

Decision

ED3 Sector Specific Methodology Decision - Cost assessment Annex

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This document sets out our decisions on the methodologies we will apply to the electricity distribution sector in the ED3 price control, which will run from 1 April 2028.

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1. Cost assessment overview

Introduction

A key outcome for ED3 is that Distribution Network Owners (DNOs) are provided with allowances that enable them to deliver in line with customer requirements while ensuring that customers do not pay more than the efficient cost. We seek to achieve this through a process we refer to as cost assessment.

The cost assessment framework is essential to protect customers by benchmarking DNOs against each other to establish the efficient level of costs to deliver their activities. This helps to mimic the cost that would be determined through a competitive process, despite DNOs being regional monopolies.

In our ED3 Sector Specific Methodology Consultation – Cost Assessment Annex (SSMC),¹ we provided an overview of our proposed ED3 cost assessment framework. This included the detailed methodology that sits within each element that we could use. Where relevant, we provided some background on how the elements have been used in the past, either in energy network price controls (including RIIO-ED2) or in other sectors such as water. We considered the potential advantages and disadvantages of different approaches and in some cases we set out our initial assessment of which approaches are suitable for ED3.

We are now publishing our Sector Specific Methodology Decision (SSMD) for ED3. This document is focused on the cost assessment framework for ED3, summarising the responses to our SSMC and setting out our views on the aspects of the ED3 price control that DNOs need to understand to be able to compile and submit their business plans.

Approach to ED3

At SSMC we described our intention to continue to rely on a toolkit approach, similar to RIIO-ED2, maintaining the use of different modelling approaches based on a combination of historical and forecast data.

We proposed expanding the approach taken at RIIO-ED2 to introduce mid models to the toolkit, complementing the bottom-up (disaggregated) and top-down (totex) benchmarking suites.

We emphasised that the complexity and fundamental importance of the cost assessment framework demands an extensive consultation process to develop our approach to benchmarking costs. Engaging directly with DNOs is particularly important due to the knowledge and insight they can provide to support Ofgem in selecting the right data, on a consistent basis, to benchmark costs and activity.

¹ See [ED3 Sector Specific Methodology Consultation - Cost assessment Annex](#)

2. Stakeholder engagement

As part of ED3 we hold regular working groups with DNOs to facilitate informal consultation on our approach to cost assessment. All DNOs support the continued use of this engagement and Ofgem remains committed to regular engagement on the ED3 cost assessment framework and implementation.

SSMC questions

CAQ1. Do you have any comments on the format and use of the engagement forums we use to develop our cost assessment methodology so far including CAWG and BPDTWG?

Stakeholder working groups

SSMC summary

- 2.1 In our SSMC we outlined two primary forums for engaging with DNOs and invited feedback on the format and use of those forums. The two forums were:
- Cost Assessment Working Groups (CAWG)
 - Business Plan Data Tables Working Groups (BPDTWG)

Summary of consultation responses

- 2.2 All DNOs agreed that the cost assessment framework requires development for ED3 and that development requires engagement with DNOs. DNOs were supportive of the use of CAWGs and BPDTWGs to enable engagement.
- 2.3 SSEN-D and SPEN requested a forward-looking programme or earlier release of agendas to support preparation for these working groups and enable targeted technical discussions to support development of the cost assessment framework. NGED and UKPN requested that adequate time is allocated to discussing the disaggregated models. SPEN and NGED also requested early sharing of cost assessment models where possible.

SSMD decision and rationale

- 2.4 We continue to be committed to using working groups to engage with key stakeholders and, since publication of our SSMC, we have conducted 8 CAWGs and 4 BPDTWGs.
- 2.5 We will continue to prioritise transparency with all stakeholders including DNOs, particularly with regard to the principles of model design. However, in response to requests for us to share cost assessment models ahead of business plans

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being submitted, we cannot commit to this, as in many cases the detail of model design will be informed by the data we receive in business plans.

- 2.6 We provided a forward-looking programme of CAWGs to DNOs for developing our cost-assessment suite for our SSMD. However, where we engage with DNOs prior to and after receiving business plans, a programme of engagement will need to be relatively flexible to account for development and findings made at pace, though we will aim to provide early sight where possible.

3. Totex models

Totex models use aggregated data to compare total submitted costs of network companies against network and business plan characteristics, taking a relatively high-level view of how different operating decisions influence overall expenditure. This approach can be beneficial in sectors with a degree of information asymmetry.

Considering the advantages and prevalent use of totex modelling within regulatory benchmarking, we deem it appropriate to retain its use within our cost assessment toolkit. However, we note several challenges that may alter or otherwise limit its use in ED3 compared to our approach in RIIO-ED2 which we discuss in detail below.

SSMC questions

CAQ2. Do you agree with the continued use of totex models in ED3?

CAQ3. Do you agree with the advantages and disadvantages of totex models we set out?

CAQ4. Do you agree with the ED3 cost driver principles we propose to use to select cost drivers in our ED3 totex models?

CAQ5. Do you agree with the ED3 model selection criteria we propose to use when specifying ED3 totex models?

CAQ6. Do you agree with the advantages and disadvantages of RIIO-ED2 totex model cost drivers we set out?

CAQ7. Do you agree with the longlist of alternative cost drivers we propose to consider when developing ED3 totex models and the advantages and disadvantages we have set out?

CAQ8. Do you recommend adding other alternative ED3 cost drivers to our longlist? In your answer, please clarify if these rely on existing reporting or might require data collection and back-casting and submit them alongside your response where possible.

CAQ9. Do you agree with our characterisation of bottom-up, top-down and Low-Carbon Technologies (LCT) composite variables?

CAQ10. Do you have any preference between the use of a bottom-up and top-down CSVs?

CAQ11. Do you have any proposals for improvements of our composite variables methodology across the three composite variables we used in RIIO-ED2?

CAQ12. Do you agree with our proposal to consider an alternative approach of separate models in ED3?

CAQ13. Do you agree with our proposal to use the log-log functional form when developing ED3 totex cost models?

CAQ14. Do you agree with our proposal to use the entire sample period RIIO-ED1 - ED3 (2016 - 2033) to estimate our ED3 totex models?

CAQ15. Do you agree with our proposal to undertake a full assessment of the scope and purpose of including time trends in our ED3 totex models?

CAQ16. Do you agree with our proposal to retain the OLS estimation approach and to evaluate a random effects estimation approach when developing ED3 totex models?

CAQ17. Do you agree with our proposed set of statistical diagnostic tests we intend to use to evaluate the robustness of ED3 totex models?

Advantages and disadvantages of totex models and their use in ED3

SSMC summary

3.1 In our SSMC, we outlined that the totex modelling approach is the leading benchmarking framework in GB-regulated sectors where there are a sufficient number of operators, because it provides a robust and flexible assessment of overall value for money. By comparing total expenditure to a set of fundamental cost drivers and delivered outputs, totex models identify efficient costs that feed directly into electricity distribution charges without requiring detailed scrutiny of individual cost components. The approach is deliberately neutral to companies' operational choices, such as asset replacement, delivery models or the use of innovative solutions, which we consider important in an environment of asymmetric information. However, because the framework aggregates costs and outputs into a single measure, it offers limited insight into the sources of efficiency or inefficiency and is less well suited to capturing significant changes in the level or scope of activities, performing best under business-as-usual conditions.

Summary of consultation responses

3.2 We received five responses, all from DNOs. All broadly agreed with our SSMC position although NPg and UKPN felt that certain disadvantages of the totex models were overstated.

3.3 NPg also proposed a common scenario for determining demand created and requested consideration of up-front decisions on the reporting split of ex ante spend and spend expected to be incurred through uncertainty mechanisms.

SSMD decision and rationale

3.4 Noting the advantages of totex modelling and the broad support of the DNOs for its continued use in ED3, we will retain the use of totex modelling within our cost assessment toolkit. However, compared to RIIO-ED2, we note that there are two material considerations of price control design and methodology application that may significantly shift our use of totex models compared to previous usage.

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- 3.5 Firstly, the ED3 price control is set to offer DNOs less fungibility in how they can use their allowances compared to previous price controls. As noted in Chapter 1 of our SSMD, this is in response to observations in RIIO-ED2's outturn data that indicate general conflation of non-delivery of activity with cost efficiency. We note that ex ante totex modelling does not strictly and solely address this issue as it assumes that regulatory subjects are incentivised to pursue whole-life least cost solutions across their funded total allowed expenditure.
- 3.6 Secondly, with respect to methodology implementation, we noted in our SSMC our intention to explore the use of workload adjustments to totex modelling. Implementing workload adjustments to this approach will be an undertaking that requires careful consideration and diligence to avoid unsuitable outcomes from arising, such as distortion of the modelling relationship between costs and cost drivers.
- 3.7 Regardless, we believe that there remains a use-case for totex modelling provided adequate development in consideration of these factors. Chapter 7 of this annex outlines further thinking in relation to the utilisation of workload adjustments within our cost assessment approach. We also note that a less fungible price control does not automatically mean a granularly ringfenced design across each cost category and totex models have proven historically capable of accommodating elements such as the NARM framework and various Uncertainty Mechanisms (UMs) that display similar effects.

Cost driver principles

SSMC summary

- 3.8 In our SSMC, we explained that totex models rely on a small set of high-level cost drivers to estimate the efficient cost of delivering electricity distribution services, supported by core principles designed to ensure transparency and robustness. For ED3, we propose retaining the RIIO-ED2 principles that cost drivers should make economic and engineering sense, be consistently measurable, show a stable relationship with costs over time, and be largely beyond the control of the network company. These principles help ensure that drivers reflect genuine underlying cost determinants, avoid spurious correlations and are supported by reliable and comparable data, while reducing the risk of distortion. As fully exogenous drivers are limited in practice, assessing the degree of endogeneity and the potential for perverse incentives remains an important part of selecting appropriate drivers to ensure fair and resilient benchmarking.

Summary of consultation responses

- 3.9 We received five responses, all from DNOs, who were supportive of the proposed cost driver selection principles, while emphasising applying them flexibly rather than mechanistically in practice.

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- 3.10 NGED agreed with the principles overall but cautioned that applying them too rigidly would make modelling difficult. It also noted that failing against a single principle should not, on its own, justify excluding a cost driver. It proposed more flexible definitions of the principles, focusing on clear economic and engineering links to costs, data of reasonable quality, stable relationships with costs over time in the absence of unmanageable structural breaks, and minimising distortion to DNO incentives rather than strict exogeneity.
- 3.11 SSEN-D agreed with the principles and suggested adding an additional principle to ensure cost drivers are forward-looking and able to capture the expected ramp-up in network investment during ED3. SPEN similarly agreed while noting that flexibility should be retained around the endogeneity criterion.

SSMD decision and rationale

- 3.12 We have decided to retain the same high-level set of cost driver principles that were set out at SSMC. Accordingly, ED3 totex model cost drivers should continue to make economic and engineering sense, be accurately and consistently measurable, have a relatively stable relationship with costs over time, and be beyond the control of the network company. We consider that these principles remain appropriate for supporting robust, transparent and comparable benchmarking in ED3.
- 3.13 In making this decision, we have considered the responses on the application of the principles in practice. We note the importance DNOs placed on applying the principles with appropriate flexibility, rather than rigidly. We will apply the principles in a balanced and proportionate way, assessing their relevance across the modelling framework as a whole and having regard to the strength of the underlying rationale and evidence.
- 3.14 We have chosen not to add an additional principle to ensure cost drivers are forward looking, recognising that this facet will naturally be drawn out of cost drivers that exhibit good relationships with explaining bigger portions of DNO costs and therefore will be implicitly captured when selecting which cost drivers we use to specify our models.

Model selection criteria

SSMC summary

- 3.15 We proposed to apply a clear set of model selection criteria when developing the ED3 totex models to ensure that each specification is conceptually sound, transparent, aligned with the wider regulatory framework, and statistically robust. These criteria focus on overall model performance, including whether the model has a strong economic and engineering rationale, produces logically consistent coefficients, aligns with ED3 policy objectives, and creates

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appropriate incentives without introducing perverse outcomes. We noted we would also assess whether models are interpretable and replicable by DNOs and stakeholders, strike an appropriate balance between complexity and transparency, and perform well statistically, including stability across samples, sensitivity to assumptions, and ability to explain historical costs and support credible forecasts. Statistical tests will inform our assessment but will not be applied mechanistically, with judgement used to determine overall suitability for ED3.

Summary of consultation responses

- 3.16 We received five responses, all from DNOs. DNOs were broadly supportive of the proposed ED3 model selection criteria for specifying ED3 totex models.
- 3.17 NGED broadly agreed with our proposed criteria while emphasising that it should be applied pragmatically and, in the case of the transparency principle, should not come at the expense of accuracy. NGED cautioned against excluding cost drivers too early in model development and requested early access to ED3 data and the modelling suite. It stressed that robustness should be demonstrated through sense checks and credible, explainable outputs such as intuitive movements in efficiency scores over time and across companies.
- 3.18 SSEN-D agreed with the proposals but cautioned against applying volume or workload adjustments through multiple mechanisms, as this could jeopardise delivery and weaken accountability through uncertainty mechanisms. It also requested clearer rationale and assumptions in our business plan guidance to support comparability, simplification of the role of engineering assessment, and noted that the relationship between forecast and historical costs is less intuitive than in previous price controls due to changes in work volumes and cost pressures.
- 3.19 SPEN broadly agreed with the model selection criteria, highlighting the importance of grounding model specifications in engineering practice as engineering assessment plays a significant role in the cost assessment process. It also emphasised the need to provide DNOs with appropriate incentives to facilitate growth and the importance of transparency ahead of Draft and Final Determinations.
- 3.20 NPg agreed with our proposals and stated that the model selection criteria should also apply to disaggregated models.
- 3.21 UKPN broadly agreed with the proposed approach but raised concerns about the application of the robustness criterion, arguing that requiring models to be robust across multiple specifications is unnecessary as different specifications test distinct cost drivers. It suggested that aggregating results from multiple valid models is a more appropriate way to mitigate risk and proposed a structured model selection process based on economic and technical rationale, plausibility

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of coefficients, appropriate use of statistical tests, standard diagnostics, and checks for outliers and overfitting.

SSMD decision and rationale

- 3.22 We have decided to adopt the proposed model selection framework for ED3 totex modelling that was set out in the SSMC. We consider that the criteria provide a structured and proportionate means of assessing model specifications and selecting suitable models in ED3.
- 3.23 We have taken account of responses from DNOs, which were broadly supportive of the proposed criteria, while highlighting considerations around how they should be applied in practice. We consider that the proposed framework provides sufficient scope to reflect differences in model design and evidence, while maintaining a clear and consistent basis for assessment. The criteria will inform our overall view on the suitability of models for ED3, drawing on the available evidence.

RIIO-ED2 cost drivers overview

SSMC summary

- 3.24 In our SSMC, we outlined the cost drivers utilised in RIIO-ED2 and how they were structured within the totex models, as well as providing our views on the advantages and disadvantages of each. We did not put forward any proposal for change but intended to provide context for consequently outlining our longlist of cost drivers in ED3.
- 3.25 In RIIO-ED2, we used a range of cost drivers within the totex models to estimate efficient expenditure, which were grouped into three categories of scale, complexity and activity-based drivers. At SSMC, we identified a range of potential advantages and disadvantages for each driver across the three categories. Scale drivers reflect the overall size of DNO activities, with measures such as Modern Equivalent Asset Value (MEAV), customer numbers, network length and peak demand capturing different aspects of asset base, service requirements, network size and load. Each has limitations, including varying degrees of endogeneity and challenges in reflecting network growth or configuration. The advantages of scale drivers broadly relate to a relatively stable relationship with costs over time and well-established estimation methods.
- 3.26 Complexity and activity-based drivers aim to capture differences in operating environments and workload. Complexity drivers reflect regional or operational characteristics that make service delivery more challenging in some areas. The main complexity driver used in RIIO-ED2 was the number of faults, as a higher number of faults on a network likely requires relatively more complex operations

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and therefore incurs higher costs. The advantage of this driver is that it can capture reactive investment needs, although a disadvantage is that this can be influenced by asset management decisions and include both controllable and uncontrollable factors.

- 3.27 Activity-based drivers measure the scope of DNO activity, including reinforcement and the transition to net zero, such as transformer capacity released and the uptake of low carbon technologies (LCT) such as heat pumps and electric vehicles. While these drivers are policy-aligned and can provide exogenous signals of demand, they also carry risks of endogeneity, uncertainty and variation in spare network capacity, highlighting the need to carefully assess their continued role in ED3 to ensure robust and predictable modelling.

Summary of consultation responses

- 3.28 Overall, there was broad agreement among the five DNOs with the advantages and disadvantages of the cost drivers set out in the SSMC, alongside calls for stronger ED3-focused caveats and a clearer recognition of the additional trade-offs expected to arise in the ED3 period.
- 3.29 NPg, UKPN, and SPEN stated that network length and peak demand could be affected by measurement error, require further estimation or be influenced by DNOs. NPg stated that network length can be affected by DNOs' mapping capabilities and that while gross peak demand is estimated by DNOs themselves, net peak demand can be measured accurately using metering data.
- 3.30 NGED stated that capacity added is likely to have limited risk of endogeneity than stated in the SSMC.
- 3.31 SSEN-D stated that MEAV, peak demand, network length and faults were not forward-looking. SPEN said that MEAV does not fully capture network growth required to meet increasing demand. NGED and SSEN-D said that it is significantly weighted towards cables. UKPN said that network length does not capture the different types of network and mainly reflects historical choices. Additionally, UKPN and SPEN stated that the use of peak demand may disincentivise the use of flexibility going forward.
- 3.32 NGED said that customer numbers and peak demand were essentially the same driver given peak demand is calculated from customer numbers, noting this may change as demand per customer increases and usage profiles change.

