3Y averages of historical financial ratios, as opposed to based on annual ratios calculated for the relevant year.	We have changed the BPFM to calculate credit rating based on annual financial ratios.
Automatic equity injection for gearing 5% above notional	The BPFM automatically assumes an equity injection when gearing increases 5% above notional. Automatic equity injection means financeability downside is eliminated by design.	We have turned off equity injections to model full impact of risks on financeability during ED2.
+/- RPI-CPIH wedge divergence	The BPFM does not allow the modelling of the RPI-CPIH wedge risk on ratios under CPI indexation.	We have adapted the BPFM to model the additional risk of RPI-CPIH wedge on RPI linked debt (which companies continue to hold on the books) under CPIH indexation (which no longer provides a full hedge for outstanding RPI ILD).
Annual iteration process	The BPFM does not include the modelling of the annual iteration process to update allowed revenues in light of changes in costs and incentives over ED2.	We have built in an annual iteration process calculation to allow updating of allowed revenues in light of actual simulated cost and incentive performance with a 2-year lag.
Calculation of excess fast money adjustment	The BPFM applies the excess fast money calculation to actual totex as opposed to allowed totex. This is incorrect, as the objective of the adjustment is to remove any excess opex included as part of allowed revenues and hence should be based on allowed totex. The BPFM fails to convert the excess fast money adjustment into nominal terms in calculating ratios.	We correct the excess fast money adjustment to apply to allowed totex (we also take into account the 2-year lag in updating allowed revenues - see "Annual iteration process" above). We correct the fast money adjustment to be expressed in nominal terms.
Excess fast money adjustment to FFO / Net Debt	The BPFM applies the excess fast money adjustment when calculating FFO / Net Debt. However, we understand Moody's will only make an excess fast money adjustment to AICR and no other ratios.	We remove the excess fast money adjustment when calculating the FFO / Net Debt.

We model financeability under the following scenarios

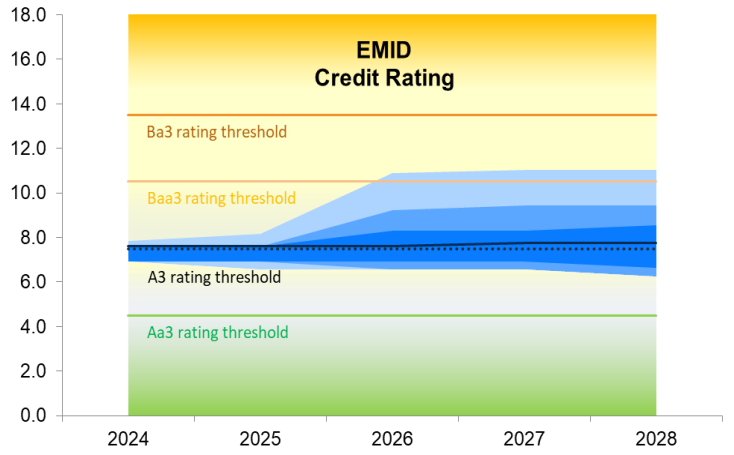
	Scenario 1	Scenario 2
Financeability	Notional	Notional
COE *(see table below for detail)*	Ofgem March 2021 SSMD	WPD view
COD *(see table below for detail)*	Ofgem March 2021 SSMD	WPD view
Dividends	3%	WPD view (= WPD COE)
Expected RoRE outperformance	0.25%	0.00%
Share of ILD	25%	25%
Sharing Factor	50%	50%
Equity Issuance Threshold	None	None
Capitalisation rate	Natural (i.e. calculated, c. 79%)	75%

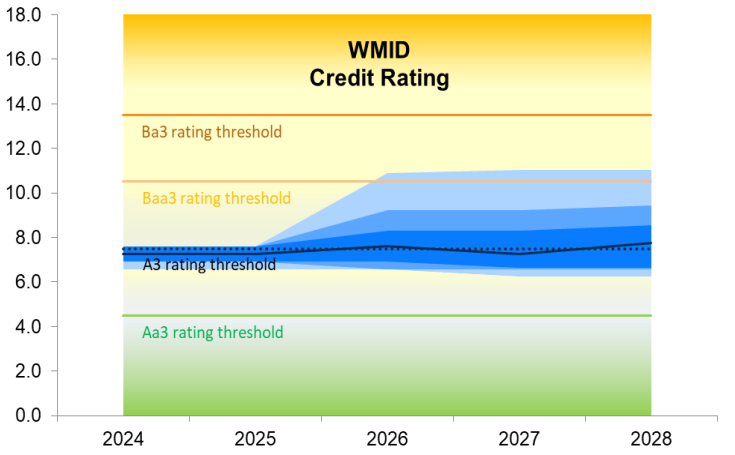
	Scenario 1	Scenario 2
Risk free rate	-1.16% based on 20Y ILG	-0.93% based on average of 20Y ILG and 10+/10-15 AAA corporate bond yields
Equity beta	0.76	0.79
TMR	6.50%	6.60%
Cost of debt	2.09% based on 17Y trailing average of iBoxx Utilities + 25bps transaction cost allowance	2.22% based on Scenario 1 COD + 13bps WPD additional cost of borrowing

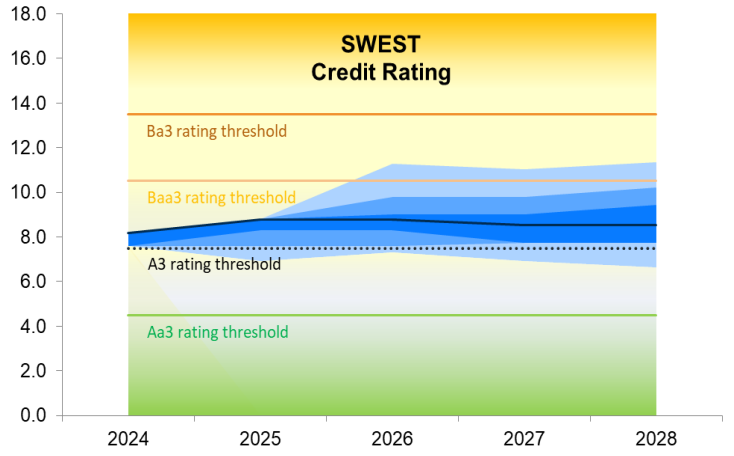
2 Risk simulation results

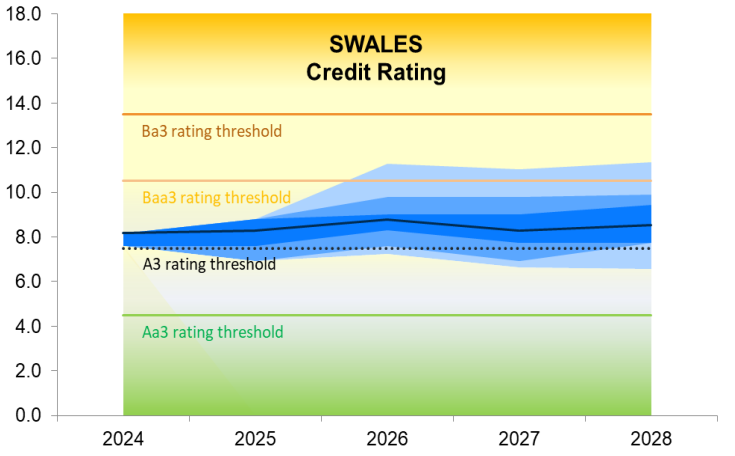
Scenario 1: Ofgem March 2021 SSMD financial parameters

