ofgem
Making a positive difference
for energy consumers

Consultation

RIIO-ED2 Draft Determinations – Core Methodology Document	
Subject	**Details**
Publication date	29 June 2022
Response deadline	25 August 2022
Contact	RIIO-ED2 Team
Team	Onshore Networks – Price Control Setting
Telephone	0207 7901 1861
Email	RIIOED2@ofgem.gov.uk

The next electricity distribution price control (RIIO-ED2) will cover the five-year period to 31 March 2028. In December 2021 the Distribution Network Operators (DNOs) submitted their Business Plans to Ofgem setting out proposed expenditure for RIIO-ED2. We have now assessed these plans and this document, and others published alongside it, set out our Draft Determinations for DNO allowances under the RIIO-ED2 price control for consultation. Responses are sought to the questions posed in these documents by 25 August 2022. Following our consideration of these responses we will confirm our Final Determinations by December 2022.

The full suite of Draft Determinations documents outlines the scope, purpose and questions of the consultation and how you can get involved. Once the consultation is closed, we will consider all responses before confirming our Final Determinations. We want to be transparent in our consultations. We will publish the non-confidential responses we receive alongside a decision on next steps on our website at Ofgem.gov.uk/consultations. If you want your response – in whole or in part – to be considered confidential, please tell us in your response and explain why. Please clearly

mark the parts of your response that you consider to be confidential, and if possible, put the confidential material in separate appendices to your response.

© Crown copyright 2022

The text of this document may be reproduced (excluding logos) under and in accordance with the terms of the Open Government Licence.

Without prejudice to the generality of the terms of the Open Government Licence the material that is reproduced must be acknowledged as Crown copyright and the document title of this document must be specified in that acknowledgement.

Any enquiries related to the text of this publication should be sent to Ofgem at:

10 South Colonnade, Canary Wharf, London, E14 4PU.

This publication is available at www.ofgem.gov.uk. Any enquiries regarding the use and re-use of this information resource should be sent to: psi@nationalarchives.gsi.gov.uk

Contents

1. RIIO-ED2 Overview

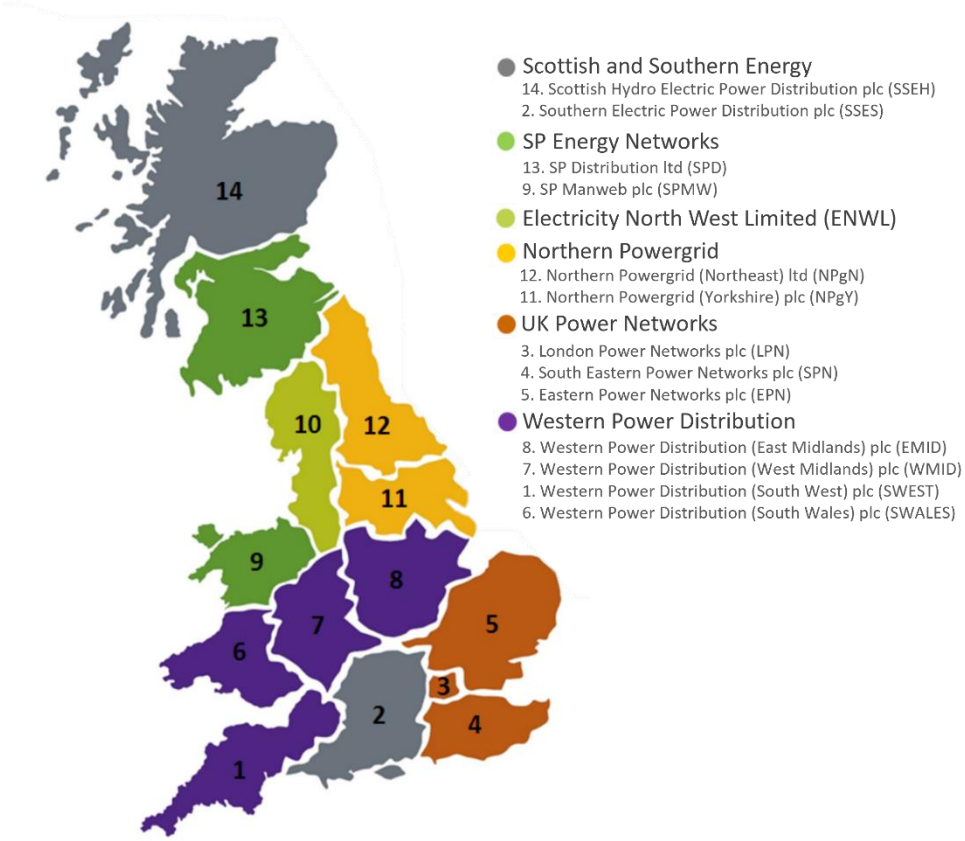
Purpose of this document

1.1 The next electricity distribution price control will cover the five-year period from 1 April 2023 to 31 March 2028. This document sets out our Draft Determinations proposals on our core methodology and how these have been applied to the cost and outputs proposals common to all Distribution Network Operators (DNOs).

Background to the RIIO-ED2 Price Control

1.2 The electricity distribution network carries electricity from the high voltage transmission network to industrial, commercial, and domestic users, as well as distributing an increasing quantity of power from generation sources that are connected directly to the distribution networks. There are fourteen electricity DNOs operating in GB, which are managed by six companies. These are shown in Figure 1 below:

Figure 1 Map showing the current ownership arrangements for the Electricity Distribution Networks



1.3 We use the RIIO model of economic regulation to set price controls for energy network companies, including the DNOs. RIIO stands for setting Revenues using Incentives to deliver Innovation and Outputs.

1.4 RIIO is a performance-based framework that seeks to put consumers at the heart of network companies' plans for the future and to encourage longer term thinking, greater innovation and more efficient delivery.

1.5 As monopoly providers of an essential service, DNOs are regulated through these price controls to ensure they deliver value for money network services to their customers. This includes the significant investments that are needed to renew their assets, connect new generation, and keep the system safe and reliable.

1.6 Price controls are a method of setting the amount of money (allowance) that can be earned by the DNOs over the length of a price control. DNOs recover their allowance from charges to energy suppliers, who in turn pass these costs on to customers through their energy bills. The allowances are set at a level which covers the DNOs' costs and allows them to earn a reasonable return subject to them delivering value for consumers, operating efficiently, and achieving their targets as set by Ofgem.

1.7 The next electricity distribution price control (known as RIIO-ED2) will start on the 1 April 2023 and run to 31 March 2028.

1.8 We began the development process for RIIO-ED2 in August 2019 with an open letter[1] setting out the context and aims for the price control. We subsequently set our RIIO-ED2 Framework with a Decision[2] in December 2019.

1.9 In July 2020, we issued our Sector Specific Methodology Consultation (SSMC) on the detailed sector methodology that we would use to apply this framework and help set the price control. We then made our Sector Specific Methodology Decisions (SSMD)[3] in December 2020, which included the outputs that we expected the DNOs to deliver in RIIO-ED2, our approaches to cost assessment and setting totex allowances, and ensuring investor returns reflect the risk associated with investments in the local distribution networks.

[1] Open Letter Consultation on the RIIO-ED2 Price Control | Ofgem
[2] RIIO-ED2 Framework Decision | Ofgem
[3] RIIO-ED2 Sector Specific Methodology Decision | Ofgem

1.10 Our SSMD provided the framework for the DNOs to develop their RIIO-ED2 Business Plans. The DNOs submitted their final Business Plans to Ofgem on 1 December 2021.

1.11 As part of the enhanced stakeholder engagement process for RIIO-ED2, the DNO Customer Engagement Groups (CEGs) published their assessments of their respective Business Plans on 17 January 2022, while the the RIIO-ED2 Challenge Group (RIIO-ED2 CG) published its final report on the DNO Business Plans on 8 February.

1.12 A series of public Open Hearings were held during March 2022 which attracted a diverse range of stakeholders, feeding in directly for the first time into an open debate on network company spending plans prior to these Draft Determinations. The Hearings included contributions from the RIIO-ED2 CG and CEGs as well as wider industry stakeholders and local and regional authorities. This ensured the RIIO-ED2 price control setting process was open and accessible for stakeholders, allowing different perspectives to be heard while holding the companies to account.

What we expect RIIO-ED2 to deliver for consumers

1.13 The RIIO-ED2 price control will play an unprecedented role in shaping the local electricity distribution networks to deliver net zero at lowest cost to consumers.

1.14 In 2019, the UK was the first major economy in the world to set a binding target to reach net zero emissions by 2050. In June 2021, the UK Government passed the Sixth Carbon Budget into law, with the aim to reduce emissions by 78% by 2035 compared to 1990 levels. For the electricity sector, this means fully decarbonising by 2035, while supporting significant growth in demand, particularly for the electrification of transport and heat.

1.15 The electricity distribution network – the wires that bring increasingly low carbon power to consumers and businesses – is fundamental to enabling these changes. Our proposals for the RIIO-ED2 price control will ensure that the DNOs are:

- delivering the local energy distribution networks needed for net zero, investing efficiently to increase network capacity, strengthening innovation, and delivering environmentally sustainable networks

- supporting a smarter, more flexible, and digitally enabled energy system, maximising the potential of flexible and other smart technologies to provide cost effective network solutions
- meeting the needs of customers and network users through the delivery of high quality services, including timely and efficient connections and support for customers in vulnerable situations
- maintaining world class levels of network reliability, further reducing the frequency and duration of power cuts, and ensuring long-term safety and resilience.

1.16 This document sets out our proposals for achieving these outcomes at lowest cost to consumers.

2. Embedding the consumer voice in RIIO-ED2

Section summary

In this Chapter, we set out how our enhanced stakeholder engagement process has strengthened the voice of consumers in reaching our Draft Determinations.

We show how the consumer groups have helped inform our proposals and provide initial views on their future role.

2.1 We expect companies to put consumers at the heart of the way they run their businesses. In our RIIO-ED2 Framework Decision,[4] we confirmed that we would apply the enhanced engagement arrangements for RIIO-ED2, as we did for the other RIIO sectors.

2.2 As part of the RIIO-ED2 enhanced engagement process, each DNO undertook a programme of research and engagement to inform its business planning and established an independent CEG. Ofgem established the RIIO-ED2 CG (collectively we refer to the CEGs and RIIO-ED2 CG as the 'Groups'). These Groups challenged the DNOs to develop Business Plans that address the needs and preferences of their stakeholders and consumers and deliver good value for money.

2.3 Ofgem received a report from each CEG on its respective DNO's final business plan, and from the CG covering all DNOs' final Business Plans. We also hosted six virtual Open Hearings, which offered an open forum for stakeholders and Ofgem to question DNOs on the proposals in their RIIO-ED2 business plans.

2.4 These key stakeholder inputs, alongside the evidence we received from DNOs on their consumers' and stakeholders' views and broader evidence submitted by stakeholders in response to our Call for Evidence on the final DNO Business Plans, have all been key considerations in the development of our Draft Determinations proposals.

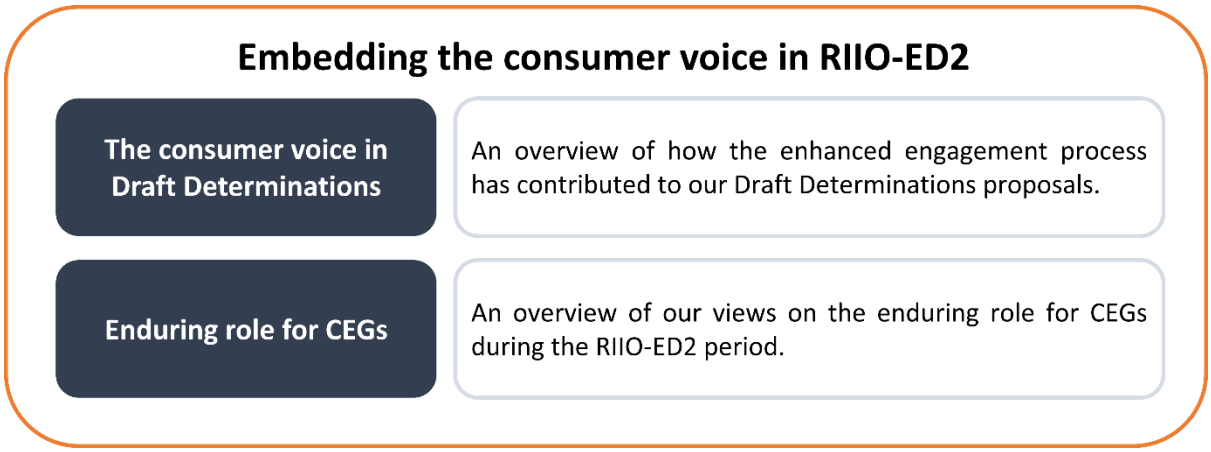
2.5 In this section we provide further information describing:

- how the enhanced stakeholder engagement process for RIIO-ED2 has informed our Draft Determinations; and

[4] RIIO-ED2 Framework Decision, Paragraph 2.20 https://www.ofgem.gov.uk/publications/riio-ed2-framework-decision

- initial views on the future role of CEGs as part of the operational phase of the RIIO-ED2 price control.

Figure 2 An overview of Chapter 2



The RIIO-ED2 enhanced engagement timeline

2.6 Table 1 provides a summary of the key milestones in the enhanced engagement process and links to further information.

Table 1 Enhanced engagement milestones

Date	Milestone
1 July 2021	Draft RIIO-ED2 Business Plans submitted to Ofgem
August 2021	CEG reports on their respective DNO's Draft ED2 Business Plans published on DNOs' websites
17 September 2021	CG review of draft Business Plans published[5]
1 December 2021	Final RIIO-ED2 Business Plans submitted to Ofgem and published on the DNOs' websites
6 December 2021	We published a Call for Evidence[6] seeking views on DNOs' final Business Plans
January 2022	CEG reports on their respective DNO's RIIO-ED2 Business Plans published on DNOs' websites
08 February 2022	CG report published[7]
10 February 2022	Deadline for our Call for Evidence on final DNO Business Plans, to which we received 35 responses

[5] RIIO-2 Challenge Group: DNO draft Business Plan response letters | Ofgem
[6] https://www.ofgem.gov.uk/publications/call-evidence-electricity-distribution-business-plans-riio-2
[7] RIIO-2 Challenge Group Independent Report to Ofgem on Electricity Distribution Business Plans

March 2022	We held Open Hearings where we discussed with stakeholders and DNOs their Business Plan proposals for the ED2 period[8]

Customer Engagement Groups (CEGs)

2.7 The CEGs are company-specific groups which were established by each of the DNOs and independently chaired. Their membership is diverse and varies across the different DNOs but includes energy sector experts, consumer research specialists, network users, and consumer advocates.[9]

2.8 Their role, as set out in the RIIO-ED2 Enhanced Stakeholder Engagement Guidance issued in 2020,[10] is to provide scrutiny of individual company business through their development. This included consideration of the draft Business Plans published by the DNOs during 2021 prior to their final submission to Ofgem in December 2021. It was also to assess the extent to which the plans would address key stakeholder priorities, to drive culture change towards stronger and more effective engagement within the companies, and to influence company decisions in the interests of consumers and stakeholders. The final output from the CEGs was to prepare a report for Ofgem setting out their views on their respective DNO's Business Plan.

2.9 A 2021 evaluation of the enhanced engagement process carried out by Ofgem found that several process changes could be implemented that would help to enhance the outputs of the process. As a result, we provided the CEGs with updated guidance on questions which each CEG might consider when reviewing the DNO's Business Plan. We encouraged the CEGs to challenge the extent to which DNOs' Business Plan proposals were grounded in consumer and stakeholder research, in particular relating to: DNOs' ambition on efficiency and innovation; net zero and Distribution System Operation (DSO) activities; strategies and outputs related to vulnerability, major connections, reliability, and resilience; 'whole systems'; competition; and flexibility optioneering.

2.10 Each CEG provided us with a report with their views on their DNO's Business Plan for RIIO-ED2, and DNOs published the CEG reports during January 2022.

[8] RIIO ED2 Open Hearings March 2022 - Transcripts | Ofgem
[9] Each CEG's membership is detailed within its report or its respective DNO's website.
[10] RIIO-ED2 Enhanced Stakeholder Engagement Guidance – Version 2 | Ofgem

The RIIO-ED2 Challenge Group

2.11 The RIIO-ED2 CG is independently chaired and comprised of energy sector experts and consumer advocates with specialist knowledge of the electricity distribution sector and economic regulation. In line with its primary objectives,[11] the RIIO-ED2 CG provided an independent challenge to, and scrutiny of, draft and final RIIO-ED2 Business Plans from the perspective of current and future consumers. The group focussed on affordability, protection of consumers in vulnerable circumstances, and sustainability, including but not limited to impact on the environment and the net zero transition.

2.12 The RIIO-ED2 CG provided us with a report in February 2022 setting out its views on each DNO's final Business Plan which we published on our website.[12]

The Open Hearings

2.13 The Open Hearings were held as video-conference calls between 14 and 25 March 2022. They provided an opportunity for Ofgem, the Groups, and the public to question DNOs on their proposals for RIIO-ED2, and to hear submissions and evidence from a range of stakeholders on various aspects of the Business Plans.

2.14 We have published the transcripts of the Open Hearings on our website.[13]

The consumer voice in Draft Determinations

2.15 All DNOs submitted evidence of extensive consumer and stakeholder engagement in building their business plans, and it was evident that this influenced their strategies for RIIO-ED2. The research and engagement activities covered a broad range of methodologies and formats. This included focus groups, interviews, online engagement and larger stakeholder events seeking feedback.

2.16 Some DNOs submitted detailed research results alongside explanations of how these had influenced proposals, and some explained how they had tried to balance varying priorities emerging from the research. In some cases, DNOs stated that they had developed bespoke outputs and Consumer Value Propositions (CVPs) in response to results from engagement activities, while in other cases stakeholders

[11] RIIO-ED2 Challenge Group's Terms of Reference https://www.ofgem.gov.uk/publications/riio-ed2-challenge-group-terms-reference-version-1
[12] RIIO-2 Challenge Group Independent Report to Ofgem on Electricity Distribution Business Plans | Ofgem
[13] RIIO ED2 Open Hearings March 2022 - Transcripts | Ofgem

and consumers were asked whether they agreed with existing proposals. DNOs also justified certain positions on common, sector-wide outputs with reference to consumer and stakeholder input.

2.17 The CEGs played an important role in providing independent assurance of the quality, depth and targeted nature of DNOs' engagement activities. We reviewed the CEG reports alongside the evidence submitted by DNOs and this enabled us to consider the quality of the DNOs' consumer engagement in our assessment. The reports helped us to contextualise the evidence presented by the DNOs, including areas where this was assessed as well evidenced or other areas where this was considered insufficiently justified. For example, some CEGs highlighted instances in which billpaying consumers' support for DNO initiatives was less strong than the support of DNO stakeholders, some of whom could be expected to gain from the measure or funding in question. Moreover, CEGs explained that in some cases consumers and stakeholders had been given insufficient information to comment on, weakening the validity of the findings and any assumptions made on customer acceptance.

2.18 Overall, the CEG reports, the CG report and the responses to our Call for Evidence and in Open Hearings helped us better understand consumer and stakeholder priorities. This substantial stakeholder input was a key consideration in reaching our Draft Determinations proposals. This includes our proposed position on individual areas as well as the broader design and planned implementation of the RIIO-ED2 price control package as a whole to ensure it achieved our key strategic objectives.

2.19 In Table 2 we show examples of how we have used the insights from the enhanced engagement process to inform our proposals. Specific issues raised by stakeholders are considered alongside the relevant policy area to which they relate, with further supporting information available in relevant sections of this document, the Overview Document and company annexes. The table provides examples and is not exhaustive.

Table 2 Examples of how stakeholder and consumer insights informed RIIO-ED2 Draft Determinations

Area of ED2	Policy area	Contribution to Draft Determinations	Reference
Company Business Plans	Multiple	CEGs challenged the companies to produce more ambitious Business Plans that better reflected stakeholder needs. See CEG reports	n. a.

		for summaries of how they challenged DNO proposals ahead of final Business Plan submission to Ofgem.	
Consumer Value Propositions (CVPs)	Multiple	CEGs and CG provided detailed assessment of CVPs proposed, including assessment against Ofgem Business Plan Guidance (BPG) criteria, likely local stakeholder support, and justification for potential rewards. These were a key consideration for our DD proposals.	Overview Document, chapter 9, and company annexes, chapter 2.
Scenarios and forecasting	Load Related Expenditure (LRE)	Stakeholders and the RIIO-ED2 CG expressed concern over whether expenditure was sufficiently justified given uncertainty in demand and emphasised the importance of agile uncertainty mechanisms in responding to local net zero ambitions. These perspectives informed our Draft Determinations proposals on baseline expenditure and the design of the LRE uncertainty mechanism toolkit.	Core Methodology Document, chapter 3.
totex	totex allowances	CG highlighted that totex forecasts were potentially higher than justified, particularly when compared to historical ED1 performance and network requirements for ED2. In our Draft Determinations proposals we have reduced baseline totex by over 17% relative to DNO submitted totex.	Core Methodology Document, chapter 7.
Efficiency	Ongoing efficiency challenge	CG and some individual CEGs challenged the ambition shown by DNOs. In our Draft Determinations proposals we have set an efficiency challenge of 1.2% per annum for all DNOs.	Core Methodology Document, chapter 7.
Outputs	Outputs and incentives package	Some CEGs set out a need to ensure full benefits to consumers are captured from new investment initiatives, including data and digitalisation and Distribution System Operation (DSO) activities. Some CEGs also highlighted the need for appropriate control mechanisms to protect consumers against non-delivery of commitments made by the companies. This has been reflected in our proposed package for outputs and incentives, including appropriate control mechanisms.	Core Methodology Document, chapters 3-6, and company annexes, chapter 2.

Outputs	Bespoke outputs and ODIs	CEGs and CG provided detailed assessment of bespoke DNO proposals, including views on customer acceptance. These were a relevant consideration in our Draft Determinations proposals for each DNO.	Core Methodology Document, chapters 3-6, and company annexes, chapter 2.
Outputs	Reliability and resilience	CEGs identified the need to ensure robust obligations supported by a sufficiently strong incentive framework. This is reflected in our proposed setting of outputs and calibration of the ODI framework. It is also reflected in our review of Guaranteed Standards of Performance in line with Storm Arwen review recommendations.	Core Methodology Document, chapter 6, and company annexes, chapter 2.
Uncertainty Mechanisms	Multiple	CEGs identified a need for agility in ED2 framework to support net zero and reflect new or updated requirements on DNOs. This flexibility is reflected in our proposed uncertainty mechanisms, including proposed re-openers for Storm Arwen recommendations and DSO arrangements.	Overview Document, chapter 6.
Innovation	Areas DNOs will focus Network Innovation Allowance (NIA) spending on	CEGs confirmed that DNOs had sought stakeholders' input when defining innovation focus areas. This supported our assessment of minimum requirements and NIA bids.	Core Methodology Document, chapter 3.
Local planning	Whole Systems/DSO	CEGs identified the importance of local planning to support net zero, recognising likely differing stages of policy commitments and whole system planning capabilities. The need for a more decentralised approach in line with local needs and circumstances is reflected in our Draft Determinations proposals for smart optimisation and DSO reform.	Core Methodology Document, chapter 4.
Business Plan deliverability	Multiple	CG and CEGs provided assessment on Business Plan deliverability given the scale of investment programmes proposed by DNOs and the increase against RIIO-ED1. This included the potential impacts on supply chains, opportunities for scale economies and risks to consumers. This has been reflected in our Draft Determinations proposals for baseline totex, application of uncertainty mechanisms, and appropriate protection mechanisms.	Across suite of RIIO-ED2 Draft Determinations documents.

