



ASSESSMENT OF THE CAPITALISATION RATE APPLIED TO UNCERTAINTY MECHANISMS IN THE RIIO-ED2 DRAFT DETERMINATIONS

FINAL REPORT PREPARED BY PA CONSULTING
FOR THE ENERGY NETWORKS ASSOCIATION

23 August 2022

Bringing Ingenuity to Life
paconsulting.com

Version	Date	Author	Comments
V0.1	15.08.22	PA Consulting	First Draft for Review
V1.0	23.08.22	PA Consulting	Final Report

Corporate Headquarters

10 Bressenden Place
London
SW1E 5DN
+44 20 7730 9000
paconsulting.com

Prepared by: PA Consulting

Reference: ENA Uncertainty Mechanisms

Version: 1.0

Contents

Executive Summary	2
1 Introduction	5
2 UK regulatory precedent about the setting of capitalisation rates	9
3 Modelling the impact of the proposed capitalisation rates	14
4 Conclusion	21
5 Appendix 1: Further details on modelling	23

List of Tables and Figures

Table 1: RIIO-ED2 DD Proposed capitalisation rates	2
Table 2: Types of uncertainty mechanisms within the RIIO-ED2 framework	5
Table 3: Proposed RIIO-ED2 common uncertainty mechanisms	6
Table 4: Proposed capitalisation rates for RIIO-ED2 Draft Determinations	7
Table 5: Capitalisation rates set in RIIO-GD/T2 Final Determinations	11
Table 6: Aggregate DNO totex, baseline and UMs, over the RIIO-ED2 period	15
Table 7: Aggregate total sector customer bill (£) for RIIO-ED2 period	17
Table 8: Modelled AICR over the RIIO-ED2 period for the sector	18
Table 9: Modelled gearing over the RIIO-ED2 period for the sector	19
Table 10: Notional DNO assumptions used in stylised modelling based on RIIO-ED2 DDs	23
Table 11: Detailed modelling outputs for the Base Case versus Scenario 1	24
Table 12: Detailed modelling outputs for the Base Case versus Scenario 2	25
Figure 1: Illustration of building blocks of RIIO-ED2 price control	14
Figure 2: Impact on closing RAV growth during RIIO-ED2 for the sector	16
Figure 3: Impact on allowed revenues during RIIO-ED2 for the sector	16
Figure 4: Impact on customer bills during RIIO-ED2 for the sector	17

Executive Summary

Electricity Distribution Network Operators (DNOs) are responsible for carrying electricity from the high-voltage transmission network (owned and operated by National Grid) and generation sources connected to their network, to network users across Great Britain (GB). To ensure value for money for consumers, Ofgem requires the DNOs to operate under a common regulatory framework (RIIO) and regulates the DNOs through periodic price controls.

The current RIIO-ED1 price control expires on 31 March 2023. In this context, Ofgem published its Draft Determinations (DDs) for the RIIO-ED2 price control on 29 June 2022. These DDs set the performance targets, expenditure allowances, allowed rate of return and the allowed revenues for the 14 DNOs over the period from 1 April 2023 to 31 March 2028.

There is significant uncertainty around the amount of activity which DNOs will need to perform, and the amount of totex they will need to spend, during the RIIO-ED2 period. To protect DNO customers and investors, Ofgem's RIIO-ED2 DDs included several uncertainty mechanisms (UMs) to enable changes to expenditure and revenue allowances during the price control period if certain events occur that means the outturn reality differs materially from the ex-ante forecasts.

The treatment of expenditures under UMs such as re-openers and volume drivers (VDs) could have important implications for DNO customers and investors: all else equal, more expenditure will lead to higher allowed revenues and customer bills and may impact on gearing and interest coverage ratios. The proportion of the expenditure added to the RAV – referred to as the capitalisation rate in RIIO - will be an important determinant of these impacts.

In the RIIO-ED2 DDs Ofgem proposed a capitalisation rate of 98.0% for re-openers and VDs, but a capitalisation rate of 68-80% for ex-ante (baseline) expenditure allowances, as shown in Table 1 below.

Table 1: RIIO-ED2 DD Proposed capitalisation rates

Ex-ante allowances including PCDs	Re-openers and volume drivers
68% - 80%	98%

Source: Ofgem RIIO-ED2 Draft Determinations Finance Annex, June 2022

Ofgem's rationale for setting different rates for ex-ante allowances (including PCDs) and re-openers and volume drivers at RIIO-ED2 was based on the belief that this approach would be both "*simple as it embeds an ex-ante view*" on the forthcoming price control period, and that it is "*effective ([as] the overall rate will be a weighted average/[reflecting underlying] categories [of expenditure])*". Ofgem also favour this method as they are required only to "*forecast the rate of capitalisation rather than the monetary quantum of all re-openers and volume drivers [with] the overall capitalisation rate reflecting the weighted average of the underlying expenditure categories, with the weight on each category dependent on future decisions for re-openers and volume drivers.*"¹

The RIIO-ED2 DDs indicate that approximately £1.4bn of expenditure is expected to be subject to UMs. This is a substantial amount of expenditure meaning the choice of capitalisation rate applied to these expenditures could have important impacts on intergenerational equity and DNO financeability. It is therefore important that the proposed rate is robust.

In this context, the Energy Networks Association (ENA) has commissioned PA Consulting to carry out an independent assessment of Ofgem's proposed approach to capitalisation rates for RIIO-ED2 UMs (specifically re-openers and volume driver-related expenditure). To assist Ofgem, DNOs, customer groups and other interested stakeholders evaluate the appropriate capitalisation rate for RIIO-ED2 UMs, we have:

- Reviewed the approaches taken by Ofgem and other economic regulators to the setting of capitalisation rates in the past, particularly the types of factors that have been considered when determining capitalisation rates and the types of analysis and evidence that have been presented to justify differential capitalisation rates for baseline and UMs expenditures; and
- Undertaken stylised financial modelling of a notional DNO over the RIIO-ED2 period to provide preliminary indications of the potential impacts of the choice of capitalisation rate on intergenerational equity (measured through customer bills) and on DNO financeability (measured through the Adjusted Interest Coverage Ratio

¹ <https://www.ofgem.gov.uk/sites/default/files/2022-06/RIIO-ED2%20Draft%20Determinations%20Finance%20Annex.pdf> page 107

(AICR) and gearing ratios). Our stylised modelling has been undertaken for a notional DNO defined equal to all 14 DNOs added together using the RIIO-ED2 Price Control Financial Model (PCFM) published by Ofgem.

To analyse the impact on intergenerational equity, we have considered a scenario where UMs expenditure is unchanged at £1.4bn over the RIIO-ED2 period, but the capitalisation rate is set at 74%. We chose this scenario because retaining the same amount of expenditure meant that we could focus on the impacts of a different choice of capitalisation rate. The 74% capitalisation rate assumption is based on the mid-point of the range of capitalisation rates applied to baseline expenditures in the RIIO-ED2 DDs.

To analyse the impact on financeability, we have considered a scenario where UMs expenditure reflects Ofgem's 'High' scenario of £3.4bn, a capitalisation rate of 74% (the same as in the intergenerational equity analysis) and assumed that DNOs incur opex that is not funded equal to 25% of the UMs expenditures.

The £3.4bn UM expenditure assumption is based on Ofgem's 'High' PCFM scenario. Expenditure figures are included in Ofgem's PCFM for a higher number of UMs in this 'High' scenario, so may provide a more realistic estimate of UMs spending. We also note that the 'Base' scenario is not a high demand scenario and it does not take into account the impact of changes to connection boundaries on DNO expenditures. We use this scenario in the financeability testing because it better reflects a downside scenario for the purposes of financeability testing, which is appropriate because our modelling aims to demonstrate the potential importance of the choice of the UMs capitalisation rate. The 25% unfunded amount is adopted because RIIO-T2 included an opex scalar to cover similar opex costs, and in the RIIO-ED2 DDs Ofgem did not include any such scalar (which suggests the costs would be unfunded), and a recommendation from DNOs not to adopt too low of an estimate of unfunded opex given that firm data on this issue is currently being collected by DNOs and is not, therefore, available to be used in this study.

Based on our work, we note:

- Ofgem's proposed capitalisation rate for UMs expenditures would – compared to the 74% counterfactual rate – lead to customer bills being around 1.5% lower by the end of RIIO-ED2, but also lead to higher customer bills in RIIO-ED3 and future periods (all else equal).
- Ofgem's 'High' PCFM scenario applying the 74% UM capitalisation rate and a 25% uplift for unfunded opex leads to a weaker AICR and higher gearing ratio for the notional DNO, both of which would – all else equal – have a material and negative impact on DNO financeability. At the margins, these deteriorations in financeability metrics could lead notionally efficient DNOs to fail to meet Ofgem's financeability tests, with consequences for investors and for customers.
- The rationale presented by Ofgem for the choice of capitalisation rate is much less detailed than the corresponding analysis it presented in the RIIO-GD2 and RIIO-T2 FDs previously. There Ofgem undertook extensive analysis of the impact of the choice of capitalisation rate on financeability. It is unclear why Ofgem has not presented similar analysis in the RIIO-ED2 DDs, but we would encourage Ofgem to share this analysis with DNOs, customer groups and other stakeholders ahead of the RIIO-ED2 FDs.
- Ofgem, and other economic regulators, have typically considered the natural rate of capitalisation (based on expected proportions of capex and opex), impacts on financeability and the implications for customer bills and intergenerational equity when setting past price reviews. We recommend Ofgem considers these issues when determining the capitalisation rate for UMs expenditures in the RIIO-ED2 FDs. We note that while Ofgem did not present analysis of intergenerational equity issues in relation to UMs capitalisation rates in the RIIO-GD2/T2 FDs, we consider that it would be best practice to do so and in any case, given the emergence of a cost of living crisis and major increases in energy costs in the last year (i.e. since RIIO-GD2/T2 FDs), we think it would be appropriate to apply greater than usual scrutiny to impacts on intergenerational equity for RIIO-ED2.