Ofgem SSMD COE parameters, 3% notional dividends, 0.25% expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, natural capitalisation rate





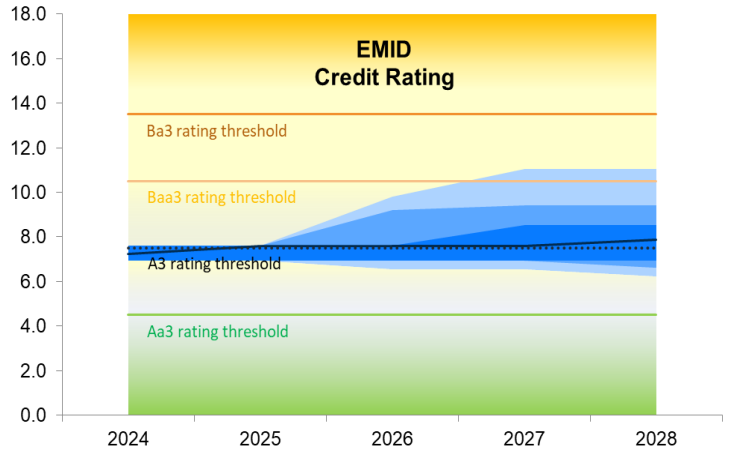


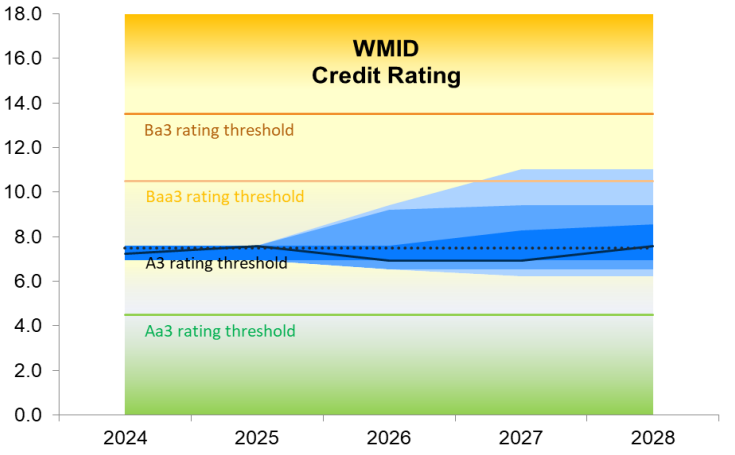


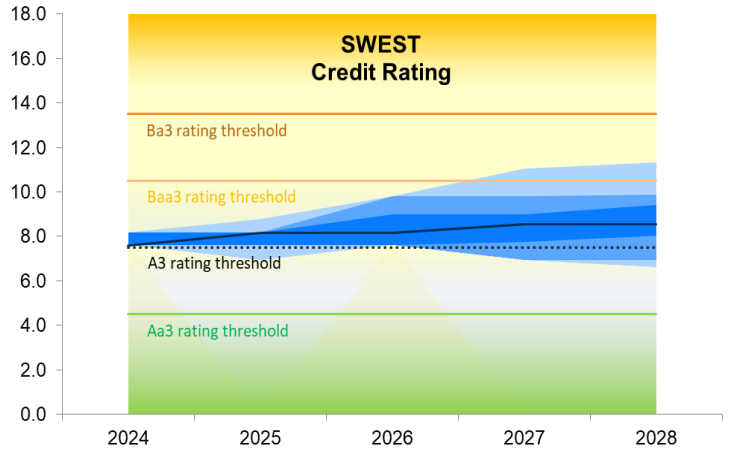
Ofgem's March 2021 SSMD financial parameters create substantial downside risk on credit rating during ED2, with all WPD DNOs falling below investment grade as early as Y3 of ED2 in the 95th percentile. Ofgem's base case also assumes 25bps RoRE expected outperformance, which is not guaranteed, and hence ratios may be even weaker.

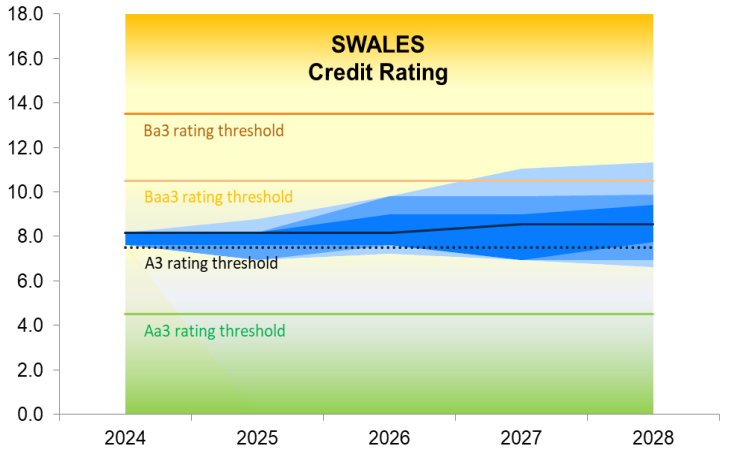
Scenario 2: WPD business plan financial parameters

WPD COE and COD parameters, dividends = COE, no expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, 75% capitalisation rate









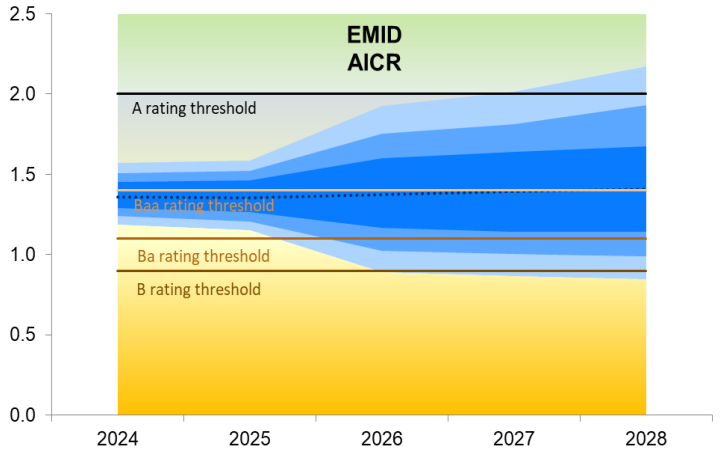
WPD's alternative financial proposals slightly reduce downside risk on rating compared to Ofgem's assumptions, with ratings falling to sub-IG only in Y4 of ED2 as opposed to already in Y3 at the 95th percentile. Hence, WPD's proposals somewhat mitigate downside risk on rating but do not eliminate it fully.