SSMD decision and rationale

- 3.33 For ED3, we will continue to group drivers into three broad categories: scale, complexity and activity-based drivers, as we consider that these categories broadly describe the underlying nature and scope of cost determinants. Ahead of our Draft Determinations, we will further consider the additional trade-offs

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that DNOs have identified with respect to measurement error, risk of endogeneity and the need to ensure drivers capture forward-looking choices and pressures.

Longlist of cost drivers for ED3

SSMC summary

- 3.34 In our SSMC, we explained that we have begun developing a longlist of alternative cost drivers for potential use in the ED3 totex models, building on the RIIO-ED2 categorisation of scale, complexity and activity-based drivers. Each prospective driver was assessed against our cost-driver principles to understand its strengths and limitations. For scale, we considered reinstating units distributed, last used in RIIO-ED1, which is largely exogenous and reflects increasing load from low-carbon technologies, but is less effective at capturing ongoing cost pressures and has historically reduced modelled allowances due to its downward trend.
- 3.35 For complexity, we set out the case for including additional complexity drivers. We proposed three potential metrics drawing on existing or external data: the share of network length that is overhead, which reflects differences in network configuration and exposure to faults but may be offset by lower installation costs; the share of network length at higher voltages, which captures increased asset complexity but is endogenous; and population density, using a new weighted average density (WAD) metric. Population density was not adopted in RIIO-ED2 due to concerns around outliers and overfitting. At SSMC we presented granular geographic data which suggested WAD better captures intraregional variation and complexity, particularly where DNOs serve both dense and sparsely populated areas.
- 3.36 We also outlined additional activity-based drivers under consideration for ED3. Asset additions MEAV captures the annual value of new assets and provides a comprehensive measure of investment activity, though it is strongly endogenous and may fund scope without assessing justification. We also explored the number of properties unlooped, which is outcome-focused and aligned with long-term investment needs but faces data and incentive risks, and the number of new connections, which reflects network growth and is largely outside DNO control, although costs can vary significantly by connection type and size.

Summary of consultation responses

- 3.37 We received five responses, all from DNOs. They broadly agreed with the longlist of drivers that we proposed for ED3 in our SSMC. SSEN-D, SPEN, NGED and UKPN proposed additional cost drivers and adaptations for ED3. Three of the DNOs proposed a capacity released driver that expands on the definition that was used for RIIO-ED2. They stated that it should include capacity released from

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other interventions such as circuit reinforcement and asset replacement. SSEN-D said that if Ofgem pursued a “plan and adapt” regulatory model, an adapted capacity released driver would be more appropriate. UKPN said that a cost driver capturing the difference in network utilisation and headroom should also be considered.

- 3.38 SSEN-D said that the LCT driver used in RIIO-ED2 should be adapted to include the significant increase in load related investments from data centres and industrial areas, as well as a cost driver to capture the impact of exogenous environmental factors such as topography and relative exposure to extreme weather.
- 3.39 NGED agreed that MEAV is a useful scale driver but raised specific concerns about how well it reflects ongoing costs and asset condition, particularly for ED3. NGED highlighted that many cost areas (ie tree cutting costs) are driven primarily by overhead assets, yet MEAV assigns them relatively little weight.
- 3.40 More generally, DNOs proposed different approaches in evaluating cost drivers. SSEN-D emphasised the importance of finalising the longlist of potential drivers and how drivers will relate to increasing indirect costs as a result of increasing delivery requirements. NPg stated the choice of drivers ultimately depends on the scope for inconsistencies in plans and data.
- 3.41 NGED and SPEN proposed that the decision to include a driver at ED3 should be taken on an empirical basis, where ultimately the assessment should be taken against ED3 data. UKPN stated the importance of running regressions with different combinations of cost drivers and assessing multiple models.
- 3.42 SSEN-D said the cost driver selection should focus on whether cost drivers can be adapted for efficient, forward-looking investments. Additionally, it said that the ED3 approach should prioritise drivers of higher costs and address issues such as the lack of normalisation for density. NGED stated that we should consider how cost drivers will work alongside one another or in substitute.
- 3.43 Additionally, SSEN-D and NPg welcomed the proposal of using Regulatory Reporting Packs (RRPs) to construct cost drivers where possible but stated the importance of ensuring consistency in reporting.

SSMD decision and rationale

- 3.44 For our modelling approach, we will consider all cost drivers in the longlist as set out in SSMC, including the additional drivers identified by the DNOs. We will look to refine the selection of cost drivers for Draft Determinations. The full list of cost drivers is set out below:
- **scale drivers:** MEAV, network length, customer numbers, peak demand, units distributed

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- **complexity drivers:** number of faults, population density, share of overhead network length, share of high voltage network, spans cut, land area
 - **activity-based drivers:** asset additions MEAV, capacity released, cumulative number of heat pumps and electric vehicles, number of properties reactively or proactively unlooped, number of new connections
- 3.45 We have decided not to discount cost drivers at this stage, as we consider it difficult to duly balance trade-offs between cost drivers in the absence of the DNOs' proposed costs for ED3, which we will receive later in the process. We recognise that for some cost drivers there are conceptual issues which are independent from the collation and quality of data, for example the degree of endogeneity. However, we believe that decisions regarding the selection of cost drivers should be made in the round. This is so that on balance, both conceptual and data quality trade-offs can be fully considered.
- 3.46 For SSMD, we have focused on ensuring that the definitions and scope of key cost drivers are appropriate for use in ED3. This includes exploring proposals from DNOs where, in their view, RIIO-ED2 cost drivers did not comprehensively capture key aspects of business plans, assets or nature of intervention activity. We engaged with DNOs through our CAWGs to assess the following adjustments to definitions and scope:
- asset life adjusted MEAV – use asset lives to weight MEAV so that it can capture ongoing operating costs
 - capacity released – include capacity released from secondary circuits, asset replacement, and connections
 - network utilisation/headroom – include as an additional cost driver with focus on how to define and collect additional data from what was included in RIIO-ED2
 - further disaggregation across customer numbers, connections, faults and network length – disaggregate the scope of these drivers to include different types of customer numbers, faults connections and network length
- 3.47 NGED proposed adjusting MEAV using average asset lives as weights. In its view, the specification used in RIIO-ED2 for MEAV does not clearly reflect the scale of each network as it places greater weight on assets that are expensive to install but does not consider the ongoing costs required to maintain assets. For example, underground cables are expensive to install but will generally drive lower maintenance costs than other assets.
- 3.48 We will not be taking NGED's proposal any further into ED3 due to limitations in data consistency and immaterial change in MEAV costs across DNOs. We

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considered three options for calculating average asset lives: using median unit costs, an engineering assessment or the standard 45-year depreciation period. We found that across DNO submissions, 32 asset categories had missing reported asset lives despite having non-zero asset volumes. Additionally, some asset categories showed wide variation in asset lives across DNOs, for example a standard deviation of 45 years for 132kV towers. Nonetheless, we find that irrespective of which approach taken to estimate asset lives, an asset life adjusted MEAV did not show material difference in its distribution compared to the RIIO-ED2 MEAV specification.

- 3.49 We acknowledge that the RIIO-ED2 specification for MEAV weighs assets according to replacement costs, and therefore by definition, will not capture ongoing maintenance costs of the asset base. While we do not consider that adjusting MEAV by asset lives is appropriate, we will review the asset weights used for MEAV and its implications for ED3 ahead of our Draft Determinations.
- 3.50 Capturing capacity released from additional interventions generally is impeded by the lack of historical reporting and consistency in calculation methods across DNOs. In RIIO-ED2, we considered including circuits on the secondary network but at the time, identified cross-DNO definitional inconsistencies in circuit interventions and a risk of double counting with capacity released from the primary network.² Additionally, capturing capacity released from asset replacement is not typically central to DNOs' planning or reporting requirements given it is classed as non-load expenditure.
- 3.51 For ED3, we will maintain the RIIO-ED2 specification used for capacity released, but we recognise that there may be an uptick in reinforcement activity further downstream across the networks, as well as asset replacement and connections that could release capacity. Therefore, we will work with DNOs to consider whether the data collected for ED3 delivery metrics could be used to supplement our understanding of capacity released for benchmarking.
- 3.52 Similarly, we find that although network utilisation or network headroom data could be derived from the Load Index (LI),³ which is already captured across the primary network for substations in the BPDTs, expanding the scope of the LI to include the secondary network could be difficult given data availability and consistency. It is not clear whether this level of data would be readily available historically across all DNOs and whether DNO consistently forecast utilisation across the secondary network. We will work with the DNOs to consider the use of network utilisation data already captured in the BPDTs, as well as the Network Headroom reports that are routinely published by DNOs.

² RIIO-ED2 Final Determination Core Methodology Document, paragraphs 7.124, [RIIO-ED2 Final Determinations Core Methodology.pdf](#)

³ Load Index (LI) is a network output measure related to network utilisation, and collects information on the utilisation of the Distribution assets supplying substations on the primary network.

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- 3.53 We considered updating the scope of customer numbers, connections, network length and faults to account for the different types of each driver that can exist across the electricity distribution network. However, we found that while some data may be available historically and in forecasts, it is unlikely to provide additional material explanatory power given the effort needed for DNOs to identify different types of customers, connections, faults and network length. We therefore have maintained the RIIO-ED2 approach of defining and collecting data in the aggregate for these drivers.
- 3.54 We considered expanding the scope of the LCT driver to include data centres and industrial areas. However, we found that there is no established industry-wide definition that could be used to consistently identify demand types such as data centres and industrial zones. While DNOs include these demand types in their Distribution Future Energy Scenarios (DFES), there is a range of different classifications and a lack of consistency across DNOs in how they are captured. We consider that activity driven by data centres will be implicitly captured through other cost drivers in our longlist and, therefore, do not consider it necessary to develop a separate definition or approach at this stage for ED3.

CSV approach vs separate models

SSMC summary

- 3.55 In our SSMC we explained that, in RIIO-ED2, we used composite variables to combine multiple cost drivers, including a combined scale and complexity variable (CSV) and a composite activity-based variable for LCT technologies. This approach, applied consistently across RIIO-1, RIIO-2 and RIIO-GD3 helps address multicollinearity, improves degrees of freedom in small samples, and avoids overcrowding models with individual drivers. In RIIO-ED2, we used both a bottom-up CSV, grounded in detailed cost-driver mapping, and a simpler top-down CSV.
- 3.56 The bottom-up CSV was constructed by mapping 29 expenditure categories to cost drivers using engineering and economic rationale, deriving median unit costs across DNOs, and applying these to annual driver values to generate a notional efficient spend. The top-down CSV followed the same conceptual basis but combined weighted cost drivers more simply, resulting in contributions from MEAV, network length, customer numbers, faults and peak demand.
- 3.57 In our SSMC, we also highlighted limitations of composite variables, including reliance on pre-modelling assumptions about driver weights and reduced transparency in interpreting individual driver impacts. As an alternative for ED3, we proposed a separate-model approach, estimating multiple models each with a single scale driver and triangulating results across them. This approach improves interpretability, allows coefficients to be more clearly understood, and

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provides a broader view of efficiency across DNO regions, though it increases administrative burden. Despite this, we consider it a credible alternative to composite variables and a useful addition to the analytical toolkit for informing efficient ED3 totex allowances.

Summary of consultation responses

Characterisation of CSVs

- 3.58 Overall, all DNOs broadly agreed with our characterisation of bottom-up, top-down and LCT composite variables. SSEN-D and SPEN said that the composite variable methodology was a valuable component of the ED3 cost assessment toolkit as it balances complexity and transparency whilst supporting robust benchmarking outcomes.

Preference between bottom-up and top-down CSV

- 3.59 NGED, UKPN and NPg agreed with the CSV approach but proposed adaptations for the ED3 model suite but disagreed with our assessment of disadvantages of a top-down CSV. NGED, UKPN and NPg disagreed with our view that the top-down CSV is potentially less accurate than the bottom-up CSV. UKPN and NGED proposed that the weightings assigned to Electric Vehicles (EVs) and Heat Pumps (HPs) in the LCT driver should be reviewed. UKPN and NGED noted that while improvements can be made to all CSVs used in RIIO-ED2, they did not agree with our view that the lack of normalisation process when developing the RIIO-ED2 top-down CSV is a potential disadvantage. Additionally, the DNOs stated that there needs to be sufficient distinction between top-down and bottom-up CSVs to avoid excessive reliance on a single approach.
- 3.60 NGED, SPEN and UKPN proposed that both bottom-up and top-down CSVs should be explored for the ED3 model suite. NGED said that if one approach is excluded, the rationale for doing so against the cost driver and model principles should be clearly stated. SPEN stated the importance of using both approaches as they have different advantages and disadvantages. The top-down metrics are more endogenous while bottom-up drivers map more clearly to individual activities. UKPN stated that it is not possible to use a definitive approach for assessing comparative efficiency of different DNOs and propose different ways to construct CSVs to avoid potential bias.
- 3.61 NPg stated its preference for top-down CSVs as they are simpler than bottom-up CSVs. It said that a flaw of the bottom-up CSV was the inclusion of capacity released in the CSV, which limited the availability of the driver to explain variation in costs. NPg proposed that separate drivers are used to control for the step-up investment as opposed to forcing the drivers into CSVs with pre-determined weights.

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- 3.62 SSEN-D also stated that it is difficult to specify preference at this stage as Ofgem need to clarify which elements and weightings will be included in the proposed CSVs and whether they adequately address the expanded cost driver principles.

Improvements to CSVs

- 3.63 In relation to mapping approaches SSEN-D, UKPN and SPEN stated that the mapping of cost activities to cost drivers should be reconsidered for ED3. UKPN stated that the cost mapping approach in RIIO-ED2 contained some subjectivity as simple averaging was used, which lacked robust justification.
- 3.64 SSEN-D, UKPN and NPg proposed the weights used to construct CSVs should be reconsidered. UKPN said that the top-down CSV weights used in RIIO-ED2 were based on industry total expenditure shares aggregated over the period from 2016 to 2024. It stated that this did not reflect the differences in expenditure composition across individual DNOs or capture trends over time. The DNO proposed the use of company-specific and annual expenditures shares as this would allow the CSV to have different weights for each DNO in each year. NPg proposed using preliminary regressions to identify weights within the CSVs.
- 3.65 UKPN and SPEN proposed that there should be further consideration of standardising the units of drivers used in CSVs as individual cost drivers are measured in different units. UKPN stated the importance of normalisation of units of each driver when using company-specific cost shared and said it would be necessary to standardise drivers to avoid bias.

Separate models

- 3.66 There were mixed responses for our proposal to use separate models as an alternative to CSVs. SSEN-D and SPEN agreed with our proposal and stated that it would be beneficial to use separate models. SSEN-D said that they had tested the use of separate models using existing data, which improved the model fit and range of efficiency scores. SPEN stated that the use of separate models avoids using weights, which place restrictions on the CSV, but ultimately both approaches should be tested and compared.
- 3.67 NGED and UKPN said that while they were open to considering separate models, it would unlikely add significant value given that single scale drivers suffer from significant omitted variable bias. Additionally, UKPN stated that it is unclear what triangulation approach would be used to weight all the single scale driver models, nor how this approach would reduce subjectivity. NGED and UKPN proposed that resource and time could be better focussed on enhancing and developing alternative CSVs.
- 3.68 NPg noted the Competition and Markets Authority's (CMA) decision for Ofwat's PR24⁴ to simplify its cost assessment and reduce the number of models used.

⁴ Water PR24 References [Provisional determinations summary.pdf](#)

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The DNO proposed model fit should not be chased and instead proposed designing models that are transparent with strong economic and engineering justification.

SSMD decision and rationale

- 3.69 We broadly agree with DNOs' responses in so far as we consider it important to explore both top-down and bottom-up approaches for ED3. At this stage, we do not believe it would be prudent to exclude either approach based purely on theoretical or conceptual considerations, as we recognise that no single construction of a CSV can be assumed to be superior at this stage. We will consider the trade-offs identified at SSMC and by DNOs for each option, along with the selection of cost drivers at Draft Determinations.
- 3.70 We will consider all three areas of improvement proposed by DNOs when constructing the composite scale variables (CSVs) for ED3. In particular, we will:
- review the cost driver mapping used in RIIO-ED2, working with DNOs to identify mappings that are no longer reflective of underlying cost trends or that could be replaced by alternative cost drivers from our longlist
 - re-assess the approach to weightings, including consideration of company specific shares alongside the RIIO-ED2 approach of using total expenditure weights
 - review the treatment of units and standardisation, including the potential normalisation of units across cost drivers and the standardisation process applied when constructing CSVs
- 3.71 We recognise that the use of separate models could improve model fit. However, we also recognise that the use of separate models can introduce omitted variable bias that could distort benchmarking results and lead to a proliferated modelling framework. We will review the use of separate models within the context of the other modelling decisions we will need to make to ensure we adopt a proportional, intuitive approach to totex modelling.