Noting the above, we recommend that further detailed analysis be published by Ofgem in relation to the choice of capitalisation rate for the ED2 UMs expenditures. We propose that this analysis include:

- **Detailed analysis of intergenerational equity issues:** the reduction in customer bills during RIIO-ED2 resulting from a higher capitalisation rate needs to be weighed against the longer-term increases in customer bills, taking into account intergenerational equity and which customers benefit from the services provided by the UMs expenditures. The analysis we have presented in our work has focused only on average customer bills, but we recommend that Ofgem also specifically considers the impact on vulnerable customers, which we expect might be most affected by any trade-offs between short- and long-term bill levels.

- **Detailed analysis of financeability issues:** our analysis has shown that higher capitalisation rates can have a material and negative impact on DNO financial ratios. We recommend that Ofgem undertakes similar analysis and considers, through scenario analysis similar to that which it undertook for the RIIO-GD2/T2 FDs, whether the proposed 98% capitalisation rate applied to RIIO-ED2 UMs expenditures provides DNOs with sufficient financial headroom.

We suggest that all of the analysis described above is performed under a range of scenarios, such as the amount of expenditure that could take place under UMs (such as Ofgem's 'High' PCFM scenario representing £3.4bn of expenditure during RIIO-ED2), the capitalisation rate applied to UMs expenditure and to other key variables such as inflation and interest rates (which also influence customer affordability and financeability ratios). Another reason to consider the 'High' scenario is that the 'Base' scenario is not a high demand scenario, and it does not take into account the impact of changes to connection boundaries.

Finally, we note that our scope of work has not included any work on what the 'natural rate' of capitalisation is likely to be for RIIO-ED2 UMs expenditures. We consider that this is an important reference point when setting capitalisation rates (and has been considered by Ofgem and other economic regulators at previous price reviews), so we recommend that detailed analysis (of, for example, the expected proportions of capex and opex within UMs expenditures) is also undertaken. This evidence on the 'natural rate' should be considered alongside the analysis of customer bills and financeability described above when making a final decision about the capitalisation rate to apply to RIIO-ED2 UMs expenditures.

Undertaking the above further analysis would be consistent with the principles of regulatory best practice and would also facilitate an informed discussion between Ofgem, the DNOs, customer groups and other stakeholders to arrive at a robust decision for the RIIO-ED2 FDs.

1 Introduction

Ofgem published its Draft Determinations (DDs) for the RIIO-ED2 price control on 29 June 2022. These DDs, inter alia, set the performance targets, expenditure allowances, allowed rate of return and the allowed revenues for the 14 electricity Distribution Network Operators (DNOs) in Great Britain (GB) over the period from 1 April 2023 to 31 March 2028.

The allowances included in the RIIO-ED2 DDs are based on a set of forecasts about what is going to happen over the 5-year period. There is inherent uncertainty around any forecast and if the outturn reality differs materially from the forecast, then DNO customers or investors will be impacted, either positively or negatively. To protect against material deviations from forecast, Ofgem has included several 'uncertainty mechanisms' (UMs) within the RIIO-ED2 DDs: these UMs enable changes to the expenditure and revenue allowances during the specific price control period if certain events occur.

Ofgem uses five different types of uncertainty mechanism in the RIIO-ED2 DDs; indexation, re-opener, pass-through, use-it or lose-it (UIOLI) and volume driver. The definitions of these types of UMs are highlighted Table 2.

Table 2: Types of uncertainty mechanisms within the RIIO-ED2 framework

Type	Purpose
Indexation	To provide network companies and consumers some protection against the risk that outturn prices are different to those that were forecasted when setting the price control, e.g. general price inflation or sector specific cost pressures.
Re-opener mechanisms	To decide, within the price control period, whether changes in allowances are needed, e.g. to deliver a project or activity once there is more certainty on the needs case, and costs.
Pass-through mechanisms	To adjust allowances for costs incurred by the network companies over which they have limited control, e.g. business rates.
Use-it or lose-it (UIOLI) allowance	To adjust allowances where the need for work has been identified, but the specific nature of work or costs are uncertain.
Volume drivers	To adjust allowances in line with actual volumes where the volume of work required over the price control is uncertain (but where the cost of each unit is stable).

Source: Ofgem RIIO-2 Final Determinations Core Document, p56, December 2020

The RIIO-ED2 DDs included 34 common UMs (i.e., UMs that apply to all 14 DNOs) in addition to three bespoke UMs (i.e., UMs that apply to specific DNOs only). The table below illustrates the full list of 33 UMs from the ED2 DDs; the final UM is the EV Provider of last resort mechanism, the details of which were not included by Ofgem in the DDs.

Table 3: Proposed RIIO-ED2 common uncertainty mechanisms

Indexation	Re-opener	Pass-through	UIOLI	Volume driver
Real Price Effects	Coordinated Adjustment Mechanism	Ofgem licence fee	Visual amenity	Polychlorinated biphenyls
Cost of debt	Environmental re-opener	Business rates	Worst Served Customers	LRE – Secondary Reinforcement
Cost of equity	LRE – General	Transmission Connection Point Charges	Cyber Resilience OT	LRE – Low Voltage Services
Inflation indexation of RAV	Net Zero re-opener	Pension deficit repair mechanism		
	Digitalisation re-opener	Ring-fence costs		
	DSO re-opener	Miscellaneous pass-through		
	Storm Arwen	Severe Weather 1-in-20		
	Physical security	Smart meter information technology costs		
	Electricity system restoration	Smart meter communications costs		
	Cyber resilience OT and IT			
	Streetworks costs			
	Rail electrification			
	High Value Projects			
	Tax review			

Source: Ofgem RIIO-ED2 Draft Determinations Overview Document, Table 4 (p39-41), June 2022

The treatment of expenditures under UMs and volume drivers could have important implications for DNO customers and investors: all else equal, more expenditure will lead to higher allowed revenues and customer bills and may impact on gearing and interest coverage ratios. The proportion of the expenditure added to the RAV – referred to as the capitalisation rate in RIIO – will be an important determinant of these impacts.

The RIIO-ED2 DDs set out proposals for the capitalisation rates to be applied to DNO expenditures. Ofgem proposed a capitalisation rate of 98.0% for re-openers and volume drivers for each DNO across the RIIO-ED2 period, as shown in Table 4 below.² This rate is substantially higher than the capitalisation rate Ofgem has proposed for base expenditures including Price Control Deliverables (PCDs), which are typically in the 70-80% range, as also shown in Table 4 below.

² <https://www.ofgem.gov.uk/sites/default/files/2022-06/RIIO-ED2%20Draft%20Determinations%20Finance%20Annex.pdf>

Table 4: Proposed capitalisation rates for RIIO-ED2 Draft Determinations

Licensee	Ofgem proposed capitalisation rate (ex-ante allowances including PCDs)*	Ofgem proposed capitalisation rate (re-openers and volume drivers)
ENWL	73%	98%
NPgN	73%	98%
NpgY	75%	98%
WMID	78%	98%
EMID	79%	98%
SWALES	79%	98%
SWEST	80%	98%
LPN	71%	98%
SPN	71%	98%
EPN	72%	98%
SPD	72%	98%
SPMW	71%	98%
SSEH	68%	98%
SSES	68%	98%

Source: Ofgem RIIO-ED2 Draft Determinations Finance Annex, June 2022

*Under Ofgem's RIIO framework, PCDs are used to capture those outputs that are directly funded through the price control and where the funding provided is not transferrable to a different output or project. See p126 of <https://www.ofgem.gov.uk/sites/default/files/2022-06/RIIO-ED2%20Draft%20Determinations%20Overview.pdf> for further details

Ofgem's rationale for setting different rates for ex-ante allowances (including PCDs) and re-openers and volume drivers at RIIO-ED2 was based on the belief that this approach would be both "*simple as it embeds an ex-ante view*" on the forthcoming price control period, and that it is "*effective ([as] the overall rate will be a weighted average/ [reflecting underlying] categories [of expenditure])*". Ofgem also favour this method as they are required only to "*forecast the rate of capitalisation rather than the monetary quantum of all re-openers and volume drivers [with] the overall capitalisation rate reflecting the weighted average of the underlying expenditure categories, with the weight on each category dependent on future decisions for re-openers and volume drivers.*"³

The proposed 98% capitalisation rate is, as noted above, much higher than for base expenditures. It is also higher than the capitalisation rates proposed by Ofgem at past price reviews e.g., RIIO-GD2/T2. The choice of capitalisation rate applied to expenditures under UMs can also have important impacts on intergenerational equity and financeability. It is important therefore that the proposed capitalisation rate for RIIO-ED2 UMs expenditure is robust.

In this context, the Energy Networks Association (ENA) has commissioned PA Consulting to carry out an independent assessment of Ofgem's proposed approach to capitalisation rates for ED2 UM and VD expenditure. Specifically, PA Consulting has been commissioned to consider:

- how the reasons provided by Ofgem for the proposed capitalisation rate compare to previous decisions about capitalisation rates by Ofgem and other economic regulators, including whether the justification for Ofgem's proposed 98% capitalisation rate is as extensive and robust as past justifications for capitalisation rates; and
- how important the choice of capitalisation rate may be and therefore whether Ofgem has provided sufficient explanation for its proposed decision, by assessing the potential implications and impacts of the proposed capitalisation rate on, for example, intergenerational equity and company financeability.

PA Consulting has not been commissioned to carry out a review of the proportions of expenditures under the UMs and VDs which are capex or opex (or sub-categories of capex and opex) and therefore whether the 98% capitalisation rate proposed by Ofgem reflects the expected proportions of capex and opex under UMs and VDs i.e. the 'natural rate' of capitalisation.

To address the requirements set out in the scope of work, the remainder of this report is structured as follows:

- Section 2 reviews UK regulatory precedent about the setting of capitalisation rates;

³ <https://www.ofgem.gov.uk/sites/default/files/2022-06/RIIO-ED2%20Draft%20Determinations%20Finance%20Annex.pdf> page 107

- Section 3 presents the results of our stylised modelling of the impact of the proposed capitalisation rates on a notional DNO, and discusses the impact of the proposed capitalisation rates on DNO investors, customers and other stakeholders; and
- Section 4 presents the conclusions and next steps from our report.

2 UK regulatory precedent about the setting of capitalisation rates

To examine whether Ofgem has provided sufficient explanation of its UMs capitalisation rate proposals in the RIIO-ED2 DDs, and also to explore the depth of evidence Ofgem has considered when explaining its UMs capitalisation rate (for example, intergenerational equity, financeability, determining the 'natural' opex/capex split etc.), below we describe how these issues have been discussed in regulatory precedents from recent network price control determinations.