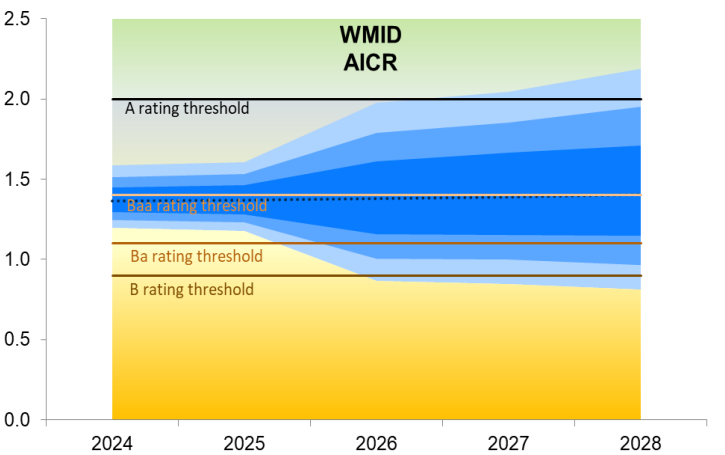
Appendix A

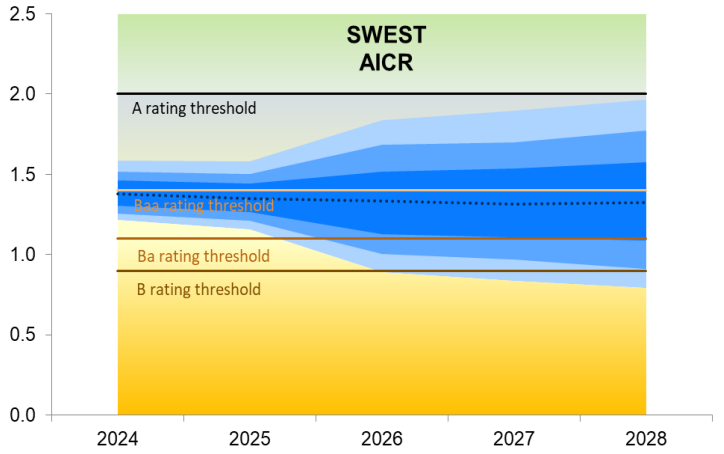
Simulation results for individual financial ratios – Scenario 1

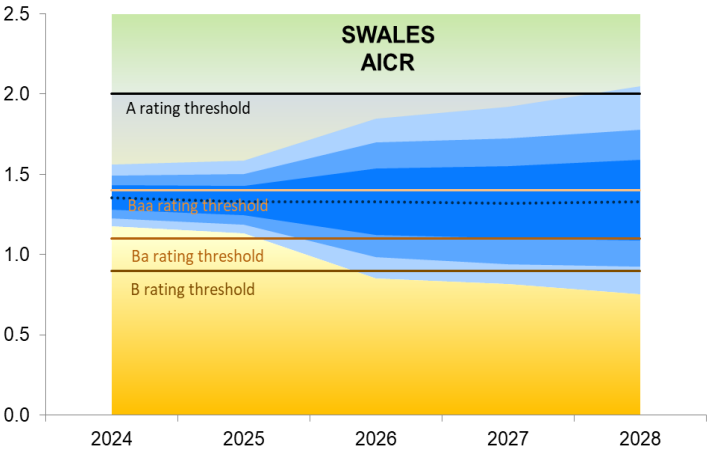
Scenario 1: Ofgem March 2021 SSMD financial parameters - **AICR**

Ofgem SSMD COE parameters, 3% notional dividends, 0.25% expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, natural capitalisation rate



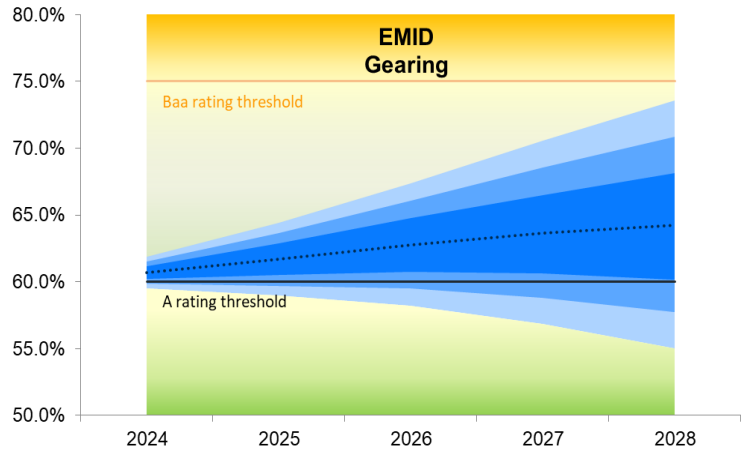


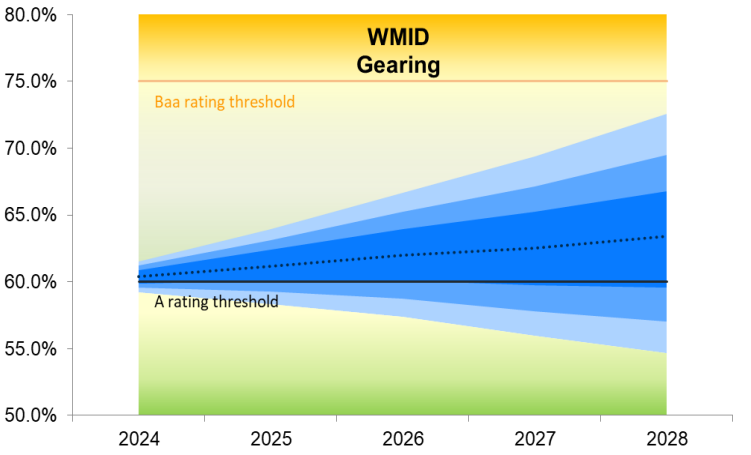


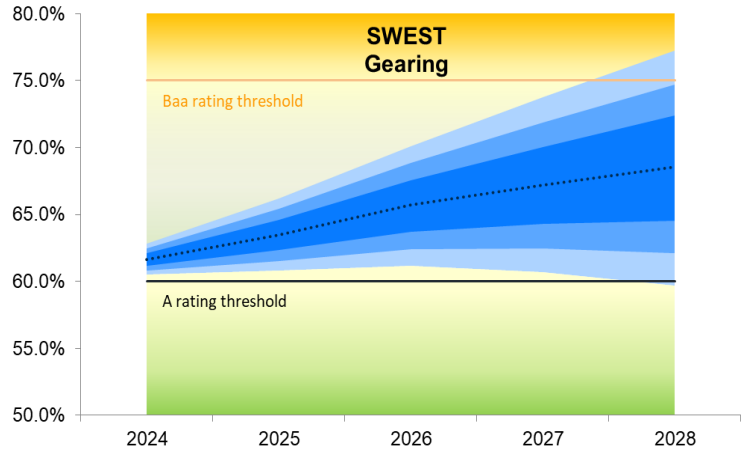


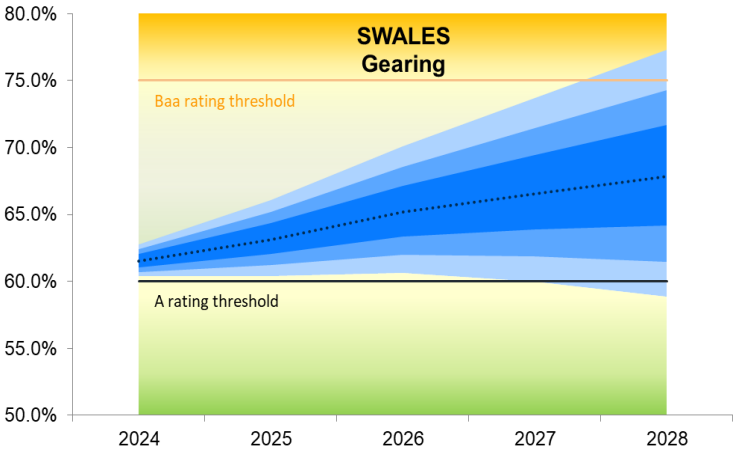
Scenario 1: Ofgem March 2021 SSMD financial parameters **- Gearing**

Ofgem SSMD COE parameters, 3% notional dividends, 0.25% expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, natural capitalisation rate