Functional form, sample size, and time trends

SSMC summary

- 3.72 As explained in our SSMC, the choice of functional form is a key element of econometric modelling because it reflects assumptions about the relationship between costs and explanatory variables. In RIIO-ED2, we used a Cobb-Douglas (log-log) specification, which is well established in GB economic regulation and aligns with the ED3 model selection criteria. This approach is simple and transparent, with coefficients interpreted as cost elasticities. Given these

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advantages, we set out the log-log form as the preferred starting point for ED3 totex modelling.

- 3.73 Sample size is also a critical consideration within the toolkit approach. Larger samples, combining historical and forecast data, can improve robustness by assessing performance over a longer period, but they also introduce risks where older data may be less representative of future costs and forecast data reflects management discretion. Historical outturn data provides an independent benchmark for challenging DNO business plans and addressing information asymmetry, but relying on it alone can constrain sample size and limit model robustness where past conditions differ from those expected in ED3.
- 3.74 Including forecast data can help reflect DNOs' superior information about future challenges, but forecasts are not a neutral measure of efficient costs. They are influenced by factors such as risk appetite, expectations of input price pressures, strategic choices linked to net zero delivery, and incentives created by mechanisms such as the Business Plan Incentive. In RIIO-ED2, models typically pooled historical and forecast data, and for ED3 we proposed a pooled sample spanning RIIO-ED1 to ED3 to support robust estimation, alongside historical-only models as sensitivity checks where forecast totex materially exceeds historical levels.
- 3.75 We also explained in our SSMC that time trends were used in RIIO-ED2 to capture unobserved, time-varying effects, including a step-change and a forecast-specific trend. While this approach improved statistical performance, time trends lack transparency and may conflict with cost-driver principles by capturing factors within DNO control. For ED3, we therefore proposed to reassess the role of time trends, testing alternative specifications alongside improved activity-based drivers, with potential outcomes including revised trends, a single ED3 dummy, or the removal of time trends altogether.

Summary of consultation responses

Functional form

- 3.76 All respondents agreed with our proposal to use log-log functional form when developing the ED3 totex cost models. SSEN-D, SPEN, NGED and UKPN proposed that alternatives should be considered where appropriate. UKPN proposed the use of a different functional form to accommodate density and density squared terms. UKPN proposed that the use of quadratic terms or linear cost functions could be considered if ED3 models fail the RESET test. NGED said that we should not assume the impact of one unit change in a variable is the same at each level of that variable as they expect benefits to scale in the round.

Sample size

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- 3.77 We received mixed responses to our proposal to use the entire sample across RIIO-ED1 to ED3 (2016 to 2033). SPEN and UKPN agreed with our proposal but noted that historical data will be limited in explaining the growth required for net zero and that structural breaks may occur to which appropriate controls should be considered. Additionally, SPEN proposed that the weighting between historical and forecast data, as well as the choice of periods for regressions, should be reconsidered and that this should form part of detailed discussions at future CAWGs.
- 3.78 NGED and NPg noted that both historical and forecast data will have limitations and that decisions on sampling should be taken on the basis of an empirical assessment of ED3 BPDT submissions. NGED said that RIIO-ED1 may be too differentiated from ED3 data across several cost categories to allow for stability over time. However, they noted that forecast data may present inconsistencies and errors and therefore stressed the importance of scrutiny through future CAWGs. Additionally, the DNO cautioned against considering that longer sample periods can provide more robust totex models. The DNO stated that a longer time series with panel structures will exhibit time series properties, such as non-stationary variables which can lead to spurious results.
- 3.79 NPg said that while historical data remains useful for establishing relative starting efficiency positions, it should not constrain Ofgem's ability to accommodate rising investment requirements as compared to RIIO-ED2. Therefore, historical costs should play a smaller role in informing forecasts for ED3, and where this is not possible due to model robustness, Ofgem should rely on forecast data alone.
- 3.80 SSEN-D disagreed with our proposal of using the entire time sample on the basis that historical unit costs do not capture forward looking price pressures. It stated that the upward pressure on raw input prices and increased supplier margins is consistent with unit cost increases in recent years, which historical data cannot capture and has been a lesson learnt from RIIO-ET3 models for indirect operating costs. The DNO proposed that sufficient guidance, time and consultation is needed to ensure forecast data is consistent across DNOs.

Time trends

- 3.81 Most respondents agreed with our proposal for assessing the inclusion of time trends in our ED3 totex models. SSEN-D and NGED stated the importance of carrying out a full assessment of time trends as well as period dummies given the risk of structural breaks in the data, which could lead to structural underfunding.
- 3.82 NGED and NPg stated the importance of assessing the need for time trends and dummy variables on an empirical basis with the full ED3 BPDT dataset. NGED said that careful consideration should be given to the use of price control dummies as a properly specified model should adequately capture the expected

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step-change at ED3. The DNO expressed concern that a time trend will only be considered if it is negative and Ofgem will interpret positive coefficients as inefficiencies. This may expose network to impacts that increase costs and are unobserved in the cost models.

- 3.83 SSEN-D, NGED and UKPN proposed introducing interaction and multiplicative forms between time variables and cost drivers to allow time to scale or dampen the impact of particular cost drivers rather than acting as a blunt residual trend. UKPN proposed the introduction of interaction terms between time dummy and relevant cost drivers to assess whether cost and driver relationships are changing due to the change in DNO activities. NGED proposed the use of time fixed effects. SPEN stated the importance of distinguishing between the use of a dummy variable for a particular price control and the use of linear time trend. The DNO also stated that this was a lesson learnt from RIIO-ET3 where time variables needed to be statistically significant. Lastly, the DNO cautioned against double counting ongoing efficiencies when applying a linear time driver.
- 3.84 UKPN disagreed with our view that applying a time dummy approach lacks transparency and engineering economic rationale. The DNO cautioned against using a time trend, smoothed or extrapolated trend data in the forecast period. It stated that this could create multicollinearity between alternative drivers and spurious relationships between drivers that all follow upward trends.

SSMD decision and rationale

Functional form

- 3.85 We will continue to use the Cobb-Douglas (log-log) functional form for ED3 as it has strong theoretical economic foundations and facilitates an economic and engineering interpretation of cost driver coefficients. While quadratic terms and non-linear specifications or transformations may improve model fit, they can make the meaningful interpretation of coefficients more difficult and therefore risk spurious model robustness, which cannot easily be verified by real-life intuition. We will not impose assumptions on the nature of the economies of scale pre-modelling but rather allow the model to estimate and determine the coefficients for the composite scale variable. We note that in the RIIO-ED2 Final Determinations economies of scale were found.⁵

Sample size

- 3.86 To develop our ED3 totex models, we will test the use of the full dataset across RIIO-ED1, RIIO-ED2 and ED3 as we believe that historical data remains relevant. Although ED3 may require increased levels of investment, we do not consider that narrative to be strong enough to disregard historical data in our assessment.

⁵ RIIO-ED2 Final Determination Core Methodology Document, paragraphs A1.5 – A1.6, [RIIO-ED2 Final Determinations Core Methodology.pdf](#)

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While we recognise the risks that longer samples can introduce, of structural breaks, trending or non-stationary variable, we believe that an assessment of those risks and weighing against the benefits brought by a longer track record should be deferred until we have the data in business plan submissions to interrogate.

- 3.87 We will consider the proposal of weighting between historical and forecast data. However, we are aware that this can impose a level of subjectivity, which may lead to developing a weighting approach that could distort benchmarking outcomes. For each sample period, we will assess the data consistency and comparability, and the impact of including each period on the statistical stability of the models.

Time trends

- 3.88 A time trend assumes a smooth, continuous change over time and imposes a linear structure on time effects while time dummies can allow for each time-period to have its own effect. We will review the inclusion of time trends and time dummies for ED3 models based on a theoretical understanding and full empirical assessment. Additionally, we will consider the inclusion of interaction terms with cost drivers as they may have merit in differentiating time effects for each period and capturing structural change. However, we acknowledge that using interaction terms can make intuitive interpretation harder and risk overfitting data with smaller sample sizes.

Estimation approach and statistical diagnostic tests

SSMC summary

- 3.89 We considered a range of econometric estimation approaches for developing the ED3 totex models. Using our panel dataset covering RIIO-ED1, RIIO-ED2 and ED3 for all 14 DNOs, there are several different econometric modelling techniques we can use to model efficient ED3 totex:
- pooled ordinary least squares (OLS)
 - random effects
 - fixed effects
 - stochastic frontier analysis (SFA)
- 3.90 We proposed in the SSMC that our starting point for ED3 would be to continue with the established OLS estimation approach as fixed effects and SFA have significant disadvantages in a regulatory cost assessment context and have not been adopted in GB regulation. Fixed effects is unlikely to improve modelling outcomes and is very data intensive due to the need to include DNO dummies. The scale drivers we use such as MEAV, customer numbers and network length, have relatively small changes over time which means there is limited variation

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within to exploit if using this approach. This can make the fixed effects approach less robust than OLS.

- 3.91 The only alternative approach we proposed to consider at SSMC is random effects, which better exploits the panel structure of the dataset and may offer improvements over OLS. As set out at SSMC, we intend to assess random effects models using appropriate statistical tests and would only adopt them if there is clear evidence of a material improvement in modelling outcomes.
- 3.92 We will use a set of statistical diagnostic tests to assess the statistical performance and robustness of the ED3 totex models. This is a well-established approach, applied in recent energy and water price reviews and is essential to ensure that the final models we select best predict efficient ED3 totex and align with our model selection criteria as set out in SSMC. As noted in our SSMC, econometric models may not pass every robustness test. We therefore reiterate that while we will consider the relative importance of each test when developing ED3 models, we will not treat performance against these tests as a mechanistic basis for model selection.
- 3.93 We proposed assigning different levels of importance to the statistical diagnostic tests. The following categories (High, Medium and Low) set out our proposed weighting when specifying ED3 totex models. All tests align with those used in past ED and GD price controls, with the only addition being the Breusch-Pagan LM test, which helps assess whether random effects may be preferable to OLS.

Table 1: Statistical diagnostic tests and our proposed levels of importance

Statistical Diagnostic Test	Importance level
Adjusted R-squared	High
Statistical significance of parameters (t-test)	High
Efficiency score distribution	Medium
RESET test	Medium
Testing for panel effects (Pooling test)	Medium
Normality of errors	Low
Heteroskedasticity	Low
Breusch–Pagan LM test	Low

Summary of consultation responses

Estimation approach

- 3.94 All DNOs broadly agreed with our proposals to retain the OLS estimation approach, and evaluate random effects estimation. SSEN-D proposed that if a random effect estimation is implemented, care should be given in how the components of the error term are treated and interpreted. This is because company specific invariant effects can be treated as inefficiency or company characteristics. Additionally, the DNO stated that random effects may be more helpful in an ED3 context due to the ability to exploit an expanded dataset, model within company variation and the higher importance of unobserved company-specific characteristics.
- 3.95 UKPN proposed that a fixed effects estimation approach should be considered and this should be considered through statistical testing. They agreed that the SFA estimation technique would not be appropriate and cautioned against the use of the Least Absolute Shrinkage and Selection Operator (LASSO) technique utilised by the CMA for the PR24 appeal.

Statistical testing

- 3.96 There was broad agreement from respondents on the suite of statistical diagnostic tests that we proposed in SSMC. SSEN-D, NGED, NPg and UKPN proposed additional statistical testing for ED3 model suite. SSEN-D proposed the Hausman test to assess the suitability of random effects or fixed effects. SSEN-D, UKPN and NGED proposed adding the Chow test to test for structural breaks in the data, with SSEN-D proposing that testing for structural breaks and panel effects should be the main focus when deciding appropriate period of analysis. NGED further proposed alternative goodness of fit measures such as Root Mean Squared Error as well as sensitivity analysis to test if model results are overly sensitive to the removal of an individual network or year. Additionally, they proposed adding Cooks distance and panel non-stationary tests if the full panel dataset is used across RIIO-ED1 to ED3.
- 3.97 SSEN-D and NGED proposed that the hierarchy of statistical tests should be reconsidered. SSEN-D proposed that the Breusch-Pagan LM test should be given greater relative importance given the possibility of the use of random effects estimation. NGED proposed that the efficiency score tests should be promoted to high importance. The DNO stated the importance of producing efficiency scores that can be credibly explained, which was not the result in RIIO-ED2 where efficiency differentials were too wide to be explained by inefficiency. Additionally, the DNO proposed that tests for statistical significance should remain high for main drivers but relaxed for any control drivers. NPg also stated the importance of efficiency scores but noted model robustness should not be questioned if efficiency scores result in one or two outliers. This may mean that there are missing drivers that are not included in the model specification.

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- 3.98 NPg and UKPN cautioned against the approach of data mining for appropriate cost drivers and model robustness. UKPN noted that while the LASSO technique would be useful to assess cost drivers, this should be balanced with risks of data mining. NPg noted that chasing higher R squared values should not be taken as an approach as the inclusion of some dummy variables may increase R squared values but may lead to spurious correlations.
- 3.99 NGED and UKPN proposed that statistical tests should be applied to all regressions including disaggregated and mid-models. Additionally, UKPN stated that the relative importance of each statistical test should be made clear, and this should include guidance on how models that fail a test classified as medium would inform the benchmarking process.

SSMD decision and rationale

- 3.100 We will retain the Pooled OLS regression method as our primary estimation technique in ED3 and consider the use of random effects estimation. However, we remain concerned that, while the random effects approach imposes the strong assumption that the composite error term is uncorrelated with cost drivers, it shares a broader limitation with Pooled OLS in its inability to distinguish between inefficiency and relevant network-specific structural factors, particularly where these are omitted or insufficiently captured in the model specification.
- 3.101 We will retain the suite of statistical diagnostic tests as noted in our SSMC. Acknowledging responses from DNOs, we will also include the use of the Durbin Wu Hausman test and Chow test within our totex modelling process. However, as we progress through cost assessment of the DNOs' business plans, we may seek to alter our testing approach based on all other elements of totex modelling being considered. This may mandate the use of other tests to assess the suitability and robustness of our models.

4. Disaggregated models

Disaggregated models use granular data relating to historic and forecast costs within allowance categories with a range of methods to estimate efficient allowances.

We recognise there are advantages and disadvantages associated with such an approach, and we believe that the advantages outweigh the disadvantages and that disaggregated models remain an appropriate tool for cost assessment in ED3.

SSMC questions

CAQ18. Do you agree with the continued use of disaggregated models in ED3?

CAQ19. Do you agree with the advantages and disadvantages of disaggregated models we set out?

CAQ20. Do you agree with our proposed principles for disaggregated model development in ED3?

Continued use of disaggregated models in ED3

SSMC summary

- 4.1 Disaggregated models use granular cost data of every category of expenditure, with combinations of categories where appropriate, to assess costs in one of several ways:
- unit cost benchmarking with or without a workload adjustment
 - regression analysis
 - total cost ratio benchmarking
 - trend modelling
 - qualitative assessment
- 4.2 We used a disaggregated modelling approach to determine efficient electricity distribution costs in RIIO-ED2, assigning a triangulation weight of 50%.
- 4.3 In our SSMC, we set out our intention to continue using disaggregated models in ED3, using the RIIO-ED2 disaggregated models as a starting point for further development.
- 4.4 All 36 of the RIIO-ED2 models are listed in Annex 4 of the SSMC.

Summary of consultation responses

- 4.5 There was broad support among DNOs for continued use of disaggregated models in ED3, but NPg argued for simplifying the cost assessment with increased aggregation.
- 4.6 There was also broad agreement amongst DNOs on the need to develop this suite of models to make them suitable for ED3. SSEN-D and NGED raised

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concerns about the number of models and operational complexity of the modelling suite and SSEN-D and NPg others expressed concern about inconsistent or unclear treatment of volume adjustments in RIIO-ED2.

SSMD decision and rationale

- 4.7 Disaggregated models will form a substantial part of the cost assessment toolkit for ED3, which is broadly supported by DNOs. We note the concerns raised about the specification or design of some such models used in RIIO-ED2 and share the ambition to develop these models further ahead of our Draft Determinations to increase the robustness of disaggregated model benchmark allowances and improve the transparency of how they are determined.
- 4.8 In line with this ambition, we have continued to engage with DNOs on developing this model suite through CAWGs.
- 4.9 Regarding concerns about the treatment of volume adjustments in RIIO-ED2, we have also engaged with DNOs on the development of our business planning guidance to attempt to provide early clarity on the areas within our disaggregated assessment in which we expect to use subject matter expertise to apply volume adjustments within our disaggregated models. Primarily these workload adjustments will occur within areas requiring specialist assessment, such as load and non-load related expenditure where Ofgem engineers will assess volumes, and cyber or digitalisation investments which will also require specialist assessment.