2.20 In reaching our Draft Determinations proposals there were a number of areas where we had to carefully balance conflicting views across a range of stakeholders. One example is around our assessment of CVPs submitted by the DNOs under Stage 2 of the Business Plan Incentive (BPI).

2.21 In total, 24 CVPs were submitted by the DNOs in accordance with the criteria set out by Ofgem in our BPG. In most cases these CVPs were submitted on the basis of strong local customer and stakeholder support and/or alignment with broader strategic objectives and potential benefits to consumers. CVPs submitted by each DNO were assessed by the relevant CEG with the Challenge Group considering all 24.

2.22 While there was broad alignment between the CEG and CG assessments for some CVPs, in others there was a divergence of views. In some cases the CEGs also noted only partial support or where opinions were split across their Group, particularly where there were concerns on whether a CVP provided value for money to consumers, whether the DNO was best placed to undertake the proposed activity, or whether it went beyond what they considered to be a business as usual activity for the DNO. In other cases the CEGs flagged further considerations to be made by Ofgem in its assessment, including in relation to the calculation of benefits and rewards and the potential interlinkages with wider regulatory policies.

2.23 The CG expressed full or partial support for four CVP proposals, but recommended that Ofgem reject the remaining 20 for reward. This was based on concerns about whether activities were appropriate for DNOs to carry out, inadequate analysis of the benefits, or proposals not being sufficiently stretching beyond business-as-usual (BAU). We have set out our assessment of CVP proposals in Chapter 2 in the company annexes.

Enduring role for Customer Engagement Groups

2.24 The enhanced engagement process has worked well in RIIO-ED2. The CEGs provided independent challenge to DNOs to engage with consumers and stakeholders, the DNOs used these insights to shape proposals, and evidenced this input within their submissions. We believe the quality of DNOs' Business Plans is reflective of the CEG's influence.

2.25 We welcome indications from the DNOs that they are intending to contract their independent CEGs, or a group with similar independence, remit and expertise, to

challenge their Business Plan implementation and monitor delivery against their commitments throughout the course of RIIO-ED2. This recognises the progress that has been made by companies in aligning their Business Plans and decision-making with the views and needs of their customers, and the role that the CEGs' independent challenge played in this process.

2.26 In light of the DNOs' intention to keep their independent CEGs, or a group with similar independence, we do not see the need to place a formal requirement on DNOs to keep such groups.

2.27 We encourage DNOs to work together and with their CEGs or successor panels, to evolve the CEG's role and ensure that the customer voice can continue to be heard over the duration of the price control. To guide companies and CEGs in designing and evolving their approaches, we recommend the following areas of focus and challenge activities for CEGs during the RIIO-ED2 period:

- independent scrutiny and challenge of the company's performance in relation to its RIIO-2 commitments, including but not limited to commitments in their business plans which we do not monitor through the Regulatory Reporting Packs (RRPs)
- independent periodic reporting to the company, Ofgem and the public on the price control commitments the CEG has been scrutinising
- any specific arrangements needed to ensure that the consumer voice is shaping company board level decision-making.

2.28 CEGs could during the RIIO-ED2 period work entirely independently with a specific regional focus, or coordinate and cooperate to varying degrees to improve transparency for wider stakeholders and harness the reputational incentives associated with comparison.

2.29 We encourage DNOs to design the terms of reference for their CEGs or successor groups such that CEGs could, if this is found to be beneficial, work together to define their methodology and precise scope of their monitoring and reporting. Once a high-level scope and role has been defined and independent chairs are in post, it may be sensible for the CEGs to then await clarity on which metrics and outputs Ofgem will be monitoring through the RRPs before defining precisely which areas are most suitable for CEGs to focus on, to avoid duplication.

2.30 We will consider our approach to enhanced engagement, and the potential role for CEGs in challenging network companies' business planning activities, as part of the preparations for future price controls.

Consultation questions

Core-Q1. Do you agree with our proposals for the enduring role of the CEG?

Core-Q2. Do you see value in the CEGs working together to deliver more coordinated and comparative reporting on some of the DNOs' Business Plan commitments?

3. Networks for Net Zero

Section Summary

In this chapter we describe the methods we propose to use to ensure RIIO-ED2 supports the transition to net zero. This includes our proposed approach to setting baseline allowances for network upgrades and the arrangements for additional investment.

We set out our proposed approach to network innovation, aimed at identifying and funding ambitious projects that are focused on the most pressing, strategic challenges facing the energy sector. We also set out our proposed package of outputs to ensure DNOs deliver an environmentally sustainable network.

Overview

3.1 To help achieve net zero we need local electricity networks that can support the expected increases in demand, particularly for transport and heating, and more dispersed sources of low carbon generation. In doing so they these networks must be efficient and maximise the opportunities from innovation and smart technologies, with new investment providing value for money for consumers who will meet the costs through their energy bills. The networks must also take steps to reduce the environmental impact of their own activities and support the transition to a sustainable low carbon energy system.

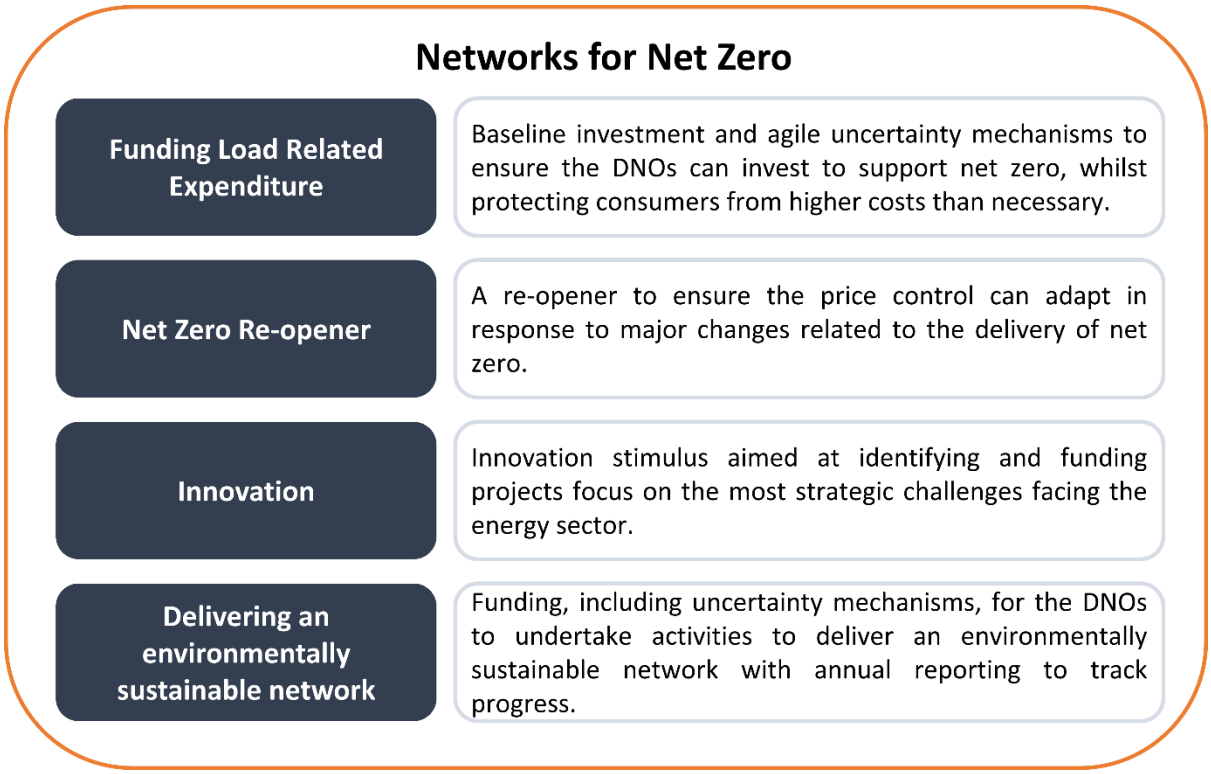
3.2 The pace of change we see over the next few years is likely to accelerate, particularly as Government policies for meeting decarbonisation targets become clearer. We expect the policy landscape and demands this places on the networks to continually evolve within the RIIO-ED2 period and it is vital that the price control can accommodate this.

3.3 Our proposals in this chapter build on the outputs that we set out in our SSMD. There are four strands to how we propose RIIO-ED2 will prepare the networks to deliver net zero:

- baseline investment of ~£2.7bn in network upgrades to support the rollout of EVs, Heat Pumps (HPs) and the connection of more local, low carbon generation including solar, wind and batteries

- an agile package of uncertainty mechanisms that will allow investment to adapt quicky to support higher volumes of low carbon technologies if networks are faced with sharper uptakes
- significant commitments to research and development of green energy through an extension of the Strategic Innovation Fund (SIF) to cover the electricity distribution companies and over £60m of additional allowances to support smaller scale innovation projects through the Network Innovation Allowance (NIA)
- funding the DNOs to undertake activities to decarbonise the electricity distribution networks and to reduce the wider impact of network activity on the environment. This includes, among other things, efforts to reduce their business carbon footprint, mitigate environmental damage from fluid-filled cables and polychlorinated biphenyls, and gain a further understanding of embodied carbon and supply chain emissions.

Figure 3 An overview of Chapter 3



Funding Approach for Load Related Expenditure (LRE)

3.4 A key objective of RIIO-ED2 is to help deliver net zero at lowest cost to the consumer, while maintaining world-class levels of system reliability.

3.5 Investment in electricity networks is likely to need to rise over the next decade and beyond to respond to higher demand for electricity arising from Government policy commitments and decarbonisation targets. This includes sufficient grid capacity to support the expected growth in electric vehicles (EVs) and the targeted roll-out of 600,000 HPs by 2028. Additionally, the commitment to decarbonise the power sector by 2035 will see growing volumes of low carbon generation connecting directly to the local grids. Accordingly, network capacity to support these demands will need to be available in a timely and strategic manner.

3.6 This investment in network capacity is called LRE. In funding LRE in RIIO-ED2, we have two main objectives:

- ensuring the networks are not a blocker to net zero by having sufficient funding to invest in network capacity and that low carbon technologies do not face installation or operational delays
- protecting consumers by keeping costs as low as possible, avoiding investment in network upgrades that are not required.

3.7 To do this we need to balance any increased investment in new physical network infrastructure with the need to maximise the potential of flexible technologies that may provide more cost-effective ways of increasing capacity. The prevalence of these smart and flexible technologies – including storage and demand side response - are an area of rapid innovation and change. This provides significant opportunity to optimise the operation of the electricity network and increase efficiencies that can lower costs for consumers.

3.8 The approach to investing in traditional network infrastructure should also enable the least cost investment path. For example, investing ahead of demand to future-proof the network where it makes sense to do so.

3.9 Each of these principles – whether optimising the balance between grid upgrades or smart and flexibility solutions and enabling the least cost investment path over the long term – apply equally to how we set baseline allowances and any funding that comes through in-period uncertainty mechanisms.

3.10 While the sources of new demand are clear, there remains significant uncertainty around network requirements. For example, where EV chargepoints and associated network capacity will need to be located and how much investment will be necessary. There are many different pathways that could be taken to achieve net zero depending on how we decarbonise the heating and transport sectors and

the level of technological innovation or behaviour change that occurs. It is likely that these factors will vary across different parts of the country.

3.11 We therefore have two key risks to mitigate to achieve our objectives:

- firstly, the risk of the networks becoming a barrier to net zero, by not having access to sufficient and timely allowances to invest. This could lead to constraints on the network and delay connections and the uptake of low carbon technologies (LCTs). In the long-run it may also prove to be more costly to consumers if networks expand incrementally rather than the required investment to deliver net zero being planned and delivered strategically
- secondly, the risk of higher costs to consumers than necessary. This could arise from inefficient investment in 'stranded assets' where the network will not be fully utilised, or the companies profiting from allowances that are not spent. This could be because demand growth does not materialise in the way it was forecast or other exogenous factors preventing timely investment and connections, for example planning restrictions or constraints on the electricity transmission network.

3.12 Accordingly, we must ensure investment plans can be adapted to respond to changing requirements from the deployment of EVs and adoption of HPs, while ensuring appropriate protections remain in place for consumers to ensure any costs flowing through into bills are justified.

3.13 We also recognise that there is value in enabling strategic investment. By this, we mean investment which enables enhanced network capacity to be deployed in the short term in anticipation of expected longer term need. This may be needed to ensure no future net zero pathway is foreclosed or to ensure deliverability in the future,[14] helping to keep longer term costs as low as possible for consumers. However, such strategic investment also carries risks to consumers, particularly when future needs are less certain. As described above, this could lead to investment in assets that the need for which does not materialise or which are not fully utilised, which could reduce efficiency and increase costs.

[14] Examples of such activities might include installing a higher voltage cable operated at a lower voltage until the additional capacity is required or laying ducts beside new cables when confident that additional capacity will be required. Additionally some strategic investment may be necessary to overcome expected delivery constraints, such as the quantity of future interventions; outage sequencing or managing off-gas grid areas.

3.14 We set out in our SSMD,[15] that we would fund such expenditure where the DNOs could evidence that it was the most efficient way to address future needs.

3.15 In the following section we describe our proposed approach to funding load related expenditure, including strategic investment. In summary:

- we propose to use a combination of baseline allowances and uncertainty mechanisms to fund LRE within RIIO-ED2
- we propose to set baseline allowances lower than requested by the DNOs, by adjusting allowances to a consistent net zero compliant starting point. This reflects concerns regarding insufficient justification for the DNOs scenario's and ensures we only provide funding for investment we have confidence is justified, thereby protecting consumers from higher costs than necessary
- where the needs case materialises for additional investment beyond baseline allowances, it can be funded by in-period uncertainty mechanisms
- we propose enabling strategic investment through our LRE package but at this stage the DNOs have put forward very little discrete, clearly justified, strategic investment. We remain open to considering the case for additional strategic investment in baseline expenditure, while this will also be enabled through our uncertainty mechanisms
- we propose to introduce two automatic volume drivers, for secondary reinforcement and low voltage (LV) services,[16] and an administrative re-opener covering all other LRE
- we will protect consumers from paying higher costs than necessary by using reporting metrics, a clawback mechanism for unjustified spend and a cap on volume driver usage.

Setting baseline allowances for load related expenditure and strategic investment

Baseline allowances	
Purpose	Provide baseline allowances to enable investment to support net zero where there is high confidence in its needs case
Benefits	Ensure networks have sufficient funding to enable net zero and protect consumers from paying higher costs than necessary

[15] RIIO-ED2 SSMD Overview Document, Paragraph 4.51 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

[16] This refers to the service line from the lower voltage distributing main to the DNO's protection device situated upon the customer's premises.

Background

3.16 In our SSMD and BPG, we set out the principles that would underpin our assessment of LRE proposals.[17,18] This required the DNOs to:

- demonstrate their forecasts have been informed by a range of assumptions derived from compliant net zero pathways for their plans[19]
- clearly describe and evidence how their proposed investments could flex to support achieving net zero in line with the range of different pathways
- ensure proposed investments were supported by robust evidence of the underpinning assumptions for the needs case, including links to demand driven through regional decarbonisation plans
- ensure any regional demand drivers (eg EV and HP deployment) were consistent with a credible aggregated forecast of demand at the national level
- make the best use of existing network capacity first, by fully utilising flexibility and smart technologies to manage changes in peak demand, before considering network infrastructure investment
- set out their approach to ensuring any strategic investment was used for its intended purpose, for example by including proposals for Price Control Deliverables (PCDs).

3.17 Our SSMD also described why we do not consider it is appropriate to rely solely on baseline allowances to provide funding for the investment required.[20] Given levels of uncertainty around the scale and pace of LCT rollout, and on ensuring the optimal balance between new network build and the use of smart and flexible solutions, this approach seems highly likely to result in allowances which are either too high or too low, neither of which would be in the consumer interest. Instead our preferred approach is for allowances to be able to flex, via the use of uncertainty mechanisms, to respond to changes in demand and facilitate the use of flexibility from all resources connecting to the local grids.

3.18 This section describes our approach to assessing how the DNOs have used the common forecast assumptions set out in the RIIO-ED2 BPG to inform robust and transparent investment plans and how we propose setting baseline allowances to

[17] RIIO-ED2 SSMD Overview Document, Chapter 4 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[18] RIIO-ED2 Business Plan Guidance, Chapter 5 and Appendix 7 RIIO-ED2 Business Plan Guidance | Ofgem
[19] In Chapter 5 of the RIIO-ED2 Business Plan Guidance we provide a set of key assumptions from Electricity System Operator's 2020 FES and the Climate Change Committee's 6th Carbon Budget.
[20] RIIO-ED2 SSMD Overview Document, Paragraph 4.41 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

enable strategic investment. The approach to cost assessment is covered in Chapter 7.

Approach to assessment

3.19 In our BPG, we set out a range of key assumptions relevant to investment planning extracted from the Electricity System Operator's 2020 Future Energy Scenarios (FES) net zero compliant scenarios, and the Climate Change Committee's (CCC) 6th Carbon Budget.[21] The intention of this was to ensure DNOs were forecasting likely demand and implications for network investment from a common basis, but allowing sufficient flexibility to reflect particular factors that may justify variation from this (for example, why following a higher demand scenario was robust and could provide better value for consumers). We required DNOs to:

- demonstrate how the range of net zero compliant demand scenarios had informed their forecasts
- transparently set out the approach taken to forecasting peak demand and the key assumptions underpinning it
- clearly describe how they engaged with local stakeholders and how this process influenced the development of their plans
- evidence how they had evaluated how investment needs may change under different net zero pathways.

3.20 Through the business planning process we engaged extensively with the DNOs regarding the key components underpinning their investment decision-making processes. The aim was to develop detailed and consistent guidance on the evidence they should provide to justify their spending plans. The key steps in this process are illustrated in Figure 2.

Figure 4 High level load related investment methodology

3.21 We assessed the Business Plans in line with these steps, undertaking a detailed review of each component and the DNOs' assumptions. The aim of our assessment

[21] RIIO-ED2 Business Plan Guidance, Paragraph 5.5 RIIO-ED2 Business Plan Guidance | Ofgem

was not to determine whether the DNOs baseline forecast was the most likely view of the future. Rather it was intended to test whether the DNO had put forward credible, evidence-based assumptions, in particular for forecast EV and HP volumes.

3.22 In addition to this qualitative review of the different components of the LRE strategies the DNOs submitted, we undertook significant quantitative analysis of their Business Plan Data Templates (BPDT). This analysis included:

- detailed analysis of how the DNOs business plan scenarios and demand pathways are reflected in key cost drivers. These drivers include the forecasts of LCTs, peak demand, units distributed, and network utilisation
- comparative analysis of the differing assumptions DNOs have made concerning the ratio of EVs to chargers, the size of chargers and HPs, and their assumed contribution to peak demand
- assessment of the relationship between forecast LCT uptake/demand growth and the DNO's proposed network reinforcement requirements in ED2.

3.23 For the overall investment plan, we expected the DNOs to carefully consider the balance in their network investment plans between ex ante funding and the spend that could flex in period through the use of uncertainty mechanisms. These expectations informed the assessment of the plans.

3.24 In the BPG, we set out our expectations that companies' proposals for ex ante allowances should reflect two key areas.[22] Firstly, spend which the DNO has a high degree of confidence in, such as it being reasonably likely to be required under a range of different scenarios. Secondly, any strategic investment ahead of need where there is well justified evidence to support this, including where this would lead to more efficient outcomes for consumers. In doing so we made clear that the DNOs should plan on the basis that sufficiently flexible and agile uncertainty mechanisms would be available to enable any additional expenditure to flex in line with whatever demand materialises.

3.25 This approach was aimed at providing an appropriate balance of risk for consumers and DNOs, and to ensure consistent approaches to assessing the deliverability of the investment plans.

[22] RIIO-ED2 Business Plan Guidance, Appendix 7 RIIO-ED2 Business Plan Guidance | Ofgem

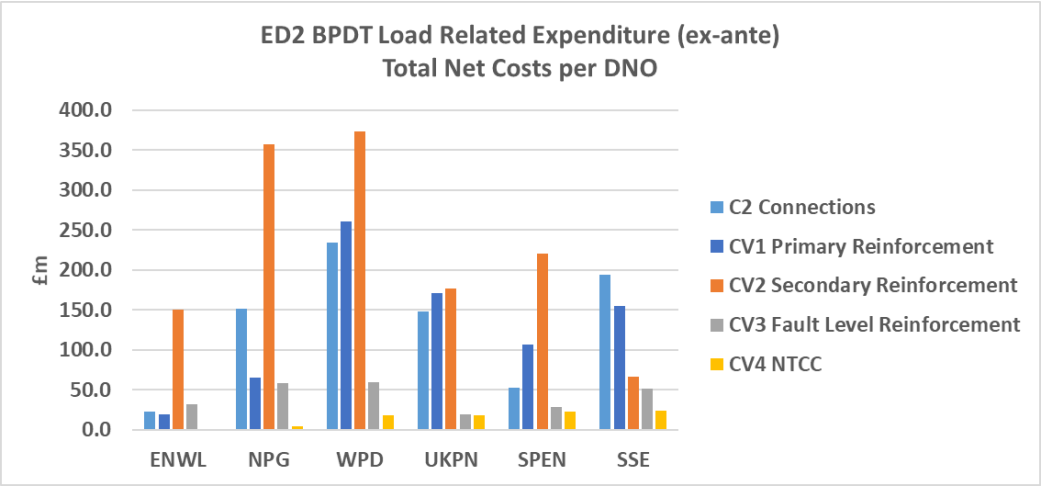
Consultation position

Output parameter	Consultation position
Baseline allowances	We propose to fund £2.68bn of LRE within DNOs' baseline allowances, where we have confidence in the justification provided.

3.26 Following data cleansing and normalisations the DNOs have requested over £3.2bn of LRE in their plans,[23] including £1.3bn of secondary reinforcement, £0.8bn for connections and £0.8bn for primary reinforcement (the rest includes fault level reinforcement and new transmission related capacity charges (NTCC)).

3.27 The level of expenditure and the profile across different activities varies by DNO as shown in Figure 3.

Figure 5 Total LRE requested by DNOs



3.28 Our proposed allowances of £2.68bn represent a reduction of 18% against the baseline proposals submitted by the DNOs.

3.29 The limited discrete strategic investment proposed in the plans was predominantly the upsizing of cables to future-proof the network. There were some very low value preparatory works proposed to support future demand needs, and in some instances additional expenditure requested above the baseline to ensure future pathways remain deliverable.

[23] To note these values are presented on a net cost basis (exclusive of any customer contributions).

3.30 Consistent with the approach proposed by DNOs, which largely embedded strategic investment within overall LRE spending plans, we do not propose any specific funding or output mechanism for strategic investment. Our approach will ensure DNOs receive funding through baseline allowances for sufficiently certain efficient costs while uncertainty mechanisms will provide the flex to provide additional allowances as the need or scope becomes clear, including strategic investment that reflects how the network is expected to evolve over time.