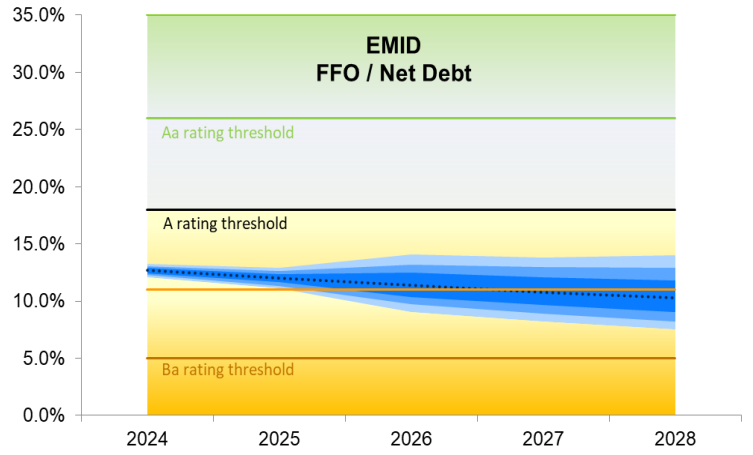


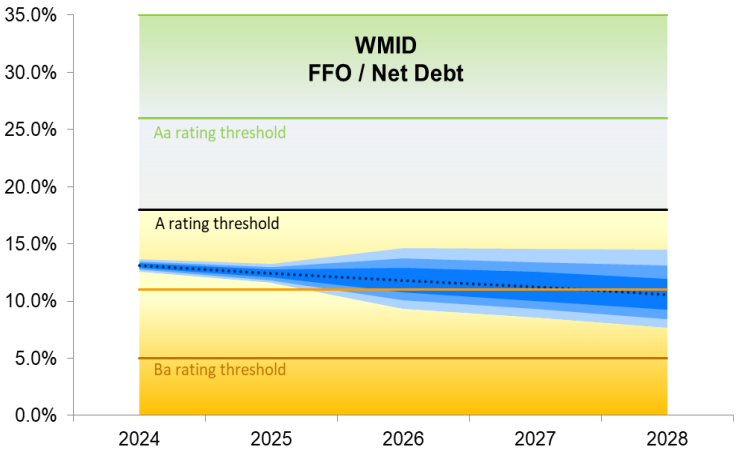


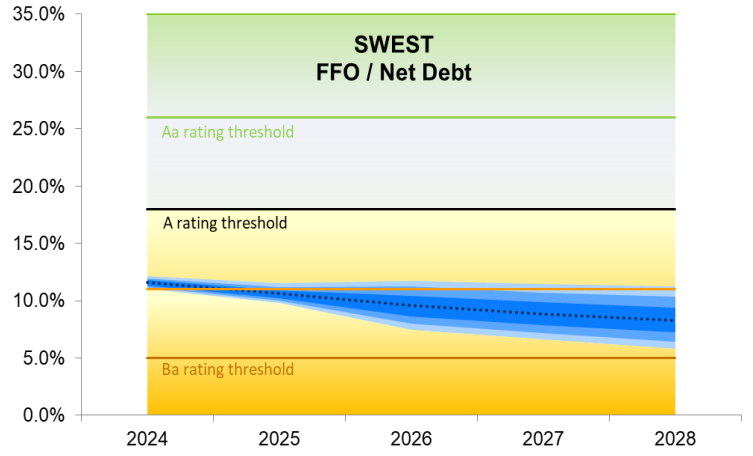


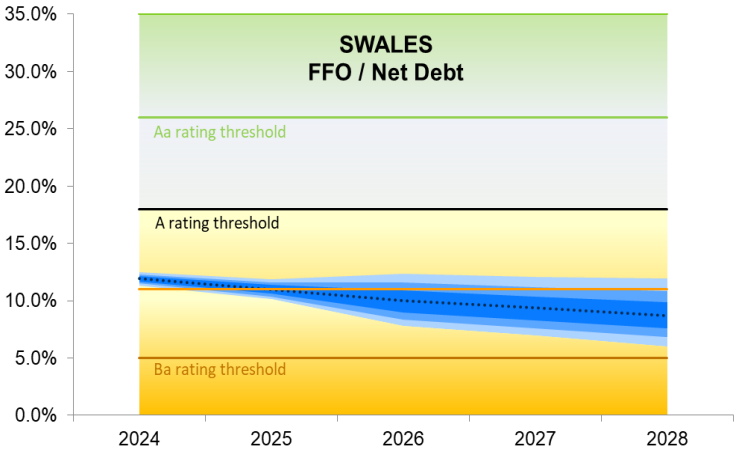
Scenario 1: Ofgem March 2021 SSMD financial parameters – **FFO/Net debt**

Ofgem SSMD COE parameters, 3% notional dividends, 0.25% expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, natural capitalisation rate