Advantages and disadvantages of disaggregated models

SSMC summary

- 4.10 In our SSMC, we highlighted three key advantages of disaggregated models, which make them an essential part of our ED3 cost assessment toolkit:
- model separation, which leverages the richness of regulatory reporting on electricity distribution services and can help to better reflect the bespoke nature of the activities in each cost category
 - a greater understanding of efficiency drivers, as we are able to examine and analyse DNO performance in discrete areas
 - responsiveness to changes in the scope of DNO activity over time
- 4.11 Disadvantages of a disaggregated approach outlined in our SSMC included:
- risk of cost allocation decisions leading to differences in apparent efficiency
 - risk of 'cherry-picking' resulting in an unattainable hybrid of maximally efficient allowances once estimated efficient costs from all categories are combined

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- risk of perverse incentives
- resource intensity of assessment and interpretation of allowances

Summary of consultation responses

- 4.12 All DNOs broadly agreed with the principles of the advantages and disadvantages outlined in SSMC.
- 4.13 SSEN-D cautioned that the ability of disaggregated models to reflect changing scope may be limited if unit costs rely too heavily on historic costs and therefore do not reflect true cost pressures. SSEN-D also proposed simplification of the disaggregated modelling suite.
- 4.14 NGED highlighted that the disaggregated modelling files are data-intensive and proposed that Ofgem provide early visibility of the data underpinning disaggregated models and the models themselves.
- 4.15 NPg warned against excessive granularity and argue for raising the level of aggregation and removing ratchets from the disaggregated models.
- 4.16 UKPN challenge the idea that disaggregated models are more responsive to step-changes in scope than totex models that include forecast costs and argue for two further disadvantages: a susceptibility to outliers where there are limited observations; and risks of inconsistent treatment of expenditure where the same or similar assets are assessed in multiple ways across multiple models.

SSMD decision and rationale

- 4.17 As we outlined in our SSMC, we recognise that there are advantages and disadvantages to the use of disaggregated models to benchmark and set allowances. However, our view is that the advantages outweigh the disadvantages. Further, we believe that by continuing to develop the disaggregated models used in ED3, in consultation with the DNOs and other stakeholders, that the disadvantages outlined can, to varying degrees, be mitigated.
- 4.18 We will continue to explore ways in which the disaggregated models used for ED3 can be improved as disaggregated models will form a core part of the toolkit for benchmarking and assessing allowances in ED3.

Principles for developing ED3 disaggregated models

SSMC summary

- 4.19 In the SSMC, we set out three high level principles for developing the ED3 disaggregated modelling:

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- the RIIO-ED2 disaggregated models will be used as a starting point for the ED3 disaggregated models
- our model development process will carefully consider the appropriate level of granularity
- we will carefully consider the appropriate mix of historical and forecast data to use in the ED3 disaggregated models

Summary of consultation responses

- 4.20 SSEN-D, NGED, SPEN and UKPN agreed with our proposals to use the RIIO-ED2 models as a starting point for ED3 with some specific suggestions on how the disaggregated models should be amended, with UKPN also recommending that we should conduct a review of the disaggregated models to address deficiencies.
- 4.21 NPg requested that we reduce our reliance on granular benchmarking that in its view fails to recognise cost trade-offs across categories. In particular, NPg do not agree that disaggregated models used in RIIO-ED2 are a suitable starting point for ED3 and suggest aggregating all load related costs into a single regression model with multiple drivers.
- 4.22 Views on our consultation position on granularity were mixed. SPEN agreed with our consultation position to carefully consider the appropriate level of granularity during the model development process. SSEN-D and NPg argued there should be less granularity where possible. NGED cautioned against too much consolidation as this would make the disaggregated assessment too similar to the mid-level assessment, undermining the case for performing both. They also say that cost categories should only be consolidated where there is a clear interaction between them, such as when one activity can be substituted for another.
- 4.23 SPEN, SSEN-D and NGED agreed with our consultation proposal to carefully consider the appropriate mix of historical and forecast data to use in the ED3 disaggregated models, noting a risk that relying too heavily on historic allowances could result in insufficient allowances.

SSMD decision and rationale

- 4.24 We will continue to engage with DNOs, primarily through CAWGs, to develop the ED3 model suite with the primary goals of improving the robustness of disaggregated benchmarking and transparency of our approach.
- 4.25 To support improved transparency, and in response to feedback received from DNOs, we will also consider ways in which the disaggregated modelling suite can be made simpler, and more usable, thus increasing the interpretability of our cost assessment.

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4.26 A consistent theme in DNO responses related to the importance of balancing the use of historical costs against forecast data, with representations made that over-reliance on historical costs will result in under-funding of allowances in ED3. Using historic data in the cost assessment adds value to our cost assessment because:

- we can benchmark forecast ED3 data against the realised historic data to assess the credibility of the forecasts
- subject to the data being sufficiently stable over time, using a longer dataset tends to improve the accuracy and robustness of the modelling

4.27 Whilst we recognise the need for balance, particularly where cost pressures are well-evidenced, for these reasons we also believe that using realised costs as the foundation of a disaggregated cost assessment is in the consumer interest.

5. Mid models

Mid models adopt a hybrid approach between the disaggregated and totex models. They compare data relating to historic and forecast costs across high-level groupings of cost categories to estimate efficient allowances.

By recognising the respective advantages and disadvantages of the disaggregated and totex models, mid models offer a potential way to mitigate the shortcomings of each. They can be used either to inform the determination of ED3 allowances or to validate the outputs of the other models.

SSMC questions

CAQ21. Do you agree with our criteria for level of aggregation when developing ED3 mid models and disaggregated models?

CAQ22. Do you agree with our proposal to consider mid models in our ED3 cost assessment toolkit approach?

CAQ23. Do you agree with our proposed level of aggregation for the mid models? If not, please state your alternative proposal.

CAQ24. Do you agree with our hybrid specification of the ED3 mid models to combine approaches from ED3 totex and disaggregated modelling?

Introduction

SSMC summary

- 5.1 At SSMC we proposed developing a modelling approach that would bridge the gap between our top-down (totex) and bottom-up (disaggregated) modelling approaches. We outlined an alternative model design (referred to as mid models) with the objective of adding value to our ED3 cost assessment toolkit.
- 5.2 We noted that mid models should avoid being either overly aggregated or granular, as this would risk offering limited additional value relative to our existing totex and disaggregated modelling approaches.

Summary of consultation responses

- 5.3 We received five responses from all the DNOs. All DNOs, with the exception of SSEN-D, were broadly supportive of the proposal to consider mid models for ED3. NGED stated that the mid models should be used if they are clearly adding unique and incremental value to the cost assessment. NPg suggested using some of the mid models to replace parts of the disaggregated modelling that are, in their view, too granular.
- 5.4 UKPN noted that mid models could help to mitigate disadvantages of disaggregated models, such as the risk of cost allocation decisions leading to

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differences in apparent efficiency. UKPN emphasised the need for statistical rigour in the design of mid models.

- 5.5 SSEN-D did not support the development of the mid models as it did not consider them to provide any significant value to the cost assessment. It suggested that, given the constraints on time and resources for ED3, the mid models be deprioritised in favour of refining the existing modelling suite. SSEN-D acknowledged that mid models may be useful for testing and validating cost drivers but considered that their suitability for determining allowances will depend on their robustness. SPEN, while more supportive of mid models, similarly raised concerns about the resource implications and additional complexity with introducing mid models, and emphasised the need for a transparent and robust process.

SSMD decision and rationale

- 5.6 Overall, there is broad support for the continued development of the mid models, and we will therefore take this work forward for ED3. The way in which mid models will be used will be determined at Draft Determinations. Potential uses may include:
- testing and validating the totex and disaggregated models
 - contributing to the calculation of allowances alongside the totex and disaggregated models
 - replacing elements of the existing disaggregated models
- 5.7 Our decision will be based on our assessment of the economic and statistical robustness of the mid models, their explanatory power, and the extent to which they provide clear and incremental value beyond existing models.
- 5.8 We will continue to develop the mid models in a transparent manner and in close engagement with DNOs.

Criteria for level of aggregation

SSMC summary

- 5.9 At SSMC we proposed the following criteria to consider when deciding on the appropriate level of aggregation of ED3 mid models:
- **complementarity** – is there a strong technical / economic reason to believe that activities or groups of expenditure are complementary and should be benchmarked together and a consistent set of cost drivers can be identified?

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- **cost trade-offs** – can DNOs make trade-offs in expenditure between the different activities / areas included in the cost pool, and so benchmarking those activities / costs together will help avoid biased relative efficiency results or unintended managerial incentives for the DNOs?
- **cost boundary complexity** – how complex is the boundary of cost reporting data that needs to be defined to benchmark the identified cost pool / activity (eg how well defined is the group of costs within regulatory reporting templates)?
- **risk of inaccurate / biased models** – is there too much ‘noise’ in the data to be confident that including certain types of expenditure within aggregated regressions could lead to inaccurate model results, or coefficient estimates that are difficult to interpret using engineering / economic logic?

5.10 We highlighted that these criteria would provide a useful framework for considering and evaluating how we can aggregate models for the development of our mid models and disaggregated models.

Summary of consultation responses

- 5.11 Five responses were received in total, all from DNOs. All DNOs, with the exception of SPEN, were supportive of the four criteria to consider when deciding on the appropriate level of aggregation for the mid models. SPEN was reluctant to comment on the criteria until proposals are sufficiently developed. However, SPEN did support the adoption of clear and transparent rules to identify the type of investment that could be aggregated.
- 5.12 NGED emphasised that although the intention for cost categories within mid models are driven by the same underlying drivers, we should still seek to include additional drivers even where they may only explain a portion of the aggregated activity and costs.
- 5.13 UKPN suggested that for the complementarity criteria, we should establish a clear, consistent threshold to define what constitutes ‘strong technical or economic reasons’ to ensure uniformity in aggregation decisions.
- 5.14 UKPN and NGED both emphasised that any aggregation of costs must be empirically justified.
- 5.15 NPg suggested adding a fifth criteria that the chosen cost pools should capture incentives toward efficiency, focusing on total cost rather than unit costs.
- 5.16 While SSEN-D agreed with the criteria outlined in SSMC, it did not support the development and use of mid models for ED3.

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SSMD decision and rationale

- 5.17 We agree with NGED's comment and will not exclude cost drivers solely because they are bespoke to cost elements. We will assess the economic rationale and statistical robustness of any model specification employed, including drivers where there is a clear and well-supported justification for doing so.
- 5.18 In response to UKPN's request, we do not believe that to set a threshold for what constitutes strong technical or economic reasons to aggregate categories within mid model design before business plans are submitted would be in the consumer interest. Several factors may indicate that cost categories exhibit technical or economic reasons to justify aggregation, examples include:
- costs that are similar in nature or function
 - costs that share common drivers
 - cost categories that draw on similar labour, equipment, or other resources
- 5.19 However, model specification and performance may vary across cost categories, and the framework must remain flexible to accommodate a range of mid model designs. The strength of economic justification and judgement of its sufficiency may vary across cost categories and mid model groupings.
- 5.20 We have decided not to adopt NPg's proposed additional criteria to explicitly capture incentives for efficiency, but we do recognise the potential benefits outlined by NPg that mid models should assess total costs rather than unit costs.
- 5.21 In summary, we continue to view the criteria outlined in SSMC for aggregating costs in ED3 mid models to be appropriate for this stage of the process. We will continue to engage with DNOs in CAWGs on our approach to aggregating costs and to discuss and address any specific concerns as those cost groupings are determined.

Scope

SSMC summary

- 5.22 At SSMC we proposed a high-level grouping of ED cost reporting categories as a starting point for considering the development of ED3 mid models. This split DNO expenditure into six main categories:
- load-related capex
 - non-load related capex
 - non-operational capex
 - network operating costs (NOCs)

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- closely associated indirects (CAIs)
 - business support costs (BSCs)
- 5.23 We emphasised that the mid models could generate important additional insights on DNO efficiency, adding value to our ED3 cost assessment modelling suite. This approach retains key cost, scale, and complexity driver insights within the cost pool, supported by engineering and economic rationale, while avoiding the potential disadvantages of disaggregated models.
- 5.24 We highlighted that the cost activities under load-related and non-load related activities are complementary and have important interactions and synergies.
- 5.25 We stated that, given our criteria, the non-operational capex category could benefit from being subsumed into other pools due to its interactions with opex. We proposed the following allocation of non-operational capex categories into pools for ED3 mid model purposes:
- IT and telecoms (non-operational) – assigned to BSCs pool
 - property (non-operational) – assigned to BSCs pool
 - vehicles and transport (non-operational) – assigned to CAIs pool
 - small tools and equipment – assigned to CAIs pool

Summary of consultation responses

- 5.26 We received five responses, all from DNOs. NGED and SPEN broadly agreed with the high-level groupings proposed. However, NGED noted that it was unclear how the NOCs category could be aggregated given the distinct nature of the activities it comprises and suggested that we should consider a mechanism to remove distinct and material cost items from mid model aggregation. SPEN also proposed that the CAI and BSC categories be combined.
- 5.27 SSEN-D and NPg did not comment on whether they agree with the high-level groupings proposed. NPg suggested that we consider whether there is merit in combining a load-related cost model with asset replacement, in order to better capture multi-driver interactions and to reflect network investment as a holistic activity.
- 5.28 UKPN advised us to consider and test a range of alternative model specifications to address the possibility that modelled allowances are sensitive to different model specifications. UKPN proposed the following potential grouping of cost categories:
- total reinforcement model - reflecting the view that different types of reinforcement are complementary
 - asset replacement and asset refurbishment model – recognising the trade-off between asset replacement and asset refurbishment

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- NOCs and indirects model - noting that this approach is similar to the one used by the Northern Ireland Utility Regulator in its assessment of Northern Ireland Electricity Networks' efficient costs, acknowledging that it will need further refinement

SSMD decision and rationale

- 5.29 We will consider the recommendations provided by DNOs and will continue to seek views on the appropriate groupings for the mid models through CAWGs. As we develop the mid models, we will test the groupings we proposed at SSMC and alternative groupings, including those suggested by DNOs.
- 5.30 During the development process, we may identify cost activities that cannot be appropriately aggregated within the mid model groupings. Where this occurs, we will consider removing these cost activities from the aggregation for a given mid model.

A hybrid approach

SSMC summary

- 5.31 At SSMC we explained that our objective for ED3 model development is to fully explore alternative specifications of mid models to understand their performance and how they can enhance our ED3 cost assessment toolkit.
- 5.32 We proposed that the ED3 mid models should represent a hybrid approach between our totex and disaggregated models, using an econometric modelling approach consistent with the framework in Chapter 2 of our SSMC (eg in relation to sample size, estimation approach, statistical diagnostic tests).
- 5.33 We noted that the statistical robustness of mid models should not be assessed on a like-for-like basis with ED3 totex models due to their different levels of granularity. Instead, we proposed using a wide range of insights from totex and disaggregated modelling to evaluate the performance of the ED3 mid models.
- 5.34 We stated that the ED3 mid models can utilise the scale, complexity, and activity-based cost driver framework for totex models to control for unique characteristics across the 14 DNO regions.
- 5.35 We illustrated our hybrid approach for mid models with three examples with some underlying activity-based cost drivers:
- **load** – peak demand (scale), number of connections, unlooped properties, capacity released, LCTs (EVs and HPs)
 - **non-load** – MEAV / network length (scale), MEAV additions (non-load), number of diversions, volumes of civil works / refurbishments, overhead line clearance sites resolved

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- **NOCs** – MEAV / network length (scale), number of faults, occurrences not incentivised (ONIs), spans cut / affected

5.36 We explained that these models can be supplemented by complexity drivers to control for regional characteristics and that every activity-based driver can be normalised by dividing by the preferred scale driver within the pool.

Summary of consultation responses

5.37 We received five responses from all the DNOs. All DNOs, except for NPg, broadly agreed with the proposed hybrid approach. NPg did not indicate whether it agreed with the approach but emphasised that the mid models should not reduce the weight placed on the totex models.

5.38 SSEN-D stressed the importance of assessing the performance of individual mid models against statistical tests and ensuring alignment with operational rationale. It noted potential challenges in developing suitable activity drivers for each mid model and in sufficiently capturing complexity factors.

5.39 NGED advised that mid models should meet the same standards of robustness as the totex model, applying all the same statistical tests to ensure credible outputs. NGED did not consider insights from disaggregated models to be necessary for developing mid models, noting that mid models are intended to be distinct from the disaggregated approach. NGED also highlighted that drivers deemed unsuitable for the totex model may be appropriate for mid models and should be considered where appropriate.

5.40 UKPN similarly stated that the standards for assessing mid models should not be lower than those applied to the totex model. It considered established statistical measures, such as adjusted R-squared and the RESET test, to remain essential for assessing performance for mid models. UKPN proposed that mid models should only be used to calculate allowances where they demonstrate appropriate explanatory power and pass the relevant statistical tests.

5.41 UKPN also provided examples for the hybrid approach with underlying drivers based on its alternative groupings for mid models:

- total reinforcement - MEAV, reinforcement asset additions, and a RIIO-ED2 dummy
- asset replacement and asset refurbishment - replacement asset additions and refurbished asset, MEAV, and a RIIO-ED2 dummy
- NOCs and indirects - network length, asset additions, and density

SSMD decision and rationale

5.42 We do not believe that it would be appropriate to pre-commit to using mid models to determine allowances at this stage, but we do believe this work is

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worth progressing. Mid models have the potential to add value within our cost assessment framework in ED3, either in validating or determining final allowances.