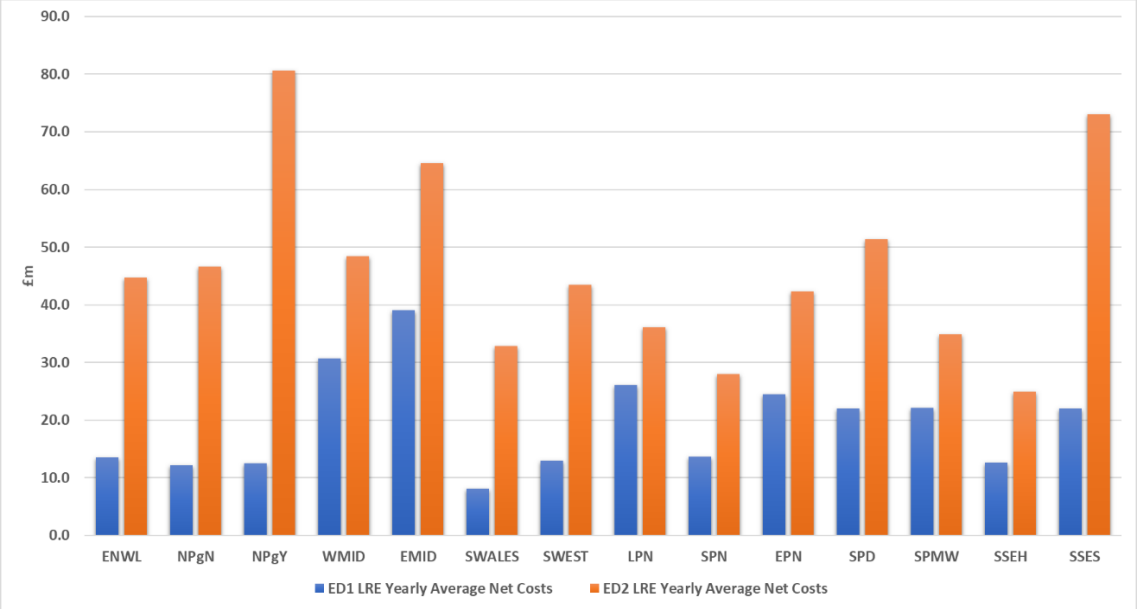
Rationale for consultation position

3.31 Our review of the plans highlighted concerns with the DNOs' scenario use and the overall evidence for the level of baseline expenditure proposed. For example, our assessment highlighted concerns regarding:

- the approach to local engagement and strategic network planning, with some plans not evidencing how local planning had influenced forecasts or that any assessment of the credibility of the plans had been undertaken
- the proposed strategy for managing network utilisation and whether the volumes were reflective of the impact of the increasing demands
- inconsistencies in the assumptions regarding the types of EV charging which will be dominant in a region, and the associated contribution to peak demand, with insufficient justification to explain why
- limited assurances for how DNOs would ensure the significantly larger spending plans would be delivered.

3.32 These concerns are amplified by the level of expenditure requested, which represent a ~120% increase on an average annual basis compared to RIIO-ED1. While we expect there to be an increased need for LRE during RIIO-ED2, it needs to be robustly justified to ensure consumers are protected from higher costs than necessary.

Figure 6 Comparison of RIIO-ED1 yearly average LRE spend with requested RIIO-ED2 yearly average LRE allowances



3.33 This proposed increase on RIIO-ED1 spending and supporting justification was a key issue raised by stakeholders in their Call for Evidence responses and by the RIIO-ED2 CG.

3.34 As articulated in paragraph 3.16, we set out the principles of our approach in our SSMD and we have worked extensively with the DNOs on the different means of justification that could be provided. In setting the baseline allowances we have considered how best to use our toolkit to ensure we are accounting for the different forecasts the companies' plans are predicated on and mitigating the risk we fund inflated plans, reflecting the concerns our assessment has highlighted.

3.35 Our proposed adjustments to allowances account for unjustified variations in demand forecasts and proposed workload volumes. We consider the adjustments necessary to ensure that DNOs are only provided with ex ante allowances for funding we have high confidence is needed. In other words, it is likely to be needed regardless of the future decarbonisation trajectory. In the absence of such adjustments, companies with high demand growth forecasts which are not justified may unduly benefit.

3.36 Specifically, we have made an adjustment to all DNOs allowances to account for our view, set out in paragraph 3.31, that there was insufficient justification for the DNOs inidividual forecasts. The proposed adjustment aligns DNOs' forecasts and associated allowances to the lowest net zero compliant scenario, the ESO's System Transformation FES. This approach ensures a more consistent starting

point across the DNOs. We opted for this scenario because while it facilitates the delivery of net zero, it is the least ambitious of the FES 2021, which will ensure we are only funding a level of investment we can be reasonably confident is needed in the next five years. This is not to say we consider System Transformation is the most likely view of the future, but instead it is the most appropriate scenario to use in order to protect consumers from higher costs than necessary while ensuring allowances are sufficient to enable net zero. The uncertainty mechanism toolkit will ensure that if higher demand growth occurs DNOs have sufficient allowances to respond quickly.

3.37 We consider this approach strikes an effective balance in mitigating the risks we highlight in paragraph 3.11. It is not that our assessment considers the DNOs proposed load growth will not materialise, but instead that there is insufficient evidence to support the assumptions made by the DNOs and provide confidence in the level of expenditure required. By utilising different levers within our cost assessment toolkit, we are ensuring we set high confidence allowances while reflecting the different regional plans.

3.38 Additionally, our approach to setting baseline allowances should be considered holistically alongside our proposed load related uncertainty mechanism toolkit, comprising two volume drivers and a re-opener, which will enable the price control to be agile and responsive to increasing demand and will allow DNOs to react quickly to network needs.

3.39 In their LRE strategies DNOs outlined their strategic vision for investing in network capacity and associated indicators for monitoring if this investment in the network is necessary. We intend to consider the ongoing role of such indicators ahead of Final Determinations to consider if they can be utilised to further mitigate the risk companies do not spend efficiently or strategically.

3.40 An alternative approach would have been to fund DNOs based on their view of expected volumes, and rely on uncertainty mechanisms that use DNO specific utilisation metrics to adjust allowances upwards and downwards. However, due to limitations in the current data quality and network monitoring capabilitues we consider this approach would not appropriately mitigate the risk that customers pay for assets that are not needed.

3.41 We also considered whether PCDs could be set to address LRE uncertainty, but given the volumes of interventions we consider that this would be

disproportionately complicated to implement and monitor, and does not enable allowances to flex upwards quickly.

3.42 As highlighted earlier, our assessment of the plans showed there to be limited discrete strategic investment proposed. Where it was proposed, DNOs highlighted and justified their strategic investment to ensure it was not removed in benchmarking. We consider the approach we have taken to setting baseline allowances to be appropriate and that any efficient investment ahead of need will be funded within our approach to setting allowances. Through the Draft Determinations consultation process we remain open to further evidence for well justified investment ahead of need.

Uncertainty Mechanisms for LRE and Strategic Investment

Uncertainty Mechanisms for LRE and Strategic Investment	
Purpose	Enable the price control to react in an agile, flexible manner to changes in demand
Benefits	Ensure networks have sufficient funding to enable net zero and protect consumers from paying higher costs than necessary

3.43 Setting an efficient baseline that funds only investment we can have high confidence in requires a well calibrated uncertainty mechanism toolkit that can allow investment to dial up in response to new demand. Having such a toolkit ensures that if the uptake of EVs or HPs is faster than expected, then investment can track these changes and flex quicky and efficiently in response, with growing flexible solutions and markets able to complement any investment in physical infrastructure. This flexible and agile approach also protects consumers from paying higher costs than necessary.

3.44 In our SSMD,[24] we set out that we preferred to use an automatic mechanism to support a fast response from DNOs to changing requirements on the secondary network, subject to whether we could establish appropriate controls on how it would be used. We outlined that in the first instance we would explore a capacity volume driver, coupled with a utilisation metric as a control. We also noted the potential need for automatic mechanisms to deal with uncertainty regarding the volume of a particular type of work that may be required on their network (such as unlooping LV services).

[24] RIIO-ED2 SSMD Overview Document, Paragraph 4.42, 4.43 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

3.45 For more material changes in requirements, we set out that we would use a wider toolkit of administrative uncertainty mechanisms. This recognises the different characteristics of the spend we need to consider in designing uncertainty mechanisms for LRE within RIIO-ED2 and how to balance the need for speed, accuracy and complexity.

3.46 For RIIO-ED2, we propose to manage load related uncertainty using a combination of automatic mechanisms for lower value interventions which are likely to occur in high volumes, including the unlooping of LV services, and an administrative re-opener for higher value, but lower volume, interventions.

3.47 There are two key risks associated with the automatic volume driver: the risk of overinvestment in network capacity and the related risk of weakening incentives for a 'flexibility first' approach, where flexibility resources and other smart technologies are prioritised by the DNOs in their management of network use before pursuing traditional investment.

3.48 To mitigate these risks we will create a set of controls that tie to an efficient investment needs case and introducing a cap on the volume driver to limit its use. Our proposed uncertainty mechanism package and associated controls are set out below.

Secondary Reinforcement Volume Driver

Secondary Reinforcement Volume Driver	
Purpose	To flex allowances in response to changing requirements
Benefits	Enable DNOs to respond quickly and enable net zero, while ensuring consumers remain protected from higher costs than necessary

Background

3.49 We propose to introduce an automatic volume driver on secondary reinforcement. This refers to investment on the lower voltages of the network (high voltage (HV) and LV).

3.50 This area of expenditure is the most material area of requested LRE spend within the companies' Business Plans, at £1.3bn (~5% of totex). We expect that the dominant driver of secondary reinforcement will be the uptake of LCTs, specifically EVs. The EV rollout is market-led, and the pace, location and local network impact

is challenging to predict. This creates uncertainty over the volumes of interventions which will be needed to ensure that new connections can be supported without compromising network reliability.

3.51 Managing this risk ex ante could be done by providing higher baseline allowances to ensure the DNOs have sufficient funding available to not be a blocker to net zero, but this could leave consumers exposed to higher costs than necessary. We also considered managing this uncertainty using only an administrative re-opener uncertainty mechanism. While this offers the potential for greater scrutiny of the need for investment, the high volume, low value nature of these secondary reinforcement works may create a disproportionate administrative burden that could prevent the networks from responding quickly and efficiently to increasing demand.

Consultation position

UM Parameters	Consultation Position
Scope	A volume driver to fund work related to capacity constraints affecting a substation and capacity constraints affecting a circuit on the secondary network (LV and HV). The scope will apply to conventional solutions for releasing capacity.
Volume measure	We will use a capacity-based mechanism to set volumes, and associated unit costs, to vary allowances. Substation: • £/MVA gross additions for pole mounted transformers (PMTs) and ground mounted transformers (GMTs). Circuits: • £/km additions with separate unit costs by voltage level.
Adjustment Mechanism	Adjustment to allowance (up or down) is the sum of the volume metrics multiplied by the relevant unit rates as set out above.
Application of the totex Incentive Mechanism (TIM)	We propose to apply the TIM to the volume driver.

Table 3 Unit costs for the secondary reinforcement volume driver

Reinforcement Category	Sub-category/Asset	Units	Unit Cost
Capacity constraint affecting substation	Pole-mounted transformer	£'000/MVA	103.9
	Ground-mounted transformer	£'000/MVA	70.8
Capacity constraint affecting circuit	LV circuit	£'000/km	120.4
	HV circuit	£'000/km	102.6

3.52 Further information on how these unit costs have been calculated is found in the Disaggregated Benchmarking section of Chapter 7.

Rationale for consultation position

3.53 In developing our proposed secondary reinforcement volume driver design (scope and volume measure) we considered a number of options. This included options proposed by DNOs in the RIIO-ED2 working group and those included as bespoke UM proposals as part of their Business Plan submission. These proposals were broadly comprised of two forms of design:

- output-based mechanism - £ per device connected, scheme completed, new connection
- capacity-based mechanism - £ per MVA and/or km

3.54 We assessed a longlist of proposals to assess the deliverability, risk of abuse and cost reflectivity of the options. The criteria we considered included risk that volumes could not be monitored or be easily manipulated; whether there was sufficient data quality and availability to set an efficient unit cost and whether the volume measure was a good proxy for DNO cost.

3.55 We propose to use a capacity-based mechanism as we consider this volume measure is most homogenous and will enable us to have greater confidence in the unit cost. Additionally, in comparison to an output-based mechanism, we consider our proposed design is less exposed to the risk of manipulation of volumes.

3.56 Within the BPDTs, we collect data on MVA of capacity released on both a net basis (net change to capacity of a transformer) and gross basis (the final capacity of the reinforced transformer). We propose to set the volume measure on a gross basis as this provides greatest cost reflectivity of the work undertaken.

3.57 A key challenge for our design of the volume drivers is how to ensure sufficiently strong incentives for the DNOs to make optimal choices between network upgrades and the procurement of flexibility services. The scope of the proposed volume driver encompasses the majority of the investments needed on the lower voltages of the network; however, it does not include a volume measure for flexibility spend on the lower voltages.

3.58 We recognise the importance of ensuring we do not weaken incentives for flexibility through the design of the volume driver. This was a key issue raised by some stakeholders in our call for evidence in response to the publication of the

final DNO business plans. Accordingly, we considered incorporating the procurement of flexibility services within the volume driver but we believe this would create a significant risk of windfall gains.

3.59 There are broadly two approaches to incorporating procurement of flexibility services in the volume driver.

3.60 The first is to set a specific unit cost for flexibility, of which the front runner volume measure would be £/value of reinforcement deferred. However, this relies on DNOs self-reporting and as such increases the risk of manipulation of the unit cost.

3.61 The second approach is to use the same unit cost for releasing capacity as applied to conventional solutions. However, while this may provide a strong incentive for flexibility use, it would increase the potential for windfall gains by not being cost reflective therefore may not result in lower costs for consumers. Given the nascent development of the LV flex market it may disproportionately impact different DNOs.

3.62 Accordingly, we consider that both options introduce a significant risk of gaming and/or windfall gains for the companies. For RIIO-ED2 we consider it more prudent to ensure the incentives for flexibility are not weakened by having effective controls in place to ensure the UMs are used efficiently, and that conventional reinforcement is only used when alternative options have been exhausted. The inclusion of robust monitoring and controls combined with wider price control measures will help maintain strong incentives to pursue flexibility options. We expand on the controls later in this section. Our proposed DSO incentive design should also drive DNOs to maximise their use of flexibility and other smart technologies, and this is covered in Chapter 4.

3.63 We also propose applying the TIM to spend through the volume driver. This will ensure we retain incentives for cost efficiency and provide additional protection for both DNOs and consumers for any under or overspend against the unit cost.

LV Services Volume Driver

LV Services Volume Driver	
Purpose	Enable DNOs to reinforce LV services in response to customer requests or on a proactive basis
Benefits	Ensure DNOs can reduce constraints to customers installing an LCT

Background

3.64 We propose to introduce a volume driver for the reinforcement of LV services, in particular the 'unlooping' of the LV service cables. Historically, there are hundreds of thousands of properties (the scale varies by DNO) where low cost, shared services were provided. Where services are shared, in simple terms this splits the LV service cable running into a property in two or more, reducing the capacity available to consumers. Accordingly, it presents a barrier to these customers installing an LCT.

Consultation position

UM Parameters	Consultation Position
Scope	A volume driver to fund proactive and reactive load related LV service reinforcement. This covers: • Overhead Pole Line – LV Service (OHL) • Cable – LV Service (UG) • Switchgear – Cut Out (metered) • Fuse upgrades
Volume measure	We will set the volume measure on a £/assets reinforced basis with separate unit costs for each activity, albeit the same unit cost will apply whether the works are proactively or reactively driven. Further information will be required to enable the inclusion of fuse upgrades within the volume driver.
Adjustment Mechanism	Adjustment to allowance (up or down) is the sum of the volume metrics multiplied by the relevant unit rates as set out above.
Application of the TIM	We propose to apply the TIM to the volume driver.

Table 4 Unit costs for LV Services Volume Driver

Reinforcement Category	Sub-category/Asset	Units	Unit Cost
Proactive service reinforcement	LV Service (OHL)	£'000/each	0.47
	LV Service (UG)	£'000/each	1.42
	Cut out (metered)	£'000/each	0.25

3.65 Further information on how these unit costs have been calculated is found in the Disaggregated Benchmarking section of Chapter 7.

Rationale for consultation position

3.66 We consider a volume driver is appropriate for this area of spend as the individual interventions are low value, with stable unit costs and the needs case will be dependent on the uptake of LCTs within the period. As such these characteristics

align to the use of a volume driver. All companies proposed a bespoke UM in the form of a volume driver for this area of spend noting the potential for rapid increases in EV uptake.

3.67 LV service 'unlooping' is a lower value, low regrets activity, although it can be very disruptive to individual consumers. In developing the proposed design, we considered whether the scope should encompass reactive and proactive reinforcement. Proactive refers to DNO taking a more strategic approach, for example undertaking work on a street-by-street basis whereas reactive refers to work which responds to a consumer notification.

3.68 Currently DNOs respond reactively to consumer requests, but this may lead to an inefficient approach or lead to the DNO becoming a blocker to the uptake of LCTs if they cannot respond to requests quickly enough. Many of the DNOs are proposing a more proactive approach for RIIO-ED2, adopting a street-by-street approach based on local forecasting. This spend was put forward in baseline allowances and to be funded via a volume driver.

3.69 We consider it appropriate to fund both proactive and reactive reinforcement within the volume driver to ensure we drive a more strategic approach and avoid any inefficient, incremental investment. We will apply the same unit cost regardless of the driver because there is not significant variance between the costs and by keeping them uniform. We consider this will create an incentive to be proactive and drive efficiencies.

3.70 As noted in our consultation position, we are proposing to include fuse upgrades in the LV services volume driver to ensure maximum coverage of LV services. We will require further information from the DNOs ahead of Final Determinations to enable us to set these unit costs.

3.71 Unlike our proposal for a secondary reinforcement volume driver, we propose the mechanism should be output-based, set on a £/asset basis as this provides the most stable unit cost. The application of the TIM will ensure any efficiency gains are shared with consumers.

Volume Driver Controls

Volume Driver Controls	
Purpose	To mitigate the risks associated with the use of a volume driver

Benefits	Ensure there are sufficient protections in place while enabling allowances to flex in an agile responsive manner

Background

3.72 In our SSMD,[25] we set out that our use of an automatic uncertainty mechanism for LRE was contingent on having sufficient controls in place. This is due to the inherent risks associated with automating the adjustment of allowances and the need to protect consumers' interests.

3.73 The key risk associated with a volume driver is the risk of overinvestment if the incentive to invest is too high. Additionally, specific to this mechanism and area of expenditure, is the risk of weakening incentives for the procurement of flexibility services.

Consultation position

Parameters	Consultation Position
Monitoring framework and review process	We propose to require reporting on common metrics on an annual basis which indicate the drivers of investment in that regulatory year. For each metric, we would set clear expectations of the threshold or trend we expect to be met to indicate justified investment. There will be an annual review process and a process to clawback unjustified spend. This monitoring framework would apply to the secondary reinforcement volume driver only.
Volume Driver Cap	We propose to set a cap on the total expenditure that can be accessed from the secondary reinforcement volume driver. This will be calculated using a common scenario (the CCC Balanced Pathway) to model an upper-bound of expenditure for each DNO. The cap would apply to the entire RIIO-ED2 period, not on an annual basis, and would be reviewed mid-period with the option to remove or revise upwards.
Mid-period parameters review	We propose to review the mechanism's parameters mid-period. This would include the unit cost and cap, an audit of the DNO's data submissions for the first half of RIIO-ED2, and an assessment of progress against the expectation of granular utilisation data be available for RIIO-ED3.

3.74 The proposed monitoring framework is comprised of a small number of metrics, which will have clear parameters to justify the needs case for investment. These would be reported on annually and will enable checks that flag if a metric is outside a tolerable range. This approach should enable a direct but proportionate monitoring of the volume driver use against these metrics with Ofgem retaining

[25] RIIO-ED2 SSMD Overview Document, Paragraph 4.43 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

the ability to trigger a detailed review process, and potential clawback, if the checks highlight concerns.

3.75 The aim of these metrics is to demonstrate that there is a justified needs case for the volumes of work undertaken. The driver for LRE results from both the demand (ie increasing loads on the network) and the condition of the network (ie how loaded it currently is). Therefore, the four metrics we are proposing will track load growth and network impact.

3.76 These metrics are:

- transformer utilisation: this metric would be a check on whether reinforcement works are occurring within 'high' utilisation bands or areas of projected high utilisation. 'High utilisation' would be defined via a threshold. As such, we would set the check to allow a limited amount of tolerance for capacity additions to occur in 'low' utilisation bands, for instance if beneficial to avoid an incremental approach to investment
- circuits utilisation proxy: for example there is a metric proposed within UKPN's bespoke proposal which compares outturn circuit volumes against the expected volumes based on a predefined relationship between transformer and circuit reinforcement (per UKPN proposal). The check would highlight significant deviation from ratio
- LCT growth: compares ex ante forecast LCT volumes with outturn to determine change in growth expectations. The aim of the metric is to indicate if there is a growth trend beyond the baseline, rather than to assess the accuracy for forecasting
- a Broad Measure of Load Growth: this would be a measure of annual load growth from a baseline derived in the first year of the price control using a representative sample of installed LV monitors.

3.77 These metrics have been shortlisted following extensive consideration of available network indicators. We believe that they complement wider metrics that will be tracked through other output delivery incentives, including the DSO incentive. We will continue to develop these metrics through the RIIO-ED2 LRE working group (LRE WG) ahead of Final Determinations.

3.78 The DNOs will report on these metrics through the annual performance reporting processes (RRPs). Where the outturn reporting is outside the tolerable range, additional justification will be sought from the DNOs to support the investment made under the volume driver. In cases where insufficient justification is provided,

Ofgem may consider a clawback of allowances. We will work with the DNOs on a template for additional justification to be provided through the LRE WG.

3.79 To protect consumers against the risks of misuse of the volume driver, we are proposing to include a cap on the total allowance accessible alongside the monitoring framework. We are proposing to set the cap on an aggregate basis, capping allowances for all assets combined. We propose that the cap will apply to allowances across the full RIIO-ED2 price control period rather than being set on an annual basis, as spend may not be required in an even profile.

3.80 We propose that the cap is calibrated based on forecast expenditure modelled using predicted LCT uptake from the CCC Balanced Pathway scenario. We believe this provides an appropriate balance of risk, ensuring the design of the uncertainty mechanism does not compromise the pursuit of net zero pathways while providing suitable protection for consumers. By aligning to a pathway, it will further support us in understanding the DNOs drivers for investment and assess if the cap needs to be amended.

3.81 We plan to undertake a review of the volume driver design and calibration during Year 3 of the RIIO-ED2 price control period. This will include a review of unit costs and the cap to ensure they remain fit for purpose.

Rationale for consultation position

3.82 Our proposal to introduce an automatic volume driver uncertainty mechanism for low value, high volume projects on the secondary network will ensure we can achieve our objectives of delivering net zero through timely access to investment while protecting consumers from higher costs than necessary.

3.83 The introduction of an automatic volume driver mechanism will ensure that the networks can respond quickly to increasing demand. It does, however, carry two key risks: the risk of overinvestment in network capacity and the related risk of weakening incentives for a flexibility first approach.

3.84 We have sought to develop two key controls to manage these risks. Firstly, creating a strong tie to an efficient investment needs case through outcome-based metrics (primarily network utilisation) to ensure that reinforcement is a last rather than first resort. Secondly, introducing a cap on the volume driver as a backstop measure to guard against inefficient overinvestment.

3.85 For the avoidance of doubt, we propose to apply the monitoring and review framework to the secondary reinforcement volume driver as this is more exposed to the risk of overinvestment and weakening incentives for flexibility. The cap will apply to both volume drivers given it is to act as backstop.

3.86 To further protect against the risk of miscalibration, we propose to revisit the cap and unit costs as part of a mechanism review in Year 3 of the price control.