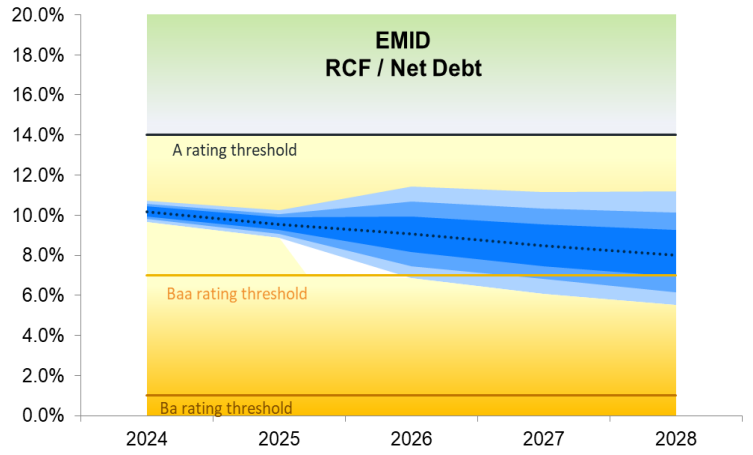


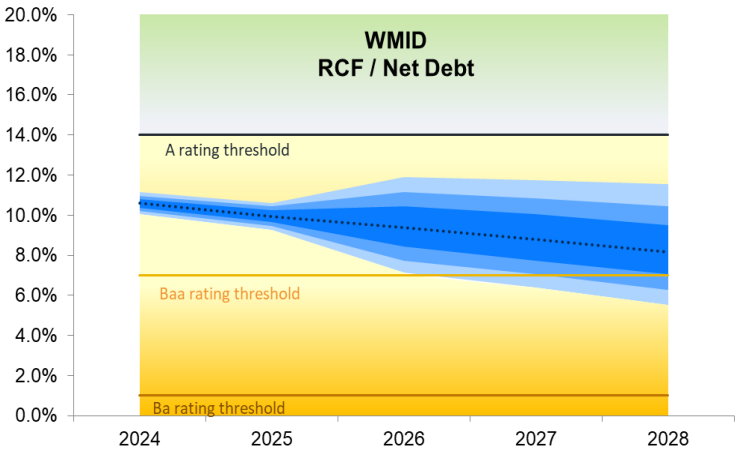


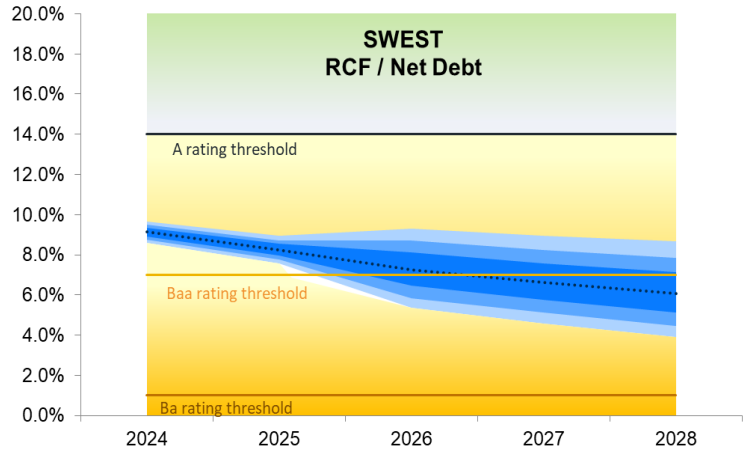


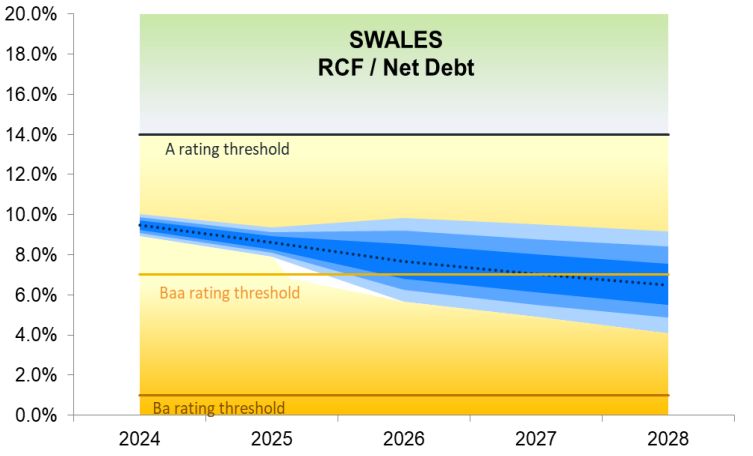
Scenario 1: Ofgem March 2021 SSMD financial parameters – **RCF/Net debt**

Ofgem SSMD COE parameters, 3% notional dividends, 0.25% expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, natural capitalisation rate





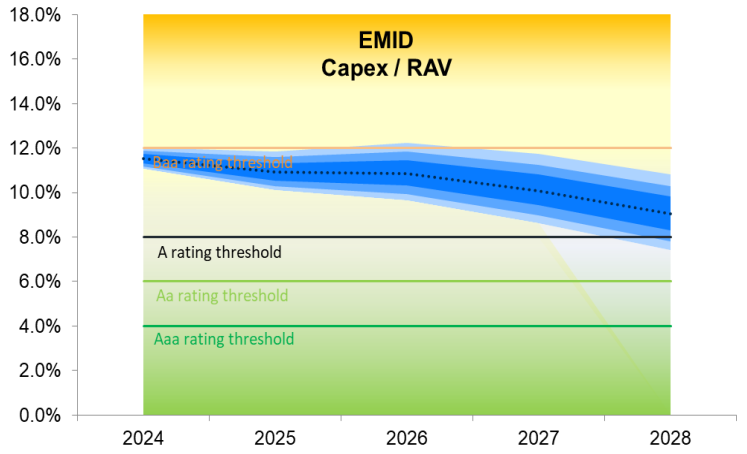


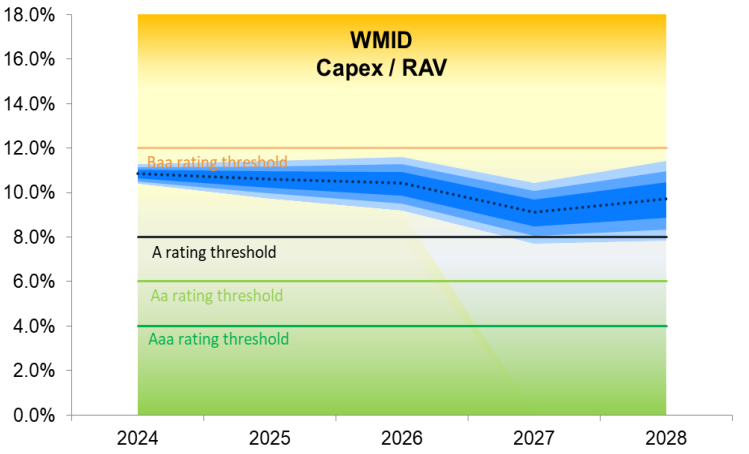


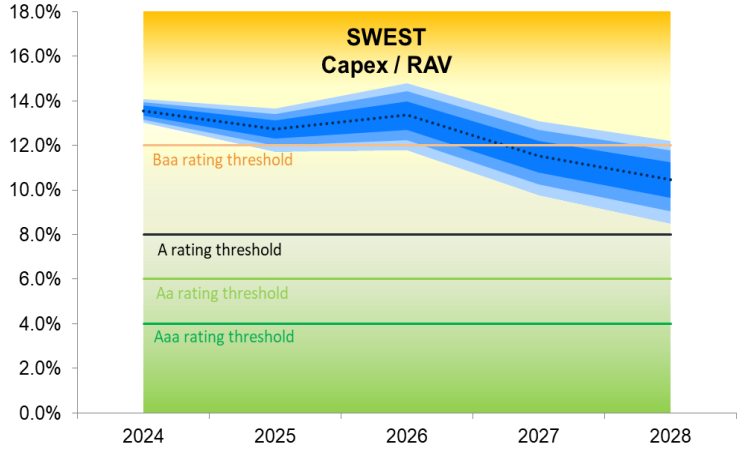
Confidence Levels: 50%- 75% - 88% - 95%

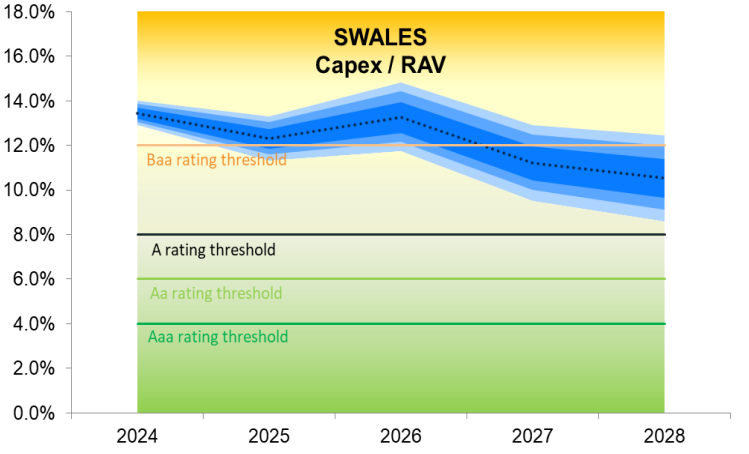
Scenario 1: Ofgem March 2021 SSMD financial parameters – **Capex/RAV**

Ofgem SSMD COE parameters, 3% notional dividends, 0.25% expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, natural capitalisation rate