We have particularly focused on Ofgem's past approaches to the RIIO-GD/T2 and RIIO-1 price controls.

We have also considered the approach taken by Ofwat, as it also applies a totex regime to water companies, and UREGNI, because it also regulates energy networks in Northern Ireland. These regulators do not, however, include a similar number of UMs as Ofgem does and consequently do not consider a separate capitalisation rate for UM-related expenditures.

RIIO-ED2

Ofgem's December 2019 RIIO-ED2 Framework Decision and subsequent July 2020 RIIO-ED2 Sector Specific Methodology Consultation (SSMC) proposed a consistent capitalisation policy approach for the DNOs as used for the RIIO-GD&T2 Final Determinations (FDs), such that rates should reflect each licensee's proportions of expected opex and capex.^{4,5} The RIIO-ED2 Framework Decision set out several design principles based on Ofgem's experience of setting the RIIO-GD/T2 FDs, and although these were not "fixed" they were published to ".... Serve as a useful guide for stakeholders to indicate how we might consider a topic in the context of a future price control, and in particular for RIIO-ED2. We consider that this will be helpful in supporting transparency in decision-making and consistency in our approach to setting price controls". Ofgem's principle relating to capitalisation stated that: *"the capitalisation rate (the proportion of totex that is added to the RAV each year) should reflect the broad balance between capital and non-capital expenditure (as forecast at the start of the control period), whilst having regard to balancing affordability, financeability and the interaction between depreciation and capitalisation."*

Ofgem concluded in their Sector Specific Methodology Decision (SSMD) that baseline totex capitalisation rates should reflect the accounting distinction between opex and capex, with capex 100% capitalised and opex 0% capitalised and that the baseline totex capitalisation rates would be set based on the same 'natural rate' split of capex/opex. Ofgem updated their position from the SSMC in the SSMD to propose separate capitalisation rates for uncertainty mechanisms based on the *"best available estimates of the likely natural rate"*.⁶ The SSMD did not state how Ofgem intended to come up with their best available estimates of the likely natural rate for UMs.

Key messages:

- Ofgem's position at the RIIO-ED2 SSMD explicitly states that they would consider setting a different capitalisation rate for UM expenditure based on the best available estimate of the likely natural rate.
- Ofgem did not, however, indicate that it expected these rates would be significantly different to those proposed for baseline totex.
- The RIIO-ED2 DDs position (separate UM capitalisation rate) is therefore not inconsistent with Ofgem's overall approach taken from earlier consultations in the RIIO-ED2 process. Further, since Ofgem did not provide any indication about how it would determine the 'natural rate' capex/opex split for the UM capitalisation rate in the SSMD, the RIIO-ED2 DDs position is not inconsistent with Ofgem's earlier RIIO-ED2 consultations; it was, however, implicit in the earlier consultations (and Ofgem's capitalisation rate principle as stated in the RIIO-ED2 Framework Decision) that Ofgem would provide a detailed explanation for its proposed UMs capitalisation rate later in the RIIO-ED2 process and that detailed justification has not been provided in the RIIO-ED2 DDs.

⁴ https://www.ofgem.gov.uk/sites/default/files/docs/2019/12/riio-ed2_framework_decision_dec_2019.pdf#page=68

⁵ https://www.ofgem.gov.uk/sites/default/files/docs/2020/07/ed2_ssmc_annex_3_finance.pdf#page=25

⁶ https://www.ofgem.gov.uk/sites/default/files/docs/2021/03/riio_ed2_ssmd_annex_3_finance.pdf

RIIO-GD/T2 Final Determinations

Ofgem's December 2018 RIIO-GD&T2 SSMC paper proposed to consider capitalisation rates following the submission of each companies' business plans.⁷ The SSMD reiterated that network companies should provide supporting evidence that their proposed capitalisation rates are appropriate and well justified.⁸

Ofgem's RIIO-GD/T2 DDs proposed separate (illustrative) capitalisation rates; one for baseline totex and one for uncertainty mechanisms.⁹ Ofgem's RIIO-GD/T2 DDs stated that capitalisation rates should be natural and reflect accounting distinctions. However, Ofgem expressed the difficulty in determining a perfect 'natural capitalisation rate' for RIIO-2, as firstly, ex-ante rates may not exactly match the required level of costs that will be incurred or classified as opex or capex, and secondly, it is difficult to perfectly reflect each company's accounting approach whilst maintaining a consistent cost classification across companies. Ofgem's RIIO-GD/T2 DDs also stated that they were "*conscious of the effects of intergenerational equity and the impact of financeability of future price controls*" in decisions relating to capitalisation rates. Ofgem maintained separate capitalisation rates for baseline and UMs expenditures in the RIIO-GD/T2 FDs. Ofgem's RIIO-GD/T2 FDs rationale to set different rates for different expenditure categories was that Ofgem believed that this approach was both simple and effective and required a forecast of only the rate of capitalisation rather than the monetary quantum of all UMs. Based on this, for all licensees Ofgem fixed capitalisation rates ex-ante based on forecast capex proportions for each relevant category of expenditure. For Transmission Operators (TOs) (GT and ET), Ofgem set capitalisation rates as the average of the 5-year forecast capex proportion, for each of the following two categories of expenditure:

- Ex-ante totex allowances (including PCDs); and
- Uncertainty mechanisms (re-openers and volume drivers).

To set different capitalisation rates in relation to each category of expenditure, Ofgem stated that judgement is required for re-openers and volume drivers where Ofgem "*cannot say with certainty the proportion of outturn expenditure that will be capex or opex*". Ofgem stated that its proposed capitalisation rate for UMs expenditure "*attempts to avoid over-capitalisation, as this could result in less fast money than might be reasonable, which could hamper company investment and consumer interests*". Ofgem also considered that its approach went some way to alleviating concerns that setting the capitalisation rate on the basis of one potential totex scenario could lead to "*significant and persistent under or over capitalisation during RIIO-2*", with overcapitalisation potentially negatively harming the credit rating of the licensees.¹⁰

Due to the uncertainty surrounding the factors listed above, as stated by Ofgem in the RIIO-GD/T2 FDs, Ofgem used sector-specific rather than company-specific capitalisation rates for the UM category (re-openers and volume drivers).¹¹

Ofgem also undertook financeability analysis of the GDNs and TOs to inform the capitalisation rate applied to UMs expenditures. Ofgem tested three different possible outturn totex scenarios ahead of the FDs¹²:

1. "**Ofgem FD**" – representing FD baseline totex allowances
2. "**Net Zero 1**" – assuming a higher level of totex than anticipated in the ex-ante allowances
3. "**Net Zero 2**" – assuming an even higher level of totex; modelled for the ET sector only

Ofgem's modelling considered two key financeability metrics – namely i) the average interest cover; and ii) funds from operations (FFO) / net debt in each of the three scenarios.

On the basis of these results, Ofgem deemed it appropriate to set the capitalisation rate for UMs at the lower end of a range of capex/opex forecast analysis carried out under these financeability scenarios, with their reasoning stating that this should provide financial support (and support credit metrics) through increased revenues if higher totex scenarios (involving higher capex proportions) outturn in reality.

⁷ https://www.ofgem.gov.uk/sites/default/files/docs/2018/12/riio-2_finance_annex.pdf#page=71

⁸ https://www.ofgem.gov.uk/sites/default/files/docs/2019/05/riio-2_sector_specific_methodology_decision_-_finance.pdf#page=112

⁹ https://www.ofgem.gov.uk/sites/default/files/docs/2020/07/draft_determinations_-_finance.pdf See Table 40

¹⁰ https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_finance_annex_revised_002.pdf See page 83

¹¹ https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_finance_annex_revised_002.pdf See page 116

¹² https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_finance_annex_revised_002.pdf See paragraph 5.23, page

Ofgem also noted that this approach to setting capitalisation rates for UMs was consistent with their ‘Decarbonisation Action Plan’, facilitating “*Net Zero-related actions to be put into place in the price controls at any time*”¹³ whilst also supporting the financial strength of the networks in the event higher totex scenarios associated with high Net Zero investment materialises.

Based on all of the above, for UMs, Ofgem proposed a capitalisation rate in the range of 70.0 – 85.0% for re-openers and volume drivers for the TO/GDNs across RIIO-2 as shown in Table 5 below.¹⁴

Table 5: Capitalisation rates set in RIIO-GD/T2 Final Determinations

Sector	Licensee	Ex ante allowances (including PCDs)	Re-openers and volume drivers
GT	NGGT (TO)	65.00%	75.00%
ET	SHET	78.00%	85.00%
	SPT	84.00%	85.00%
	NGET	80.00%	85.00%
GD	EoE	29.00%	70.00%
	Lon	20.00%	70.00%
	NW	28.00%	70.00%
	WM	26.00%	70.00%
	NGN	35.00%	70.00%
	Sc	44.00%	70.00%
	So	35.00%	70.00%
	WWU	32.00%	70.00%

Note: We have excluded the SO from the table above due to it being an asset light business and therefore not directly comparable to the other regulated energy networks

Source: Ofgem RIIO-2 Final Determinations Finance Annex for the gas and electricity transmission sectors, February 2021

Key Messages:

Ofgem’s position at the RIIO-GD/T2 FDs explicitly sets separate capitalisation rates for both baseline totex and UMs (re-openers and volume drivers) and Ofgem’s approach used to set capitalisation rates for ex-ante baseline totex (including PCDs) is consistent with the proposed method outlined in the RIIO-ED2 DDs.

However, Ofgem’s approach to setting UM capitalisation rates in RIIO-GD/T2 is not consistent with the approach used in the RIIO-ED2 DDs. In the RIIO-GD/T2 FDs Ofgem set the UM capitalisation rate based on a range of financeability analysis, stating that this should provide financial support to network companies in the event that higher than anticipated totex (specifically capex) materialises. Given that there’s no obvious difference in underlying assumptions (importance of UM expenditures, notional gearing, credit rating, financeability metrics etc.) between the GDNs and TOs on the one hand and DNOs on the other, it is not evident why Ofgem has carried out financeability analysis to inform the UMs capitalisation rate for the GDNs/TOs but not for the DNOs.