3.87 The rollout of data and digital capabilities through the RIIO-ED2 period, including enhanced LV monitoring, also presents opportunities to consider the use of alternative thresholds (eg actual real time network utilisation data) or enhancements to the control framework. These opportunities will be reviewed as part of the Year 3 review to ensure the volume driver and control framework can be as effective as possible.

LRE Re-opener

LRE Re-opener	
Purpose	Enable the price control to react in an agile, flexible manner to changes in demand
Benefits	Ensure networks have sufficient funding to enable net zero and protect consumers from paying higher costs than necessary.

Background

3.88 While the area of most significant uncertainty within RIIO-ED2 is investment on the lower voltages and secondary reinforcement, we recognise the uncertainty over the pathways to net zero impacts other LRE activities. In applying uncertainty mechanisms to spend we need to consider the nature of the uncertainty we are handling and the characteristics of the investment.

3.89 The key additional area of uncertainty within LRE is at the higher voltages, where investments are typically larger, heterogeneous projects with unique engineering drivers. This is evident in the bespoke UMs proposed by the DNOs in their plans on primary reinforcement (covering a mixture of re-openers and automatic mechanisms).

Consultation position

UM Parameters	Consultation Position
Scope	This re-opener would apply to all other LRE activities which fall outside of the scope of the secondary reinforcement volume

	driver and LV services volume driver. This excludes activities already funded within baseline.
Re-opener window	We propose that the re-opener window for DNO submissions should be in Year 3 of the price control, in April 2025.
Materiality Threshold	In line with the proposed RIIO ED2 common parameters, we propose to apply a materiality threshold of 1%.

Rationale for consultation position

3.90 While the proposed re-opener has a broad coverage, we expect the main area it to be used for to be investment at the higher voltages (primary reinforcement).

3.91 For investments at higher voltages, we consider a re-opener more appropriate than a volume driver due to the significant variance in the cost and technical design of these varied projects. We note that there were bespoke UM proposals from some DNOs for an automatic mechanism to cater for this uncertainty, but we have not seen convincing evidence of a stable relationship between interventions and efficient costs.

3.92 Additionally, given the expected value of these investments we consider it is appropriate they are subject to a detailed review of the justification for the costs and volumes. In line with the RIIO-ED2 common re-opener parameters, we would provide additional guidance which sets out our expectations of what is appropriate justification for a re-opener application. This guidance will build on the BPG Appendix 7 LRE Strategy guidance.

3.93 The re-opener coverage is broad to ensure the price control can manage all LRE uncertainty. Although flexibility falls within the scope of the re-opener, we expect DNOs to consider the use of flexibility in spending their ex ante allowances and that the TIM should drive this. The re-opener is intended for use where additional LRE spend is needed beyond the materiality threshold.

3.94 We propose the timing of the re-opener to be in the third year of the price control, 2025/2026. The common re-opener parameters would put this in January 2026, however we consider earlier within the regulatory year, April 2025, to be more suitable to align to wider planning processes and to ensure it enables timely access to allowances for DNOs if necessary.

3.95 Lastly, we consider the design of the re-opener will ensure it is suitable to manage increases in demand driven by Access SCR implementation. While we have specified a window for the licensee to submit an application, we would include the option for the Authority to direct additional windows.

Consultation Question

Core-Q3. Do you agree with our proposal to adjust allowances to £2.68bn to account for the concerns highlighted by our assessment?

Core-Q4. Do you agree with our proposed secondary reinforcement volume driver and LV services volume driver and the associated controls?

Core-Q5. Do you agree with our proposed LRE re-opener?

Net Zero Re-opener

Net Zero Re-opener	
Purpose	To introduce an increased level of adaptability into the RIIO-ED2 price control by providing a means to amend the price control in response to changes relating to the meeting of the net zero carbon targets, which affect the costs and outputs of network licensees.
Benefits	To allow for necessary amendments within the RIIO-ED2 period, as opposed to waiting until the settlement of the price control.

Background

3.96 In our Decarbonisation Action Plan,[26] we said that we would seek to introduce a system-wide Net Zero re-opener spanning the gas and electricity sectors. Our aim was to balance the need for investor confidence with the need to respond flexibly to technological and policy developments along the path to net zero.

3.97 It is critical that the RIIO-ED2 price control enables DNOs to support the achievement of net zero targets. We recognise that net zero policy will not develop in five-year increments and there may be circumstances during the price control period where assumptions used to set the price control are no longer appropriate due to changes related to the transition to net zero.

3.98 In our SSMD we outlined where material changes from exogenous factors may require significant adjustment to expenditure in the RIIO-ED2 price control. This may could include, for example, changes in Government policy, the role of network companies, or technological or market developments. The effect of these adjustments could be, among other things, to increase or decrease allowed revenues during the price control period rather than waiting until the next price control review.[27] It is for these reasons we decided to introduce a Net Zero re-

[26] Ofgem's Decarbonisation Action Plan | Ofgem
[27] RIIO-ED2 SSMD Overview Document, Paragraph 4.63 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

opener in RIIO-ED2 to complement the wider set of uncertainty mechanisms proposed.

3.99 To make ongoing funding decisions on major strategic investments in a cohesive way, we committed to improve our coordination with the UK and devolved Governments and other key stakeholders, such as the National Infrastructure Commission and the Committee on Climate Change. To do this, we have established a Net Zero Advisory Group (NZAG).[28] NZAG, alongside other relevant considerations, would help inform the circumstances where a triggering of the Net Zero re-opener may be necessary.

Consultation position

UM parameter	Net Zero Re-opener
Scope	Changes in national or local Government policy, new obligations arising from the agreement of a Local Area Energy Plan, the change in the pace or nature of the uptake of low carbon technologies, as well as technological or market developments to be reflected in company allowances.
Re-opener window	The re-opener mechanism could be used by Ofgem at any time throughout the price control.
Materiality threshold	In line with the proposed RIIO ED2 common parameters, we propose to apply a materiality threshold of 1%.

Rationale for consultation position

Scope

3.100 We propose to proceed with the introduction of the Net Zero re-opener along the lines of the scope detailed above. This approach would help to ensure that RIIO-ED2 can be adaptable to a wide range of potential developments relating to the transition to net zero. We consider that a narrowly framed re-opener would be ineffective in enabling the DNOs to respond to a broad range of potential developments in RIIO-ED2.

Process

3.101 We consider the re-opener mechanism should operate as outlined in the RIIO GD&T2 Final Determinations[29] where Ofgem alone has the ability to trigger the

[28] RIIO-ED2 SSMD Overview Document, Paragraph 2.15, 2.16 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[29] RIIO-2 Final Determinations Core Document, Paragraph 8.40 https://www.ofgem.gov.uk/publications/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator

mechanism at any time during the price control period, with scope for stakeholders to draw our attention to relevant issues. This is because the proposed approach allows Ofgem to consider whether the Net zero Re-opener is the most appropriate mechanism to be used as well as if there is reasonable certainty over the change in question and its impact.

3.102 Subject to the consideration of all relevant available evidence, received through the NZAG or others, we would determine whether a relevant change of circumstances that could have a material impact on RIIO-ED2 costs or outputs has occurred or will occur.

3.103 Where a relevant change in circumstances is identified, we would consult on the anticipated impact of the change to inform our decision on whether and what changes need to be made, what amendments to DNO licences are necessary to facilitate the change, and the extent to which other uncertainty or price control mechanisms could facilitate the required changes.

3.104 As part of the process, we would consider the extent to which other uncertainty mechanisms or price control mechanisms may be capable of enabling the changes required.

Materiality threshold

3.105 Consistent with the Net Zero re-opener design in RIIO GD&T2,[30] we propose to apply a materiality threshold in line with the RIIO-ED2 common re-opener parameters. This would ensure that Ofgem and licensees only deal with changes that are sufficiently material and where the costs of using the mechanisms are clearly outweighed by the expected benefits.

Adjustments

3.106 We propose that through the re-opener process, the types of changes that could be made to DNO licences could include:

- increases or decreases in allowed revenue
- adjustments to existing output targets or the introduction of new output arrangements through a PCD

[30] Statutory consultation on modifications to the RIIO-2 Transmission, Gas Distribution and Electricity System Operator Licence Conditions | Ofgem

- changes to existing reporting requirements or the introduction of new reporting requirements.

Consultation question

Core-Q6. Do you agree with our proposed approach to the Net Zero re-opener?

Innovation

3.107 Innovation will support the transition to a smarter, more flexible and sustainable low carbon energy system. It will also help to develop and trial new ways of operating and developing networks and uncover technologies which support the transition to a low carbon economy. It will also enable efficiency and help to keep bills down for consumers by allowing a more efficient and cost-effective system.

3.108 As set out in our SSMD, we expect innovation should be a core part of a companies' BAU activities.

3.109 In our SSMD,[31] we decided to provide dedicated innovation stimulus funding in the form of a Strategic Innovation Fund (SIF), devoted to large-scale transformational research and development projects, and the Network Innovation Allowance (NIA), devoted to smaller-scale innovation projects.

Strategic Innovation Fund (SIF)

SIF	
Purpose	To support network innovation that contributes to the achievement of net zero, while delivering real net benefits to network companies and consumers; and to work with other public funders of innovation so that activities appropriately funded by network consumers are coordinated with activities funded by Government
Benefits	Supports strategic network innovation projects that would not otherwise be supported by the price control or other sources of funding and contributes to the energy system transition

Background

3.110 In our SSMD[32], we decided to introduce the SIF, in line with our decisions in the other RIIO-2 sectors. The SIF invites project proposals to address Innovation

[31] RIIO-ED2 SSMD Overview Document, Paragraph 4.86 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[32] RIIO-ED2 SSMD Overview Document, Paragraph 4.86 - 4.89 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Challenges set by Ofgem. The aim is to identify and fund ambitious, innovative projects with the potential to accelerate the transition to net zero.

3.111 Since our SSMD, we have implemented the SIF in the other RIIO-2 sectors. In 2021, we appointed Innovate UK (IUK) as part of UK Research and Innovation (UKRI) as our SIF Delivery Partner. We also issued version 1 of the SIF Governance Document.[33] Coordination around innovation is critical and this partnership between Ofgem and Government is helping to align respective innovation funding programmes, and ensuring research and development activities support a common strategic direction. We will shortly publish the Draft Version 2 of the SIF Governance Document and the associated consultation on our website. We propose that this will apply to the ED sector from the start of RIIO-ED2. Through our consultation on the SIF governance document, we are seeking views from stakeholders on our proposed changes to the SIF governance arrangements, and on whether any further changes are needed specifically for the ED sector.

3.112 In March 2022 we issued our decision to fund a first tranche of SIF projects.[34]

3.113 The next set of SIF Challenges have been issued by Ofgem.[35] Applications for funding to address these Challenges can be submitted to IUK and Ofgem from 5 September 2022, and applications close on 23 November 2022. Funding decisions would be expected in early 2023, with projects successful in the competition receiving funding from April 1 2023.

3.114 From April 2023 DNOs will enter the RIIO-ED2 price control. In our consultation on the SIF Governance Document, we propose that DNOs will also be eligible to lead projects under round 2 of the SIF.

Consultation Position

Output Parameter	SIF
Value of the SIF	Make available a level of total funding equivalent to that provided via the RIIO-1 Network Innovation Competition(NIC), which was £450m, and increase this if necessary.

[33] Decision on the SIF operational arrangements and Version 1 of the SIF governance document https://www.ofgem.gov.uk/publications/sif-governance-document
[34] Decision to fund discovery projects under round 1 of the SIF https://www.ofgem.gov.uk/publications/strategic-innovation-fund-discovery-projects-approved-funding
[35] Our round SIF Round 2 Innovation Challenges are published here: https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-two-innovation-challenges

3.115 We have made £450m available through the SIF for the RIIO-ET2, GT2, GD2 and ESO price controls. We do not propose to increase the size of the SIF at this time to accommodate RIIO-ED2 in the SIF, but we will keep its size under review during the price control period. The factors we will examine when considering whether there is a need for additional SIF funding will include:

- progress of completed and ongoing SIF projects
- DNOs' and other network companies' success in rolling out proven solutions to business as usual
- the evolution of the RIIO-3 price controls, including the shape of any innovation stimulus package
- developments in the wider innovation landscape
- any other relevant information.

Consultation Question

Core-Q7. Do you agree with our proposed approach to the value of the SIF?

Innovation in BAU activities

3.116 All companies committed in their Business Plans to spending a defined value on innovation from business-as-usual funding (ie shareholder funds or totex allowances). However, consistent with feedback from our RIIO-ED2 Challenge Group, the DNOs' CEGs, and several other stakeholders who submitted evidence to us, we consider that DNOs need to show more ambition to take forward innovation as part of BAU and rely less on requests for CVP rewards, or additional NIA funding to take forward innovative activities.

3.117 WPD and SSEN also presented evidence from their own engagement with consumers and stakeholders that they would value greater ambition and transparency on the roll-out of successful innovation to the wider business and associated benefits, and both DNOs proposed to publicly report on this. We welcome this initiative and encourage all DNOs to report publicly on the rollout of innovation, once a robust monitoring and measurement framework has been established and implemented. However, a consistent framework is not yet in place, so progress cannot yet be robustly monitored. We therefore do not propose to track performance in this area via a bespoke ODI-R.

Network Innovation Allowance (NIA)

NIA	
Purpose	To fund innovation relating to support for consumers in vulnerable situations and/or the energy system transition.
Benefits	The NIA will enable DNOs to take forward innovation projects that have the potential to address consumer vulnerability and/or deliver longer–term financial and environmental benefits for consumers, which DNOs would not otherwise undertake within the price control.

Background

3.118 In our SSMD,[36] we decided to reform the NIA for RIIO-ED2 to narrow its scope to fund only innovation projects related to longer-term energy system transition challenges and/or consumer vulnerability issues. This was consistent with the approach adopted for RIIO-ET2, RIIO-GD2 and RIIO-GT2.

3.119 We also indicated[37] that we do not intend to raise the NIA funding level above RIIO-ED1 levels without clear justification from the DNO. In RIIO-ED1, each DNO was awarded NIA as a percentage of their base revenue. This ranged from 0.5% if its submission met the defined minimum requirements on innovation to 0.7% of base revenue where Ofgem determined that a DNO had exceeded these.

3.120 In their Business Plans, SPEN, NPg and ENWL sought increases in NIA funding relative to their RIIO-ED1 allowance. Please refer to the relevant company annexes for our views on the justifications provided.

Approach to assessment

3.121 As set out in our SSMD[38], we expected DNOs requesting RIIO-ED2 NIA to evidence that:

- they have identified areas in which to target NIA funding that are high-risk and in need of ring-fenced innovation stimulus

[36] RIIO-ED2 SSMD Overview Document, Paragraph 4.91 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[37] RIIO-ED2 SSMD Overview Document, Paragraph 4.97 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[38] RIIO-ED2 SSMD Overview Document, Paragraphs 4.95 – 4.96 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

- they are proposing to undertake other innovation as BAU activities during RIIO-ED2
- their proposals incorporate the application of best practices
- there are clear processes to rollout proven innovation into BAU and they are already doing so
- there are processes in place to monitor, report and track innovation spending, submitting evidence that they are already doing so.

3.122 When assessing DNOs' bids for NIA against these criteria, we considered the strength of this evidence and supporting justification provided. We also assessed other relevant information, including on past innovation projects funded through the NIA, the information provided by DNOs in their annual reporting, information submitted by DNOs to support our recent evaluation of innovation stimulus funds,[39] and the views of the CEGs and RIIO-ED2 CG.

3.123 We scored DNOs against each of the criteria at paragraph 3.21 and weighted them equally. We propose that DNOs who presented satisfactory evidence against all five criteria should receive the lower of, either, an annual allowance benchmarked against RIIO-ED1, or an annual equivalent of their requested RIIO-ED2 allowance. We calculated DNOs' proposed NIA as an annual figure initially. We propose to implement a sector-wide equal benchmark of the average of 0.5% of RIIO-ED1 base revenue annually for DNOs who presented satisfactory evidence and justification against our five NIA criteria. Where evidence was not satisfactory, the RIIO-ED1 benchmark would reduce (to 0.4% for a score of 4 out of 5, and so on).

3.124 We then assessed whether any of the DNOs had provided evidence that justifies awarding more NIA than was available in RIIO-ED1. If a DNO provided a strong, well-evidenced case, we would increase its allowance accordingly.

Consultation position

NIA	
Provision of NIA funding	We propose to make available £66.9m in NIA funding.

[39] We published a call for evidence to support our evaluation of RIIO-1 and RIIO-2 innovation funds in November 2021 https://www.ofgem.gov.uk/publications/call-evidence-evaluation-riio-1-and-riio-2-innovation-funds

NIA	
Reviewing NIA funding by 2025	We propose to provide DNOs initially with an allowance equivalent to 3 regulatory years, and that projects must start within the first three regulatory years. In 2025, we would review whether more NIA funding is needed for regulatory years 4 and 5.
Flexibility to allocate funds	DNOs would have a use-it-or-lose-it (UIOLI) allowance defined in £m, with flexibility to allocate funds across RIIO-ED2.

3.125 Our proposed allowances for each DNO are set out in

3.126 Table 5 and in Chapter 5 of each company annex.

3.127 We propose to award NIA as a fixed allowance in RIIO-ED2 with flexibility for DNOs to allocate funds across regulatory years. This is consistent with the approach taken to the other RIIO-2 sectors. We also propose that DNOs will be required to register and start projects within the first three years of RIIO-ED2, ie before April 1 2026. Such projects can still run throughout the full price control period, maintaining flexibility for the use of allowances over that time.

Table 5 Proposed RIIO-ED2 NIA allowances

DNO group	NIA funding requested for 2023 – 2028 (annual equivalent)	Satisfactory evidence presented against NIA criteria	Annual figure	Proposed initial NIA RIIO-ED2 award, to be reviewed in 2025
ENWL	£25m (£5m)	5/5	£2m	£6m
SSEN	£17.5m (£3.5m)	4/5	£3.2m	£9.6m
SPEN	£35m (£7m)	5/5	£3.7m	£11.1m
UKPN	£25m (£5m)	5/5	£5m	£15m
NPg	£25m (£5m)	4/5	£2.5m	£7.5m
WPD	£30m (£6m)	4/5	£5.9m	£17.7m
Total	£156.5m			£66.9m

Rationale for consultation position

Applying our SSMD criteria

3.128 We found three DNOs to have satisfactorily met our five NIA criteria, and the remaining three to have met four of five NIA criteria. Following our review of

Business Plans and our wider evaluation of the RIIO innovation funds,[40] we have concerns about several DNOs' practices with regards to quantifying and monitoring the benefits from innovation activities. Three DNOs did not provide evidence to demonstrate they have in place a process to track and monitor innovation benefits. Monitoring benefits is a prerequisite for realising benefits from projects once they have closed, and we therefore have doubts about the robustness of these DNOs' framework to rollout innovation to BAU. These concerns lead us to propose a reduced NIA award relative to annual RIIO-ED1 levels for these DNOs.

3.129 We welcome stakeholder views on whether we have weighted the NIA criteria appropriately, or whether gaps in DNOs' processes with regards to monitoring project benefits, and hence rolling out innovation to BAU, should carry heavier weight, and therefore lead to a higher reduction in NIA than proposed.

3.130 Our review also showed that, across all sectors, more work is needed by network companies to establish a consistent framework for robustly monitoring and reporting on innovation spend and benefits. We note that DNOs, together with other energy network companies and the Energy Networks Association, have developed the Innovation Measurement Framework (IMF).[41] The IMF is intended to provide stakeholders with an accurate and comparable representation of the benefits of investing in network innovation.

3.131 We note that some DNOs have begun to implement the IMF, but it is not clear that benefits are being quantified on a consistent basis, and that the IMF will report on innovation benefits realised through roll-out to BAU. As part of their consultation response, DNOs should provide evidence to satisfy us that the IMF is robustly quantifying the benefits created by innovation on a consistent basis across DNOs.

Reviewing NIA for regulatory years 4 and 5

3.132 As previously indicated,[42] we intend to review the arrangements for the NIA in light of the ongoing development of our other innovation stimulus mechanism, the SIF. By 2025, we will consider whether changes are needed to the innovation stiumulus package, and therefore propose to award NIA initially only at a level

[40] As above, https://www.ofgem.gov.uk/publications/call-evidence-evaluation-riio-1-and-riio-2-innovation-funds
[41] The Innovation Measurement Framework is contained in chapter 5 of the ENA's Energy Networks Innovation Process document https://smarter.energynetworks.org/enip/
[42] Cover letter Consultation on SIF Governance Document | Ofgem

equivalent to three regulatory years. We will then review whether DNOs should be awarded additional NIA for the final two years of RIIO-ED2, consult on the value for each DNO, and, if necessary, amend the licence in accordance with the statutory modification process.

3.133 This will enable us to consider alignment of the RIIO-ED2 Innovation Stimulus with potential future reforms in other sectors as a result of the development of RIIO-3.[43] Considering alignment will allow electricity distribution consumers to benefit from the learnings and experiences of operating the SIF and NIA alongside one another, and support the aims of the SIF to promote collaboration between energy network companies across sectors.

Implementing a sector-wide RIIO-ED1 benchmark

3.134 Where we are benchmarking a DNOs' allowance against RIIO-ED1, we propose to align with what was available annually in RIIO-ED1, but to equalize this across the sector as at most 0.5% of base revenue, rather than benchmarking against each DNOs' respective ED1 allowance.[44] This approach to benchmarking maintains fairness between consumers in each DNOs' area, as it awards NIA based on updated submissions, and each DNOs' performance against the RIIO-ED2 SSMD criteria, rather than based on their RIIO-ED1 innovation strategies.

Consultation questions

Core-Q8. Do you agree with our proposed approach to weighting SSMD criteria and benchmarking RIIO-ED2 NIA requests against RIIO-ED1?

Core-Q9. Do you agree with our proposed approach to setting NIA allowances?

Closing out RIIO-ED1 NIA

Carry-over RIIO-ED1 NIA	
Purpose	To prevent abrupt ending of some NIA projects, and potential reductions in innovation activity.
Benefits	To enable project delivery and completion, and resulting lessons learned to be shared across industry, with potential consumer benefits.

[43] In 2023, we will issue our consultation on the RIIO-3 sector-specific methodology for the Electricity Transmission, Gas Transmission and Distribution, and the Electricity System Operation sectors.
[44] In ED1, DNOs were awarded NIA at the value equivalent to: 0.5% of base revenue for SSEN, SPEN, UKPN and WPD; 0.6% for NPg; and 0,7% for ENWL.

Background

3.135 RIIO-ED1 NIA funds are provided on an annual 'use it or lose it' basis. As such, all expenditure on RIIO-ED1 NIA projects must be incurred by 31 March 2023 or the allowances will be lost.

3.136 As set out above in paragraph 3.118, we decided in our SSMD to narrow the scope of the RIIO-ED2 NIA, so that projects must relate to longer term energy system transition challenges and, or consumer vulnerability issues, which means that projects that focus only on operation and maintenance improvements for instance, will be out of scope in RIIO-ED2. This may mean that some longer term NIA projects which have no direct link to the new themes could be cut shorter than optimal.

3.137 Moreover, several DNOs raised concerns about the deliverability of some of their planned NIA projects in the context of global supply chain shortages.

Consultation position

Carry-over RIIO-ED1 NIA	Consultation position
End date for spending RIIO-ED1 NIA funds	Allow companies to carry over any unspent NIA funds from the final year of RIIO-ED1 into the first year of RIIO-ED2.