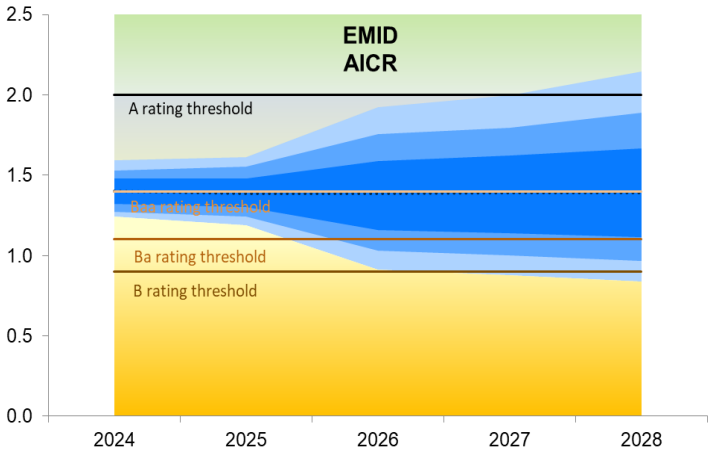


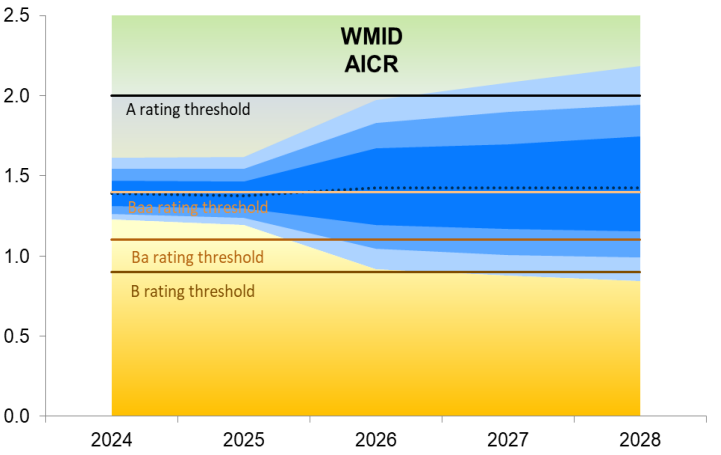


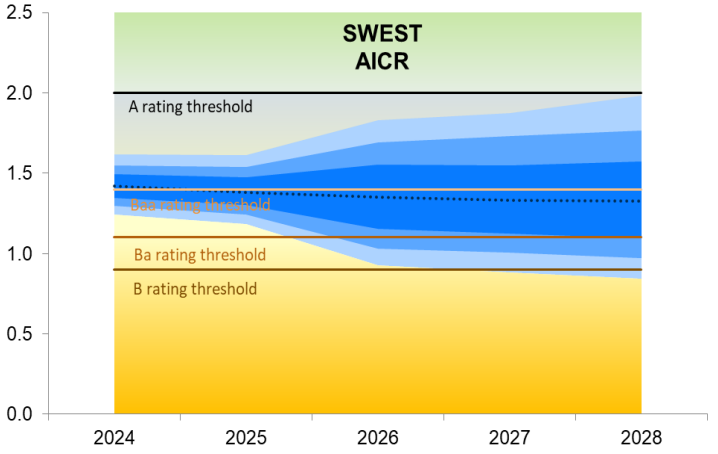
Appendix B Simulation results for individual financial ratios – Scenario 2

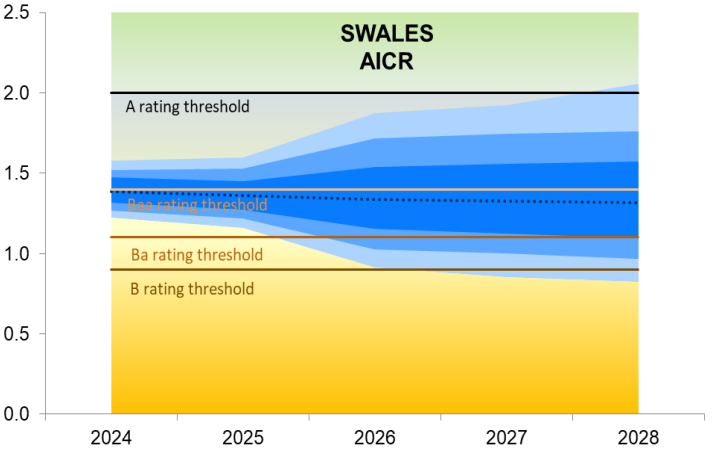
Scenario 2: WPD business plan financial parameters - **AICR**

WPD COE and COD parameters, dividends = COE, no expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, 75% capitalisation rate



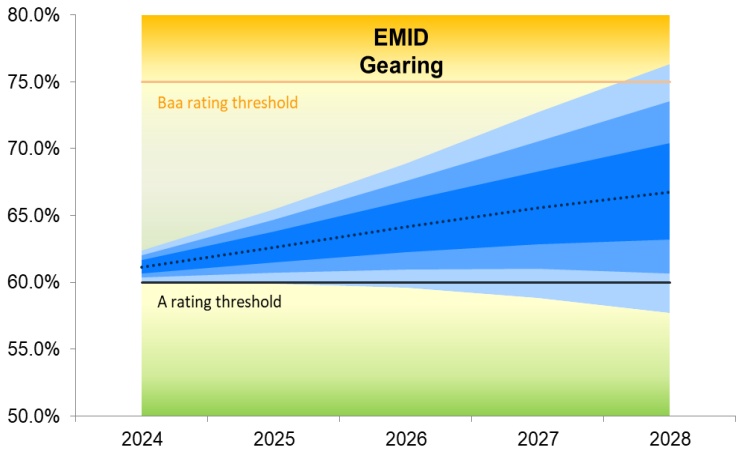


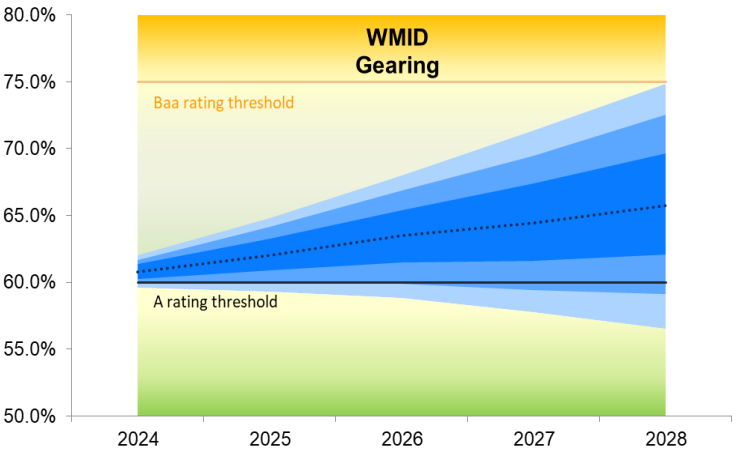


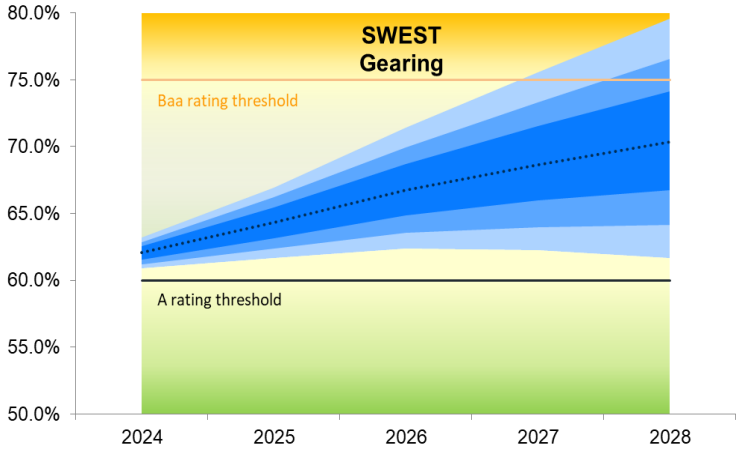


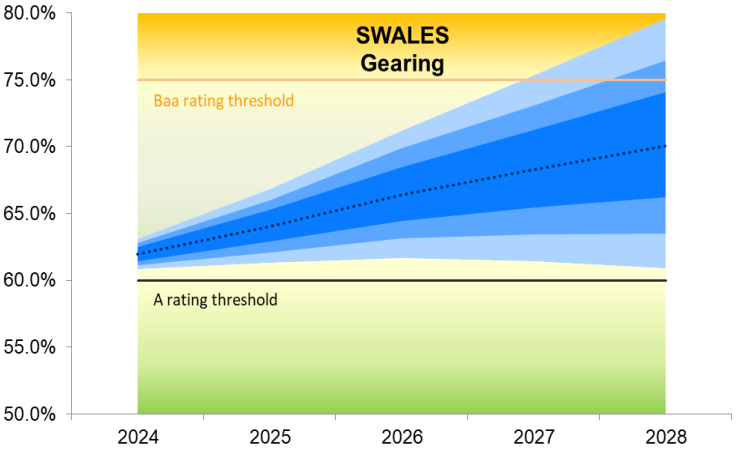
Scenario 2: WPD business plan financial parameters - **Gearing**