- 5.43 For the mid model design, our starting point to select cost drivers will be the longlist of totex drivers that have been discussed with DNOs at multiple CAWGs. However, we will not necessarily restrict ourselves to this list if we believe the explanatory power of a given mid model can be improved through the incorporation of an additional cost driver for which we have satisfactory data available.
- 5.44 As part of the development of mid models, we will consider multiple ways of aggregating allowances, including those suggested by DNOs, where we believe a proposed grouping has a sufficiently strong economic rationale. The examples provided at SSMC for aggregating costs into mid models should not be considered definitive.
- 5.45 We will aim to incorporate the best practice for benchmarking via regression established within our totex models, including the range of statistical tests applied. However, the thresholds considered for accepting or rejecting mid models may differ from those applied within our totex models depending on how mid models are used, the weight they may be given for final allowances, or because of the specifics of the mid model in question. Mid models will not be used to determine allowances unless we have confidence in their explanatory power.

6. Cross-cutting issues

This section covers cost assessment decisions that affect all types of modelling, such as how those modelling outputs from top-down and bottom-up approaches are combined.

We believe that the use of a common pathway for demand should negate the need for a post-modelling adjustment such as that used in RIIO-ED2 and we explain how the proposed changes to the Business Plan Incentive (BPI) interact with cost assessment design. We consider it unlikely that we will use 'implicit allowances' to disaggregate allowances in ED3, but note that a final decision on the method of disaggregation and triangulating of allowances from multiple model suites will not be made until Draft Determinations.

SSMC questions

- CAQ25. Do you agree with our proposal not to apply a demand driven post-modelling adjustment in ED3?
- CAQ26. Do you have any proposals how we can improve the RIIO-ED2 methodology for disaggregation of allowances to consider for ED3?
- CAQ27. Do you agree with our proposal to explore implicit allowances as an alternative approach to disaggregate efficient ED3 cost allowances?
- CAQ28. Do you agree with our proposed ED3 triangulation principles?
- CAQ29. Do you agree with our proposed approach to retain the RIIO-ED2 catch-up efficiency challenge of 75th percentile with a glide path to the 85th percentile over three years for ED3?
- CAQ30. Do you agree with our proposal to inform our final decision on the ED3 catch-up efficiency challenge by considering the overall level of efficiency challenge for the sector?
- CAQ31. Do you agree with our proposal to consider the design of the ratchets we apply in our ED3 modelling suite?
- CAQ32. Do you agree with our proposal to consider the interaction between ratchets and stage B of the BPI in ED3?

Introduction

6.1 In our SSMC, we cover the following cross-cutting issues in this chapter:

- post-modelling adjustments
- disaggregation of allowances
- triangulation
- efficiency challenges and the ratchet

6.2 These issues apply to all three modelling approaches proposed for the cost assessment and form a key part of the process for determining efficient ED3 allowances.

Post-modelling adjustments

SSMC summary

- 6.3 In our SSMC we explained that submitted costs for RIIO-ED2 included increases in LCTs⁶ forecasted by DNOs and capacity released.
- 6.4 We had concerns that RIIO-ED2 forecasts of the take-up of LCTs were too optimistic and inconsistent across DNOs, which risked inflating submitted costs and therefore, RIIO-ED2 allowances. To address this, we applied a ‘post-modelling adjustment’, which amended the DNO LCT forecasts downwards based on Future Energy Scenarios (FES) forecasts. We also used a benchmarking approach to normalise submitted volumes to produce an alternative forecast of capacity released, and we implemented an uncertainty mechanism for load-related expenditure (LRE).
- 6.5 Our SSMC explained that we did not intend to implement such post-modelling adjustments for ED3. This is because forecasts of future investment for ED3 will be based on the transitional Regional Energy Strategic Plan (tRESP), which should result in more reliable and consistent forecasts.

Summary of consultation responses

- 6.6 The majority of DNO respondents agreed with our proposal to not apply post-modelling adjustments.
- 6.7 SSEN-D, SPENW, NPg, and UKPN agreed with the proposal to not apply a post-modelling adjustment in ED3, mentioning the tRESP as the driving factor. NPg and UKPN also stated the importance of ensuring the tRESP is applied consistently across DNOs.
- 6.8 NGED stated that it is too early to determine if a post-modelling adjustment is required and that the decision should follow submission of all the business plans. NGED agreed that if forecasts are set on a consistent basis, then no post-modelling adjustment will be required, but it is too early to say if consistency will be achieved as DNOs translate the tRESP into detailed plans, so forecasting approaches will still vary between the DNOs.

SSMD decision and rationale

- 6.9 It remains our ambition and our expectation not to apply post-modelling adjustments in the manner of RIIO-ED2, reflecting the support for this approach from the majority of consultation respondents. However, having considered the responses to SSMC, we recognise that the decision as to whether or not to apply

⁶ These LCT drivers were the cumulative number of EVs and the cumulative number of HP.

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a post-modelling adjustment does require a sufficient level of consistency in the approach used across DNOs in the development of their business plans.

- 6.10 The introduction of the tRESP and the common planning assumptions within that framework should greatly improve consistency in business planning, but this may not sufficiently remove the scope for DNOs to vary their interpretation or application of those consistent planning assumptions.
- 6.11 As a result, following our assessment of business plans, we may choose to apply a post-modelling adjustment if we find sufficient variation in business planning assumptions to justify the application of such an adjustment.

Disaggregation of allowances

SSMC summary

- 6.12 ‘Disaggregation of allowances’ here refers to setting efficient allowances for individual cost categories based on the output of aggregated cost modelling (totex and mid-models). The sum of these individual allowances should equal the aggregated value. In RIIO-ED2 Final Determinations, the only aggregated cost modelling was the totex model suite and we used a combination of company-submitted cost shares (50%) and the output of disaggregated model cost shares (50%) to disaggregate those allowances.
- 6.13 In our SSMC, we stated that there is no single optimal way to calculate the disaggregation of allowances, but that the high-level principle is that they should reflect the nature of the ED3 modelling suite. We proposed to reconsider the methodology for disaggregating allowances and welcomed views on how we should approach the disaggregation of allowances in ED3.
- 6.14 Our SSMC then discussed an alternative approach called ‘implicit allowances’. This involves removing the cost categories from a regression model one at a time, re-running the model excluding each category and calculating the difference between the aggregate modelled allowance with and without the excluded category. The difference is then the allowance for each cost category. The SSMC noted that this approach is used in the water sector.

Summary of consultation responses

- 6.15 NGED, SPEN, NPg and UKPN agreed that the disaggregation of allowances can be improved. NGED and SPEN offered some high-level suggestions. NPg referred to its appeal at RIIO-ED2 and the CMA ruling on the disaggregation of allowances for RIIO-ED2, stating that an improved approach in ED3 must ensure that the allocation of allowances reflects the price control framework under which they are set.

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- 6.16 SSEN-D did not have any suggestions at this time but noted that establishing a methodology for disaggregated allowances is an iterative process.
- 6.17 UKPN considered that the blended approach taken in RIIO-ED2 is likely to be more appropriate in ED3 if no demand-driven adjustment is made as that adjustment led to a systematic over-allocation to LRE. UKPN also provided some detailed thoughts on how mid-models could be incorporated into the disaggregation of allowances.
- 6.18 NGED, NPg and UKPN did not support the introduction of implicit allowances as they consider them to be unreliable or flawed. NPg said that using implicit allowances would likely be appealed. SSEN-D and SPEN did not reject implicit allowances outright, but they expressed concerns about using them.

SSMD decision and rationale

- 6.19 We recognise the various concerns raised by DNOs about a range of methods for disaggregating allowances and will continue to explore ways in which the methodology for disaggregating allowances can be improved.
- 6.20 The potential challenges of calculating implicit allowances for ED3 and using these to disaggregate totex have been thoughtfully articulated in the DNOs' responses. Having considered these responses we find it unlikely at this stage that implicit allowances will be the most appropriate method to use for our ED3 determinations.
- 6.21 In the absence of implicit allowances, the most appropriate and transparent methods for disaggregating totex allowances are the use of submitted cost shares, the cost shares from disaggregated model allowances or some combination of the two, such as the 50:50 blend used in RIIO-ED2.
- 6.22 The choice of approach should be cognisant of the wider price control framework and as such, a final decision on the disaggregation approach will only be taken once that price control framework is more fully developed. We will continue to engage with stakeholders throughout this process.

Triangulation

SSMC summary

- 6.23 Triangulation refers to assigning a weight to the outputs of each of the modelling approaches (totex, disaggregated and mid-models) used in the cost assessment to derive final allowances. Weights will also need to be set for different model specifications, where used, within the totex and mid-level modelling suites.
- 6.24 Our SSMC set out that the overarching principle should be to apply equal weight across all modelling approaches, unless there are strong engineering or economic reasons for doing otherwise. We therefore proposed to retain our

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RIO-ED2 approach of giving a 50% weight to the totex models and a 50% weight to the disaggregated models and mid-models (with a 25% weight on each). Our rationale for this position was:

- this follows regulatory precedent
- the equal weighting approach means we recognise the advantages and disadvantages of each of the modelling methodologies
- a more sophisticated approach would invite significant regulatory judgement and may worsen modelling outcomes
- the 50% weight on both disaggregated and mid-models (rather than one-third weight on each of the three approaches) acknowledges that the main split in modelling approaches is between ‘top-down’ totex and ‘bottom-up’ disaggregated and mid-modelling approaches

Summary of consultation responses

- 6.25 UKPN agreed with the current 50%-25%-25% triangulation proposals. NPg argued that more weight should be assigned to totex, citing the 100% totex precedent from GD3.
- 6.26 SSEN-D, NGED and SPEN said it is too early to take a firm view on the nature of the triangulation. NGED disagreed with the proposed 50%-25%-25% weighting as a starting point. NGED and SPEN argued that optimal triangulation will depend on the quality of each of the modelling approaches, while SSEN-D said that optimal triangulation will depend on whether the mid-level models are used.

SSMD decision and rationale

- 6.27 We do not think that it is appropriate to finalise triangulation weightings until our suite of models are sufficiently developed, tested and assessed. The starting point articulated in SSMC, a 50%-25%-25% weighting if mid-models contribute to allowances or a 50%-50% weighting otherwise, remains valid where we maintain broadly equal conviction in each approach. Although the starting point for totex models is 50% of final allowances in both cases noted, that should be considered no guarantee or minimum expectation for the role of totex modelling in ED3.
- 6.28 The final weighting will depend on our assessment of the quality and robustness of each of the modelling approaches, accounting for the strengths and weaknesses of each approach in the context of the wider ED3 price control design. We will continue to develop our approach in the run up to Draft Determinations informed by appropriate consideration of stakeholder feedback.

Efficiency challenges and the ratchet

SSMC summary

- 6.29 In our SSMC we outlined the approach to setting efficiency challenges in RIIO-ED2 for which:
- an average benchmark was set for the totex models and the disaggregated models which use a regression approach while a benchmark was set for non-regression disaggregated models through use of the median
 - a catch-up efficiency target was applied, moving the benchmark from the average company to the 75th percentile and set on a glidepath to the 85th percentile over the first three years of the price control
 - an ongoing efficiency challenge which was applied to all DNOs and their final allowances considering external productivity improvements
- 6.30 We outlined our intention to use this approach as our starting point for setting efficiency challenges in ED3.
- 6.31 Also laid out in our SSMC, is our approach to ratcheting efficient allowances. This is the process of imposing a 'minimum of' rule between DNO forecasts in ED business plans and our final efficient benchmarks. That is, when DNO forecasts are below our independent view of efficient expenditure, we use the DNO forecast to set efficient allowances.
- 6.32 This means that, by design, no DNO can be awarded a higher allowance than it has asked for.
- 6.33 However, this has important incentive properties for DNOs that we need to consider. If DNOs anticipate being more efficient than our benchmarks, their incentive to reveal efficient costs might be reduced. This is because the entirety of the efficiency they demonstrate in business plans is reflected in efficient allowances. If this efficiency is partly driven by spending in another cost category which is excluded from our efficient benchmark then a DNO may be restricted from realising that efficiency and therefore disincentivised to pursue it.
- 6.34 As a result, the process described could potentially be inconsistent with another important regulatory objective - to encourage efficient and ambitious business plans that drive the rest of the sector forward and lead to improvements for customers. Indeed, we use incentives elsewhere in the regulatory framework such as the Business Plan Incentive (BPI) to encourage high quality business plan submissions.
- 6.35 We proposed to consider carefully the incentive properties of applying ratchets in our ED3 cost assessment, and the interaction with BPI. We also stated that we would consider whether removing some or all ratchets could act as an alternative to Stage B of the BPI that assesses efficient cost.

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Summary of consultation responses

- 6.36 We received responses from all five DNOs. There was broad recognition of the need to ensure that the ED3 efficiency challenge and associated benchmarking mechanisms remain proportionate to the robustness of the underlying models and the level of forecast uncertainty anticipated for ED3.
- 6.37 SPEN accepted the proposed retention of the RIIO-ED2 catchup efficiency challenge and glide path, noting that targets should reflect modelling uncertainty, whereas NGED and NPg considered it too early to set the benchmark.
- 6.38 NGED and NPg also emphasised that any catchup percentile must be determined only once model quality and forecast uncertainty are fully understood, with NPg further highlighting that a larger gap between the upper quartile and 85th percentile in electricity distribution may justify a lower percentile benchmark.
- 6.39 SSEN-D agreed that the benchmark should be calibrated to model precision and may need to be less stringent given the ED3 delivery challenges.
- 6.40 On the wider calibration of the overall efficiency challenge, SPEN and SSEN-D supported considering the aggregate burden placed on companies, while NGED opposed this, suggesting decisions should rely solely on model quality.
- 6.41 All DNOs supported our proposal to review the design of ratchets, with SSEN-D, NPg and UKPN recommending their removal due to perverse incentives and double-penalty effects. SPEN and NGED supported reconsidering ratchet design subject to avoiding incentives for submitting non-credible plans.
- 6.42 There was also broad support for reviewing the interaction between ratchets and Stage B of the BPI, with companies emphasising the need to avoid double penalisation and ensure that incentives for efficient and ambitious business plans remain effective.

SSMD decision and rationale

- 6.43 For the approach to setting efficiency challenges in ED3, we continue to take the view that the approach adopted in RIIO-ED2, and outlined in our SSMC, remains an appropriate starting point for ED3. However, we noted the concern raised about the potential for significant variation between the 75th and 85th percentile and we will take this into consideration when assessing our final approach to setting allowances to ensure efficiency challenges maintain a balance between being challenging and being achievable.
- 6.44 In the application of the ratchet to allowances, we continue to believe that this has value, to ensure that DNOs are monitored against their efficient costs where their submission was lower than their modelled allowance.

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- 6.45 We also believe that a clear incentive for companies to reveal their true, efficient costs is warranted, as this has benefits to consumers not only by improving efficiency for that DNO, but by increasing the efficiency for the benchmark applied to all DNOs.
- 6.46 As a result, it is our intention to link the reward associated with BPI Stage B of the BPI, subject to a cap, to the value of efficiency demonstrated in DNO business plans, with the sharing factor applied.
- 6.47 This has been summarised in our main SSMD document under discussion relating to the BPI and effectively means that the forecast efficiency is treated as realised outperformance and is broadly equivalent to a removal of the ratchet.

7. Regional and company-specific factors

In order to improve the consistency of inputs to our cost models we may make adjustments to, or normalise, the data used as an input.

Our approach for such normalisations remains largely consistent with RIIO-ED2, but we intend to explore an approach to adjusting for regional factors within-model and are committed to exploring appropriate ways of applying workload adjustments informed by engineering assessment more broadly and consistently than in RIIO-ED2.

SSMC questions

CAQ33. Do you agree with our proposed ED3 criteria for normalisation?

CAQ34. Do you agree with our proposed ED3 methodology for each factor?

CAQ35. Do you have any views on the stage at which we should apply the adjustments for each factor (where applicable)?

Selection criteria for factors

SSMC summary

- 7.1 In previous ED price controls, we have applied five categories of factors that we adjust for to help normalise DNOs' costs:
- regional factors
 - company-specific factors
 - exclusions
 - cost and workload adjustments
 - other adjustments such as reclassifying costs from one activity to another
- 7.2 In our SSMC, we highlighted how our approach in RIIO-ED2 focused on regional and company-specific factors and we proposed largely to maintain our approach for these factors in ED3.
- 7.3 In RIIO-ED2 we maintained that the onus to justify proposed adjustments rested with the DNOs and kept a high evidential bar for regional and company-specific claims. Adjustments were only considered where factors were clearly defined, beyond the control of an efficient DNO, and had a material and distinctive impact on one or a small number of DNOs' networks.
- 7.4 In terms of setting the materiality threshold for company-specific factors, in our SSMC we proposed keeping this at 0.5% of a DNO's gross unnormalised totex, which is aligned with the approach taken at RIIO-3 for Gas Distribution.
- 7.5 In RIIO-ED2, we applied cost exclusions where some costs were not explained by the cost drivers used, or there was a substantial change in the nature of the activity being undertaken. In RIIO-GD2, we applied a set of questioning criteria to

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assess company-specific factors. In our SSMC, we proposed consolidating the RIIO-ED2 and RIIO-GD2 approach for ED3.