3.138 We propose to allow unspent 2022/23 RIIO-ED1 NIA funds to be carried forward into 2023/24 (the first year of RIIO-ED2). We would require that projects utilising these carried-over funds must start before 31 March 2023. Any unspent 2022/23 RIIO-1 NIA funding would be lost on 31 March 2024.

3.139 This should enable RIIO-ED1 NIA projects to be delivered and completed during the course of 2023/24. Consumers will benefit because the proposal would enable projects to be completed and with resulting lessons learned to be shared across the industry.

Consultation question

Core-Q10. Do you agree with our proposal to allow DNOs to carry over any unspent NIA funds from the final year of RIIO-ED1 into the first year of RIIO-ED2?

Delivering an environmentally sustainable network

3.140 The distribution network and related business activities can be harmful to the environment and stakeholders expect the companies to take appropriate steps to mitigate their environmental impacts, such as pollution to the local environment, loss of visual amenity, and a reduction in biodiversity.

3.141 In this section, we set out our consultation position on the environmental elements of the RIIO-ED2 Business Plans. This includes:

- the Annual Environmental Report ODI-R (AER)
- common elements of the Environmental Action Plans (EAPs)
- the Environmental Re-opener
- visual amenity in designated areas provision
- the environmental ODI-F ("Environmental Scorecard")
- polychlorinated biphenyl (PCB) volume driver.

3.142 Our consultation positions on the bespoke environmental proposals can be found in the company-specific annexes.

Annual Environmental Report (ODI-R)

Annual Environmental Report	
Purpose	To ensure the DNOs are reporting transparently on the environmental impacts arising from their networks and demonstrate what they are doing to mitigate these.
Benefits	To bring greater awareness on the environmental impacts that arise from network activities and increase transparency on their actions and plans to decarbonise in line with net zero.

Background

3.143 In our SSMD, we decided that DNOs should be required through a new Licence Obligation and reputational ODI to develop and publish an AER detailing their progress in activities outlined in their Business Plans and against their targets, using the agreed metrics from their EAPs.[45] To ensure maximum efficacy, we will consult with DNOs separately to determine a common format for the report.

[45] RIIO-ED2 SSMD Annex 1, Paragraph 9.33 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Consultation position

Output parameter	Consultation position
Annual Environmental Report	We propose that DNOs do the following: • Track, measure, and report annually against targets and activities as set out in their EAPs using methodologies approved by Ofgem. This will include Key Performance Indicators as well as efforts towards a longer-term plan to net zero by 2050. • Report on bespoke commitments as it relates to their EAPs. • Submit their AER to Ofgem annually as well as publish publicly on their respective websites for interested stakeholders.
Mid-period review	As part of the AER, we propose that DNOs do the following: • Report against mid-period targets so to ascertain their performance in specified environmentally related aspects of RIIO-ED2 before the completion of the price control period.

Rationale for consultation position

3.144 We consider that an annual report would drive the DNOs to consistently improve their environmental performance throughout RIIO-ED2 and hold them accountable to their respective EAP commitments and targets on a yearly basis. We further consider that a public report will increase the transparency of the DNOs environmental impact and enable comparability of performance between DNOs. As such, it should drive consumer and societal benefits.

3.145 We consider a review of progress made in the first half of the RIIO-ED2 price control to be beneficial to consumers. It would illustrate if DNOs are on track to meet their targets or where performance may be lacking. This could take the form of a RAG rating based on mid-period targets, which are to be confirmed by the DNOs. We will consult on the Environmental Reporting Guidance which will set out the process and we will continue to engage with the DNOs between Draft Determinations and Final Determinations to confirm mid-period targets and other features to a mid-period review.

3.146 We will consult separately with the DNOs on the process and format of a mid-period review.

Consultation question

Core-Q11. Do you agree with our proposed approach for the Annual Environmental Report ODI-R?

Core-Q12. What are your views on the proposed mid-period review on DNO environmental performance and their progress to targets?

Environmental Action Plan commitments and targets

Background

3.147 In our SSMD, we decided to adopt the common environmental framework, as applied in the RIIO-2 price controls for the other sectors. This required DNOs to outline the activities they will undertake to work towards the realisation of an environmentally sustainable network in their RIIO-ED2 Business Plans in the form of an EAP[46].

3.148 In our SSMD, we decided that the DNOs would be required to report on their EAP commitments in the AER. For additional detail on the AER, see section above.

Consultation position

Output parameter	Consultation position
Business Carbon Footprint (BCF)	We propose to accept all the DNOs' proposals submitted through their respective Business Plans subject to the following conditions or amendments for specific areas: **Reducing BCF** Our consultation position on WPD's bespoke CVP proposal for achieving a 1.5C science-based target (SBT) is set out in the WPD Annex. **Reducing building energy usage** All DNOs have proposed low carbon technology installations (eg., solar PV arrays) as a means of reducing emissions from their built environment. Our consultation position is that baseline funding for these projects is subject to submission of evidence to address concerns regarding SLC 43B (Prohibition on Generation). **EVs and charging infrastructure** Our consultation position on WPD's bespoke PCD proposal is set out in the WPD Annex. **Carbon offsetting or removal** UKPN, WPD, and SPEN have proposed to spend consumer funds on carbon offsetting to achieve net zero. We request that the DNOs submit further information as part of their respective consultation response. For further detail, see Appendix 1 of this document. Our consultation position on SSEN's bespoke PCD for nature-based carbon removal is set out in their company-specific annex.
Sulphur hexafluoride (SF_6)	We propose to accept the DNOs' proposals for activities regarding SF_6 without amendment. Our consultation position

[46] RIIO-ED2 SSMD Annex 1, Paragraph 9.25 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Output parameter	Consultation position
	on SSEN's bespoke PCD proposal for SF_6 asset replacement is set out in the SSEN Annex.
Electricity distribution losses	We propose to accept the commitments made by the DNOs in their distribution losses strategies without any amendment.
Embodied carbon	We propose to accept the DNOs' proposals without amendment.
Supply chain management	
Resource use and waste	
Biodiversity and/or natural capital	We propose to accept the proposals submitted by ENWL, UKPN, WPD, and NPg without amendment. Our consultation positions on SPEN's and SSEN's bespoke outputs are set out in the respective company annexes.
Fluid-filled cables	We propose to accept the DNOs' proposals submitted subject to the request for additional information and evidence. For further detail, see Appendix 1 of this document.
Noise pollution	We propose to accept the DNOs' proposals without amendment.
Polychlorinated biphenyls (PCBs)	We propose a common volume driver to address the uncertainty around asset replacement so that DNOs can meet their compliance obligations while protecting consumers.

Rationale for our consultation position

3.149 We propose to accept the majority of the DNOs' EAP commitments, subject to certain conditions or amendments in specific areas. This is because we consider that the EAP commitments should lead to a significant improvement in the environmental performance of the distribution networks by 2027-28 and justify the cost of the EAP commitments covered in this chapter.

3.150 In Appendix 1 of this document, we provide more detail on the DNOs' EAP proposals in line with our baseline expectations and the rationale for our consultation position on the specific commitments in each area.

Consultation question

Core-Q13. Do you agree with our consultation position for the DNOs' EAP proposals in RIIO-ED2 as set out in this document? (Further detail included in Appendix 1 of this document)

Environmental Financial Incentive

Background

3.151 In our SSMD, we decided to develop a financial incentive for areas of the EAP which were controllable and measurable and where there is sufficient data to

enable robust targets to be set.[47] This was to take the shape of an Environmental Scorecard, as included in RIIO-T2.

Consultation position

Output parameter	Consultation position
Financial ODI	We are proposing to withdraw the Environmental Scorecard and incentivise improvements in environmental impacts through the Annual Environmental Report (AER) only.

Rationale for consultation position

3.152 We are proposing to withdraw the Environmental Scorecard for RIIO-ED2. We consider that the AER, with a mid-period review, is best positioned to support greater environmental ambition and action in RIIO-ED2.

3.153 We believe that withdrawing the Environmental Scorecard is in the best interest of consumers for the following reasons:

- we are of the view that the proposed EAP[48] areas considered for inclusion within the scorecard carry a small materiality meaning that a reward or penalty may not be proportionate to drive performance over and above an ODI-R
- we identified that certain proposed EAP areas considered for inclusion are subject to an evolving legislative landscape as well as pose the risk of creating a perverse incentive to replace assets where it is not economic and efficient
- we identified that there will be a small marginal benefit to consumers associated with the impact areas for implementation in the Environmental Scorecard
- we recognise that in the majority of the impact areas there are factors that could impact the DNOs' performance which means that the DNOs may be unduly rewarded or penalised for factors outwith their control
- we identified that there is lack of sufficient data for setting baseline and stretch targets and uncertainty due to the impacts of the COVID pandemic.

3.154 We believe that the obligations under the AER are the appropriate driver for activities to reduce the environmental impacts arising from the networks as well

[47] RIIO-ED2 SSMD Annex 1, Paragraph 9.35 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[48] Areas included from the Environmental Scorecard in RIIO-T2 Final Determinations: Operational transport emissions, business mileage, waste recycling, waste reduction, water use, and biodiversity net gain on net network projects.

as to deliver on wider decarbonisation objectives. The AER will encourage transparent reporting of activities to hold DNOs to account while also supporting enhanced data quality, information-sharing, and comparability. Further details on the AER can be found earlier in this section.

3.155 Ensuring that DNOs decarbonise their own networks and mitigate the wider environmental impact of network activity continues to be a priority for Ofgem and to ensure that DNOs deliver against these key objectives, we will pursue transparent and robust environmental reporting. We consider this consultation position to be most appropriate and that the AER will be an effective driver of performance.

Consultation question

Core-Q14. Do you agree with our proposal to withdraw the Environmental Scorecard ODI-F for RIIO-ED2?

Visual Amenity in designated areas provision

Visual amenity in designated areas provision	
Purpose	To fund projects that mitigate the impact of existing infrastructure on visual amenity in National Parks, Areas of Outstanding Natural Beauty and National Scenic Areas.
Benefits	To protect the quality of visual amenity in National Parks, Areas of Outstanding Natural Beauty and National Scenic Areas for the enjoyment of current and future consumers.

Background

3.157 In our SSMD we decided to retain the undergrounding scheme and maintain the RIIO-ED1 methodology for calculating the funding pot for RIIO-ED2.[49] Regarding the Willingness-to-Pay (WTP) value used to set the funding pot, we decided to uplift the WTP value to consider inflation to £3.14 per customer over the RIIO-ED2 price control.

3.158 In our SSMD we decided to allow DNOs to spend up to 10% of their allowance on undergrounding overhead lines that are located outside the boundaries of designated areas.[50]

Consultation Position

UM Parameter	Consultation position
Value of UIOLI Allowance	Total value of the funding pot is £46.8m in 2020-21 prices. To retain methodology from RIIO-ED1 for calculating the funding pot for RIIO-ED2 through a UIOLI and allow for no baseline funding for ED2 projects.

Rationale for Consultation Position

3.159 We propose to set the cap at £46.8m following the WTP value and using updated customer numbers and adjusted for a 5-year price control. Due to the inclusion of Visual Amenity in both our totex and disaggregated assessments and our method of disaggregating allowances, this number is lower than that produced by the visual amenity disaggregated model but is in line with DNO submitted costs.

3.160 We calculate individual DNO allowances by dividing the total pot between DNOs first by number of customers and second by the length of lines to be undergrounded in each licensed region. The undergrounding allowance for each

[49] RIIO-ED2 SSMD Annex 1, Paragraph 9.73 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[50] RIIO-ED2 SSMD Annex 1, Paragraph 9.77 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

DNO is the average of these two values. Our proposed Visual Amenity allowance does not include ongoing efficiency given the cost activity as a whole is proposed to be subject to UIOLI funding.

Table 6 Visual Amenity modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	6.3	5.4	-0.9	-14%
NPgN	5.1	4.4	-0.7	-13%
NPgY	5.1	4.6	-0.6	-11%
WMID	2.0	1.7	-0.3	-13%
EMID	1.3	1.1	-0.2	-13%
SWALES	1.1	0.9	-0.1	-12%
SWEST	2.3	1.9	-0.4	-19%
LPN	0.0	0.0	0.0	0%
SPN	7.4	7.1	-0.3	-5%
EPN	6.9	6.3	-0.6	-8%
SPD	1.9	1.7	-0.1	-8%
SPMW	2.7	2.5	-0.2	-9%
SSEH	4.0	3.3	-0.7	-17%
SSES	7.0	5.8	-1.2	-17%
Total	53.1	46.8	-6.3	-12%

Environmental Re-opener

Environmental Re-opener	
Purpose	To accommodate environmental legislative changes within period that require a material change in the approach to DNOs' EAPs.
Benefits	To ensure the environmental framework retains flexibility to respond to legislative changes to support the timely compliance of the electricity distribution sector.

Background

3.161 In our SSMD we decided to introduce a re-opener to ensure the framework retains flexibility to respond to legislative change,[51] such as changes regarding the use of SF_6 in switchgear. The environmental re-opener is intended to cater for distinct changes in environmental legislation that require DNOs to take specific material action to ensure compliance. This is in addition to the Net Zero Re-opener, which focusses on net zero developments such as changes in Government policy.

Consultation Position

Proposals	Environmental Re-opener
Re-opener window	The re-opener mechanism could be used by Ofgem at any time during the RIIO-ED2 period.
Trigger mechanism	Authority triggered only.
Scope	We propose that the scope of the Environmental Re-opener captures changes to legislation which impact the following baseline expectations undertaken by DNOs as part of their EAPs. • Business carbon footprint • Electricity distribution losses • SF_6 • Embodied carbon • Supply chain management • Resource use and waste • Biodiversity and natural capital • Fluid-filled cables • Noise pollution
Funding Approach	Adjustments could include increasing or reducing cost allowances, adjust outputs, and/or delivery dates.
Materiality threshold	In line with the proposed RIIO-ED2 common re-opener parameters, we propose to apply a materiality threshold of 1%.

[51] RIIO-ED2 SSMD Annex 1, Paragraph 9.55 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Rationale for Consultation Position

Scope

3.162 We consider the proposed re-opener scope will help ensure that RIIO-ED2 can be adaptable to a wide range of potential environmental legislative developments.

3.163 We consider that a narrowly framed re-opener, such as for SF_6 only, would be ineffective in enabling the DNOs to respond to new or changed legislative requirements, to protect the natural environmental and/or to decarbonise their networks.

3.164 While there may be instances where the Environmental re-opener may overlap with the Net Zero re-opener, in such instances we would use the most applicable mechanism to adjust the price control. We consider the scope of the Environmental re-opener is distinct and necessary to address changes in environmental legislation that would require DNOs to take specific action to ensure compliance.

3.165 It is proposed that any uncertainty regarding PCBs is better suited to the PCB volume driver and the reporting requirements of the AER. Further details on our proposal for a PCB volume driver can be found later in this chapter.

Process

3.166 In our SSMD,[52] we decided that the design of the re-opener should be in line with our common parameters. We also committed to further consult on the design of the mechanism.

3.167 We propose that Ofgem should have the sole ability to initiate the Environmental re-opener. This is because we consider that additional flexibility may be required to decide when a significant issue needs to be addressed. However, stakeholders, including the DNOs, would be able to make representations to Ofgem on environmental legislative changes they believe are relevant and material.

Materiality threshold

3.168 As proposed in Chapter 5 of the Overview Document, our general principle is that re-openers within RIIO-ED2 must feature a specific materiality threshold which

[52] RIIO-ED2 SSMD Annex 1, Paragraph 9.57, 9.59 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

has to be met to consider the use of the mechanism. We consider this to be appropriate in this case as changes to environmental legislation which result in impacts below this should be managed within existing allowances.

Adjustments

3.169 We propose that the following changes could be made through the re-opener process:

- increases or decreases in allowed revenue
- adjustments to existing outputs and delivery dates or the introduction of new output arrangements, such as PCDs.

Consultation questions

Core-Q15. Do you agree with our proposed approach to design of the Environmental Re-opener?

PCB Volume Driver

PCB Volume Driver	
Purpose	To provide flexibility to accommodate uncertain volumes of PMT replacements so that DNOs can meet their compliance obligations under the PCB Regulations.
Benefits	To provide flexible funding for DNOs to replace PCB-contaminated PMTs in response to uncertainty while protecting consumer interests.

Background

3.170 PCBs are a group of synthetic chemicals, typically oil liquids or solids, that were banned in the UK in 1987. However, they continued to exist on distribution networks due to an exemption. In 2000, the Environmental Protection (Disposal of Polychlorinated Biphenyls and other dangerous substances) (England and Wales) Regulations 2000 ("PCB Regulations") came into force as well as a similar provision in Scotland.[53,54]

3.171 All DNOs must comply with the PCB Regulations. As such, DNOs are required to remove any transformer from service on or before 31 December 2025 if it is

[53] Amendments came into force 1 July 2020 via The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) (Amendment) Regulations 2020 (legislation.gov.uk)
[54] The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (Scotland) Regulations 2000 (legislation.gov.uk)

confirmed or can be reasonably assumed that the volume of PCBs surpasses the permitted thresholds. This applies to both ground-mounted transformers (GMTs) and pole-mounted transformers (PMTs).

3.172 Due to the possibility of PCB cross-contamination in any transformer manufactured prior to 1987, the volume of PCB-contaminated transformers is uncertain. Presently, GMTs can be tested for PCB concentration levels and, where possible, be decontaminated so that they can remain in service until the end of their life. If decontamination is not possible, the GMT must be replaced. It is not possible to test and decontaminate PMTs as they do not often have a sample point. As such, Regulatory Position Statement (RPS) 246 allows for a statistical modelling approach where the PMT must be replaced if it can be reasonably assumed or is confirmed to be contaminated with PCBs.[55]

3.173 The DNOs have proposed through their Business Plans different funding mechanisms to meet their compliance obligations which we have reviewed and considered. This section outlines our proposal to introduce a volume driver to address PCB contamination in PMTs.

Consultation position

UM Parameter	Consultation position
Scope	Subject to further information from the DNOs, we propose to set a volume driver to fund the replacement of PCB-contaminated pole-mounted transformers (PMTs).
Methodology	The form of the volume driver could be based on the unit cost of the number of individual units installed (£/unit). We are proposing to calculate licensee-specific unit costs for PMTs and to include tiered unit rates to accommodate upsizing, where appropriate and justified. Due to the legislative compliance deadline, we propose to include a sunset clause where the volume driver is no longer in effect after this date. In our view, it is not appropriate for this mechanism to exist beyond the legislative compliance deadline.

3.174 Our proposed design of the volume driver takes into account the proposals from the DNOs and is aimed at achieving a proportional mechanism that reflects the efficient costs incurred by the DNOs when meeting their compliance obligations in this area.

3.175 As such, we are proposing to implement a volume driver for PMTs which are confirmed to be or are statistically likely to be PCB-contaminated. However, we

[55] Transformers containing PCBs: new rules - RPS 246 - GOV.UK (www.gov.uk)

note that the volume driver should only capture PMT replacement activities which are not otherwise attributed to another investment driver and therefore captured via another RIIO-ED2 mechanism.

3.176 Oil testing and GMT decontamination or replacement volumes are reasonably certain and therefore are proposed to be excluded from the volume driver and funded through baseline allowances.

3.177 Where appropriate and justified, DNOs could upsize the PMT through tiered unit rates within the volume driver. We will consult with the DNOs separately on a guidance document that would outline the requirements to support such activities.

Rationale for consultation position

Scope

3.178 There is considerable uncertainty over the volumes of PMTs which need replacing predominantly due to the lack of visibility into PCB cross-contamination in transformers manufactured and installed prior to 1987. However this uncertainty is not applicable to other activities required for compliance as noted in paragraph 3.176 above. Therefore, we propose the scope of this volume driver to extend to PMTs only.

Methodology

3.179 We consider a volume driver based on the unit cost of the number of individual units installed (£/unit) to be an appropriate approach as transformer replacement is a business-as-usual activity for the DNOs and the unit costs can be reasonably determined prior to the commencement of RIIO-ED2.

3.180 When considering the lifetime of these assets and the decarbonisation objectives, we also consider the possibility of upsizing transformers to be appropriate as long as the DNOs provide sufficient evidence to justify the incremental costs to consumers.

3.181 We consider a sunset clause linked to the legislative compliance deadline to be in the best interest of consumers. This is because the volume driver is meant to ensure that consumers only pay for the assets that are mandated to be replaced relative to the DNOs' compliance obligation with the PCB Regulations.

3.182 So far, the DNOs have submitted a variety of proposals to meet their compliance obligation and address this uncertainty. We request that the DNOs provide further data and evidence for the costs and volume of work as part of their consultation responses. If this data and evidence can support the design of a robust volume driver, we propose to confirm the design in our Final Determinations, including the form and granularity of the mechanism to reflect the unit rate(s) and possible upsizing requirements. If the DNOs do not provide sufficient data and evidence, we propose to set an evaluative PCD to ensure appropriate delivery.

3.183 DNOs will also be required to report on activities undertaken to reduce PCB contamination in the AER.

Consultation questions

Core-Q16. Do you agree with our proposal for addressing PCB contamination in PMTs through a volume driver in RIIO-ED2?

4. Supporting a smarter, more flexible, digitally enabled energy system

Section Summary

In this chapter, we set out our position on the proposed package of RIIO-ED2 outputs that will support a smarter, more flexible, digitally enabled energy system. These include Licence Obligations (LOs), ODIs and other new arrangements for data and digitalisation, and regulating DSO functions.

We are also putting in place arrangements to enable changes to roles and responsibilities, if required, and using incentives and implementing mechanisms to drive and enable whole system solutions.

4.1 A smarter, more flexible, digitally enabled energy system will require more active management of the flows of energy across the networks. The interconnected nature of the electricity networks and the wide variety of resources that are now connected at different voltage levels requires DNOs to maximise efficiencies across the whole energy system. New technologies and resources can help to smooth out peaks and minimise the need for investment in traditional network infrastructure. All of this will require better and more easily accessible data than is currently available.

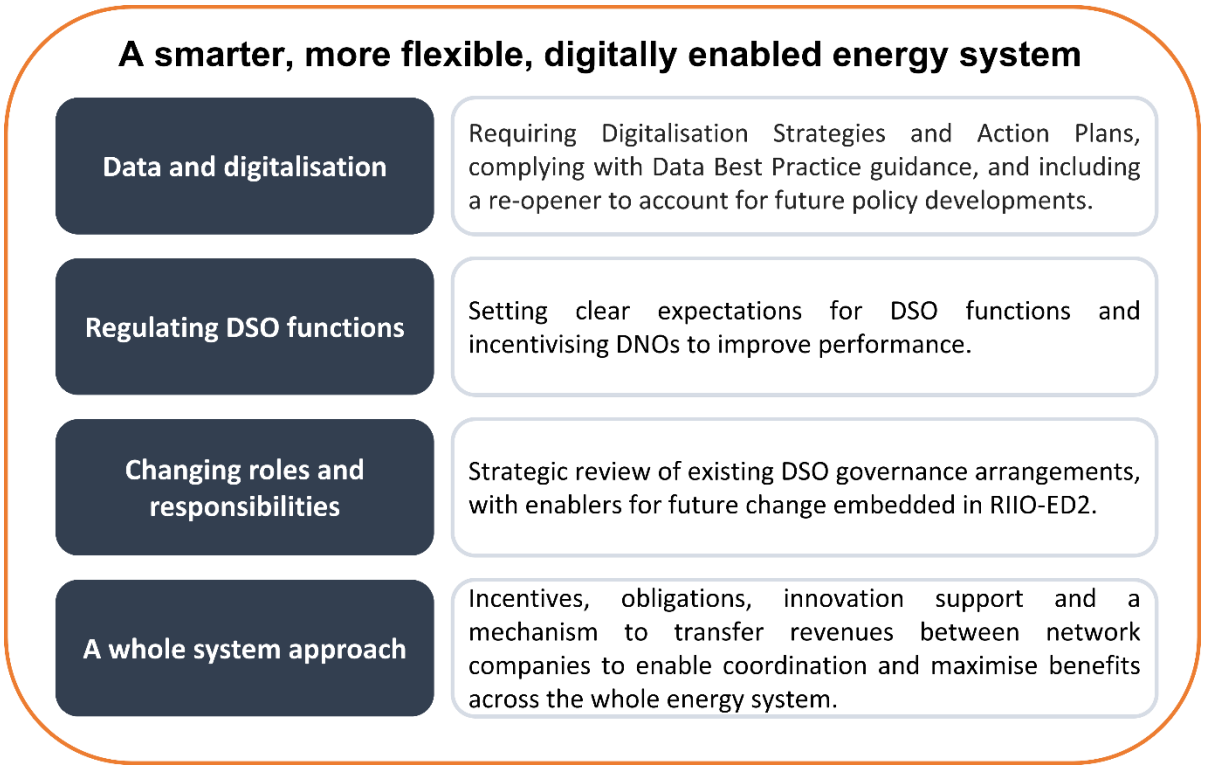
4.2 Our proposals in this chapter build on the outputs that we set out in our SSMD. Smart optimisation will be delivered by investment in network monitoring, data and digital processes and new DSO functionalities. Through the installation of physical monitoring and advanced analytics, DNOs will acquire a fuller understanding of their LV network and be subject to an incentive on the speed and penetration of this rollout.