WPD COE and COD parameters, dividends = COE, no expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, 75% capitalisation rate



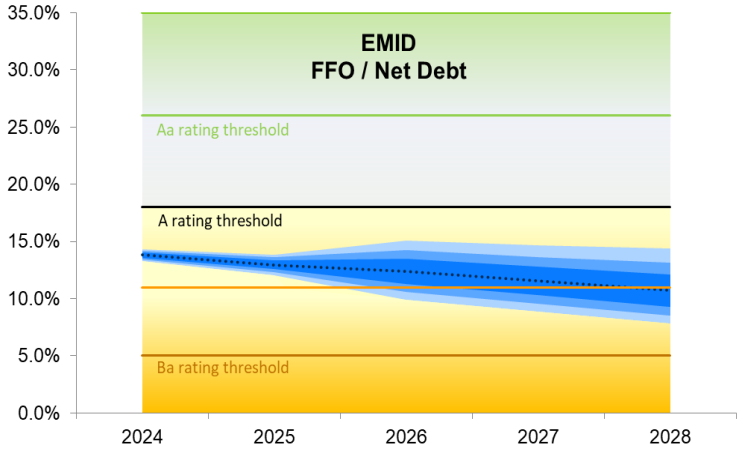


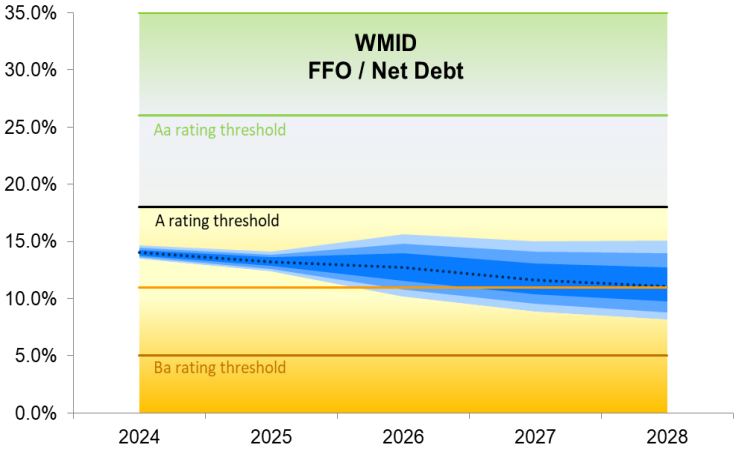


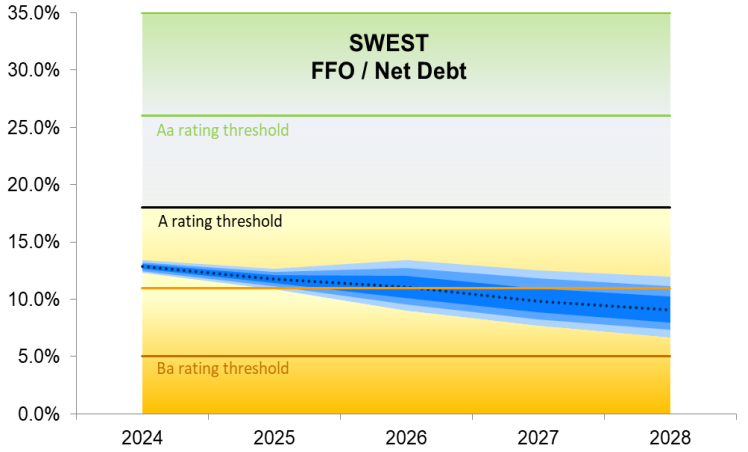


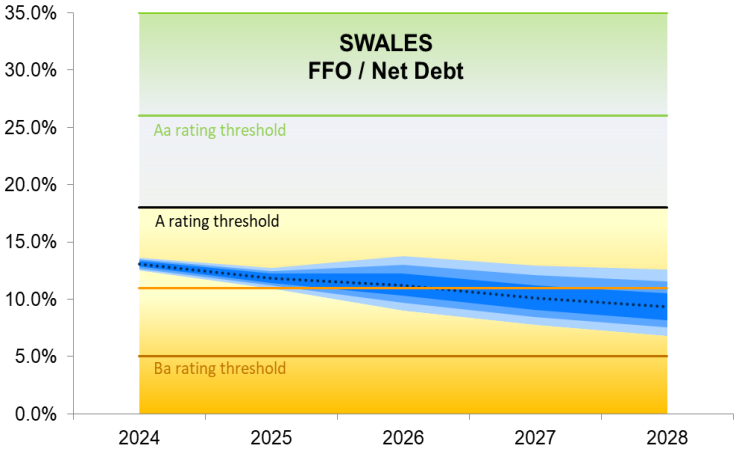
Scenario 2: WPD business plan financial parameters – **FFO/Net debt**

WPD COE and COD parameters, dividends = COE, no expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, 75% capitalisation rate