We also note that Ofgem referred to intergenerational equity and the delivery of net zero when considering capitalisation rates for GD/T2, but it has not referred to these factors when determining the UMs capitalisation rate for ED2.

RIIO-1 Final Determinations

In RIIO-1, with the exception of National Grid Gas Transmission (NGGT), there was no distinction for the proposed capitalisation rates set for ex-ante allowances (including PCDs) and re-openers and volume drivers; rather one all-in capitalisation rate was set for a specific licensee which applied to all totex.

Ofgem considered a split appropriate only in the case of NGGT, where ‘incremental totex’ (defined as expenditure that “*may result in significantly higher overall spend than the base level*” and therefore similar to the UMs for re-openers and volume drivers in RIIO-2)¹⁵ was potentially forecast to result in significantly higher overall spend

¹³ https://www.ofgem.gov.uk/sites/default/files/docs/2020/02/ofg1190_decarbonisation_action_plan_revised.pdf See page 16

¹⁴ https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_finance_annex_revised_002.pdf See Table 17

¹⁵ https://www.ofgem.gov.uk/sites/default/files/docs/2012/07/riio-t1-initial-proposals-for-nggt-and-nget-overview-2707212_0.pdf See page 21

compared to the baseline allowance. In their RIIO-T1 business plan submission, NGGT suggested that split capitalisation rates should be applied to reflect the difference between ex-ante funding and funding relating to incremental totex. Ofgem agreed with NGGT that in some circumstances a split capitalisation rate is an appropriate approach, particularly when the majority of expenditure is covered by UMs.¹⁶

Ofgem considered this sufficient justification to set NGGT a capitalisation rate of 90.0% for uncertain incremental spend compared to a capitalisation rate of 64.4% for base totex.¹⁷

RIIO-ED1 price controls

At RIIO-ED1 Ofgem calculated the capitalisation rate by using a selection of the information available at the time to derive an appropriate all-in capitalisation rate for the DNOs. Ofgem took into consideration:

- Network company business plan projected capitalisation rates, using an average over the 8-year business plan period and considering all expenditure with an asset life of 3 years or less as fast money, with the remaining balance treated as slow money. Indirect costs followed the asset to which they related;
- Company capitalisation levels in their regulatory accounts and other regulatory reporting over the past as a check against future forecasts; and
- Where in a well-justified business plan, network operators made a case for technical innovation but with assets having lives slightly longer than three years. Ofgem considered this expenditure as fast money.

Taking these factors into account, Ofgem aimed to ensure that RAV additions broadly matched investment in long life assets but did not consider that exactly matching the statutory financial accounts added any further benefit. Ofgem's RIIO-ED1 FDs emphasised the importance of factors that will shape *the "inter-generational balance and also facilitate efficient financing for the benefit of consumer sin the long-run"*.¹⁸

RIIO handbook

The RIIO handbook states that Ofgem aims to equalise incentives across the regulated network companies by setting a fixed percentage of allowed total expenditure to be capitalised during each price control period, using a "capitalisation percentage rate". This percentage will be set beforehand by Ofgem at each price control review, seeking to strike a fair balance between existing and future consumers in light of the nature of the expenditure expected over the price control period (e.g., drawing on the amount of capex like costs submitted in a company's business plans).¹⁹

According to the RIIO handbook, capitalisation rates should broadly reflect the 'natural' split of capital and non-capital (i.e., operating) expenditure in company business plans for a forthcoming price control period. Capitalisation rates therefore determine the proportion of company expenditure paid for by consumers over time and added to each network's Regulated Asset Value (RAV) (referred to by Ofgem as 'slow money'), rather than recovered in the year the cost was immediately incurred (referred to by Ofgem as 'fast money').

Key Messages:

- At RIIO-1, Ofgem considered factors such as intergenerational balance, financeability and the natural rate when determining the appropriate capitalisation rate to apply.
- Ofgem's approach for RIIO-1 applied the same capitalisation rate to both baseline totex and to the UMs (re-openers and volume drivers, or their equivalent).
- However, Ofgem took a different approach for NGGT, where significantly higher expenditure above the baseline was anticipated. In that case, Ofgem were satisfied that NGGT had justified its use of a higher (and separate) capitalisation rate for UMs on the basis that the majority of their allowed totex was to be covered by UMs in RIIO-T1.

¹⁶ https://www.ofgem.gov.uk/sites/default/files/docs/2012/07/riio-t1-nggt-and-nget-finance_0.pdf See page 5

¹⁷ https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/1_riiot1_fp_overview_dec12_0.pdf

¹⁸ https://www.ofgem.gov.uk/sites/default/files/docs/2014/11/riio-ed1_final_determination_overview_-_updated_front_cover_0.pdf See page 48

¹⁹ https://www.ofgem.gov.uk/sites/default/files/docs/2010/10/riio_handbook_0.pdf

Conclusion

Based on our review of regulatory precedents, there is a notable difference between the detail and supporting reasoning justifying the UM capitalisation rate provided in the RIIO-ED2 DDs and the RIIO-GD2/T2 FDs. In particular, Ofgem's explanation of its approach in the RIIO-ED2 DDs is not as extensive, nor does it appear to consider the same range of issues. For example, the RIIO-GD/T2 FDs contained several paragraphs of scenario analysis on network company financeability, reference to the possibility of unplanned net zero projects that may arise during the price control period, and also the need to provide the network companies sufficient headroom and flexibility in any UM capitalisation rate if a significant amount of unanticipated totex were to materialise.

Moreover, in comparison to Ofgem's typical approach at past price reviews and the approaches of other economic regulators, Ofgem does not seem to have considered at this stage the factors that other decisions had i.e., intergenerational equity, financeability, the composition of spending (capex versus opex), delivery of Net Zero and wider energy policy requirements, and so on.

We would therefore recommend Ofgem provides further detailed reasoning supplemented by supporting financeability and intergenerational equity modelling and/or analysis to justify its proposal of a 98% UM capitalisation rate ahead of the RIIO-ED2 FDs.

3 Modelling the impact of the proposed capitalisation rates

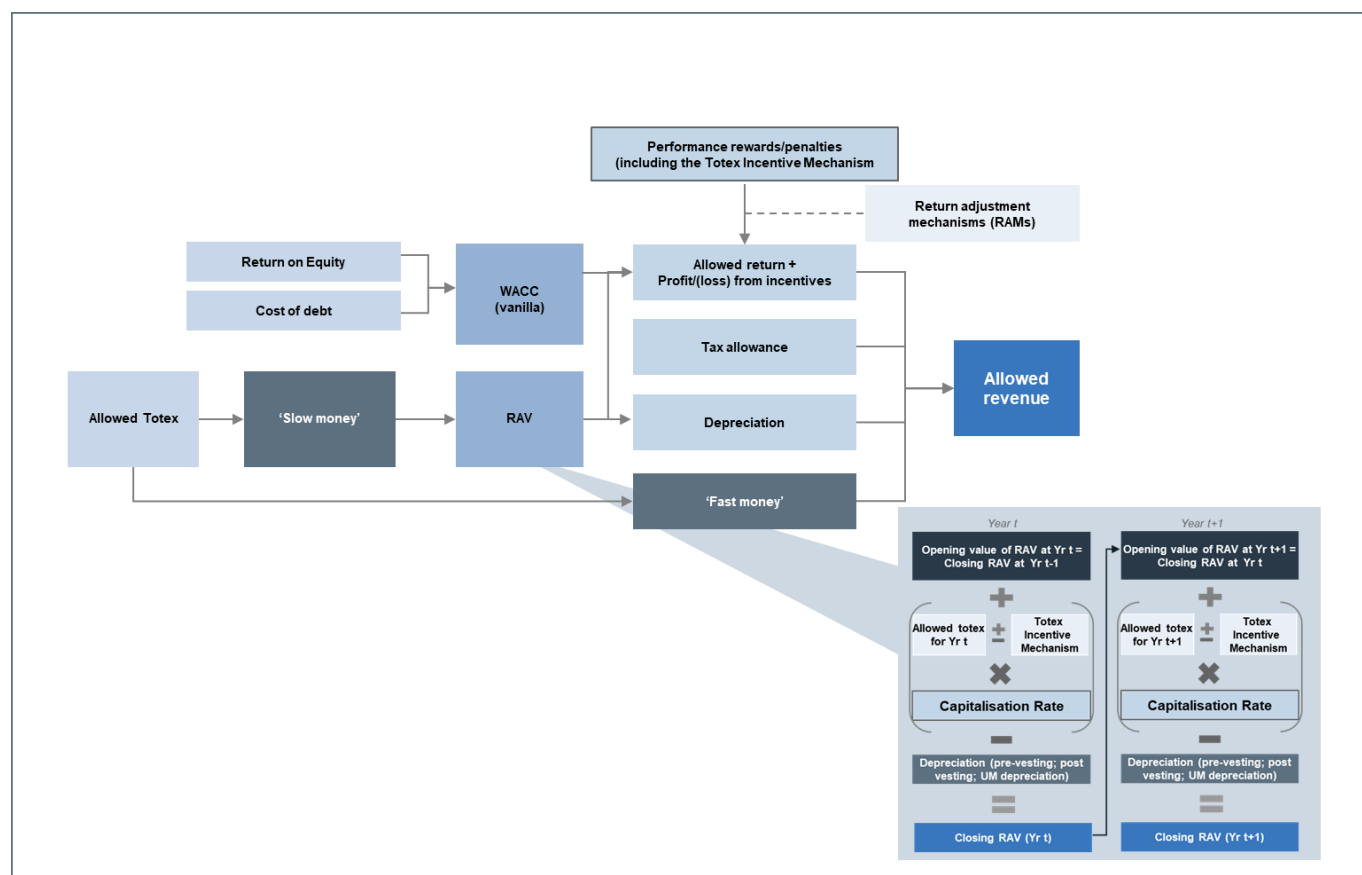
As noted in the preceding section, further analysis of the capitalisation rate applied to UMs would be appropriate ahead of RIIO-ED2 FDs. While we recommend that Ofgem undertakes, and publishes, its own analysis ahead of the FDs, to assist Ofgem, DNOs and other stakeholders understand the types of analysis that may be appropriate in more detail, and to explain the potential implications of different capitalisation rate choices, in this section we present some analysis of these issues.