4.3 There are four strands to how we propose RIIO-ED2 will support the energy system transition:

- first, we are proposing an obligation to consult stakeholders and publish Digitalisation Strategy and Action Plans and comply with Data Best Practice, as well as including a Digitalisation re-opener to increase adaptability relating to Data and Digitalisation roles and responsibilities

- second, we are proposing a DSO incentive to drive DNOs to more efficiently develop and use their network, taking into account flexible alternatives to network reinforcement
- third, we recognise there is scope for DSO roles to evolve and there are questions about enduring institutional arrangements, and we are proposing a DSO re-opener to reassign costs and outputs if needed within the RIIO-ED2 period
- fourth, we need arrangements to ensure that DNOs take into account the impacts across the whole system in the operation of the distribution networks.

Figure 7 An overview of Chapter 4



Data and Digitalisation

4.4 The BEIS Smart Systems and Flexibility Plan 2021 recognises Data and Digitalisation as an essential requirement for realising a smart and flexible energy system.[56] BEIS estimates that by 2050, improved system flexibility enabled by Data and Digitalisation could reduce overall UK energy system costs by up to £10bn annually and create up to 24,000 jobs.

[56] Transitioning to a net zero energy system: Smart Systems and Flexibility Plan 2021 (publishing.servicegov.uk)

4.5 We expect that Data and Digitalisation will drive system-wide benefits for the electricity sector in terms of increased efficiencies while enabling innovators to access the data they need to deploy novel business models including Demand-Side Response (DSR) and deployment of low-carbon infrastructure.

4.6 RIIO-ED2 will represent a step change for DNOs with regards to Data and Digitalisation. DNOs will not only be modernising their internal data processes and capabilities to provide efficiency gains, but also to provide stakeholders and ultimately consumers with key digital services to drive value across the energy system.

4.7 As part of their Business Plans, we asked DNOs to submit a Digitalisation Strategy and Action Plan (DSAP), which served as both an illustration of Data and Digitalisation costs in the Business Plan, and as a justification (from stakeholder engagement) for the Data and Digitalisation elements of the Business Plan. The DSAP was supported by individual investment proposals for the key digital deliverables proposed in RIIO-ED2.

4.8 In our view DNOs have proposed Data and Digitalisation outcomes which are clearly linked to stakeholder needs and Business Plan outputs. The proposed deliverables are consistent with Data Best Practice (DBP).[57]

4.9 We are confident that DNOs are proposing system architectures that incorporate both the necessary data platforms and data processes needed to improve their digital capabilities and seek to enable services required by the overall energy system. This includes the capability to capture, triage and publish network datasets, noted by the Energy Data Taskforce as a key requirement to deliver a digitalised energy sector.[58]

4.10 From our review of the Data and Digitalisation proposals and associated CBAs we received from the DNOs they appear to offer value for money, with benefits to consumers, the sector, and the DNOs themselves being delivered during RIIO-ED2 and with substantial benefits realised in RIIO-ED3 as the deployment of low carbon technologies increases significantly.

4.11 This Data and Digitalisation section summarises our proposals for RIIO-ED2. Specifically:

[57] Data_Best_Practice_Guidance_v1.pdf (ofgem.gov.uk)
[58] https://es.catapult.org.uk/report/energy-data-taskforce-report/

- we are proposing to implement a Digitalisation Licence Obligation in RIIO-ED2. The purpose of this Licence Obligation is to require the DNOs to make their intentions and plans for digitalisation of their energy network and associated services for data publicly available, and to comply with Data Best Practice
- we are proposing to include a "Digitalisation" re-opener in Year 3 of the RIIO-ED2 price control. There is significant uncertainty associated with the future digital energy roles and responsibilities for DNOs and, hence, the digital products and services they will be required to deliver. This proposed re-opener will allow DNOs to change their IT and Digital estates in response to emerging changes in the structure of the UK energy sector
- we are proposing to require all licensees to use the Technology Business Management (TBM) Taxonomy[59] to report on their IT and Digital estate during the price control. The total spend on IT and Digital Estates is now significant, therefore the taxonomy will provide enhanced transparency and comparability across the DNOs' Information Technology, Operation Technology, and Data and Digitalisation spend
- we are proposing to run an innovation project to test modernisation of the regulatory reporting process. This innovation project will aim to simplify and develop more cost-effective regulatory reporting. If successful we intend to implement any changes to the regulatory reporting process in Year 3 of the price control.

Digitalisation Licence Obligation

Digitalisation Licence Obligation	
Purpose	Provide an obligation for DNOs to consult stakeholders and publish Digitalisation Strategy and Action Plans, and to comply with Data Best Practice
Benefits	Enhanced transparency to stakeholders, and the ability for stakeholders to influence DNO plans. Increased consistency between DNOs with regards to data sharing and utilisation

Background

4.12 All DNOs are currently voluntarily adopting the "Digitalisation" Licence Obligation that applies to transmission, gas distribution and the Electricity System Operator companies regulated by the RIIO-2 price controls. This Licence Obligation requires

[59] TBM Council Homepage - Technology Business Management

DNOs to produce DSAPs and operate using DBP principles. There are two guidance documents associated with the RIIO-2 price control that outline how to produce DSAPs[60] and how to comply with DBP.[61]

4.13 In our SSMD[62], we proposed to apply the cross-sector policy position we adopted for the other sectors RIIO-2 price controls. We are proposing to maintain that position, introducing the Digitalisation Licence Obligation on DNOs to make information publicly available about their intentions and plans for digitalisation of their network and associated services for data.

Consultation position

Output parameter	Consultation position
Produce Digitalisation Strategies and Action Plans	Maintain the position from the RIIO-2 GD&T price control, as set out in our SSMD. DNOs will be required to produce Digitalisation Strategies every two years from 1 April 2023 and Action Plans every six months from 30 June 2023.
Adhere to Data Best Practice	Maintain the position from the RIIO-2 GD&T price control. DNOs will be required to abide by Data Best Practice guidance.

Rationale for consultation position

4.14 We are proposing to introduce a Digitalisation Licence Obligation, which already exists in the RIIO-2 GD&T licences. We believe consistency is important across all network companies, to ensure companies are acting in the best interests of stakeholders and consumers. Common requirements also help drive collaboration between network companies, including through the ENA's Data and Digitalisation Steering Group.[63]

4.15 We propose to update the DSAP and DBP guidance documents to point towards the RIIO-ED2 price control. We view this as more appropriate than having separate guidance documents for each sector. We will consult on any proposed changes to these guidance documents before the start of the RIIO-ED2 price control period.

[60] https://www.ofgem.gov.uk/sites/default/files/2021-11/Digitalisation_Strategy_Action_Plan_Guidance_v1.pdf
[61] https://www.ofgem.gov.uk/sites/default/files/2021-11/Data_Best_Practice_Guidance_v1.pdf
[62] RIIO-ED2 SSMD Overview Document, Paragraph 5.4 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[63] https://www.energynetworks.org/creating-tomorrows-networks/modernising-energy-networks-data

4.16 Our proposed Licence Obligation requires licensees to publish their first Digitalisation Strategy on 1st April 2023, with publications due once every two years. DNOs will be required to publish their first Digitalisation Action Plan on the 30th June 2023 with publications due once every 6 months.

4.17 Digitalisation Strategies provide stakeholders and consumers with the opportunity to better understand the DNOs' approach to digitalising the energy system, surfacing key datasets, efforts to ensure commonality of approach and overall improvement of digital services. Digitalisation Action Plans provide updates to the delivery of the Digitalisation Strategies. We believe a 2-year cycle strikes the right balance between transparency and regulatory reporting burden, as in the RIIO-2 price controls.

4.18 While Digitalisation Strategy publications are not aligned with the publications for RIIO-2 GD&T licensees (who publish their Digitalisation Strategies) in 2024 and every 2 years), we consider that delaying publication of the first DNO Digitalisation Strategy by a year, presents significant loss of valuable information to wider stakeholders that is not proportionate to the value gained from aligned publications.

4.19 We are not proposing to amend the core principles[64] contained within our DBP guidance as part of this price control, as we believe the principles are applicable to all energy sector participants. We will, however, consult with stakeholders and issue supplementary guidance for DNOs to consider in their application of these principles by the end of 2022.

Consultation questions

Core-Q17. Do you agree with our proposal for implementing a Digitalisation Licence Obligation?

Core-Q18. Do you agree with our proposal to have staggered publications of Digitalisation Strategies between RIIO-ED2 and RIIO-2 licensees?

Digitalisation Re-opener

Digitalisation Re-opener	
Purpose	To introduce an increased level of adaptability into the RIIO-ED2 price control by providing a means to amend the price control in response to changes relating to Data and Digitalisation roles and responsibilities.

[64] Data_Best_Practice_Guidance_v1.pdf (ofgem.gov.uk) Page 3, Data Best Practice Principles

Benefits	To allow for necessary amendments within the RIIO-ED2 period, as opposed to waiting until the settlement of the subsequent price control.

Background

4.20 The digital energy landscape is undergoing fundamental and rapid change, a crucial undertaking for reaching net zero. Through their proposals for this price control, DNOs are modernising to better enable net zero, and to provide digital products and services to the energy sector.

4.21 Data and Digitalisation is a rapidly evolving policy area in the energy sector. Regulators and policymakers are having to act flexibly to deliver necessary reforms and ensure consumers are receiving the right products and services from sector participants. There are likely to be policy changes that take place during the RIIO-ED2 price control.

Consultation position

UM parameter	Digitalisation Re-opener
Re-opener window	24 January 2026 - 31 January 2026, or by Ofgem at any time during RIIO-ED2.
Scope	We propose this re-opener may be used where there has been a material shift in the roles and responsibilities of the licensee due to a change in legislation, licences, or industry codes, and as a result there is a requirement for the licensee to provide new, or significantly altered, digital or data services.
Materiality threshold	In line with the proposed RIIO-ED2 common parameters, we will apply a materiality threshold of 1%.

Rationale for consultation position

4.22 Changes in the energy sector may require the DNOs to establish new products and services and interfaces, and to that extent, we are proposing to introduce a common re-opener to all the DNOs relating to Data and Digitalisation. We are proposing a single window re-opener in January 2026 and require a materiality threshold of 1% in line with the RIIO-ED2 common parameters. We propose that Ofgem would also be able to trigger this re-opener at any time during the price control.

4.23 There are some uncertainties in the future of the energy sector that may impact DNOs. These include:

- the Energy Digitalisation Taskforce recommendations[65] and any potential energy sector reforms that take place in the implementation of any of the recommendations. These could create additional Data and Digitalisation requirements for the DNOs
- the Future System Operator may have co-ordinating roles related to Data and Digitalisation in the energy sector. This co-ordination may require interaction with DNOs' data structures
- the evolving landscape around smart meter infrastructure and third-party service providers.

4.24 This re-opener therefore gives DNOs the ability to respond to the needs of the GB energy system and provide significant value if responded to during RIIO-ED2 rather than delaying until future price controls.

Consultation question

Core-Q19. Do you agree with our proposed Digitalisation re-opener?

IT/OT/Data and Digitalisation Cost Taxonomy

IT/OT/Data and Digitalisation Cost Taxonomy	
Purpose	To introduce an agreed independent framework to monitor IT/OT/Data and Digitalisation spend on DSAP investment projects.
Benefits	Increases transparency in IT spend and comparability between DNOs and cross sector organisations.

Background

4.25 From the DNOs' Business Plans, we observe that IT, OT and Data and Digitalisation spend is increasing and converging. In the Business Plans we can see common platform components and shared spend across the DSAP investment proposals. We consider that we need enhanced transparency, and increased comparability across DNOs' IT, OT, and Data and Digitalisation spend categories.

4.26 One of our key Data and Digitalisation aims for the price control is to ensure that IT, OT, and Data and Digitalisation spend delivers the DNOs' DSAPs, in an efficient and cost-effective manner.[66]

[65] Delivering a Digitalised Energy System - Energy Systems Catapult
[66] RIIO-ED2 SSMD Overview Document, Paragraph 5.4 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Consultation Position

Output Parameter	Consultation position
Reporting IT, OT, and Data and Digitalisation spend	DNOs adopt the Technology Business Management taxonomy when describing their IT, OT, and Data and Digitalisation spend.

Rationale for consultation position

4.27 To allow us to monitor and validate delivery of their proposals and associated spending we are proposing that DNOs adopt the TBM[67] taxonomy when describing their IT, OT, and Data and Digitalisation spend.

4.28 We are proposing that the information submitted regarding the DSAP investments should include a TBM data model and, in addition to compliance with the TBM taxonomy, the data model should include an additional layer that lists the DSAP investment projects. This 'projects' layer should include fields of data about the DSAP investment projects including summary project reports. We have already adopted this process for elements of the ESO Price Control[68] and seek to replicate the process in this price control.

4.29 We plan to develop and consult on the implementation of a TBM model and supporting artifacts via the RIIO-ED2 Regulatory Instruction and Guidance (RIGS) and Regulatory Reporting Pack (RRP) process, as the adoption of TBM would negate the need for some legacy reporting artefacts.

Consultation question

Core-Q20. Do you agree with the proposed enhanced reporting framework associated with IT/OT Data and Digitalisation spend and DSAP investment proposals?

Core-Q21. Do you agree with our proposal to adopt TBM as part of the RIGs/RRP?

Modernisation of the Regulatory Reporting Process

Modernisation of the Regulatory Reporting Process	
Purpose	To leverage DNO investments in IT, OT, Data and Digitalisation to design a new cost-effective regulatory reporting process between DNOs and Ofgem.

[67] Technology Business Management (TBM) is a widely used framework that provides business alignment for all IT investments and allows for this information to be seen from a wide range of perspectives.
[68] ESO Business Plan: IT Investment Plan Guidance (ofgem.gov.uk)

Benefits	Reduces the regulatory reporting burden of the submission process. Provides Ofgem with information in a timely manner and in a stable format with which to make regulatory decisions.

Background

4.30 The existing regulatory reporting process is a legacy of the era from which it was created. At the beginning of the RIIO price controls, information could be easily transferred between DNOs and Ofgem in a standard format.

4.31 As network price controls have progressed, regulatory reporting requirements have increased to a point where the existing format for regulatory submissions is no longer functioning effectively. These processes do not utilise modern data transfer techniques.

4.32 This lack of utilisation of modern digital tools is leading to a delay between data submission and Ofgem decision-making based on the submitted data. A modernised regulatory reporting process would improve the speed at which Ofgem can review submissions.

4.33 During RIIO-ED2 DNOs will develop enhanced Data and Digital services and capabilities to collate, triage, and validate data associated with network expendature. We consider that there is opportunity to leverage these enhanced capabilities for better, more agile regulation in line with our Data and Digital Strategic Change Program (SCP) commitments in our Forward Work Programme.[69]

4.34 Ofgem (through our SCP) and DNOs (through the proposals submitted for this price control) should have the necessary digital capabilities to implement changes to the regulatory reporting process.

Consultation position

Output parameter	Consultation position
Modernising regulatory reporting	Run an innovation project to scope out a modern regulatory reporting process, with implementation during year three of the price control.

Rationale for consultation position

4.35 We are proposing to modernise the price control regulatory reporting process during RIIO-ED2, utilising modern digital technologies such as application

[69] 2022/23 Forward Work Programme Consultation | Ofgem

programming interfaces (APIs) and enhanced data services to streamline data submission from DNOs to Ofgem.

4.36 We envisage undertaking this modernisation of regulatory reporting over a multi-year, multi-stage process. We intend to involve the Transmission and Gas Distribution network companies and the Electricity System Operator in this process to align the regulatory reporting process across all energy network companies.

4.37 We intend to start an innovation project between Draft Determinations and Final Determinations. This innovation project will explore the practicalities of modernising the regulatory reporting process and determine the key design elements of a final process. We will highlight key datasets for testing these processes, both internally and externally.

4.38 This innovation project will then lead into a project we expect to last no longer than one year to finalise the design of the modern regulatory reporting process and outline a timeline for implementation of this new process. We currently envisage this implementation to be finalised by the end of year three of the price control. Until then, the regulatory reporting process will continue as normal. We will provide further updates at Final Determinations.

4.39 Modernising the price control regulatory reporting process should provide significant value to both Ofgem and the DNOs. Ofgem will benefit from faster data submissions and more easily manipulated data, leading to faster regulatory decision-making. This process should reduce the regulatory burden on DNOs and allow them to leverage their new digital capabilities to synchronise internal and external reporting processes. We believe this will accelerate the approval process for price control re-openers and allow for better assessment of Business Plans for future price controls.

4.40 We have engaged with all network companies on this proposal, both through the RIIO-ED2 cost assessment working group, and the Energy Network Association (ENA) Data and Digitalisation Steering Group.

Consultation question

Core-Q22. Do you agree with our intention to modernise the regulatory reporting process?

Core-Q23. Do you agree with the proposed timeline for implementation of this modernisation?

Regulating Distribution System Operation functions

4.41 RIIO-ED2 represents a step change for Distribution System Operation (DSO), with DNOs required to deliver enhanced and, in some cases, entirely new DSO functions and services. In the price control, we will provide clarity through our baseline expectations for DSO that we initially set out in the BPG.[70] We will also put in place an incentive framework to drive best practice in delivery. Further, we recognise that alternative governance models may help to deliver effective DSO in the long term, and we consider this further in the next section on changing roles and responsibilities.

4.42 In this section, we set out our consultation position on the RIIO-ED2 package of DSO measures. This includes:

- DSO strategies and baseline expectations
- a DSO incentive (ODI-F)

4.43 We have set out our consultation positions on bespoke outputs in the company annexes.

DSO strategies and baseline expectations

DSO strategies and baseline expectations	
Purpose	To ensure that DNOs provide the appropriate DSO functions and services to customers in RIIO-ED2.
Benefits	Avoided or deferred network reinforcement resulting in lower bills for customers.

Background

4.44 In our SSMD,[71] we introduced a minimum requirement under Stage 1 of the BPI for DNOs to submit DSO strategies that set out the DNO's proposed approach to delivering DSO capabilities in RIIO-ED2. The DSO strategies were required to demonstrate that a DNO would deliver the standard of service outlined in the activities and baseline expectations for DSO.[72]

[70] RIIO-ED2 Business Plan Guidance, Appendix 4 RIIO-ED2 Business Plan Guidance | Ofgem
[71] RIIO-ED2 SSMD Overview Document, Paragraph 5.31 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[72] RIIO-ED2 Business Plan Guidance, Chapter 4 and Appendix 4 RIIO-ED2 Business Plan Guidance | Ofgem

4.45 We also signalled in our SSMD[73] that we would work with DNOs and other stakeholders in considering whether DSO strategies could have an enduring role in the DSO incentive framework, with DNOs being required to update them before the start of and within RIIO-ED2.

Consultation position

Output parameter	Consultation position
Baseline funding for DSO activities	We propose to accept the majority of the DNOs' DSO strategy proposals without amendment, with the exception of investments where we have found weak justification in the associated Engineering Justification Paper (EJP).

Rationale for consultation position

4.46 We propose to accept the majority of the DNOs' DSO strategy proposals without amendment. Broadly speaking, DNOs have articulated the DSO transition issues prevalent in the DNO's region and have put forward coherent proposals to address them in RIIO-ED2. We believe these proposals will lead to DNOs increasing data visibility and facilitating flexibility, including energy efficiency measures and Demand Side Response (DSR), to develop more economic and efficient solutions to network reinforcement.

4.47 In total, the proposed DSO spend across all companies in RIIO-ED2 was ~£890m, almost four times the forecast spend in RIIO-ED1. While we recognise the need to invest in DSO capabilities, we are also mindful that many of these investments lack a historical equivalent or comparator in RIIO-ED1. In these instances, we relied on our assessment of the DNO's EJPs to come to a view on the appropriate allowances. We discuss our approach to cost assessment further in Chapter 7.

4.48 We recognise concerns raised by stakeholders, including the RIIO-ED2 CG, around the level of ambition and risk to delivery associated with the proposals set out in the DSO strategies. In particular, we identified the following challenges with the DSO strategies:

- the benefits associated with the delivery of the strategies are often not well evidenced. Like the RIIO-ED2 CG, we have concerns on the level of ambition

[73] RIIO-ED2 SSMD Overview Document, Paragraph 5.30, 5.39 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

and the extent to which, for example, DSO benefits will be realised through interaction with the ESO. It is also often not clear if the benefits are attributable to the actions of a DNO as opposed to other energy market developments

- forecast distribution flexibility procurement also varies significantly across the DNOs, with marked regional disparities. The information provided in the Business Plans was inconsistent, requiring extensive engagement with the DNOs to understand projections across different years/flexibility products. However, the new reporting requirements under Electricity Distribution Standard Licence Condition 31E (C31E) should improve consistency going forward[74]
- there is also an inherent risk that DSO functions and services could, by virtue of their being developed by DNOs, be centred on distribution network issues and create barriers to third-party participation in markets.

4.49 In light of these concerns, it is important that our regulatory and incentive framework for DSO holds the DNOs to account on delivering against the baseline expectations. While it would be possible to ask DNOs to provide periodic updates of their DSO strategies, we consider that applying financial rewards where DNOs exceed our baseline expectations and financial penalties where DNOs fail to meet them to be more effective. These considerations are reflected in our proposal for the new DSO incentive.

DSO incentive (ODI-F)

DSO incentive	
Purpose	To drive DNOs to more efficiently develop and use their network, taking into account flexible alternatives to network reinforcement
Benefits	Avoided or deferred network reinforcement resulting in lower bills for customers

Background

4.50 We set out in our SSMD[75] that we would introduce a new financial DSO incentive, through which we would undertake an ex post review of DNO's delivery of their

[74] Decision on the Procurement and Use of Flexibility Reporting Guidance for Electricity Distribution Licensees
[75] RIIO-ED2 SSMD Overview Document, Table 6, Paragraph 5.38 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

DSO activities. We did not specify the design of the mechanism or value of the DSO incentive in the SSMD, but said that we would consult on them at Draft Determinations. We also invited companies in our SSMD[76] to propose metrics and performance benchmarks in their Business Plans to support the development of the DSO incentive.