- 7.6 Cost and workload adjustments support like-for-like benchmarking by aligning modelled volumes with the needs case evidenced through engineering assessment. In RIIO-ED2, these adjustments were mainly applied within disaggregated models due to the lack of suitable workload drivers in totex models. In our SSMC, we highlighted the need for a more consistent and integrated approach across the modelling suite.
- 7.7 In RIIO-ED2, we applied additional adjustments to DNO cost data to correct misallocations between activities and to reallocate some costs reported in BPDT memo tables into activity tables for consistent benchmarking. In our SSMC, we proposed to reduce the need for such adjustments by working more closely with DNOs to improve BPDT design and guidance, supported by ongoing engagement through CAWG and BPDTWG. However, we will retain flexibility within the ED3 cost assessment models to correct any remaining allocation issues in submissions.

Summary of consultation responses

- 7.8 We received responses from all five DNOs. UKPN, SPEN and SSEN-D endorse maintaining strong, objective criteria, while NPg emphasises that companies must quantify the impacts of any claimed factor and demonstrate interactions with cost drivers.
- 7.9 On the materiality threshold, UKPN asked us to clarify whether related claims can be aggregated to meet 0.5% threshold for company specific factors, while NGED is explicitly against applying a fixed 0.5% threshold.

SSMD decision and rationale

- 7.10 For regional and company-specific factors, in RIIO-ED1 and RIIO-ED2, we put the onus on DNOs to justify the case for any proposed adjustments. In RIIO-GD2 and GD3, we applied a set of criteria questions to assess company-specific factors:
- is the claim material?
 - is the claim unique?
 - is the claim outside the control of a company?
 - is the claim excluded from the cost drivers used in our econometric modelling?
 - is the claim excluded from our other adjustments, such as regional factors?
- 7.11 For ED3, we propose to maintain our RIIO-ED2 approach and consolidate the criteria used in RIIO-GD3. We will continue to apply a high evidential bar for accepting regional and company-specific factors. In terms of applying a materiality threshold, we will stick with regulatory precedent, which also aligns

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with the recent RIIO-3 approach and apply 0.5% of a DNO's gross unnormalised totex for company-specific factors. In response to UKPN's request, this threshold is to apply to each claim individually.

- 7.12 In terms of the selection criteria for exclusions the onus also remains on DNOs to justify exclusions. Our proposed criteria for exclusions in ED3 are as follows:
- cost is only incurred by a small number of DNOs
 - cost is not explained by the cost drivers we use in the models
 - cost substantially changed in nature between RIIO-ED2 and ED3
- 7.13 In RIIO-ED2, we excluded the following cost categories at the normalisation stage as a pre-modelling adjustment:
- cyber
 - quality of service (QoS)
 - streetworks
 - rising and lateral mains (RLMs)
 - worst served customers (WSCs)
 - physical security
- 7.14 We cannot at this stage guarantee that our criteria will lead to these same categories being excluded from ED3 models, but where one or more of our exclusion criteria continue to apply for a given category, it is likely it will remain in the list of exclusions.
- 7.15 In RIIO-ED2, workload adjustments were applied only in disaggregated models. In ED3, we intend to explore the use of workload adjustments in totex models as well.
- 7.16 For ED3, where necessary, we will continue to make other adjustments to DNO cost data to correct misallocations between activities and to reallocate some costs reported in BPDT memo tables into activity tables for consistent benchmarking.

Methodology for applying adjustments

SSMC summary

- 7.17 In our SSMC we discussed regional factors, company specific factors, exclusions, cost and workload adjustments, and other adjustments, which we summarise below.
- 7.18 Regional factors account for structural characteristics that influence efficient costs and are outside DNO control. In RIIO-ED2, regional labour adjustments were applied, based on wage indices. For ED3, we proposed retaining the underlying RIIO-ED2 principles but to reassess the necessity and calibration of

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regional adjustments where new cost drivers – such as weighted average density – may capture many of these effects within the modelling itself.

- 7.19 Company-specific factors address unique, exogenous circumstances that materially affect the costs of only one or a small number of DNOs. These factors must be clearly defined, outside management control, and have a material cost impact. In RIIO-ED2, only a limited number of claims were accepted, demonstrating the high bar applied. For ED3, we proposed retaining the same approach.
- 7.20 Exclusions, in RIIO-ED2, were applied sparingly to remove cost categories from benchmarking where including them would distort model outcomes – for example, where costs applied only to a small subset of DNOs, are not explained by model drivers, or have fundamentally changed in nature. In RIIO-ED2, exclusions were limited to a small number of areas and for ED3, we proposed to maintain this high threshold. Although load-related expenditure may change materially in ED3, we noted that excluding such a significant cost category could undermine the integrity of totex modelling, so it will remain in scope.
- 7.21 Cost and workload adjustments ensure that only comparable costs across networks are benchmarked by aligning modelled volumes with the needs case of the investment. In RIIO-ED2, these adjustments were applied largely within the disaggregated modelling suite due to the absence of suitable workload drivers in totex models. For ED3, we proposed to explore a broader and more consistent approach to applying workload adjustments. As investment needs expand significantly in ED3, a robust workload adjustment process is essential to ensure customers fund only efficient and evidenced activities while incentivising DNOs to provide high-quality engineering justification of their proposed investments.
- 7.22 In RIIO-ED2, we also made other adjustments to correct data quality and allocation issues to ensure costs are comparable before benchmarking. This included reallocating costs between reporting categories and moving items from memo tables into activity tables. In our SSMC we noted that for ED3, we aim to minimise the need for such adjustments through improved BPDT design and clearer guidance, while retaining the ability to correct misallocations where necessary to ensure consistent cost interpretation and preserve the integrity of the cost assessment framework.

Summary of consultation responses

- 7.23 We received responses from all five DNOs. NPg, NGED and SSEN-D supported us exploring the inclusion of a density cost driver in the totex model that captures regional differences in costs resulting from how sparse or densely populated an area is.
- 7.24 UKPN and SPEN favoured keeping pre-modelling adjustments. UKPN cautioned against substituting pre-modelling adjustments for a within-model density

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variable, saying that this alone cannot capture the causes of regional wage differences or operational challenges. UKPN highlighted the persistent impact on costs of street conditions, congestion charging and traffic management requirements. SPEN said that adding a density variable will likely add additional complexity. NPg supported capturing regional effects within models where feasible but recognised that some factors may still require explicit adjustments.

- 7.25 SPEN has called for more granular regions for regional labour adjustments and SSEN-D said it would like us to treat north of Scotland as a specific region for regional labour adjustments.
- 7.26 SSEN-D emphasised having consistency across totex, mid-models and disaggregated models regardless of approach, and cautioned against volume-based workload adjustments. It argued that the needs case is determined by tRESP.
- 7.27 UKPN, SSEN-D and NPg objected to introducing pre-modelling cost and workload adjustments in RIIO-ED3 while SPEN and NGED were supportive of it.
- 7.28 UKPN argued that applying engineering-based workload adjustments within totex models would undermine transparency, distort efficiency scores, and duplicate disaggregated assessments. SSEN-D opposed workload adjustments on the basis that applying volume adjustments in multiple places could significantly harm delivery. NPg opposed workload adjustments because totex benchmarking already includes an implicit volume assessment, creating a risk of double counting and excessive penalisation.
- 7.29 SPEN said it supported our approach to cost and volume adjustments. NGED considered cost and workload adjustments in totex models reasonable but stressed that they should reflect different efficient ways of delivering the same outcome, expressing concern that the SSMC implies a single efficient scope determined by engineering assessment. NGED also emphasised that any engineering-based workload assessments must be applied consistently across all DNOs.

SSMD decision and rationale

- 7.30 For ED3 we will maintain the high evidential bar for company-specific factors and proceed with our SSMC proposal, assessing company claims on a case-by-case basis according to the criteria we have outlined.
- 7.31 Similarly for exclusions, we intend to use these sparingly, removing them only where they meet the criteria we have outlined, and as a result would distort model outcomes if included. This is as proposed in SSMC.
- 7.32 On regional factors, our starting position is to consider both the pre-modelling approach to regional adjustments taken in RIIO-ED2 and the within-model approach that can capture regional differences through the inclusion of

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weighted average density (WAD) variables in our model specifications. We will review the potential overlap and differences between these approaches in capturing regional variation. Overall, there is broad support from DNOs for us to look into urbanity and sparsity adjustments for ways of improving our models and we will do this once we receive Business Plan data from DNOs.

- 7.33 As stated previously, it is our intention for ED3 to explore a broader and more consistent application of workload adjustments than was the case in RIIO-ED2. This may mean the application of workload adjustments, informed by engineering assessments, to the cost and cost driver data used in top-down regression models.

Application of adjustments

SSMC summary

- 7.34 In our SSMC we outlined that adjustments may be applied at three points in the modelling process – pre-modelling, within-model, or post-modelling – each with distinct implications.
- 7.35 Pre-modelling adjustments offer clarity by removing distorting factors upfront and allow the modelling to operate on normalised data, but they risk weakening incentives for DNOs to mitigate them. As a result, DNOs may prioritise justifying exclusions from benchmarking over efficiently managing company-specific factors, with exclusions reflecting an inefficient “do nothing” approach.
- 7.36 Within-model adjustments, where factors such as density or sparsity are represented directly through cost drivers, can enhance transparency and reduce subjectivity. However, this approach is not suitable for all factors, particularly company-specific ones that affect only one or a small number of DNOs.
- 7.37 Post-modelling adjustments provide transparency by relying on unadjusted data during modelling, but they risk creating a “one-way bet” in which DNOs seek only upward adjustments. Also, the lack of pre-modelling normalisation could in theory affect the quality of our totex models if a material factor affecting costs is not corrected for pre-modelling.

Summary of consultation responses

- 7.38 We received responses from all five DNOs on this topic. Across SPEN, UKPN, and NGED, there was alignment that we should continue to apply pre-modelling adjustments.
- 7.39 SPEN and UKPN both argued that applying regional labour and company-specific adjustments within or after regression risks bias and unnecessary complexity, so the RIIO-ED2 pre-model approach should continue.

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7.40 NGED's position was more flexible but still maintained that exclusions, company-specific factors, and reallocations are best handled pre-model, while any within or post-model adjustments should only be used where there is strong econometric justification and after testing with ED3 BPDT data. NPg supported within-model adjustments being explored.

SSMD decision and rationale

- 7.41 Pre-modelling, within-model and post-modelling adjustments may each have a role to play in ED3 and it is our view that the choice of where to apply adjustments should be made once we have received business plans and tested various approaches using the data received. Ahead of receiving those submissions, we can only outline our expectations where we have them.
- 7.42 For exclusions, company-specific factors and other adjustments such as reclassifying costs, we expect these adjustments to be made primarily pre-modelling, where required.
- 7.43 For regional factors, which were adjusted for pre-modelling in RIIO-ED2, we intend to explore an alternative within-modelling approach for ED3.
- 7.44 For cost and workload adjustments, we expect to continue to apply these within disaggregated models but also intend to explore pre-modelling or within-model workload adjustments in ED3 to ensure broader and more consistent application of our engineering assessments to the cost assessment process.

8. Real price effects and ongoing efficiency

Real price effects (RPEs) and ongoing efficiency (OE) are key elements of the price control, the former allowing for growth in allowances based on input price pressures outside the DNOs' control and the latter setting a productivity improvement challenge. We have broadly retained our approach for RPEs and OE as noted in our SSMC, but have committed to engaging with stakeholders upon receipt of the DNOs' business plans to make detailed decisions with regard to the assessment and determination of each.

SSMC questions

- CAQ36. Do you agree with our proposal to maintain an RPE indexation approach for ED3?
- CAQ37. What alternatives should we consider for the key methodology aspects of our ED3 approach including the input cost structure, selection of indices, materiality threshold and forecasting?
- CAQ38. Do you agree with the key principles we propose to inform our assessment of ED3 OE targets?
- CAQ39. Do you agree with the growth accounting approach and the choices used when setting ED3 OE targets? If not, what alternatives should we consider?
- CAQ40. Do you agree with the selection of wider pieces of evidence when setting ED3 OE targets? If not, what alternatives or additions should we consider?

Real price effects

SSMC summary

- 8.1 In our SSMC, we proposed retaining an indexation-based approach to Real Price Effect (RPE) adjustments for ED3, consistent with the framework applied in RIIO-ED2. Under this approach, baseline allowances will continue to be indexed to Consumer Prices Index including owner occupiers' housing cost (CPIH), with an in-period true-up mechanism to reconcile forecast and outturn movements in selected input price indices. This approach manages uncertainty around material divergences between general inflation and relevant input prices, while limiting the risk of windfall gains or losses to either consumers or network companies.
- 8.2 In reaching this position, we took account of stakeholder views ahead of SSMC that recent RPE outcomes under RIIO-ED2 have not always aligned with DNOs' reported cost pressures, including instances where RPE adjustments have been negative despite elevated supply chain costs. We recognised that the RPE index may not fully track all costs incurred by DNOs at all times. However, we considered that this reflects, in part, the distinction between economy-wide

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supply side shocks and sector specific or demand driven effects and it does not justify a fundamental change to the purpose or scope of the RPE mechanism.

- 8.3 In our SSMC we remained of the view that RPEs should operate as a targeted uncertainty mechanism, intended to address sustained and demonstrably exogenous differences between CPIH and input price movements, rather than as a general pass-through of cost pressures faced by the sector.
- 8.4 Consistent with this position, we proposed to retain a notional input cost structure and materiality thresholds for ED3. We consider that adjusting the input cost structure to reflect outturn activity levels or changes in asset installation profiles would add complexity and risk weakening efficiency incentives, given that such changes largely reflect management decisions on timing and delivery.
- 8.5 While we proposed retaining the core RIIO-ED2 RPEs framework, we committed to continue to consider whether refinements are appropriate, including in relation to the selection and assessment of indices and the treatment of volatility and persistence of shocks. Any such refinements will need to be clearly evidenced and consistent with the principle that RPEs should balance risk appropriately between DNOs and consumers without undermining efficiency incentives or materially increasing complexity.

Summary of consultation responses

- 8.6 We received responses from all DNOs. Consultation responses show general support among DNOs for retaining RPE indexation in ED3, but this is contingent on indices being better aligned with their actual costs, though SSEN-D does not believe that indexation alone would be sufficient to fund DNOs. SPEN and SSEN-D believe the RIIO-ED2 approach resulted in underfunding due to its failure to account for factors like supply chain constraints, competition for resources, supplier margins, and broader employment expenses. Improvements suggested including using forecast data, expanding RPE coverage to all relevant costs, and selecting indices that correlate strongly with uncontrollable input costs. SSEN cautioned that indexation alone may not adequately shield them from significant cost volatility.
- 8.7 All DNOs suggested improvements to the indices were needed, including the use of more granular and frequently updated indices. NGED highlighted that wage indices used in RIIO-ED2, such as the Annual Survey of Hours and Earnings (ASHE) and average weekly earnings (AWE), do not adequately capture total labour costs, including wider employment expenses like employer National Insurance, leading to underfunding, indicating support for more comprehensive labour cost indexation in ED3.
- 8.8 Where suitable indices are unavailable, NPg recommended fixed allowances to address volatility risks. It noted alternatives to pure indexation include hybrid

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models combining indexation and fixed adders, RPE re-openers, and allowances based on DNO procurement outcomes, reflecting calls for a more flexible and responsive approach.

- 8.9 Concerns were raised about the materiality threshold that systematically under-compensates network companies. SSEN-D, NGED and NPg advocated for removing or revising the threshold to ensure RPE are applied across the full cost base, with NPg suggesting that any threshold should consider the combined effect of smaller categories.
- 8.10 In addition, two DNOs were divided on the cost structure for applying indices to allowances with NGED favouring company-specific cost structures for accuracy, while NPg supported an efficient notional cost structure.
- 8.11 Finally, we received a third-party report commissioned by a trade body to review the RIIO-ED2 RPE mechanism, and multiple DNOs supported the findings. The report points to what it describes as structural flaws in the RIIO-ED2 RPE mechanism which fails to reliably track DNO cost pressures, with concerns in materials indexation driven by basis risk, supplier margins, and fixed cost structures, noting that these issues cannot be resolved by minor changes to indices or weights alone. For ED3, they recommended that we adopt a more fundamental and transparent reassessment of how RPE risk is managed, consider a wider range of mechanisms, and develop a clear framework for evaluating options.

SSMD decision and rationale

- 8.12 We will retain the position noted in our SSMC and will broadly maintain the methodological approach used in RIIO-ED2 where indexation will remain core to our approach as we have not received evidence that some proposed alternatives will clearly lead to more appropriate outcomes.
- 8.13 However, we will continue to engage with stakeholders and consider a number of options raised by DNOs and their trade body aimed to improve the approach, including reviewing indices used, their composition and how they are assessed, as well as how to deal with the persistence of shocks, and managing volatility.

Ongoing efficiency

Approach and key principles

SSMC summary

- 8.14 We stated in our SSMC our intention to use a holistic approach for the assessment of ongoing efficiency (OE) targets, utilising a historical and forecast evidence as well as qualitative and quantitative evidence. We further outlined key principles that were fundamental to our approach, these being:

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- the alignment with regulatory precedent
- considerations of energy sector characteristics
- considerations of past, present and future macroeconomic conditions

Summary of consultation responses

- 8.15 We received six responses provided by all DNOs and one GDN, Cadent.
- 8.16 NGED and UKPN disagreed with our principles, outlining that the resulting methodology would be predominantly discretionary and pointed to certain qualitative factors being potentially flawed when using judgement. UKPN noted they considered the key principle to be the credibility of the OE target compared with actual productivity improvements, with NPg similarly reflecting that the target should reflect the productivity improvements that the sector is able to achieve.
- 8.17 SPEN and SSEN-D agreed with one or more principles but caveated concerns on how this approach has been used historically and whether maintaining an OE target was appropriate given the expectation of an expanding sector.
- 8.18 Cadent noted that our principles were merited but highlighted issues with the methodology used in RIIO-3, noting that the targets should be set with regards to the characteristics of the sector in question.