Specifically, to explore these issues in greater detail, in this section we illustrate the potential impact of Ofgem's proposed RIIO-ED2 capitalisation rates on re-openers and volume drivers by modelling the 98% capitalisation rate for the notional DNO against a counterfactual lower capitalisation rate.

Because a higher capitalisation rate for the DNOs uncertainty mechanisms would mean that a higher proportion of UM totex will flow through the price control framework into network RAV as 'slow money', with less 'fast money' expensed in the year it was incurred, we expect that several factors such as the Regulated Asset Value (RAV), equity and debt values, revenues, cash flows and financial metrics (for example, actual gearing, interest cover) could all be impacted by the proposed capitalisation rates for UMs. We also expect that customer bills will be impacted and consequently there may be intergenerational equity issues for consumers to face beyond RIIO-ED2.

As the diagrammatical representation below illustrates, changes to the capitalisation rate flows through several aspects of the RIIO-2 building block regulatory framework: the fast and slow money split is directly impacted by the capitalisation rate, but in turn RAV and depreciation are also affected. The allowed return, as a function of RAV, is also impacted by the capitalisation rate. As a result, the impact on allowed revenues (and therefore customer bills) depends on whether the reduction in fast money driven by a higher capitalisation rate is higher or lower than the increase in depreciation and allowed revenue. The resultant impact on cash flows will be similar to the impact on revenues, but the net effect on financial ratios also depends on how the expenditure under UMs is assumed to be financed i.e., the proportions of debt and equity.

Figure 1: Illustration of building blocks of RIIO-ED2 price control



To try and explore these range of impacts, our analysis uses Ofgem's published RIIO-ED2 DDs Price Control Financial Model (PCFM) and assesses the impact that the proposed UM capitalisation rate may have on:

- Intergenerational equity, measured by the potential impact on customer bills, both in RIIO-ED2 and in RIIO-ED3 and beyond; and
- RIIO-ED2 financeability metrics, specifically the Adjusted Interest Coverage Ratio (AICR) and gearing.

Since both customer bills and financeability metrics depend on the impact of the capitalisation rate on RAV growth and on allowed revenues, we also present analysis of these parameters too.

Our results are presented in aggregate for the entire electricity distribution sector during RIIO-ED2. We have adopted this approach to highlight the overall impact of the assumptions outlined in Ofgem's RIIO-ED2 DDs without the need to individually call out specific DNOs or their customers that are impacted more or less than the other network companies.

Intergenerational equity

To demonstrate the impacts on intergenerational equity, we have considered the following two scenarios:

- **Base Case:** Ofgem's 98% UM capitalisation rate as proposed in the RIIO-ED2 DDs (hereinafter referred to as the "Base Case"); and
- **Scenario 1:** a counterfactual capitalisation rate of 74% that is more consistent with the proposed rate for baseline expenditure including PCDs (hereinafter referred to as "Scenario 1").²⁰ We are not saying that 74% is the correct capitalisation rate that should be applied to UMs expenditure, but we use this rate to illustrate the importance of the choice of the capitalisation rate and the need for detailed analysis to be performed to select the preferred capitalisation rate for UMs expenditures.

The key input to our modelling, aside from the capitalisation rate, is the totex assumptions for both baseline spend and UMs spend. These totex assumptions are derived from the RIIO-ED2 DDs and summarised in Table 6 below. The other assumptions we have used in our modelling are taken from the RIIO-ED2 DDs and/or PCFM and are summarised in Appendix 1.

Table 6: Aggregate DNO totex, baseline and UMs, over the RIIO-ED2 period

Component	2024	2025	2026	2027	2028	Total
Totex (Base Case - total) (£m)	3,857.2	3,908.4	3,902.6	3,700.1	3,568.9	18,937.2
Totex (Base Case - UM only) (£m)	135.9	180.0	479.9	304.1	343.8	1,443.7

Source: Ofgem RIIO-ED2 Draft Determinations, June 2022, 2020/21 prices, PA Consulting analysis

UMs expenditure is projected to be £1.4bn over the RIIO-ED2 period, around 7.6% of baseline totex. Given the scale of totex governed by UMs, it's clear that the capitalisation rate applied to UMs expenditure could have significant implications for consumers and investors.

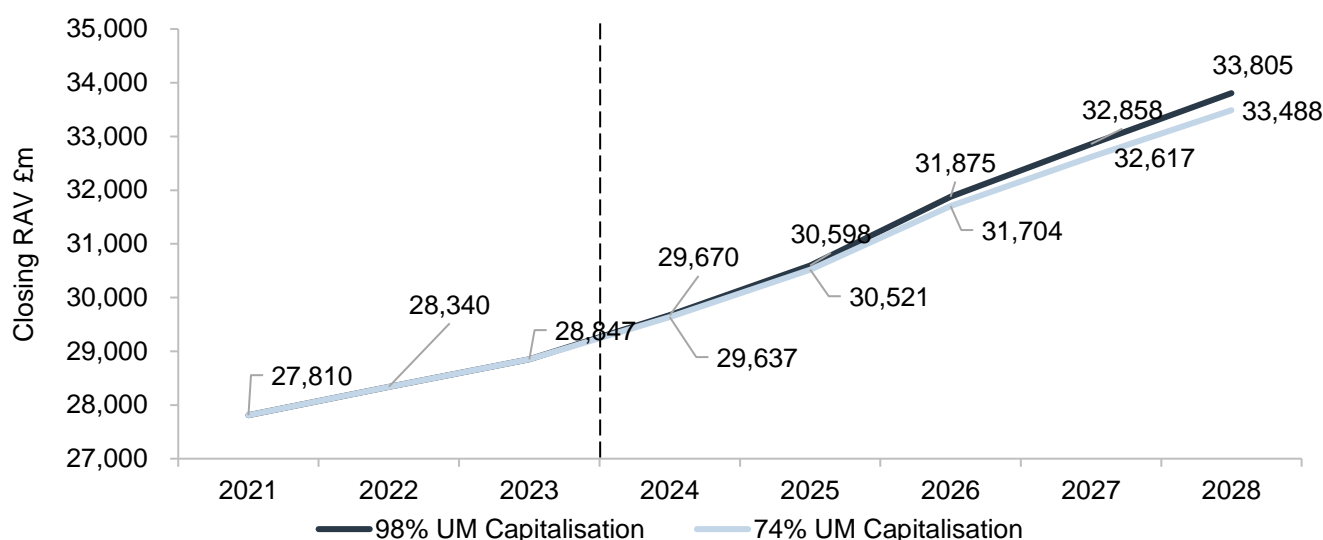
Below we present results from the modelling for RAV, allowed revenues, customer bills and financeability tests. Further detailed modelling results are presented in Appendix 1.

Modelling Results - Closing RAV

As would be expected, adopting the 98% capitalisation rate proposed in Ofgem's DDs leads to an increase in slow money flowing through into the RAV and a subsequent increase in the rate of RAV growth during RIIO-ED2, compared to a counterfactual scenario with a lower capitalisation rate. As Figure 2 below illustrates, total DNO RAV is forecast to be 1% (£317m) higher in the 98% scenario than the 74% scenario, by the end of RIIO-ED2.

²⁰ 74% is both the arithmetic mean (73.57% unrounded) and the mid-point of the range of capitalisation rates proposed in Ofgem's RIIO-ED2 Draft Determinations for baseline expenditure and PCDs across the 14 DNOs (68.0% – 80.0%)

Figure 2: Impact on closing RAV growth during RIIO-ED2 for the sector



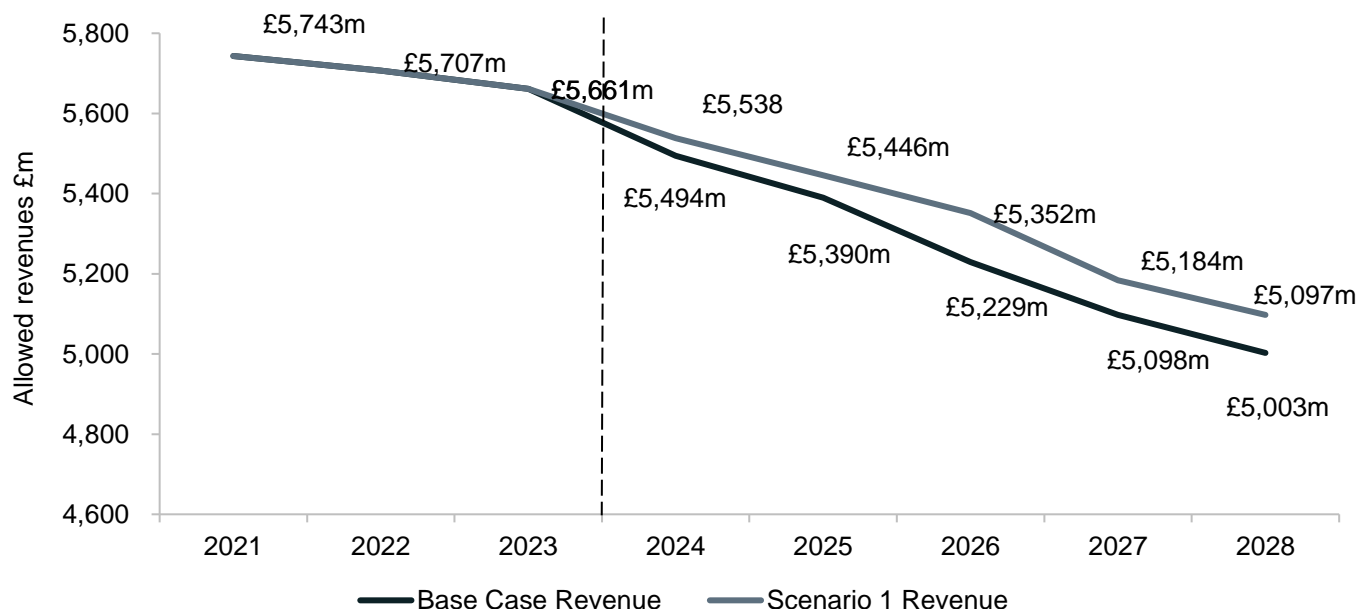
Source: Ofgem RIIO-ED2 Price Control Financial Model, PA Consulting analysis, 2020/21 prices

Modelling Results - Allowed revenues

As we noted earlier, in theory the impact on allowed revenues depends on whether the reduction in fast money is greater than the increase in slow money and return on RAV. In practice, because DNO asset lives are long and the allowed WACC is relatively low, a higher capitalisation rate will lead to lower allowed revenues (and customer bills) in the near term, but higher allowed revenues (and customer bills) in the longer term.