Approach to the assessment

4.51 Through our review of the Business Plans, we reflected on DNOs' own proposals for the potential design of the DSO incentive. This included ~100 different metrics that were proposed as a means of evaluating the DNO's progress in delivering its DSO strategy and associated outcomes, which we assessed against a set of criteria to determine their appropriateness.[77]

4.52 We also considered views expressed by the RIIO-ED2 Challenge Group, the DNOs' CEGs and stakeholder responses to the Call for Evidence on the Electricity Distribution Business Plans for RIIO-ED2.[78] These groups highlighted the need to focus on outcome-based measures, such as the customer benefits from reduced network investment costs or reduced system balancing costs. The DNOs' CEGs also highlighted the importance of continuous monitoring and stakeholder engagement. More generally, stakeholders pointed to flexibility market development and improved LV network visibility as key areas of focus.

Consultation position

Output parameter	Consultation position
Financial incentive framework	Ex post review of DNO's delivery of their DSO activities through three evaluation criteria: • Stakeholder survey (mechanistic) • Performance panel assessment (evaluative) • Outturn performance metrics (mechanistic)
Incentive value	+/- 0.2% of RoRE[79] per year
Incentive weightings	Stakeholder survey: 40% Performance panel assessment: 40% Outturn performance metrics: 20%

[76] RIIO-ED2 SSMD Overview Document, Paragraphs 5.40, 5.42 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

[77] The criteria we considered were whether a metric was relevant, outcome-focussed, robust and transparent, appropriate, verifiable, attributable and proportioned.

[78] Call for Evidence on Electricity Distribution Business Plans for RIIO-2.

[79] RoRE is the financial return achieved by shareholders in a licensee during a price control period from its actual performance under the price control.

Output parameter	Consultation position
Frequency of assessment	Annual
Reporting requirements	Regularly reported evidence (RRE) Annual DSO performance panel assessment report Annual stakeholder survey Outturn performance metrics
Evaluation criteria	The reward/penalty for each evaluation criterion is calculated individually: • Stakeholder survey: stakeholder satisfaction is measured against a common ex ante target • Performance panel assessment: a performance panel undertakes an evaluative assessment of company performance • Outturn performance metrics: outturn performance is measured against ex ante company specific targets The three values are then summated to determine the overall DSO incentive reward/penalty

Rationale for consultation position

Financial incentive framework

4.53 We propose introducing a new DSO incentive comprised of a stakeholder survey, a performance panel assessment and outturn performance metrics, each of which would be subject to an ex ante reward/penalty methodology.

4.54 We believe our proposal strikes the right balance between mechanistic and evaluative assessments, while taking into account the relative immaturity of DSO and limited availability of historical performance data. It leverages the opportunities to embed robust performance measures, capture stakeholder views and incorporate a more holistic assessment from a performance panel of technical and industry experts.

4.55 Specifically, the DSO incentive framework is intended to evaluate performance against the baseline expectations for DSO that were set out in our BPG,[80] as well as the associated delivery of DSO benefits that emanate from these activities. It is subject to the following principles:

- companies are penalised for failing to meet the baseline expectations
- companies are neither penalised nor rewarded for meeting the baseline expectations

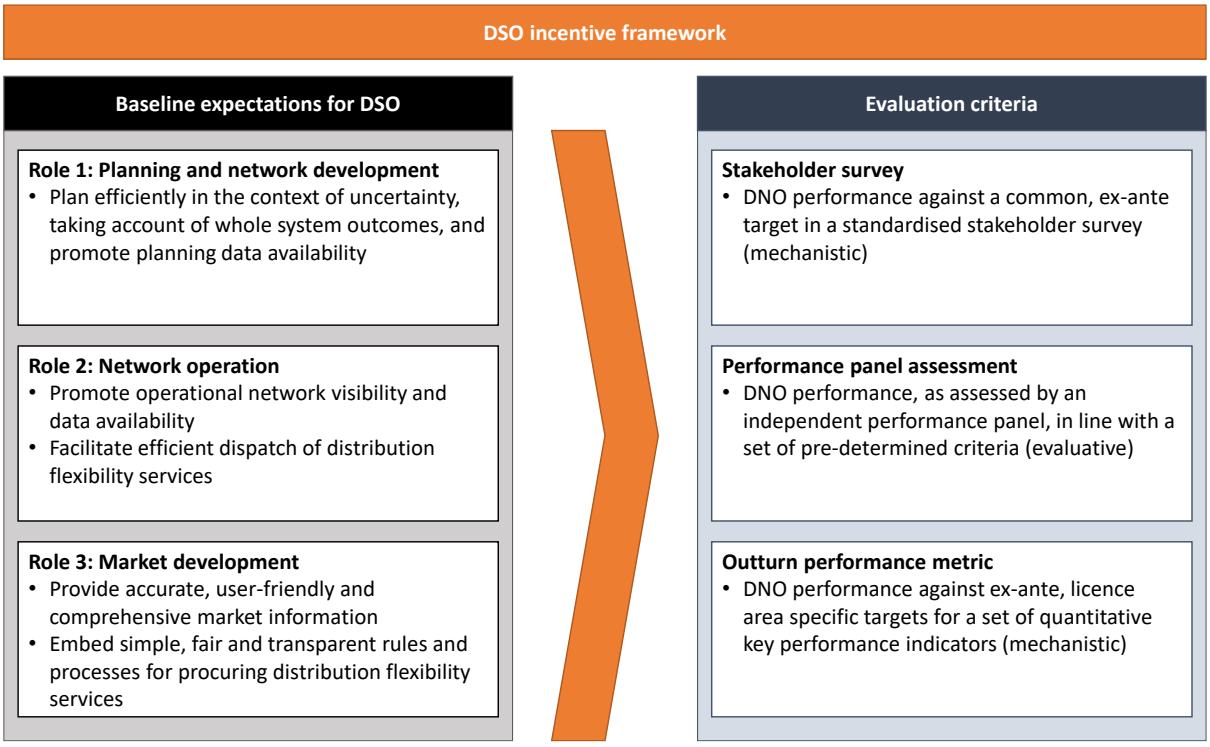
[80] RIIO-ED2 Business Plan Guidance, Appendix 4 RIIO-ED2 Business Plan Guidance | Ofgem

- companies are rewarded for exceeding the baseline expectations

4.56 For the outturn performance metrics and the stakeholder survey, we propose that the reward or penalty is determined mechanistically with reference to outturn performance against ex ante targets. A mechanistic assessment would deliver increased certainty on the outcome of assessment, enable simpler comparison across DNOs and limit the administrative burden.

4.57 For the performance panel assessment, we propose that the reward or penalty is determined by Ofgem following a recommendation from a DSO performance panel that would evaluate evidence submitted by the DNO. This assessment process is more holistic, allowing for interlinkages and dependencies to be scrutinised, and the narrative provided in a company's submission means that factors outside of its control can be considered.

Figure 8 Overview of DSO Incentive Framework



Incentive strength

4.58 The proposed DSO incentive value of +/- 0.2% of RoRE is an annual figure.[81] We believe it represents a proportionate level of risk/reward for companies given the

[81] See the Frequency of assessment section below for our proposals on how to allocate the incentive value over the price control period.

scale of DSO investment planned for RIIO-ED2 and the level of ambition set out in the DNOs' DSO strategies. We propose a symmetric incentive because we believe that the penalty associated with failing to meet the baseline expectations should be proportionate to the reward available for exceeding them, in line with the principles outlined in the preceding section.

Incentive weightings

Table 7 DSO incentive weightings

Evaluation criteria	% of total DSO incentive value
Stakeholder survey	40%
Performance panel assessment	40%
Outturn performance metrics	20%

4.59 We propose that the stakeholder survey and DSO performance panel assessment have equal weighting and account for the majority of the DSO incentive value, as set out above in Table 7. These two evaluation criteria provide a comprehensive assessment across a range of baseline expectations for DSO.[82] Conversely, the outturn performance metrics are more narrowly focussed and, as such, we believe that they should account for a smaller proportion of the overall incentive value. This should minimise the risk of DNOs focussing on specific targets at the expense of wider DSO activities.

4.60 The proposed weightings also mean that mechanistic assessment (outturn performance metrics and stakeholder survey) accounts for 60% of the total DSO incentive value, and evaluative assessment the remaining 40%. We believe this strikes the right balance between more predictable and less onerous mechanistic components, and a more holistic evaluative assessment.

4.61 We propose that the rewards or penalties for each of the three evaluation criteria are determined independently of each other. This means that the incentive rate for each evaluation criteria would be calculated by dividing its annual revenue exposure, as determined by the percentage weighting, by the difference between the target and the maximum reward/penalty score. The overall reward or penalty for the DSO incentive would then be a summation of the rewards or penalties from each evaluation criteria.

[82] RIIO-ED2 Business Plan Guidance, Appendix 4 RIIO-ED2 Business Plan Guidance | Ofgem

Frequency of assessment and reporting

4.62 In our SSMD, we indicated that, in determining the frequency of reporting and assessments, we would need to balance the administrative burden with the need for transparency and opportunity to steer DNO progress.[83] We consider that a more frequent, annual assessment is appropriate in this case. It would ensure that DNOs are incentivised to improve performance throughout the price control and receive more regular feedback on performance such that they can "course correct". This should drive up performance.

4.63 We propose that DNOs are required to report annually on regularly reported evidence (RRE), a DSO performance panel assessment report, the stakeholder survey and their performance against metrics.[84] We anticipate that this will be supported by the RIIO-ED2 Regulatory Instruction and Guidance (RIGS) and Regulatory Reporting Pack (RRP) processes. This will enable stakeholders to assess DNO performance throughout the price control in a transparent and accessible way. We will consider options for disseminating this information to ensure that other stakeholders can access performance reporting and meaningfully contribute to the assessment process.

Evaluation criteria: stakeholder survey

4.64 As part of the DSO incentive, we propose introducing an annual survey to measure stakeholder satisfaction. We believe this will drive companies to become more responsive to their stakeholders' needs and improve service levels.

4.65 These surveys would measure stakeholder satisfaction on a scale of 1-10 on a set of 5 common questions designed to capture significant points of interaction between DSO and stakeholders. We propose that questions cover the range of baseline expectations identified as the most relevant to stakeholders. The purpose of this is to reduce any overlap between different evaluation criteria of the incentive, limiting the risk of double rewards or penalties, and to generate questions that allow stakeholders to provide meaningful responses. Our initial proposal for the stakeholder questions is set out in Table 84 in Appendix 3. We propose that these five questions are weighted equally.

[83] RIIO-ED2 SSMD Overview Document, Paragraph 5.43 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

[84] This is contingent on us being able to set targets for the outturn performance metrics prior to the start of RIIO-ED2.

4.66 We propose that DNOs should appoint a common, established, independent and reputable market research company to administer the survey, in line with the precedent for the RIIO-ED1 Customer Satisfaction survey.[85] Survey recipients should reflect the broad and continuously developing stakeholders that interact with DSO functions, such as flexibility providers, local Government and the ESO.

4.67 We propose that targets should be common for all DNOs and fixed over the RIIO-ED2 period, as set out below in Table 8. A fixed, common target should strengthen the incentive by facilitating performance comparison while also making it easier for DNOs to justify investment in order to make service improvements. We believe that a common target is also appropriate as stakeholders should receive the same DSO service levels across GB.

Table 8 DSO stakeholder survey target and values

Stakeholder survey component	Consultation position
Target	7.7/10
Cap	9/10
Collar	6.4/10
Upside deadband	+0.2
Downside deadband	-0.2

4.68 There is no reliable historical data on DSO from RIIO-ED1 to assign a baseline target for the DSO stakeholder survey. We considered whether the survey could be piloted initially, but had concerns that it would create a peverse incentive to not deliver a high quality of DSO service from the first year of RIIO-ED2 if it is used to inform subsequent target setting.

4.69 We therefore propose the use of the ESO stakeholder survey as a relevant industry proxy to set a baseline target. The target of 7.7/10 is formed from the average score of the ESO stakeholder surveys from each year since 2017/2018[86] to 2019/2020.[87] We contend that this is a robust target that is reflective of the levels of investment in DSO activities. We also considered using proxies from the Electricity Transmission and Gas Transmission stakeholder surveys, which would have resulted in a higher target, but considered that using the ESO survey as a

[85] Paragraph 3.3, RIIO-ED1 regulatory instructions and guidance: Annex H – Customer Service (ofgem.gov.uk)
[86] National Grid ESO, 2019. ESO RIIO-2 Annex 7 - Metrics and measuring performance
[87] National Grid ESO, 2020. Our Performance 2019 - 2020

proxy should be reflective of a level of satisfaction expected by stakeholders involved in similar activities.

4.70 We propose that a reward cap of 9/10 represents a highly desirable level of stakeholder satisfaction and that scores beyond 9/10 would be challenging to achieve. We also propose that a collar is set symmetrically at 6.4/10. We consider that setting a maximum/(minimum) score at these levels will ensure that only a DNO that performs considerably better/(worse) than average will earn the full reward/(penalty).

4.71 We also propose that an upside/(downside) deadband is set at +/(-) 0.2 standard deviations from the target. We believe that a narrow deadband will ensure that the incentive is not too sensitive to modest changes in survey scores that may not be directly attributable to changes in performance.

4.72 We recognise that the baseline target, cap and collar, and deadbands are not set relative to current DSO performance levels. Our proposal is to set these parameters for the duration of RIIO-ED2. However, given the level of uncertainty we propose that Ofgem retains the discretion to adjust targets in-period should yearly results show significantly high levels of over or under performance. This will ensure DNOs are appropriately rewarded or penalised for the level of service they provide.

Evaluation criteria: DSO performance panel assessment

4.73 We propose introducing a DSO performance panel assessment as an evaluative component in the DSO incentive. We believe a well-designed DSO performance panel, made up of a mix of independent experts and industry representatives as appointed by Ofgem, will provide the following to the incentive:

- help reduce the information asymmetry between DNOs and Ofgem
- strengthen incentives on DNOs to demonstrate their performance to a wider audience (rather than just the regulator) and add greater transparency to the performance evaluation process
- bring in additional expert views, potentially from other sectors or countries, thereby adding an extra layer of scrutiny of DNO performance
- play a key role in challenging and providing feedback on DNOs' within-period performance
- provide industry with a platform to hold the companies to account

4.74 We propose one performance panel for all DNOs as we believe this will be important in enabling comparison between companies, ensuring consistency in assessment and limiting the administrative burden.

4.75 We propose that the DSO performance panel scores the network company out of ten against five equally weighted criteria relating to the following areas:

- delivery of DSO benefits
- data provision
- flexibility market development
- options assessment and conflict of interest mitigation
- distributed energy resources (DER) dispatch decision making framework

4.76 We propose to set out DSO performance panel assessment criteria for each of the above themes, and in line with the scoring reference points set out in the below table. These criteria would build on the baseline expectations for DSO and the companies own estimates of DSO benefits through, for example, avoided or deferred network reinforcement. We consider DSO benefits to be an important area of scrutiny to ensure that the implementation of DSO functions and services are delivering the desired outcomes for consumers.

Table 9 DSO performance panel scoring reference points

Score	1-2	3-4	5-6	7-8	9+
Description	Poor	Weak	Average	Good	Excellent
Penalty/reward implication	Maximum penalty at a score of 2	Penalty for scores below 5	No reward or penalty	Reward for scores above 6	Maximum reward at a score of 9

4.77 We propose that an overall DSO performance panel score is calculated as an average of each panel member's score. The overall DSO performance panel score would act as a recommendation, which Ofgem would consider when deciding on the final score for this evaluation criterion of the DSO incentive.

4.78 We propose that performance panel members consider RRE alongside any justification provided in a DSO performance panel assessment report as a way of assessing DNO performance. In this report, DNOs would be required to explain how their DSO activities over the past year delivered against the performance panel criteria. The report would be subject to specific guidance, for instance a common page limit.

4.79 We believe including RRE in the DSO incentive will improve performance assessment through access to common, quantitative information. We also believe there is value in publishing the RRE in one standard, accessible format. We believe this will improve the ability of the DSO performance panel, and other stakeholders, to scrutinise performance. Our proposed shortlist of RRE, which requires further development and may be consolidated down, is set out for consideration in Table 83 in Appendix 2. We propose the RRE are reported annually.

Evaluation criteria: outturn performance metrics

4.80 We also propose that the DSO incentive includes outturn performance metrics that facilitate comparison between companies and performance tracking over time against a set of key outcomes. In the below table, we set out our views on outturn performance metrics that we believe should form part of the DSO incentive framework.

Table 10 DSO outturn performance metrics

Metric	Definition
Flexibility market testing	The metric will validate the extent to which a DNO is undertaking comprehensive quantitative assessments when determining if distribution flexibility services are the most economic solution with respect to reinforcement decisions across the LV, HV and EHV networks: $Flexibility\ market\ testing\ \% = \frac{\sum MVA\ of\ network\ reinforcements\ market\ tested\ for\ flexibility}{\sum MVA\ of\ network\ reinforcements\ subject\ to\ DNOA} * 100$
Network visibility	The metric will consider the extent to which there is near real time, aggregate monitoring of LV network load data: $Network\ visibility\ = \frac{\sum T_i N_i}{N_t} * 100$ where T_i takes the value of 1 if location i is visible to the DNO and 0 otherwise, N_i is the number of customers connected to location i, and N_t is total number of customers.
Curtailment efficiency	The metric will consider the extent to which a DNO is limiting curtailment of users on non-firm connections resulting from actions taken by the DNO to restrict the conditions of a connection in response to a constraint on the distribution system: $Curtailment\ efficiency = \frac{\sum H_i A_i}{A_t}$ where H_i is duration of curtailment in hours for user i, A_i is the MVA reduction in access for user i, and A_t is total MVA access for all users on non-firm connections.

4.81 We propose including a flexibility market testing metric that validates a DNO's commitment to flexibility first when considering reinforcement schemes across all

voltage levels. This would require evidence in the reporting year that all network reinforcement decisions have been subject to the ENA's Common Evaluation Methodology (CEM) Cost-Benefit Analysis (CBA)[88] through the Distribution Network Options Assessment (DNOA). As DNOs have a Licence Obligation, under SLC31E, to procure flexibility when it is economic to do so, it may be that this metric as currently conceived would be penalty only. We will consider this further as part of target setting for each licence area.

4.82 We also propose including an outturn performance metric to promote network visibility through the use of LV monitoring, smart meter data and potentially advanced modelling capabilities.[89] The availability of LV network data will support DNOs in delivering against the baseline expectations for network planning as, for example, access to more granular demand and voltage data will improve understanding of existing capacity on individual LV circuits, which will allow DNOs to produce enhanced forecasts. All DNOs have submitted network visibility strategies in their business plans, and we believe this outturn performance metric is an important means of holding DNOs to account on the delivery of these strategies. As such, we propose to penalise companies that underperform against a target, and reward those for an accelerated rollout, through this metric.

4.83 The third outturn performance metric we propose including in the DSO incentive relates to curtailment of users on non-firm connections. We consider that the definition of curtailment, and the methodology for calculating it, should be consistent with our Access SCR Decision.[90] Under the Access SCR Decision,[91] DNOs will also face financial obligations if curtailment is above agreed limits and, as such, it may be that this metric operates as reward only. Again, we will consider this further as part of target setting for each licence area.

4.84 We propose that each outturn performance metric is weighted equally in the assessment. Targets would be established for each metric, with a cap and collar for the maximum reward score and maximum penalty score also calibrated. We recognise that companies have different starting positions and therefore believe that DNO specific targets may often be appropriate. We are not proposing to set the company specific targets for each licence area at this point as further work is

[88] ENA CEM tool.
[89] We will also consider the need for targeted data quality audit within the price control to ensure that the use of smart meter data and modelling capabilities is comparable to the outcomes of LV monitoring.
[90] Access SCR - Final Decision - paragraph 4.30.
[91] Access SCR - Final Decision - paragraphs 4.48 - 4.62.

required. We will consult on the targets before finalising them, and have set out how we propose to take this work forward in the next section.

Next Steps

4.85 We intend to hold further working groups with the DNOs in Summer 2022 to set company specific targets for the outturn performance metrics, and finalise the list of RRE, ahead of Final Determinations.

4.86 We will also consult on a DSO incentive guidance document in Autumn 2022, ahead of Final Determinations.[92] This guidance document, which will be established by the DSO incentive Licence Condition, will set out more detail on:

- the process and criteria for the performance panel assessment
- the methodology we will use to determine a DSO incentive reward or penalty
- the reporting requirements placed on companies
- any other matters relating to the regulation, governance or administration of the DSO incentive arrangements.

Consultation questions

Core-Q24. Do you agree with our proposed design of the DSO incentive?

Core-Q25. What are you views on the outturn performance metrics and RRE we are proposing to include in the DSO incentive? If you do not support their inclusion, please outline which alternative outturn performance metric(s) or RRE you think should be included in the framework instead.

Changing roles and responsibilities

4.87 Our immediate priority is to ensure DNOs continue to develop DSO capabilities. At the same time, we recognise that there could be merits to alternative governance models or allocations of responsibilities. The right allocation of roles and responsibilities is an important part of delivering effective DSO in the long term. The review, decision, and implementation of any changes to structures is wider than the price control, but we are seeking to include measures in the RIIO-ED2 methodology that will aid decision-making and help any implementation.

[92] See SECV incentive guidance and ESORI Guidance Document 2021-2023 for examples of other incentive guidance documents that have some similarity to our proposal for the DSO incentive.

DSO re-opener

DSO re-opener	
Purpose	To introduce an increased level of adaptability by providing a means to amend the RIIO-ED2 price control in response to changes to the roles, responsibilities and governance arrangements for DSO functions, which could have an effect on the costs and outputs of licensees.
Benefits	To allow for necessary amendments within the RIIO-ED2 period, as opposed to waiting until the settlement of the subsequent price control.

Background

4.88 In our SSMD,[93] we said we would work to identify where further internal separation of DSO roles is appropriate. We also committed, in our SSMD[94], to initiating a review of DSO governance arrangements to consider the challenges for system operation at the distribution level, the effectiveness of the current governance model, and trade-offs between alternative models.

4.89 In our SSMD,[95] we also committed to identifying the tools that we would need to enact or enable any decision on separation or separability of DSO functions from DNOs should we decide that is appropriate. Recognising these actions could have impacts on licences, costs and outputs, we proposed that a DSO re-opener or other tool could be incorporated within the price control framework to allow for adaptability in response to any change in governance arrangements.

4.90 In November 2021, we submitted a Request for Information to DNOs in order to understand the opportunities and risks of the structural organisational change required to deliver DSO under different scenarios. This included requesting information on costs, benefits and implications of different governance arrangements for a DSO transition.

4.91 Subsequently, in April 2022, we launched a Call for Input to DNOs in order to better understand what functions are required at a sub-national level to meet the evolving energy system needs and deliver a timely net zero transition.[96] This

[93] RIIO-ED2 SSMD Overview Document, Paragraph 5.53 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[94] RIIO-ED2 SSMD Overview Document, Paragraphs 5.56 to 5.57 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[95] RIIO-ED2 SSMD Overview Document, Paragraphs 5.58 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[96] Call for Input: Future of local energy institutions and governance.

included asking for input from DNOs on whether governance arrangements in place for distribution network and system operation need to be reformed to ensure effective energy planning, network operation and flexibility market development at a local level.

Consultation position

UM parameter	DSO re-opener
Scope	We propose that the scope of the DSO re-opener captures any changes to costs, outputs and incentives associated with any future decision on further separation of DSO functions from DNOs.
Re-opener window	We propose that the re-opener mechanism could be triggered by the Authority at any time during the RIIO-ED2 period.
Funding approach	Adjustments could include increasing or reducing cost allowances, and recalibrating specified outputs and incentives.
Materiality threshold	In line with the proposed RIIO-ED2 common parameters, we propose to apply a materiality threshold of 1%.