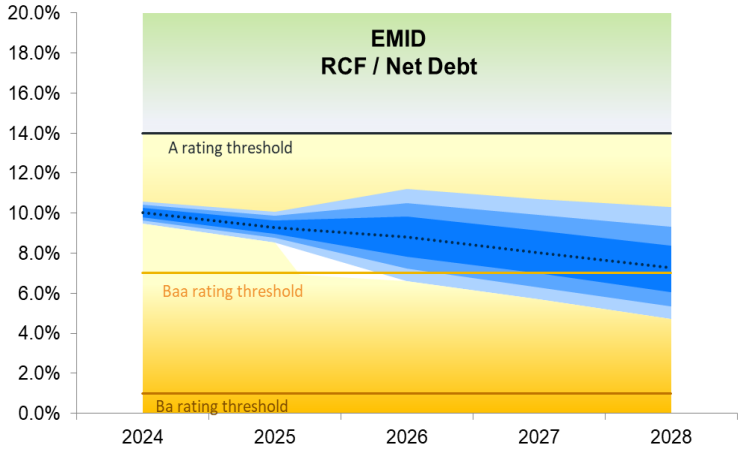


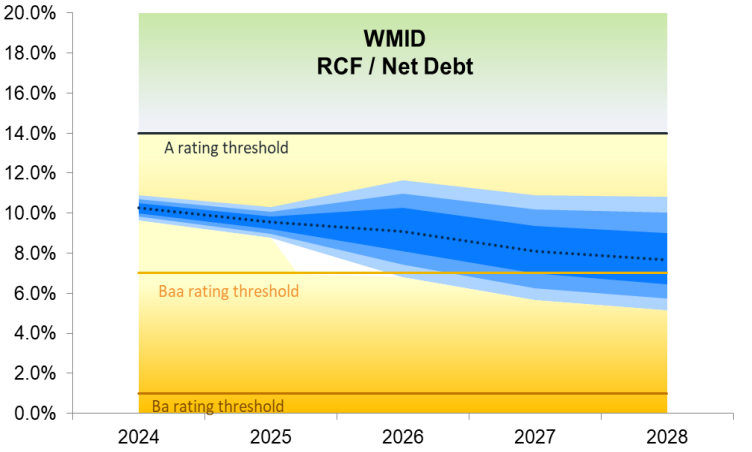


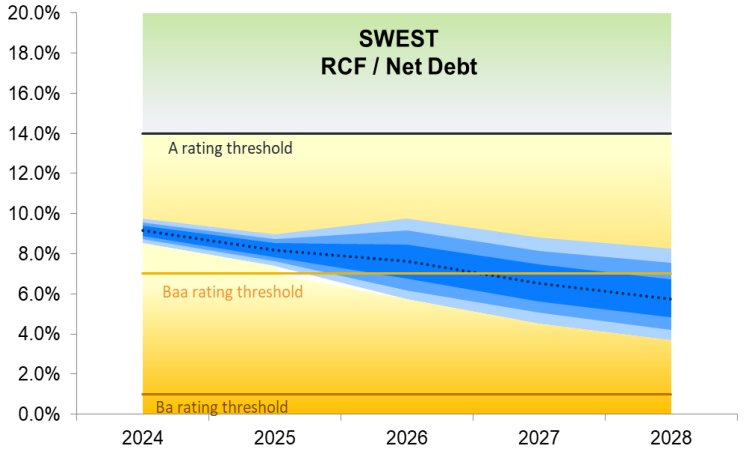


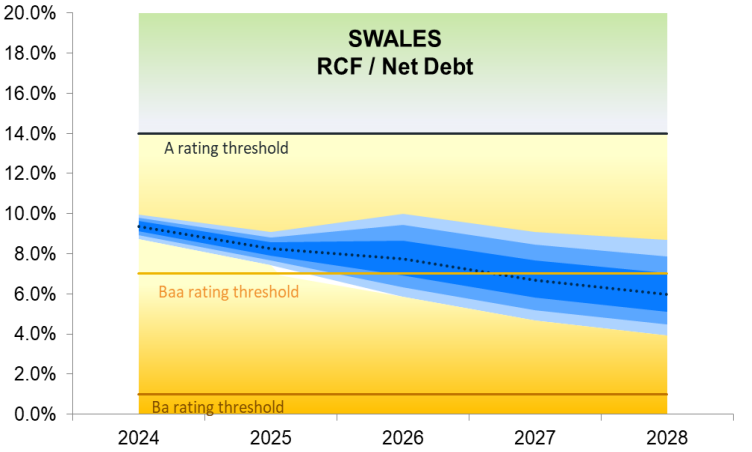
Scenario 2: WPD business plan financial parameters – **RCF/Net debt**

WPD COE and COD parameters, dividends = COE, no expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, 75% capitalisation rate



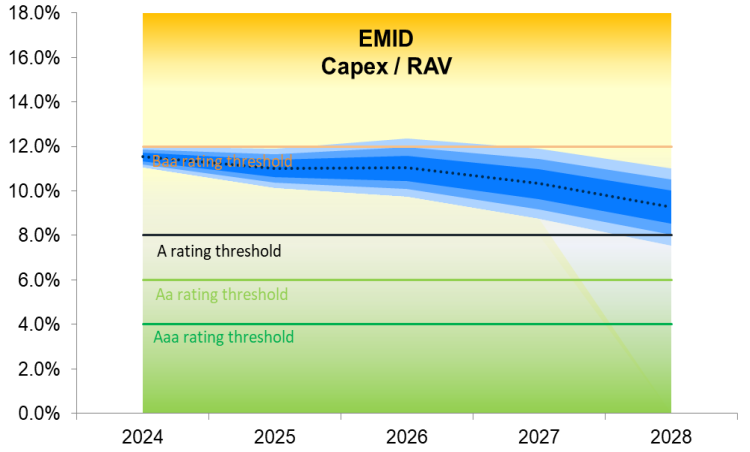


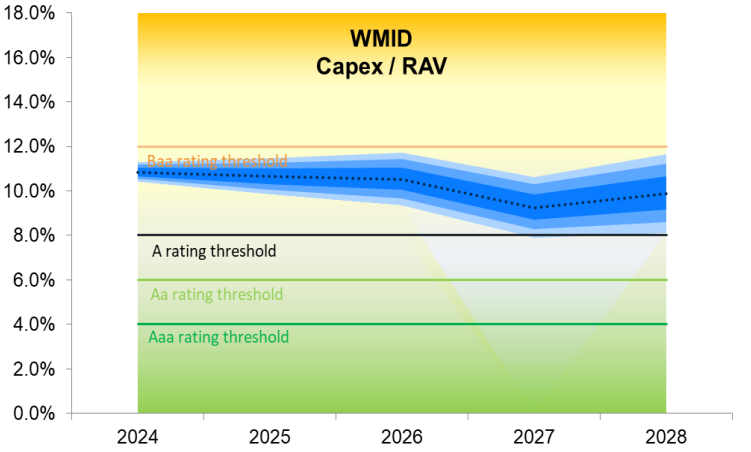


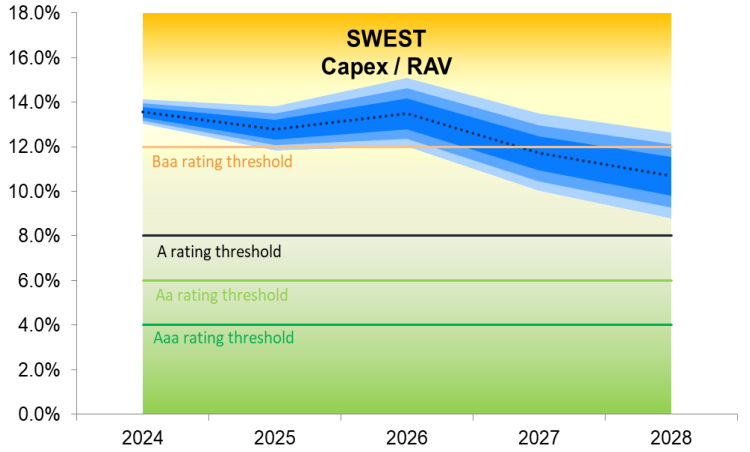


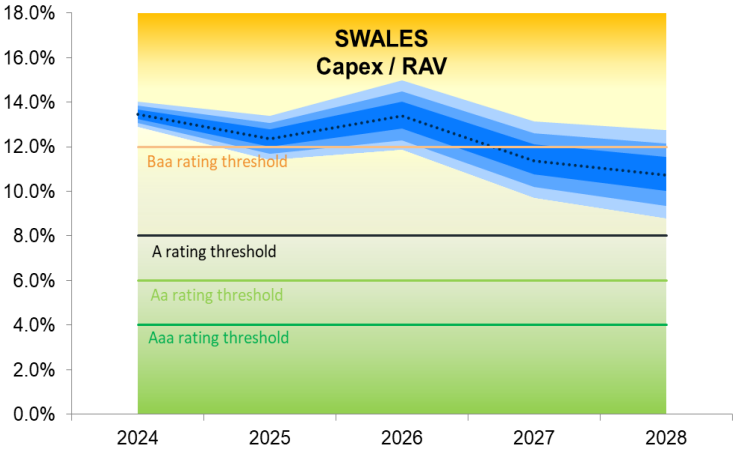
Scenario 2: WPD business plan financial parameters – **Capex/RAV**

WPD COE and COD parameters, dividends = COE, no expected RoRE outperformance, 25% share of ILD, no equity issuance threshold, 75% capitalisation rate









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