Figure 3 illustrates this point and shows that the scenario modelling higher capitalisation rates leads to a decline in allowed revenues for the electricity distribution sector during RIIO-ED2. Specifically, adopting a 98% capitalisation rate on the UMs expenditure, rather than a 74% rate, would mean that the sector stands to end RIIO-ED2 with annual revenues which are 1.5% lower.

Figure 3: Impact on allowed revenues during RIIO-ED2 for the sector



Source: Ofgem RIIO-ED2 Price Control Financial Model, PA Consulting analysis, 2020/21 prices

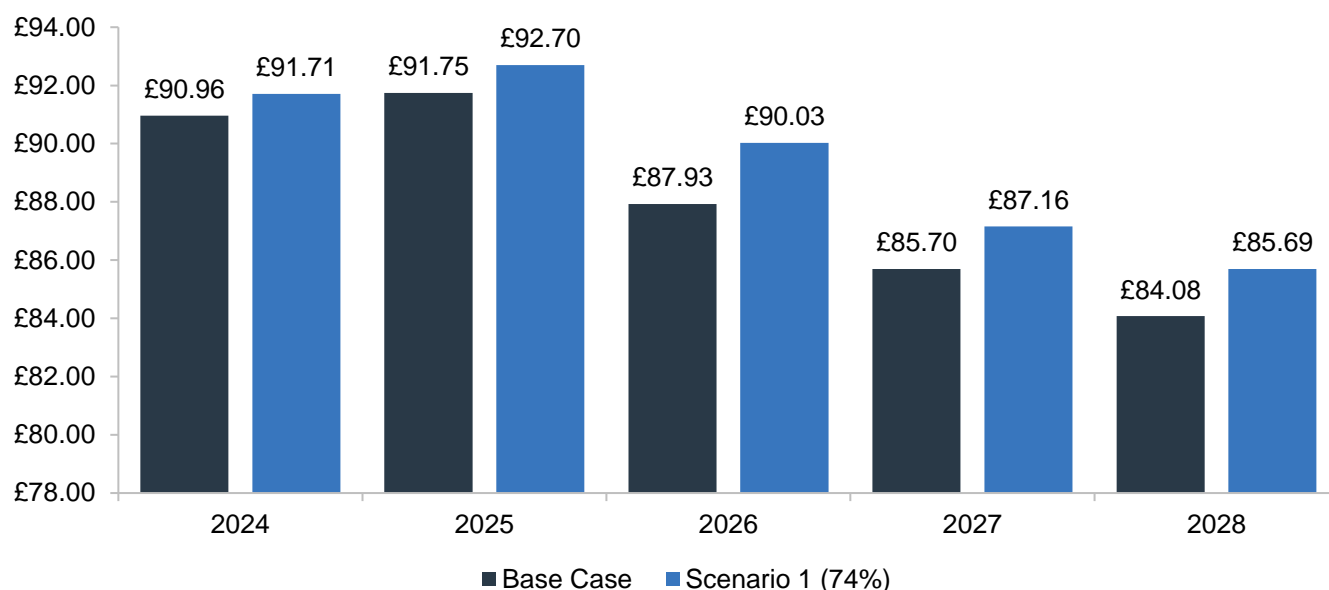
Modelling Results - Customer bill impacts

Consistent with the impact on allowed revenues, our modelling results indicate that a higher capitalisation rate (98%) will lead to a reduction in the average customer bill during RIIO-ED2 as less expenditure is recovered by the networks in the year incurred. As Figure 4 and Table 7 below shows the average customer bill would be £84.08 in 2028 with a 98% capitalisation rate, whereas it would be £85.69 with a 74% utilisation rate i.e., 1.9% lower. The results in other

years are broadly similar i.e., a small increase in customer bills would result from adopting a lower capitalisation rate. The impact in each year fluctuates according to the scale of UMs totex expected to be incurred in that year. The overall saving aggregated across the five years of RIIO-ED2 is around £6.87, or 1.54%.

We have not undertaken modelling of the RIIO-ED3 period and beyond, but in very simple terms, if customer bills are reduced by around c£7 in total over RIIO-ED2 and that c£7 is recovered over the following 45 years (the economic life of DNO assets assumed by Ofgem), then that would equate to an around 15p p.a. increase in bills for RIIO-ED3 and subsequent periods. This analysis serves to highlight the intergenerational equity issues which need to be considered when setting the capitalisation rate for UMs expenditures: higher capitalisation rates during RIIO-ED2 will reduce customer bills in the short term, but will lead to higher bills in the longer term. Considerations needs to be given to whether this is an equitable distribution of costs taking into account who benefits from the services provided by the UMs expenditures.

Figure 4: Impact on customer bills during RIIO-ED2 for the sector



Source: Ofgem RIIO-ED2 Price Control Financial Model, PA Consulting analysis, 2020-21 prices

Table 7: Aggregate total sector customer bill (£) for RIIO-ED2 period

Component	2024	2025	2026	2027	2028	Total (RIIO-ED2)
Base Case	£90.96	£91.75	£87.93	£85.70	£84.08	£440.42
Scenario 1	£91.71	£92.70	£90.03	£87.16	£85.69	£447.29
<i>Difference versus Base Case (£)</i>	£0.75	£0.95	£2.10	£1.46	£1.62	£6.87

Source: Ofgem RIIO-ED2 Price Control Financial Model, PA Consulting analysis, 2020-21 prices

Key Messages:

- All else equal, a higher capitalisation rate applied to UMs expenditure will lead to lower customer bills during RIIO-ED2 but higher customer bills in RIIO-ED3 and subsequent periods.
- Ofgem has not presented any analysis of these intergenerational equity issues associated with the selection of the capitalisation rate for UMs expenditure in the RIIO-ED2 DDs. We would encourage Ofgem to publish analysis of these issues ahead of the RIIO-ED2 FDs, thereby facilitating dialogue and consultation with DNOs, customer groups and other stakeholders.

Financeability

To demonstrate the impact on financeability, we have considered the following two scenarios:

- **Base Case:** Ofgem's 98% UM capitalisation rate and 'Ofgem Base' scenario as modelled in the RIIO-ED2 PCFM; and
- **Scenario 2:** a counterfactual scenario (hereinafter referred to as "Scenario 2") assuming a UM capitalisation rate of 74%; UM expenditure of £3.4bn during RIIO-ED2; and a 25% uplift for unfunded, actual opex during RIIO-ED2. We provide further reasoning for each of these individual assumptions below:
 - **74% UM capitalisation rate:** as assumed above in our intergenerational equity analysis, this rate is more consistent with the proposed rate for baseline expenditure including PCDs.
 - **£3.4bn UM expenditure:** Ofgem's 'Base' PCFM scenario for RIIO-ED2 assumes £1.4bn of UM-related expenditure, with monetary values only attached to a subset of UMs with the majority being load (transformers, circuits, and unlooping) related and categorised as 100% capex. Under Ofgem's 'High' PCFM scenario, however, UM-related expenditure rises to £3.4bn. We also note that the 'Base' scenario is not a high demand scenario and it does not take into account the impact of changes to connection boundaries on DNO expenditures. Noting the number of UMs which do not contain forecast expenditure values in the £1.4bn scenario, the **£3.4bn 'high' scenario seems more reasonable for the purposes of financeability testing.**
 - **25% uplift for unfunded opex:** further, Scenario 2 assumes that each DNO's *actual* indirect costs incurred over RIIO-ED2 are equal to an additional 25% of Ofgem's *allowed* total UM-related expenditure under Ofgem's 'High' PCFM scenario, and that this additional 25% of indirect costs incurred would not be funded through allowed revenues. The 25% unfunded amount is adopted because RIIO-T2 included an opex scalar to cover similar opex costs²¹, and in the RIIO-ED2 DDs Ofgem did not include any such scalar (which suggests the costs would be unfunded), and a recommendation from DNOs not to adopt too low of an estimate of unfunded opex given that firm data on this issue is currently being collected by DNOs and is not, therefore, available to be used in this study.

Ofgem's RIIO-ED2 DDs financeability analysis tests whether the price control package allows the notional efficient operator sufficient headroom to service its debt. Ofgem's financeability tests focus on the Adjusted Interest Coverage Ratio (AICR) and gearing, so we discuss the impact of applying Scenario 2 on both of these metrics below. Further detailed modelling results are presented in Appendix 1.

Modelling Results - Adjusted Interest Coverage Ratio (AICR)

The AICR is defined by Ofgem as:

$$\frac{\text{Funds from operations (FFO)} + \text{RAV depreciation} - \text{net interest paid}}{\text{Net interest paid}}$$

Source: Ofgem RIIO-ED2 Price Control Financial Model

Table 8 presents the annual AICR results from our stylised modelling across the ED sector.

Table 8: Modelled AICR over the RIIO-ED2 period for the sector

AICR	2021	2022	2023	2024	2025	2026	2027	2028
Base Case (RIIO-ED2 DDs)	1.48	1.73	1.87	1.39	1.39	1.39	1.40	1.41
Scenario 2	1.48	1.73	1.87	1.37	1.34	1.30	1.34	1.36

Source: Ofgem RIIO-ED2 Price Control Financial Model, PA Consulting analysis

As shown above, Scenario 2 (74% UM capitalisation rate, 'High' PCFM scenario and an additional 25% of actual unfunded indirect opex) would lead to a decrease in the AICR over the 5-year period, worsening the network companies' overall financeability position. This is the result of several moving parts.

- The numerator **decreases** slightly overall as a result of its underlying components:

²¹ https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_et_annex_revised.pdf page 76

- Despite operating revenues rising as a larger absolute amount and hence a greater proportion of totex is now allocated to network companies' 'fast money' pot, total operating costs are increasing at a faster rate than revenues due to the level of unfunded opex assumed. As a result, funds from operations (FFO) declines (0.6%) over the RIIO-ED2 period for the notional DNO.
- Total depreciation increases (0.7%) as a result of a larger proportion of revenues capitalised into the RAV under Ofgem's 'High' PCFM scenario and hence increased RAV growth.
- Finally, the largest difference between the Base Case and Scenario 2 was 'net interest paid', which increases 3.9% based on a higher opening net debt balance under Scenario 2.
- As stated, the denominator (i.e. net interest paid) increased under Scenario 2. This is because net debt and therefore gearing are higher under this scenario (as discussed in more detail below), increasing interest payments.