SSMD decision and rationale

- 8.19 We will retain our approach to assess and set OE targets as noted within our SSMC.
- 8.20 Though we agree that ED3 is likely to encapsulate a significant change in the sector compared to prior price controls, we believe that maintaining an OE target is appropriate given the potential for DNOs to deliver productivity growth as any potential increase in proposed expenditures presents an opportunity for productivity improvement.
- 8.21 We will continue engaging with stakeholders to ensure that our approach and methodological components to setting OE targets remains appropriate and can adequately provide a duly stretching target for the sector.

Growth accounting

SSMC summary

- 8.22 We proposed using a growth accounting approach as the basis to quantify historical productivity measures across comparable sectors as it is supported by regulatory precedent being used in other regulated sectors. We noted that we would not primarily use it to set OE targets mechanistically.

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- 8.23 We outlined various considerations on the four components of the growth accounting approach and listed our thinking across the usage of productivity datasets, business cycle time periods, industry comparators, and productivity metrics.

Summary of consultation responses

- 8.24 We received five responses from DNOs as well as a consumer group. All respondents were broadly supportive of the approach to be used but noted caveats on the components of the approach.
- 8.25 SPEN and SSEN-D disagreed with the use of value-added metrics as it does not account for intermediate inputs to total factor productivity with UKPN supporting the use of both growth output and value-added measures.
- 8.26 SSEN-D and UKPN argued that the historical period prior to the 2008 global financial crisis is no longer representative of productivity growth and that the time period selected should be more recent.
- 8.27 SSEN-D and UKPN also stated that comparator industry weightings should accurately reflect the nature of DNO activities outlining considerations such as high weighting of the construction industry and the existence of incomparable sectors in the RIIO-ET3 approach.
- 8.28 The consumer group argued that setting OE targets with reference to non-regulated sectors would not be sufficiently challenging and noted that they should be set at the upper limit of any range selected by the methodology. They noted that innovation is consumer funded and that there are mechanisms to share best practices amongst DNOs that do not exist in competitive markets.

SSMD decision and rationale

- 8.29 We have retained our SSMC position of adopting a growth accounting approach as our basis on which to build and set the ongoing efficiency challenge for DNOs for ED3, supported by respondent views.
- 8.30 We will not be taking detailed decisions at this stage on our use or inclusion of productivity datasets, productivity metrics, time periods, or industry comparators at this time. We have noted within our BPG that DNOs are required to provide their views and assumptions on OE utilised for their expenditure, and how these have been derived. We will review and factor in all available information upon receipt of the business plans prior to making decisions within our Draft Determinations.

Wider evidence

SSMC summary

8.31 We stated that we would consider a host of evidence in setting our OE targets that would include historical performance of DNOs, productivity forecasts from wider macroeconomic sources, impacts of previously awarded innovation funding and DNO-specific productivity forecasts to supplement our forward-looking view on market considerations. We also proposed to retain our RIIO-ED2 position of applying the OE target on the entirety of the totex base.

Summary of consultation responses

- 8.32 We received responses from four DNOs, three of whom provided caveated support for considering wider evidence in setting OE targets but stressed that any evidence used must be relevant and empirically driven.
- 8.33 SPEN disagreed with the use of regulatory precedent as applied in RIIO-3, arguing that OE targets must be based on empirical evidence rather than assumptions utilised in previous decisions. They also proposed weighting comparable industries where possible and using a characteristically comparable time horizon.
- 8.34 SSEN-D and NPg emphasised that historical information alone was insufficient given the sector's forthcoming expansion and supply-chain challenges, and that the target should reflect realistically achievable productivity targets.
- 8.35 Lastly, UKPN did not support the inclusion of the impacts of historic innovation funding, arguing that efficiency gains from innovation are included in historic productivity figures and outlined that the improvements in the electricity distribution sector are likely to match those of the wider economy.

SSMD decision and rationale

8.36 We will include a variety of relevant and suitably justified evidence in determining an appropriately stretching OE target for DNOs for ED3. We do not intend to discount the use of regulatory precedent, historical sector information, and historic innovation funding without further conducting due diligence on the rationale and effects of inclusion or exclusion of these elements in setting the target for Draft Determinations.

9. Engineering assessment

The overall approach to the engineering assessment in ED3 will require licensees to submit Investment Decision Packs (IDPs) comprising Engineering Justification Papers (EJPs) and Cost Benefit Analysis (CBAs) as part of their ED3 business plans.

We have broadly retained the structure proposed in our SSMC but in response to issues raised in relation to Portfolio EJPs and the use of different EJP types, we have proposed changes to improve the proportionality of the required submissions while ensuring we are capturing the right information to enable an appropriate level of scrutiny.

SSMC questions

- CAQ41. Do you agree with our proposal to introduce an excel based Portfolio EJP to capture all known investment proposals?
- CAQ42. Do you agree with our proposal to use this Portfolio EJP to inform a holistic long-term view of the needs of the networks?
- CAQ43. Do you agree with our proposed data requirements within this Portfolio EJP, and do you consider this to be relevant and effective across all voltages and asset categories?
- CAQ44. Do you agree with our proposal to retain the use of CBAs at a portfolio level for portfolios of investment?
- CAQ45. Do you consider there is a need for any further EJP types?

EJP design including the use of portfolio EJPs

SSMC summary

- 9.1 In our SSMC we proposed a revised approach to our EJP assessments from the RIIO-ED2 process. This involved a move away from a purely narrative based approach towards a more data driven decision-making process. This approach would result in our assessment utilising excel based templates to allow us to identify which assets were proposed for intervention and which were not. The basis of this would be a Portfolio EJP - a data driven excel based EJP intended to be used for all investments other than Major Projects on an asset-by-asset basis.
- 9.2 We proposed to clarify our recommendations from a single outcome of 'Justified, Partially Justified or Not Justified' into multiple outcomes. These covered, as a minimum, 'Needs Case' and 'Optioneering'.

Summary of consultation responses

- 9.3 Across all five responses on the engineering assessment there were key thematic responses when considering the use of Portfolio EJPs.
- 9.4 All five DNOs expressed limited interest in changing the EJP format and in particular in relation to the use of Portfolio EJPs. All questioned the benefits of asset level data from these EJPs and how it would be used in our assessment.

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The key concern raised was how that data would be used as part of the assessment process. Concerns were also expressed by all five respondents with regards to the duplication of data which is being used in other parts of the price control process, in particular in NARM reporting.

- 9.5 Additional concerns were expressed by NGED, UKPN, SPEN and NPg regarding the use of Portfolio EJPs for high-volume and low-value assets ie HV and LV given the associated volumes of data. NPg noted that, as a result, the engineering justification for these assets is typically programme-based. SPEN noted that for such assets a significant level of flexibility is required in-period to manage new condition information or emerging assets risks. This led to the suggestion that any such process should exclude lower voltage / high volume assets and that instead these should be addressed through summary level data tables for asset portfolios. UKPN noted that, if the data were clearly linked to investment assessment, a Portfolio EJP Excel template might be appropriate for EHV and 132kV assets.
- 9.6 There were limited responses suggesting that there may be benefits when considering changes to the submission design. While four respondents (UKPN, SPEN, SSEN-D and NGED) noted support for the need to ensure visibility of long-term investment trends, all agreed that the portfolio EJP was not the optimal place for this information transfer. NPg proposed that the EJPs should focus on the interventions for the period in question, with the Long-term Integrated Network Plan (LINP) used to articulate the long-term strategy.
- 9.7 The use of Portfolio EJPs to monitor licensees both in-period and at close-out was a concern. Notably, the general view was that the level of data granularity required would be unreasonable to maintain over a seven-year investment cycle (accounting for the submission of company's business plans nearly two years ahead of ED3 starting).

SSMD decision and rationale

- 9.8 We have decided to retain the use of Portfolio EJPs for ED3. However, based on the DNOs' responses we recognise that the efficacy of the portfolio work would diminish for higher volume assets because these are generally driven by plans to address a defined number of units with individual intervention decisions unknown at the time of allowance setting. This is particularly acute for LV and HV circuits assets (such as wood poles and cables). This is compounded by either generally longer inspection timeframes and/or more binary health metrics.
- 9.9 We note the support for a more streamlined Portfolio EJP approach including a reduction in the input data and a more limited asset coverage, specifically with relation to the definition of assets proposed for intervention. While we do believe there would be benefits to linking information between LRE and NLRE capex, we agree that the format and type of assessment proposed would likely not yield the

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expected benefits when compared to the effort needed to provide this data. Similarly, this would also be vulnerable to creating tensions on the non-load intervention based on the different network configurations used entirely between licensees or in some cases within specific regions of individual licensees.

- 9.10 The ongoing monitoring of the price control is technically demanding when the initial assumptions of the contents of the plan change. We retain the view that EJPs and other business plan submissions should be used to help inform our monitoring of the price control and at close-out. Specifically, while we recognise that intervention plans will change for a range of reasons to ensure that each licensee's delivered outputs continue to align with consumer needs, this should not prevent us from reviewing or understanding the nature of those changes. Portfolio EJPs, which provide more granular data, would help minimise information asymmetry and as such, they would bring a range of benefits to our in-period reviews and monitoring.
- 9.11 To address licensees' concerns, we have altered the proposed approach to explicitly create a High Volume Portfolio EJP category which will be narrative rather than excel based. This approach addresses many of the concerns raised by reducing the required volumes of data. Specifically, reducing these asset classes will result in a more proportionate impact in terms of data collected, with limited impact on our assessments. An example asset class which we propose to reduce is wood poles, where the input data to the DNO Common Network Asset Indices Methodology (CNAIM) outputs is often binary in nature. While some data supporting the overall approach would be beneficial, the specific nature of the individual interventions is marginally less important than the wider data trends.
- 9.12 We do however propose to retain our portfolio approach for Low Volume Portfolio EJPs, although we have reclassified some asset categories as High Volume in response to the issues raised by respondents. For the avoidance of doubt, the focus of Portfolio EJPs is solely on the asset modernisation tables, specifically, those in CV7, CV8 and CV9.

Use of CBAs at portfolio level

SSMC summary

- 9.13 We set out that we expected a CBA to be carried out at the portfolio level to inform the volume of interventions. However, we further clarified that individual investment level CBAs may be used to inform the individual investments that comprise the portfolio of proposed investments. For Major Projects we noted that we expected a CBA to be carried out on each credible option and used to inform the licensee's preferred solution.

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Summary of consultation responses

9.14 All DNOs were supportive of the continued use of CBAs including at the portfolio level for ED3. However, a key theme again was proportionality and that requiring both a Portfolio CBA and an Excel Portfolio EJP creates unnecessary additional burden. To ensure proportionality, efficiency and consistency, UKPN and NGED requested clearer guidance on the level of supporting evidence required, CBA requirements and assessment methodology. UKPN also requested greater transparency on how CBAs are used in decision-making. SPEN noted that there may be additional benefits for investment programmes that a CBA may not be able to quantify, for example levels of climate resilience, which should still be considered.

SSMD decision and rationale

- 9.15 We welcome support for the use of CBAs at a portfolio level as essential for demonstrating that proposed investments represent the optimal solution and deliver the best value for customers. As above, we recognise the concerns around proportionality and note that our proposed refinements to the EJP requirements should also result in reduced CBA requirements and a more consistent approach to evaluation.
- 9.16 Finally, we agree that benefits such as climate resilience are also important and therefore will ensure that licensees can provide such supplementary information alongside CBAs.

Justification for additional EJP Types

SSMC summary

9.17 We proposed revising the EJPs from a single template into three distinct templates: Portfolio EJPs (Excel), Portfolio Narrative EJPs (which supported the Excel EJP) and Major Projects. This would be supported by a broadly similar assessment framework comprising the need to provide a Needs Case, Optioneering, Cost and Risk and Deliverability. We also sought views on the need for any further EJP types.

Summary of consultation responses

9.18 All DNOs rejected the need for any additional types of EJPs with the particular concern being that it could lead to the need to develop a much higher volume of EJPs. Three respondents (UKPN, SPEN and NPg) noted that the thresholds for EJPs should be considered carefully given EJP volumes are expected to increase due to a range of factors including rising asset and delivery costs, proactive network management, and NESO-led strategic investment. NGED, UKPN and

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SPEN noted that, regardless of the approach, additional guidance for EJP requirements would be essential.

SSMD decision and rationale

- 9.19 The broad consensus from DNOs on the minimisation of EJP types is noted. We are concerned that, given the range of potential investments that licensees may make which cross cost thresholds for EJP use, the EJP guidance would need to cover a wide range of investments. As a result of the range of investment types, parts of the guidance could potentially be redundant in some applications resulting in an overly burdensome guidance document. For example, tree management/cutting may result in an EJP threshold being triggered; this would have limited to no relationship with asset health and NLRE investments and as such, guidance would need to address points where the requirements are not needed. This would add significant complexity to the guidance and any subsequent core submission requirements which are associated with EJPs. Therefore, we consider that introducing templates helps to focus the submission requirements and thus to address the DNOs' proportionality concerns.
- 9.20 We also recognise that in RIIO-ED2 and other price controls which have used EJPs, there have been inconsistencies between the application of EJPs and how the guidance is applied. For example, some may rigidly follow the required guidance headings, whereas others may provide the same, or indeed additional information, in a different format. While a level of diversity within EJP submissions is both expected and beneficial to the consumer, the range of outcomes is at times too broad to perform a comparative analysis.
- 9.21 We have considered the feedback of respondents and undertaken additional engagement with licensees to ensure that our decisions strike an appropriate balance for the various use cases and development needs of EJPs. In doing so, we have carefully considered both the proportionality of the information that will be required to ensure the appropriate level of engineering scrutiny, and the practicality for the licensees providing that information. A key aim is to ensure that we avoid the duplication of reporting requirements, and we will work with licensees to ensure this is avoided.
- 9.22 One area where we have made changes is in relation to the thresholds associated with producing EJPs. We agree that a combination of factors including inflationary pressures merit a review of the thresholds and as a result propose to set the levels at £4m or greater for High Volume Portfolio and Atypicals and to increase the Major Projects threshold to £6m. We consider that these changes enable a more appropriate balance, reducing the reporting requirement for licensees but retaining scrutiny at a proportionate level. The values reflect a consideration of the average value of projects across all DNOs.

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- 9.23 In the case of Atypical EJPs, these should be on a narrative basis and will broadly follow the structure of the Major Projects EJPs, but licensees may use the excel based Portfolio EJP templates to support where required.
- 9.24 Ultimately, we have decided to use a suite of EJP Types. This is displayed in Figure 1. Green boxes show material that will be narrative based with a CBA required while amber boxes show material that will be Excel based with no CBA required.

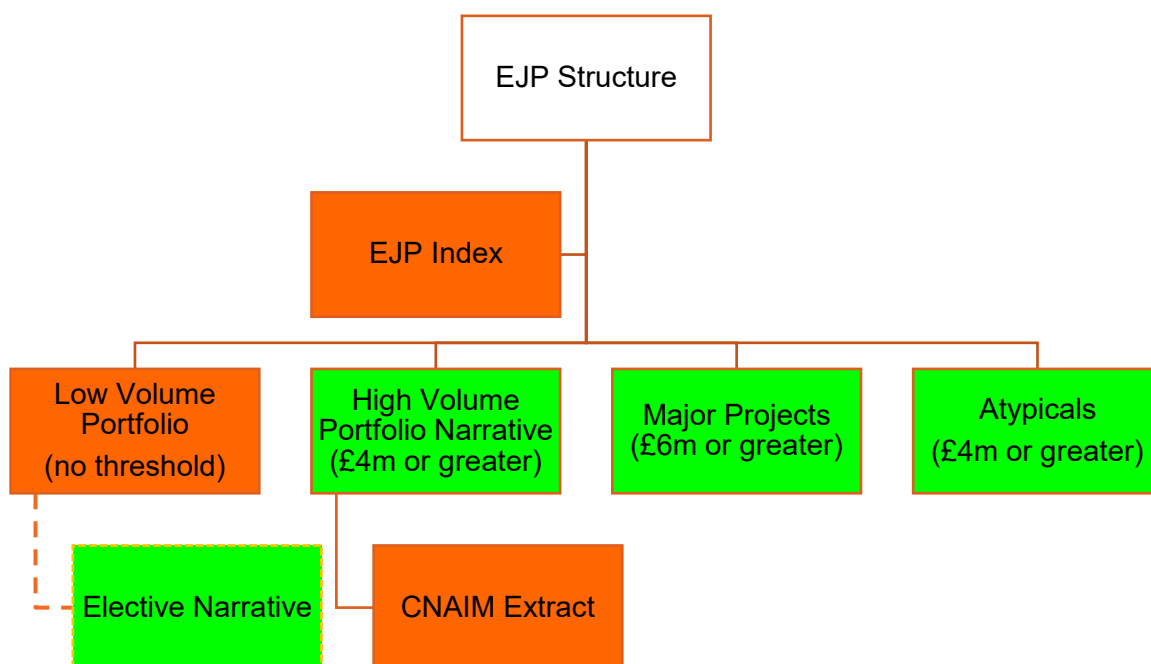


Figure 1 - EJP Structure

- 9.25 Through this suite of EJPs we will reduce the guidance burden and enable licensees to focus their approaches to specific investment types. This also supports our efforts to standardise our review practices between the electrical sectors.
- 9.26 This approach will also enable us to use a more template-based system which aims to minimise our guidance requirements and as a byproduct accelerate our reviews.
- 9.27 The use of templates also enables us to provide more detailed engagement with licensees during reviews, which should avoid the need for large levels of supplementary questions on the EJPs. This was a recognised benefit of the approach from the RIIO-3 processes across all sectors.
- 9.28 These templates represent the core submission requirements. We recognise in some cases that a particular licensee may consider that additional narrative or evidence is required to support a particular Excel based submission. One such scenario may be where high-volume assets are not in CNAIM. In such cases,

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licensees would be able to submit additional supportive information where it is required. This would not have the same requirements and could take the form of a slimmed down narrative.