In Scenario 2 the absolute degree of the increase (decrease) in the denominator is greater than the increase (decrease) in the numerator, leading to a decrease (increase) in the AICR overall.

Modelling Results - Gearing

The modelled gearing is defined by Ofgem in the PCFM as:

$$\frac{\text{Closing net debt}}{\text{Closing RAV}}$$

Source: Ofgem RIIO-ED2 Price Control Financial Model

Table 9 presents the annual results from our analysis of gearing across the ED sector.

Table 9: Modelled gearing over the RIIO-ED2 period for the sector

Gearing	2021	2022	2023	2024	2025	2026	2027	2028
Base Case (RIIO-ED2 DDs)	63.2%	62.6%	62.0%	59.5%	60.3%	61.3%	61.5%	62.0%
Scenario 2	63.2%	62.6%	62.0%	60.1%	61.5%	63.3%	63.0%	62.9%

Source: Ofgem RIIO-ED2 Price Control Financial Model, PA Consulting analysis

As shown above, Scenario 2 leads to an increase in the gearing for the network companies during RIIO-ED2. This is the result of both net debt and closing RAV increasing compared to the Base Case. Closing RAV is larger based on the same reasons described above for the AICR - a larger proportion of revenues are capitalised under these pathways, and we therefore see increased RAV growth across the ED sector as a result.

Ofgem's PCFM has several in-built assumptions on how totex is funded by the network companies during a price control i.e., the proportion of debt funding versus equity funding. Gearing is higher under Scenario 2 because the RAV is higher, and the PCFM assumes that the increased RAV growth is almost entirely debt funded. This implies that net debt will be lower under Ofgem's Base Case scenario proposed in the RIIO-ED2 DDs.

Our modelling estimates that in Scenario 2 closing RAV (denominator) for RIIO-ED2 will increase more slowly than net debt (numerator); this means that gearing is higher in Scenario 2 compared to what Ofgem has proposed in the RIIO-ED2 DDs. Under Scenario 2 closing RAV is projected to grow 2.7% for the notional DNO across RIIO-ED2, whereas net debt is forecast to increase at a faster rate (4.8% over RIIO-ED2 in total) largely as a result of funding the additional unfunded proportion of opex (25% of each DNO's actual indirect costs).

The financeability impacts on the AICR and gearing for the DNOs are material and negative in their nature. Our counterfactual assumptions are forecast to increase gearing and lower the AICR during RIIO-ED2, with these differences making it more difficult for the notional company to achieve the target investment grade credit rating Ofgem has assumed in the RIIO-ED2 DDs. It's possible that these changes to the UM capitalisation rate and the level of UM-related expenditure could make an important difference to the DNOs' financeability further into RIIO-ED2 and beyond. For example, in the RIIO-ED2 DDs Ofgem states that its financeability modelling did not justify adopting a higher notional gearing assumption for the DNOs, yet Ofgem's approach to the capitalisation rate for UMs appears likely to put upward pressure on notional gearing.

Ofgem has not, however, presented any analysis of the financeability impacts of the choice of UMs capitalisation rate. This is in contrast to Ofgem's approach for RIIO-GD2/T2, as discussed earlier. It is also in contrast to Ofgem's approach to assessing financeability in the RIIO-ED2 DDs, where Ofgem's RIIO-ED2 DDs presents scenario analysis

on the AICR which implies nine network companies had three notches of headroom above a minimum investment grade rating, with the remaining five networks two notches above. We recommend this point be considered further ahead of the RIIO-ED2 FDs

Key Messages:

- All else equal, the assumptions underpinning Scenario 2 will lead to inferior financeability metrics for DNOs: gearing will be higher and AICR lower compared to Ofgem's RIIO-ED2 DDs. The AICR worsens compared to the Base Case as the increase in the denominator (interest payments) is greater than the increase in the numerator (FFO + depreciation). Gearing increases as net debt rises more quickly than closing RAV under Scenario 2 during RIIO-ED2.
- The impacts on individual metrics are material and could potentially lead to a situation where financeability ratios for the notional DNO are not consistent with the credit rating targeted by Ofgem in the ED2 DDs.
- We would encourage Ofgem to publish analysis of these issues ahead of ED2 FDs, thereby facilitating dialogue and consultation with DNOs, customer groups and other stakeholders.

Summary

Overall, our analysis shows that adopting a higher capitalisation rate for UMs expenditure could lead to inferior financeability during the RIIO-ED2 period for the DNOs and could also give rise to some intergenerational equity issues relating to the trade-off between lower customer bills during RIIO-ED2 and higher customer bills in RIIO-ED3 and beyond.

Given that £1.4bn of expenditure is expected to be subject to the UMs capitalisation rate under Ofgem's 'Base' PCFM scenario, the potential implications of the choice of the capitalisation rate and that – in contrast to some of its past decisions – Ofgem has presented only limited explanation in the RIIO-ED2 DDs for its selection of a 98% capitalisation rate, we would recommend that Ofgem publishes more detailed analysis of these issues ahead of RIIO-ED2 FDs to enable a transparent and constructive dialogue with DNOs, customer groups and with other interested stakeholders.

4 Conclusion

The RIIO-ED2 DDs indicate that approximately £1.4bn of expenditure is expected to be subject to UMs. This is a substantial amount of expenditure meaning the choice of capitalisation rate applied to these expenditures could have important impacts on intergenerational equity and DNO financeability. It is therefore important that the proposed rate is robust.

To assist Ofgem, DNOs, customer groups and other interested stakeholders evaluate the appropriate capitalisation rate for RIIO-ED2 UMs, we have:

- Reviewed the approaches taken by Ofgem and other economic regulators to the setting of capitalisation rates in the past, particularly the types of factors that have been considered when determining capitalisation rates and the types of analysis and evidence that have been presented to justify differential capitalisation rates for baseline and UMs expenditures; and
- Undertaken stylised financial modelling of a notional DNO over the RIIO-ED2 period to provide preliminary indications of the potential impacts of the choice of capitalisation rate on intergenerational equity (measured through customer bills) and on DNO financeability (measured through the AICR and gearing ratios).

Based on our work, we note:

- Ofgem's proposed 98% capitalisation rate for UMs expenditures would – compared to a 74% counterfactual based on capitalisation rates applied to baseline expenditures – lead to customer bills being around 1.5% lower by the end of RIIO-ED2, but also lead to higher customer bills in RIIO-ED3 and future periods (all else equal).
- Ofgem's 'High' PCFM scenario applying the 74% UM capitalisation rate and a 25% uplift for unfunded opex leads to a weaker AICR and higher gearing ratio for the notional DNO, both of which would – all else equal – have a material and negative impact on DNO financeability. At the margins, these deteriorations in financeability metrics could lead notionally efficient DNOs to fail to meet Ofgem's financeability tests, with consequences for investors and for customers.
- The rationale presented by Ofgem for the choice of capitalisation rate is much less detailed than the corresponding analysis it presented in the RIIO-GD2 and RIIO-T2 FDs previously. There Ofgem undertook extensive analysis of the impact of the choice of capitalisation rate on financeability. It is unclear why Ofgem has not presented similar analysis in the RIIO-ED2 DDs, but we would encourage Ofgem to share this analysis with DNOs, customer groups and other stakeholders ahead of the RIIO-ED2 FDs.
- Ofgem, and other economic regulators, have typically considered the natural rate of capitalisation (based on expected proportions of capex and opex), impacts on financeability and the implications for customer bills and intergenerational equity when setting past price reviews. We recommend Ofgem considers these issues when determining the capitalisation rate for UMs expenditures in the RIIO-ED2 FDs. We note that while Ofgem did not present analysis of intergenerational equity issues in relation to UMs capitalisation rates in the RIIO-GD2/T2 FDs, we consider that it would be best practice to do so and in any case, given the emergence of a cost of living crisis and major increases in energy costs in the last year (i.e. since RIIO-GD2/T2 FDs), we think it would be appropriate to apply greater than usual scrutiny to impacts on intergenerational equity for RIIO-ED2.

Recommendations for next steps

Noting the above, we recommend that further detailed analysis be published by Ofgem in relation to the choice of capitalisation rate for the RIIO-ED2 UMs expenditures. We propose that this analysis include:

- **Detailed analysis of intergenerational equity issues:** the reduction in customer bills during RIIO-ED2 resulting from a higher capitalisation rate needs to be weighed against the longer-term increases in customer bills, taking into account intergenerational equity and which customers benefit from the services provided by the UMs expenditures. The analysis we have presented in our work has focused only on average customer bills, but we recommend that Ofgem also specifically considers the impact on vulnerable customers, which we expect might be most affected by any trade-offs between short- and long-term bill levels.

- **Detailed analysis of financeability issues:** our analysis has shown that higher capitalisation rates can have a material and negative impact on DNO financial ratios. We recommend that Ofgem undertakes similar analysis and considers, through scenario analysis similar to that which it undertook for the RIIO-GD2/T2 FDs, whether the proposed 98% capitalisation rate applied to RIIO-ED2 UMs expenditures provides DNOs with sufficient financial headroom.

We suggest that all of the analysis described above is performed under a range of scenarios. The amount of expenditure that could take place under UMs is, by its nature, uncertain, so we'd recommend that consideration is given to scenarios where UMs spending is higher or lower than the expected figure. For example, although Ofgem's 'Base' PCFM scenario for RIIO-ED2 assumes £1.4bn of UM-related expenditure, with monetary values only attached to a subset of UMs with the majority load (transformers, circuits, and unlooping) related, under Ofgem's 'High' PCFM scenario UM expenditure rises to £3.4bn. Another reason to consider the 'High' scenario is that the 'Base' scenario is not a high demand scenario and it does not take into account the impact of changes to connection boundaries on DNO expenditures.

We would also suggest that, while our analysis has only considered two capitalisation rate scenarios for illustrative purposes, Ofgem should consider a range of additional capitalisation rates in its analysis.

We'd also suggest, in light of economic conditions in 2022 and forecasts for the next few years, that the scenario analysis is extended to consider sensitivities around expected inflation and expected interest rates (both of which will also have impacts on gearing and AICR, as well as on customer affordability) e.g. the negative impact on financeability ratios flowing from a high capitalisation rate may be more or less likely to contribute to a notional DNO's financial ratios falling short of the RIIO-ED2 target credit rating if financeability has already been affected by higher or lower than expected inflation and interest rates.

We also note that the analysis conducted in this report is presented at a sector aggregate level. There is potential that some of the DNOs are impacted more than others by Ofgem's ED2 DDs with regard to financeability, or indeed their consumers bills impacts. Further detailed analysis at licensee level would help to understand these issues better, so we recommend that Ofgem considers individual DNOs as well, not just sector level analysis.

Finally, we note that our scope of work has not included any work on what the 'natural rate' of capitalisation is likely to be for UMs expenditures. Ofgem's RIIO-ED2 DDs proposals for a high capitalisation rate on re-openers and volume drivers in part reflects their view on the amount of baseline expenditure versus unanticipated expenditure required during RIIO-ED2. However, if, for example, a significantly higher proportion of indirect costs are required to support higher direct costs through uncertainty mechanisms (such as in the secondary volume driver mechanism), then this would not be reflective of the current proposals in the DDs. As a result, we recommend that detailed expenditure analysis (of, for example, the expected proportions of capex and opex within UMs expenditures) is conducted to ensure an appropriate capitalisation rate is applied to uncertainty mechanism proportion of the DNOs totex allowance. While we acknowledge that the exact expenditures under UMs are by their nature uncertain, we would expect that Ofgem may be able to access relevant information from DNOs (e.g. their expectations for expenditures under UMs) or from historical expenditures that have already taken place under UMs included in past price controls.

We consider that undertaking the above further analysis would be consistent with the principles of regulatory best practice and would also facilitate an informed discussion between Ofgem, the DNOs, customer groups and other stakeholders to arrive at a robust decision for the RIIO-ED2 FDs.

5 Appendix 1: Further details on modelling

Table 10 summarises several key assumptions relevant for our modelling purposes that are stated in Ofgem's RIIO-ED2 DDs.

Table 10: Notional DNO assumptions used in stylised modelling based on RIIO-ED2 DDs

Component	RIIO-ED2 assumptions for the notional DNO
Totex baseline	As per ED2 DDs, summarised in Table 6
Totex UMs	As per ED2 DDs, summarised in Table 6
WACC	3.26% (vanilla, CPI-H real) WACC; 3.29% LPN, NPgN and SWALES
Cost of Equity	4.75% (CPIH-real) on average over the 5 year period; annual value of the cost of equity index is as per ED2 DDs.
Cost of Debt	2.26% (CPIH-real) on average over the 5 year period; annual value of the cost of debt index is as per ED2 DDs based on an index of the iBoxx GBP Utilities 10yr+ index with a fixed 17-year trailing average for all DNOs and a 25bp uplift for borrowing costs. A further 6bp uplift is applied for LPN, NPgN and SWALES for an infrequent issuer premium.
Net debt	Net debt is reset to 60% notional gearing level at the start of RIIO-ED2, with any opening de-gearing assumed to be achieved by an equity injection or re-gearing assumed to be achieved by debt issuance
Debt Costs	25% of the licensee's notional debt is assumed to be CPIH linked
Tax Allowances	Tax allowances are equal to tax costs
Inflation Indexation	Immediate transition to CPIH from 1st April 2023 for WACC and RAV calculations. Inflation assumptions are as per ED2 DDs.
Business Plan Incentive	No business plan rewards/penalties were applied
RAV	Opening RAV based on totex forecasts for RIIO-ED1 provided by companies in their RIIO-ED2 business plan data template submission and inclusive of any logged-up adjustments
Depreciation	Straight line depreciation profile with assumed economic lives of 45 years for new assets; depreciation applied to historical expenditure is as per ED2 PCFM.
Dividend Yield	3% dividend yield working assumption for modelling purposes
Equity Issuance	5% equity issuance transaction costs on any amount forecast to be issued.
Revenue	Lagged RIIO-ED1 revenue e.g. inflation true-ups, cost pass-through adjustments, ODIs revenue and over/under collection of revenue was excluded for RIIO-ED2.
RoRE	Return on cost of equity, outperformance against totex/ODIs. For the purpose of the PCFM modelling it was assumed no out/under performance for ODIs or Totex Allowance.
Financeability	Several measures used to stress test financeability of DNOs including AICR and gearing

Source: Ofgem RIIO-ED2 Draft Determinations Finance Annex, pg. 66-67 PCFM modelling assumptions, June 2022

Table 11 summarises some further detailed outputs from our intergenerational equity analysis.

Table 11: Detailed modelling outputs for the Base Case versus Scenario 1

Component		2024	2025	2026	2027	2028
Base Case	Closing RAV (£m)	29,670	30,598	31,875	32,858	33,805
	RAV growth (%)	2.9%	3.1%	4.2%	3.1%	2.9%
	Allowed revenue (£m)	5,494	5,390	5,229	5,098	5,003
	Customer bills (£)	£90.96	£91.75	£87.93	£85.70	£84.08
Scenario 1	Closing RAV (£m)	29,637	30,521	31,704	32,617	33,488
	RAV growth (%)	2.7%	3.0%	3.9%	2.9%	2.7%
	Allowed revenue (£m)	5,538	5,446	5,352	5,184	5,097
	Customer bills (£)	£91.71	£92.70	£90.03	£87.16	£85.69
Variance (absolute; Scenario 1 – Base)	Closing RAV (£m)	-33	-77	-171	-241	-317
	RAV growth (%)	-0.2%	-0.1%	-0.3%	-0.2%	-0.2%
	Allowed revenue (£m)	44	56	123	86	94
	Customer bills (£)	£0.75	£0.95	£2.10	£1.46	£1.62
Variance (percentage)	Closing RAV (£m)	-0.1%	-0.3%	-0.5%	-0.7%	-0.9%
	RAV growth (%)	-6.9%	-3.2%	-7.1%	-6.5%	-6.9%
	Allowed revenue (£m)	0.8%	1.0%	2.4%	1.7%	1.9%
	Customer bills (£)	0.82%	1.04%	2.38%	1.70%	1.92%

Source: Ofgem RIIO-ED2 Draft Determinations, June 2022, PA Consulting analysis, 2020/21 prices

Table 12 summarises some further detailed outputs from our financeability analysis.

Table 12: Detailed modelling outputs for the Base Case versus Scenario 2

Component		2024	2025	2026	2027	2028
Base Case	Closing RAV (£m)	29,670	30,598	31,875	32,858	33,805
	RAV growth (%)	2.9%	3.1%	4.2%	3.1%	2.9%
	Allowed revenue (£m)	5,494	5,390	5,229	5,098	5,003
	Gearing (%)	59.5%	60.3%	61.3%	61.5%	62.0%
	AICR	1.39	1.39	1.39	1.40	1.41
Scenario 2	Closing RAV (£m)	29,912	31,165	32,816	34,029	35,194
	RAV growth (%)	3.7%	4.2%	5.3%	3.7%	3.4%
	Allowed revenue (£m)	5,650	5,597	5,558	5,373	5,303
	Gearing (%)	60.1%	61.5%	63.3%	63.0%	62.9%
	AICR	1.37	1.34	1.30	1.34	1.36
Variance (absolute; Scenario 2 – Base)	Closing RAV (£m)	242	567	941	1,171	1,389
	RAV growth (%)	0.8%	1.1%	1.1%	0.6%	0.5%
	Allowed revenue (£m)	156	207	329	275	300
	Gearing (%)	0.6%	1.2%	2.0%	1.5%	0.9%
	AICR	-2.0%	-5.0%	-9.0%	-6.0%	-5.0%
Variance (percentage)	Closing RAV (£m)	0.8%	1.9%	3.0%	3.6%	4.1%
	RAV growth (%)	27.6%	35.5%	26.2%	19.4%	17.2%
	Allowed revenue (£m)	2.8%	3.8%	6.3%	5.4%	6.0%
	Gearing (%)	1.0%	2.0%	3.3%	2.4%	1.5%
	AICR	-1.4%	-3.6%	-6.5%	-4.3%	-3.5%

Source: Ofgem RIIO-ED2 Draft Determinations, June 2022, PA Consulting analysis, 2020/21 prices

AUTHORS OF THIS REPORT



Anthony Legg

Partner

Anthony.Legg@paconsulting.com



Navdeep Sandhu

Principal Consultant

Navdeep.Sandhu@paconsulting.com



Nicholas Cass-Tansey

Principal Consultant

Nicholas.Cass-Tansey@paconsulting.com



About PA.

We believe in the power of ingenuity to build a positive human future in a technology-driven world.

As strategies, technologies and innovation collide, we create opportunity from complexity.

Our diverse teams of experts combine innovative thinking and breakthrough use of technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

An innovation and transformation consultancy, we are 3,300 specialists in consumer and manufacturing, defence and security, energy and utilities, financial services, government and public services, health and life sciences, and transport. Our people are strategists, innovators, designers, consultants, digital experts, scientists, engineers and technologists. We operate globally from offices across the UK, US, Netherlands and Nordics.

PA. Bringing Ingenuity to Life.

Discover more at paconsulting.com

Corporate Headquarters

10 Bressenden Place
London
SW1E 5DN
+44 20 7730 9000

paconsulting.com

This report has been prepared by PA Consulting Group on the basis of information supplied by the client, third parties (if appropriate) and that which is available in the public domain. No representation or warranty is given as to the achievability or reasonableness of future projections or the assumptions underlying them, targets, valuations, opinions, prospects or returns, if any, which have not been independently verified. Except where otherwise indicated, the report speaks as at the date indicated within the report.

All rights reserved

© PA Knowledge Limited 2022

This report is confidential to the organisation named herein and may not be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical or otherwise, without the prior written permission of PA Consulting Group. In the event that you receive this document in error, you should return it to PA Consulting Group, 10 Bressenden Place, London, SW1E 5DN. PA Consulting Group accepts no liability whatsoever should an unauthorised recipient of this report act on its contents.