- 9.29 Our reviews in RIIO-ED2 and RIIO-ET3 also highlighted that having a non-standardised list of submissions creates a tension in our review. Specifically, where our review puts inconsistent scrutiny on licensees due to different submissions. To avoid this, we have decided to use core submission requirements to ensure that there is a defined list of submissions which must be made. We recognise that for some licensees there may not be any investment associated with the core submission requirements. As such we considered requiring a “boilerplate” submission which clarifies that there is no investment/spend in the categories proposed for EJPs. Having assessed the potential duplicative effort that may have involved, we propose instead to use the EJP Index to capture whether an investment is proposed or not. The aim is to have a clear, concise view of areas where no investment is planned.
- 9.30 We intend to work with the licensees in developing the form and structure of the EJP Index. In doing so, it is our intention to consider interactions/alignment between different assets to recognise whether these may be in separate EJPs but might be part of a common intervention programme.

10. Business Plan Data Tables (BPDTs)

Our BPDTs are a key mechanism for obtaining DNOs' data in a clear and structured format to support our assessment of business plans. We have engaged extensively with DNOs to develop a template suite that is fit-for-purpose and will continue to engage with DNOs to ensure that they are able to populate their business plan data in a consistent manner.

SSMC questions

CAQ46. Do you agree with the proposed phased approach and timeline for ED3 BPDT development?

CAQ47. What are your priority areas for ED3 BPDT development? Please explain their relevance and include BPDT proposals where possible.

Approach and timeline

SSMC summary

- 10.1 In our SSMC, we stated our objectives for the ED3 BPDTs to support consistent and streamlined submissions and to ensure continuity with RIIO-ED2, while facilitating the price review process, improving transparency and enabling a cross-cutting view of the price control.
- 10.2 We proposed the following high-level principles for the development of ED3 BPDTs:
- use the RIIO-ED2 Regulatory Reporting Packs (RRPs) as the default starting and refining point where changes are supported by a clear and strong rationale
 - collaborate with DNOs to transparently deliver improvements to structure, content and reporting approaches
 - include input relevant to all aspects of the ED3 price review such as developments stemming from policy, regulatory finance, engineering or other areas
 - use an iterative but proportionate approach to refine changes, particularly for new data or changes to existing reporting
- 10.3 We proposed a phased timeline for BPDT developments with stages for early scoping and engagement, collaborative development and policy alignment, and finalisation and submission.

Summary of consultation responses

- 10.4 We received five responses, all from DNOs. All expressed support for the collaborative approach and welcomed the phased timeline.

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- 10.5 NGED and UKPN agreed with keeping ED3 BPDTs consistent with the RRP. NGED agreed with us on relying on RRP as a starting point but stated that BPDTs development should be more forward-looking, reflecting strategic thinking rather than resolving operational issues. Another DNO noted that the RIIO-ED2 BPDTs should be continued into ED3 as they are fit-for purpose, transparent and simple.
- 10.6 All DNOs emphasised the importance of streamlining the business plan process. NPg asked for only data directly used for cost assessment to be reported on. However, it was acknowledged that there might be cases when this is not possible if the cost assessment approach is still to be determined. We also received a number of specific suggestions where the tables could be merged or removed.
- 10.7 NGED and SPEN noted that the process would be more transparent if the purpose of each dataset was clearly documented, suggesting this to be included in the BPDT guidance. We were also asked to share the modelling suite earlier in the process to enable the DNOs to collaborate more effectively.
- 10.8 SPEN supported a cross-cutting design of the ED3 BPDTs to facilitate policy and engineering decisions, with specific suggestions received to introduce a multi-driver table to capture this.
- 10.9 Regarding our timelines, NGED and UKPN stressed the importance of carefully managing the timescale set out by aligning discussions between SSMD, BPG and BPDTs and avoiding duplications. They raised concerns about adhering to the timeline, noting the importance of quality assurance in the process.
- 10.10 UKPN welcomed clarity on the submission of the draft BPDTs and supported having these provided alongside the wider RIGs submission on the 31st July.

SSMD decision and rationale

- 10.11 In line with the stakeholder feedback, we have continued to engage with the DNOs following the publication of our SSMC to develop our BPDT suite published alongside our BPG, sharing multiple drafts along the way.
- 10.12 As a next step, we have detailed the process by which DNOs will submit draft business plan data to us on 31st July 2026, which will enable us to test the templates and guidance we have issued. Following this, we will continue to collaborate with the DNOs via existing channels and through further BPDTWGs to resolve any outstanding issues and enhance the templates ahead of final business plan submissions.
- 10.13 The BPDT, guidance documents and instructions for completion will remain under review and may be subject to final adjustments based on stakeholder feedback or validation checks using the draft data submitted. These documents will be finalised and issued in September 2026.

BPDT priorities for ED3

SSMC summary

10.14 In our SSMC we listed areas that may be subject to change compared to RIIO-ED2 RRP and BPDTs to ensure that the ED3 BPDT supports robust cost assessment and reflect evolving policy requirements. We further outlined our considerations on the treatment of historical data to support benchmarking in ED3 and requested views on whether additional data collection beyond ED3 is appropriate.

Summary of consultation responses

10.15 All DNOs noted generic and specific cost-category priorities relating to streamlining and adopting an aligned, proportionate and forward looking design for the ED3 BPDT, though some cautions of oversimplification were raised, given the view that some considered the RIIO-ED2 BPDTs to be a relatively mature product.

10.16 UKPN and SPEN noted their concerns over requesting data that may be used outside of benchmarking purposes.

SSMD decision and rationale

10.17 We utilised a measured approach to reviewing proposed changes to our BPDT and have engaged extensively with DNOs to obtain feedback prior to implementing changes. This involved working with internal stakeholders and the use of BPDTWGs to ensure material changes were duly assessed.

10.18 We have taken a pragmatic approach and consulted with DNOs where we have requested data that we do not expect to use within our benchmarking, noting that the information within the BPDTs may also be used by other teams in setting the ED3 price control outside of cost assessment.

10.19 To ensure our BPDT suite is fit-for-purpose and to provide early sight of potential consistency or quality issues within the BPDTs, we will be staging an exercise where DNOs are required to submit a version of their populated BPDT and a sample of accompanying materials to us for review and validate. DNOs will not be assessed on this submission though we expect to utilise any findings to provide an updated suite of materials for the DNOs' submissions of business plans in December 2026. Separate guidance for this process has been issued to DNOs.

11. Cost benefit analysis

Cost benefit analysis (CBA) helps DNOs justify investment decisions by allowing for the provision of information on strategic objectives, key drivers and alternatives to investments that have been considered to support a specific proposal for investment.

We have made minor updates to our CBA framework and guidance, acknowledging that changes were needed to reflect our priorities and principles underpinning a new framework for investment in ED3.

SSMC questions

CAQ48. Do you think current CBA guidance should be updated to reflect climate resilience?

CAQ49. How should the CBA framework be updated to better reflect the long-term consumer value associated with low-regret proactive investment?

CAQ50. Do you think we should review CBA guidance and the interaction with CEM to assess flexibility proposals?

CAQ51. Do you think we should change the approach to inflation to account for future supply chain constraints?

SSMC summary

11.1 In our SSMC, we proposed to continue using the CBA framework to support significant investment proposals. The CBA framework ensures that proposed interventions deliver value for money and are compared against alternative options. We stated our expectations for DNOs to submit CBAs to justify a wide range of potential interventions with them being closely related to EJPs.

11.2 In addition, we proposed updating the guidance and considering enhancements that might address:

- undervaluing proactive investment
- introducing sensitivity analysis
- expanding the scope of societal benefits considered
- streamlining the use of CBAs for high-volume interventions
- improving consistency and transparency

Summary of consultation responses

11.3 We received five responses from DNOs who were broadly supportive of our suggestions but provided multiple caveats on undertaking changes in response to each of our questions.

11.4 On updating current CBA guidance to reflect climate resilience, DNOs were broadly supportive. However, a key theme drawn out for updating the guidance

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was a contingency on sufficient learnings being available from the setting of the Climate Resilience Metrics and Indicators (CRMI).

- 11.5 UKPN supported updating the CBA framework to include climate resilience but considered this infeasible within the ED3 timeline as we are developing CRMI but noted that more experience and learnings were needed before these can be incorporated. It recommended that any update should be clear, proportionate, and provide a framework for comparing qualitative assessments across options, ensuring guidance on combining qualitative and quantitative evidence for decision-making.
- 11.6 NGED stated that the CBA framework should reflect the benefits of carrying out investment for climate resilience and that a reference metric based upon a common understanding of future climate impacts is required.
- 11.7 NPg supported our ambition but noted that we would need to ensure that we had enough information to monetise resilience risks and benefits with a degree of confidence.
- 11.8 SSEN and SPEN requested that we clarify how climate resilience should be incorporated into CBA guidance, ensuring clear definitions and consistent assumptions so that investment decisions based on climate resilience metrics are properly reflected in cost assessments and allowances.
- 11.9 On updating the CBA framework to better reflect long-term consumer value from low regret proactive investment, we received mixed views that overall leaned towards updating the framework.
- 11.10 UKPN requested clarification on our intended use of the updated CBA framework given that demand forecasts will be externally set in the tRESP. It recommended that we either update the CBA to guide regulatory decisions or provide guidance for DNOs to appraise proactive investment options. They noted that the CBA should incorporate uncertainty, wider societal impacts, and streamline assessment for high-volume interventions, while improving consistency and transparency in evaluation.
- 11.11 SPEN and NGED agreed that the CBA framework must be updated on the basis we set out but noted that prioritising relevant, quantifiable metrics, such as network headroom, system losses, curtailment, and network risk will ensure that the framework retains consistency across the DNOs while also avoiding penalising forward looking investments as inefficiencies. SPEN noted that the CBA framework may currently fail investments if the costs are outweighed by short-term benefits, even if they unlock substantial long-term value. SPEN proposed the inclusion of domestic economic growth metrics within the CBAs and the consideration of strategic infrastructure needs which were in-scope of the tRESP.

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- 11.12 NPg did not think that material changes to the CBA framework were required to support proactive investment.
- 11.13 SPEN recommended that the CBA framework should explicitly account for economic growth and future demand benefits from proactive investments, as well as the costs of delayed capacity.
- 11.14 On reviewing the CBA guidance and its interaction with Common Evaluation Methodology (CEM) to assess flexibility proposals, all DNOs responded favourably and outlined the need to ensure consistency between the independent tools and equitable and consistent treatment of flexible options through further guidance and continued engagement.
- 11.15 UKPN sought clarification on how flexibility options should be considered in planning, given our shift away from the 'flex first' approach. It noted that using the CEM tool in CBAs will help ensure consistent evaluation of flexibility versus network reinforcement options.
- 11.16 NGED thought that a review of the CBA guidance and its interaction with the CEM is needed to address evolving flexibility use cases under ED3 and ensure effective investment decisions for which they proposed two approaches. Firstly, it outlined updating the CEM as a stand-alone tool or integrating it into the CBA framework, with the latter preferred despite practical challenges. Secondly, it noted collaboration with us was essential for designing a suitable, future-proof approach.
- 11.17 On changing the approach to inflation to account for future supply chain constraints, DNOs provided mixed views.
- 11.18 UKPN cautioned that changing the approach to inflation in CBAs to account for future supply chain constraints could lead to unintended consequences, noting that there is uncertainty about whether such constraints will materialise, and that imposing inflation assumptions based on expected constraints may encourage early investment, potentially causing supply chain issues to arise sooner. It recommended that the CBA framework should select options with the lowest regret and highest expected net societal benefits, regardless of supply chain constraints.
- 11.19 NGED and NPg disagreed on changing the approach, with one noting that it would be inappropriate to speculate on how inflation may affect future costs.
- 11.20 SSEN agreed out of principle that when assessing different investment options, all information must be compared on a like-for-like basis, but it stressed that DNO allowances must be adjusted to account for future cost increases.
- 11.21 SPEN recommended that we adopt a consistent application of inflation throughout the price control framework, and that this should reflect the challenges DNOs are facing when making investment appraisal decisions.

SSMD decision and rationale

11.22 In reaching this decision, we considered the implementation of three options:

- option 1 - improving guidance and updating assumptions. This option presents a focus on improving consistency by establishing clearer guidance on where to use CBAs (minimum threshold possibly) and expectations for populating additional fields. It would also include updating assumptions for monetising existing metrics.
- option 2 - introduction of a qualitative 'bolt-on' to the existing CBA and guidance. This would include a summary in the EJP body of existing monetised societal benefits and a qualitative benefit assessment covering wider economic benefits.
- option 3 - expanding the scope of requested metrics that are monetised. This option establishes a longer list of societal benefits which can be requested from DNOs to inform an NPV that better reflects wider economic benefits of ED3 proposals.

11.23 After considering responses to the consultation and the practicality of introducing new metrics in the available time, we have decided to include a qualitative bolt-on within the CBAs in the EJPs covering several hard-to-quantify aspects in relation to the strategic alignment of investment proposals with wider ED3 objectives and the impact on economic growth. We outline below the additional components of the narrative associated with strategic objectives and economic growth.

11.24 The components and narrative associated with strategic objectives of the EJP bolt-on should cover:

- proactive investment: Describes the relative difference between each option in how it takes a proactive approach to low-regret investments ahead of need. DNOs may wish to make reference to:
 - number of forecast connections that will be facilitated
 - emissions impact associated with and not associated with losses (with reference to values stated in CBA template)
 - level of investment brought forward from ED4 onwards (with reference to values stated in CBA template)
- touch the network once: Describe the relative difference between each option in how it supports the policy objective of touching the network once. DNOs may wish to make reference to:
 - High level assessment of magnitude or likelihood of mitigating future curtailment costs

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- cost efficiency of avoided future investment, such as proactive installation of higher capacity transformer or preparatory civil works (with reference to values stated in CBA template)
- high level assessment of the risk that anticipated future needs or demand do not materialise, resulting in stranded assets
- whole system planning / multi-driver investments: Describes the relative difference between each option in how it achieves synergies across different investment drivers. DNOs may wish to make reference to:
 - high level assessment of savings due to synergies across different investment drivers - climate resilience, smarter networks, flexibility use cases, asset health and the environment. This may include explicit cost savings stated in the CBA template
 - non-DNO benefits such as reduced losses, reduced probability of fatality or major injury or reduced oil leakage (with reference to values stated in CBA template)
 - high level assessment of the magnitude or likelihood of reducing interruptions above and beyond VoLL and customer minutes stated in the CBA template.
 - climate resilience and the expected benefits from long-term avoided impacts from interruptions (with reference to values stated in CBA template)
- supporting growth in labour and industrial markets: Describes how each option supports economic growth. DNOs may wish to make reference to:
 - number of jobs supported
 - industrial zones unlocked
 - place-based alignment (regional plans)
 - community impact associated with street works or road closures
- NPV impact: Each of the components above should describe how impacts could increase/decrease NPV (if monetised).

11.25 The introduction of a qualitative assessment of growth impacts and strategic alignment in EJPs would allow networks to complement the Net Present Value from CBAs with non-quantifiable information which would allow a degree of flexibility when comparing different options. It would also allow DNOs to recommend proposals that would have a better strategic fit or higher long-term benefits that would be difficult to calculate in Net Present Value terms.

11.26 We consider Option 2 is a better approach because it gives DNOs the opportunity to support investment proposals with additional evidence. We note it would be difficult to include these strategic aspects as part of monetised values given that there is a wide scope for different projects and interactions between them, and that these would need to be captured in a single template. Additionally, the approach to resilience needs additional research before we can

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propose the monetisation of those benefits. Lastly, as DNO responses indicated the need to coordinate the CEM tool with CBAs, we believe a qualitative flexible bolt-on to the EJPs would be better suited to achieve this.

Send us your feedback

We believe that consultation is at the heart of good policy development. We are keen to receive your comments about this decision. We would also like to get your answers to these questions:

- do you have any comments about the quality of this document?
- do you have any comments about its tone and content?
- was it easy to read and understand? Or could it have been better written?
- are its conclusions balanced?
- did it make reasoned recommendations?
- do you have any further comments?

Please send your feedback to stakeholders@ofgem.gov.uk.