Rationale for consultation position

4.92 Our RIIO-ED2 Draft Determinations are based on the current governance framework that sees DNOs delivering DSO functions and services. However, we have now commenced our review into the effectiveness of institutional and governance arrangements in place for DSO roles through our recently published Call for Input.[97] The outcome of this review will be to, among other things, provide a recommendation on the right governance framework for DSO in order to deliver net zero targets at lowest cost to consumers.

4.93 If this review — or any subsequent review or decision, for example by Government — results in our deciding to make changes to the current model for DSO, then we may need to make changes to the RIIO-ED2 price control to effect or reflect the new model. Any changes made under the DSO re-opener would be done using the statutory licence modification process. This may include changes to costs, outputs and incentives associated with any decision on further separation of DSO functions.

4.94 We also considered the value in having a more narrowly defined DSO re-opener in RIIO-ED2 that could make use of the self-modification procedure common to other re-openers that we are proposing. This could outline how cost allowances would

[97] Call for Input: Future of local energy institutions and governance.

be increased or decreased if we decided on, for example, legal or full ownership separation of DSO functions and services. However, at this stage in our process of determining the appropriate institutional and governance arrangements for DSO, we do not think we can confidently prescribe the scope of such a re-opener. It may be necessary to make broad changes to outputs and incentives to recalibrate or entirely redesign aspects of the control. For these reasons, we consider that a DSO re-opener subject to the statutory licence modification process is appropriate.

Next steps

4.95 In parallel to RIIO-ED2 price control setting process, following publication of the Call for Input, our next step is to continue compiling perspectives and evidence on the case for change to institutional and governance arrangements at a sub-national level, as well as the reform options to be considered to address this. In the second half of 2022, we will focus on evaluating reform options, with a view to arriving at conclusions by early 2023.

Consultation questions

Core-Q26. Do you agree with our proposal for the DSO re-opener?

Long-term demand reduction and energy efficiency measures

4.96 In our SSMD,[98] we noted that when network constraints are anticipated, we expect DNOs to first consider whether flexibility, including energy efficiency measures and Demand Side Response (DSR), would provide a more economic and efficient solution than network reinforcement. We also said that we want to see DNOs play a more proactive role in managing future system growth, as taking part in measures to reduce growth now might be cheaper than reactively responding in the future.[99] However, in doing so we said that we want DNOs to take into account the role that other parties could play, including any potential overlap with initiatives supported or funded by Government.

[98] RIIO-ED2 SSMD Overview Document, Paragraph 1.13 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[99] Overview SSMD RIIO-ED2 SSMD Overview Document, Paragraphs 5.60 - 5.62 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

4.97 Since 2020, DNOs have had a licence condition to promote the uptake of energy efficiency measures where this cost-effectively alleviates the need to upgrade or replace electricity capacity.[100]

4.98 In February 2022, we issued our Procurement and Use of Flexibility Reporting Guidance for Electricity Distribution Licensees[101]. This did not provide specific guidance for DNOs to report on their activities in relation to energy efficiency, but we indicated that these would be considered for future reporting cycles.

4.99 In their DSO strategies, all DNOs demonstrated that they had considered steps to promote energy efficiency measures during RIIO-ED2. For instance, several DNOs committed to, during the first years of RIIO-ED2, develop energy efficiency flexibility products to procure energy demand reduction where this cost-effectively avoids network reinforcement. We expect DNOs to deliver their commitments in this area during RIIO-ED2.

4.100 However, we are exploring whether more work may be needed.

- more work may be needed to allow DNOs to robustly assess the value that building insulation measures can have to the network in the context of heat decarbonisation
- we want energy efficiency measures with value to the network to be able to compete as a form of flexibility with demand-side response (DSR), energy storage and traditional reinforcement. The benefits of energy efficiency measures accrue not only to energy network consumers, but also other parties. As such, DNOs will need to coordinate with the parties who benefit from and/or fund energy efficiency measures to ensure that costs are distributed appropriately. It is not currently clear that DNOs have a model that enables this.

4.101 We have included a theme on energy efficiency which includes long-term demand reduction within one of our recently launched SIF challenges.[102] This will enable funding trials to fill knowledge gaps and de-risk innovative propositions. Trials

[100] SLC31E states: "The licensee must coordinate and direct the flow of electricity onto and over its Distribution System in an efficient, economic and coordinated manner. This includes the following: […] (d) promoting the uptake of measures to improve Energy Efficiency, where such services cost-effectively alleviate the need to upgrade or replace electricity capacity and support the efficient and secure operation of the Distribution System. This may include procuring Energy Efficiency Services, where it is economic and efficient to do so."
[101] Decision on Procurement and Use of Flexibility Reporting Guidance for Electricity Distribution Licensees
[102] Our round SIF Round 2 Innovation Challenges are published here https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-two-innovation-challenges

could also help evaluate possible future changes to regulatory regimes which may support the deployment of energy efficiency services.

Whole system

4.102 The electricity distribution networks do not operate in a vacuum. Planned DNO investments and activities both affect, and are affected by, decisions and activities in other energy and social systems.

4.103 Although DNOs have traditionally engaged with those third parties most closely connected to the day to day operation of their networks, there is significant potential for much greater coherence in forward planning and targeted investment through greater collaboration. We consider that this should bring down costs for consumers, reduce overlap of activity and roles, and uncover previously unseen synergies. Such activity is particularly vital in cases of joint investment across energy networks such as development of heat networks.

4.104 In our SSMD,[103] we said we would introduce:

- a whole system minimum requirements as part of Stage 1 of the BPI
- an increased focus on the whole system in the innovation stimulus
- a whole system re-opener called the 'Coordinated Adjustment Mechanism'.

4.105 We propose to apply our position as articulated in our SSMD. During subsequent engagement with DNOs and stakeholders no additional whole system policies specific to electricity distribution network needs were raised. We acknowledge the value of aligning the electricity and gas networks - distribution and transmission - into the same policy framework in order to facilitate cooperation.

4.106 We note that the main issues raised by stakeholders – such as visibility of data across all energy sectors for Local Authorities – are being addressed through the Data and Digitilisation Strategies, the DSO strategies, and the ENA's developing work on data platforms for local authorities.

[103] RIIO-ED2 SSMD Overview Document, Table 8, Paragraphs 5.84 -5.103 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Approach to assessment

4.107 The whole system strategies in DNOs' Business Plans were assessed against the whole system minimum requirements of the BPI. Overall, we were satisfied that all DNOs passed the whole system requirements within Stage 1 of the BPI.

4.108 Where DNOs submitted a clear and costed rationale for activity, with clear outcomes and benefits, we have proposed baseline funding to deliver these activities. Where DNOs submitted "added value" CVPs that they propose go beyond the activity that consumers should expect as a minimum, we have also considered where the balance of risk of non-delivery should be held. Our decisions on individual proposed activities by each DNO can be found in the company annexes.

4.109 In forming our views on specific activities we have paid close attention to stakeholder feedback. A number of stakeholders were clear that whole system activities should not be funded where they could be seen to be duplicating activity best undertaken by another body or sector. Such activities where costs and benefits were clearly agreed and apportioned reasonably between sectors however, should be allowed.

Overview

4.110 While we acknowledge that DNOs are at difference stages of development for their whole system thinking, we have not assessed this element of the plans in the light of how much progress they have made over RIIO-ED1. Rather we have focussed on assessing their proposals against the requirements for RIIO-ED2. As such, we agree with the views expressed by the RIIO-ED2 CG and the CEGs that UKPN and SPEN have provided genuinely ambitious, sector-spanning, coherent whole system plans. NPg, ENWL, SSEN, and WPD plans all contain examples of coherent whole system planning in discrete areas, but currently remain much more focused on electricity system activities.

4.111 One of the purposes of including a requirement for DNOs to submit whole system strategies as part of their Business Plans was to encourage more systemic thinking within DNOs on whole system considerations; rather than ad hoc responses to individual issues as they arose.

4.112 We have seen some good proposals in this area, namely from ENWL and SSEN who have demonstrably embedded processes for whole system culture change

throughout the organisation, supported by board assurance processes. We expect to see this approach deliver more opportunities for collaborative work and investment as the price control progresses.

4.113 By contrast, some DNOs such as WPD have opted for specific roles within the business to focus on whole system training, delivery and stakeholders. While there is value in this work, we do not see that it will deliver the same scale or pace of systemic change as the structural changes proposed by other DNOs.

4.114 Similarly, all DNOs have put forward proposals to collaborate with local authorities on Local Area Energy Plans. There was a wide range of ambition in this area, with some DNOs putting forward proposals for additional rewards under the CVP process. Although we welcome the increased ambition shown in these proposals, we consider that engaging with local authorities on future investment and planning options is part of the core business of DNOs, and consumers should not be asked to pay for additional incentives in this area.

4.115 The Challenge Group and the CEGs share our concerns on this topic, and in our Call for Evidence UK100 were particularly concerned that 'proactive partnering' with local authorities should be BAU, and not presented as additional value worthy of additional reward.

4.116 We propose to allow baseline funding for the activities put forward, but the differing levels of ambition and engagement across DNOs raises concerns that some areas will develop more slowly than others. Regional and local authorities, including those represented by the UK100 group, were very clear in our Open Hearings that they were keen to engage with DNOs on this work as part of their net zero transition. Although we note that the ENA is working on coordinating expectations across the electricity and gas sectors, we expect to see DNOs intensify their progress in this area, participating fully in cross-utility planning led by the local authorities.

4.117 Our proposals on individual DNO bespoke and CVP proposals across a range of activities in heat, transport, and collaboration, can be found in the company annexes.

Whole System Strategic Planning

Whole Systems Licence Obligation	
Purpose	Provide an obligation for DNOs to plan strategically, and evidence how they make decisions in a whole system way on a practical level.
Benefits	Greater transparency on how whole system considerations impact decision making, as well as improved information sharing between DNOs and other local actors.

Background

4.118 Increasingly, achieving optimised outcomes in our energy system requires a whole system lens. This means considering before making a decision, how a particular action could benefit or impact different parts of our energy system, as well as evaluating which outcome it is driving within the electricity system itself.

4.119 This will only become more important as areas like heat and transport are electrified further, as this will require all local actors to consider the broader implications of decisions on the energy system.

4.120 Other stakeholders are also taking decisions and undertaking planning, which in turn need to inform and be informed by DNOs' plans.

Consultation position

Output parameter	Consultation position
Licence Obligation	To put in place a new licence obligation which requires DNOs to produce an annual whole systems strategic plan on their approach to decision making, and how they consider whole system outcomes and report whole system benefits. This will require the sharing of all input assumptions and planning outputs in an open, interoperable format.

Rationale for consultation position

4.121 While the DNOs have set out their approaches to enabling whole systems solutions in their Business Plans, we believe there is a rationale for further action, particularly on the delivery aspect. Overall, our assessment shows that a key weakness remains the focus purely on electricity system interfaces between

distribution and transmission, rather than fostering an approach that can help realise the full potential benefits in the wider energy system and in other sectors.

4.122 As set out earlier in this chapter, Ofgem is working with Government and stakeholders to look at local institutions and governance and how that can interface with more joined-up energy planning to consider future demand, supply and network needs. This will include a role for distribution system operation to achieve more efficient solutions to network congestion problems by using local markets and new technologies to drive greater energy efficiency, smooth out peaks in demand and maximise the contribution from local sources of energy, for example from solar panels and EV batteries.

4.123 To support this and help enable benefits from a truly whole system approach in the shorter term, DNOs will need to engage beyond their own network and investment plans on the needs of their customers. This means taking account and planning for impacts and opportunities in the gas, waste, water and telecoms sector, as well as considering cross-vector impacts such as heat and transport, to ensure that decarbonisation ambitions can be achieved in an integrated way.

4.124 The UK is embarking on an unprecedented economy-wide decarbonisation transition at pace. It is anticipated that after the end of this decade DNOs will see rapidly increasing new demands on their networks. Other stakeholders will be ramping up their own activities over this period to support decarbonisation ambitions, much of which is expected to lead for much higher levels of electrification. This includes transport and the transition to low carbon heating alongside a rapid growth in smart and flexibility technologies. We need to find co-optimised solutions and identify working practises and tools that help improve strategic planning at all geographical levels.

4.125 Accordingly, we propose that this Licence Obligation will be part of an ongoing process through the RIIO-ED2 period, with the initial output of a set of tools and articulation of the logic behind decisions, which together constitute a strategic plan. The strategic plan will be communicated clearly. All associated data (including input assumptions and planning outputs) will be available digitally, presented in an open, transparent, interoperable format, consistent with the standards set by the Centre for a Digital Built Britain.

4.126 The DNO should set out a more robust approach to co-ordination with other local actors, as well as a more systematic and analytic approach to how to use that information to inform decisions, especially the whole systems assumptions and

considerations. It may identify areas for planned network upgrades, future needs and opportunities for flexibility, and conditionality of, and locations where future upgrades may be needed. It should be a live plan – digital and online - that can be understood and interrogated by stakeholders especially in a location-based manner.

4.127 We propose that is underpinned by a series of digital tools that will inform this live information sharing, as well as providing a framework for the DNOs to report their progress. It should therefore be linked with the development of advanced modelling approaches, inlcuding digital twins.

4.128 Interoperability is an essential requirement. GB's flexibility providers – and markets – are national, and benefit from plans that can be brought together into a single digital image. The DNO's transparent plans are required to evidence not only where they will need to invest in infrastructure and where they could deploy flexibility, but where other contradictions or challenges might emerge (for example around the physical siting of network infrastructure). Built on standardised datasets, these DNO plans also need to be capable of being overlaid with gas, transport, land registry, urban and other plans to form cohesive, granular local cross-vector genuinely whole systems plans.

4.129 We believe that this approach will help ensure that whole system thinking is reflected in a practical way in the day-to-day decisions of the DNOs, rather than being an abstract concept. For wider stakeholders, access to these plans will help support more integrated local planning, for example by considering the needs for EV charging alongside wider requirements for housing, transport, waste and planning, enabling a faster, more cost-effective transition to a net zero future.

4.130 We expect the quality of DNOs plans to develop over time, with initial iterations delivered in the first year of RIIO-ED2 and with agreed improvements in subsequent years.

4.131 The Licence Obligation will be accompanied by guidance that we will intend to share with DNOs shortly to develop this further over the coming months.

Consultation Question

Core-Q27. Do you agree with our proposal to introduce a new whole system strategic planning Licence Obligation?

Core-Q28. What are your views on the digital tools that could be used to support this?

5. Meet the needs of consumers and network users

Section Summary

In this chapter, we set out the output and incentive arrangements we propose to implement to ensure DNOs respond to the needs of their customers in RIIO-ED2 in three key service areas: customer service, consumer vulnerability and connections.

Our proposals focus on ensuring DNOs provide high levels of customer service, managing complaints effectively and provide support to those experiencing an interruption to supply. We also set out our proposals for ensuring the DNOs provide appropriate support and services to vulnerable consumers and also the arrangements and support for customers seeking a new connection to the electricity distribution network.

Overview

5.1 We expect DNOs to deliver high quality services that meets the needs of consumers and network users while enabling a flexible low carbon transition. This includes continuing to improve the quality of service that customers receive when they require a new or modified connection or have a general enquiry. We also expect DNOs to take the necessary steps to ensure that complaints are dealt with quickly and effectively.

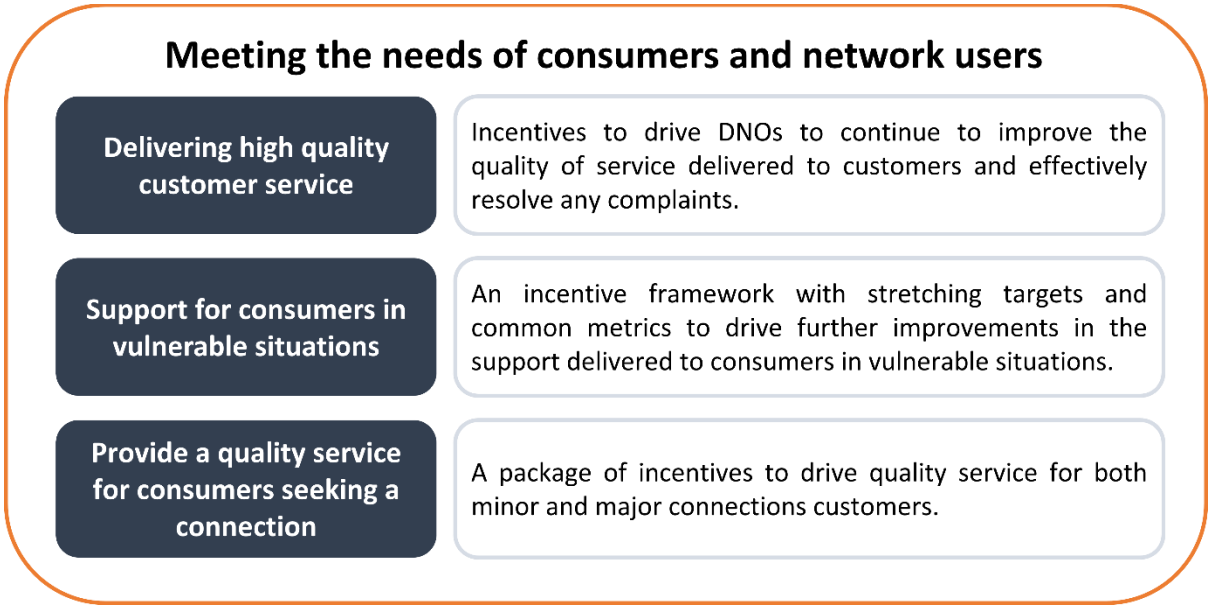
5.2 Additionally, while the changes in the energy system are expected to bring a range of benefits overall, some consumers, especially those in vulnerable situations, may be at risk of being excluded from accessing the benefits and so may suffer new forms of detriment. It is also important therefore that DNOs provide appropriate support and services to consumers in vulnerable situations and address their key priorities.

5.3 Our proposals in this chapter build on the outputs that we set out in our SSMD. There are three strands to how we propose RIIO-ED2 will meet the needs of consumers and network users:

- we will retain the Customer Satisfaction Survey and Complaints Metric as ODI-Fs in RIIO-ED2 to drive improvements in the quality of service provided to customers, we have set out our proposals for applying rewards and/or penalties within period

- we set out a strong package of consumer vulnerability measures to hold DNOs accountable for a minimum standard of service and in delivering their vulnerability strategies
- we detail proposals that build on existing incentives to deliver improvements in the time it takes to connect minor connection customers and a new incentive to improve the service delivery for major connections customers to enable a flexible low carbon transition.

Figure 9 An overview of Chapter 5



Deliver high quality customer service

5.4 We expect DNOs to deliver high quality services that meet customers' needs. For RIIO-ED2, we expect DNOs to continue to improve the quality of service provided to customers that require a new connection, seek information from the network in the event of a supply interruption or have made a general enquiry. We also expect DNOs take the necessary steps to ensure that complaints are dealt with quickly and effectively.

5.5 The Customer Satisfaction Survey (CSS) and Complaints Metric (CM) incentives aim to drive the network companies to deliver good customer service by

replicating the sorts of measures typically used by consumer-facing businesses in a competitive environment.[104]

Customer Satisfaction Survey

Customer Satisfaction Survey	
Purpose	To encourage DNOs to continue to improve the quality of customer service delivered to customers and to reward exceptional performance
Benefits	Rewards will encourage DNOs to deliver exceptional customer service while penalties will ensure performance does not deteriorate.

Background

5.6 In our SSMD,[105] we said that we would:

- retain the CSS as an ODI-F in RIIO-ED2, including the scope and associated weightings for each of the three surveys,[106] as well as the overall incentive strength of +/-1% base revenue
- require separate reporting of the levels of satisfaction awarded by Priority Service Register (PSR) customers who experience a supply interruption, and LCT customers who seek a new connection or have a general enquiry
- set RIIO-ED2 targets, and minimum and maximum reward and penalty scores, that reflect RIIO-ED1 performance improvements by applying: fixed targets using industry average performance data over the most recent years of RIIO-ED1 and an upside and downside deadband around new target scores
- continue to factor in the number of unsuccessful calls when calculating DNO performance under the interruptions survey in RIIO-ED2[107]
- consider if changes to the survey channel (telephone interview) or survey questions should be implemented for RIIO-ED2 by reviewing results from a trial that is being undertaken by DNOs to assess the impact of different survey channels (email and SMS messages) to DNOs' scores for all three surveys

[104] To note, in RIIO-ED1 the CSS and CM were part of the Broad Measure of Customer Satisfaction (BMCS) which also included the Stakeholder Engagement and Consumer Vulnerability (SECV) incentive. The SECV is being removed for RIIO-ED2.
[105] RIIO-ED2 SSMD, Annex 1 Chapter 4 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[106] The survey weightings are 30%, 50% and 20% for the interruptions, connections and general enquiries surveys, respectively.
[107] Under the interruption element of the customer satisfaction survey in RIIO-ED1, DNOs are penalised 0.02% of annual base revenue for each 1% of calls to the DNO that are unsuccessful.

5.7 In this chapter, we are consulting on our proposed target score, deadband, minimum and maximum reward and penalty scores, as well as changes to the survey channel.

5.8 Following Storm Arwen in November 2021, Ofgem published its final report on the network operators response to this event.[108] This was published on 9 June 2022 and identified lessons to be learned and recommendations to be taken forward. The review found that during the storm, customers received poor service when attempting to contact their DNO. This chapter also sets how we will incorporate the recommendations related to customer service from this report between now and Final Determinations.

Approach to target setting

5.9 To help us establish the target score of this incentive, we analysed DNO performance across RIIO-ED1 to date and reviewed DNO Business Plans to understand the improvements they intend to make to their services as well as their proposed targets for the CSS in RIIO-ED2. We also engaged with DNOs on our target setting methodology and options via the relevant working group.

5.10 We considered four options in relation to the target, the deadband around the target and the maximum reward and penalty scores. The options we considered are set out in Table 11. Options 2-4 were not considered to be appropriate as the reward/penalty ranges were either too narrow or too wide to provide DNOs with a sufficient incentive to make performance improvements.

Table 11 CSS Target Setting Options

Option	Maximum penalty	Start of penalty	Target	Start of reward	Maximum reward
1	8.4 2 Standard Deviations (SDs) below the target	8.6 1 SD below the target	8.9 Average sector performance in the last 4 years	9.2 1 SD above the target	9.4 2 SDs above the target
2	8.7 1 SD below the target	8.8 Lower Quartile of sector performance	8.9	9.0 Upper Quartile of sector	9.1 1 SD above the target

[108] Final report on the review into the networks' response to Storm Arwen

Option	Maximum penalty	Start of penalty	Target	Start of reward	Maximum reward
		in the last 4 years	Average sector performance in the last 4 years	performance in the last 4 years	
3	8.1 10% below the target	8.5 5% below the target	8.9 Average sector performance in the last 4 years	9.3 5% above the target	9.7 10% above the target
4	8.2 2 SD below the target	8.5 1 SD below the target	8.8 Average sector performance in the last 6 years	9.1 1 SD above the target	9.4 2 SDs above the target

Consultation position

Output parameter	Consultation position
Targets	Target of 8.9 for supply interruptions, connections and general enquiries surveys.
Deadband	Scores between 8.6 and 9.2 (inclusive will receive zero reward or penalty.
Financial Incentive	Scores greater than 9.2 will receive a reward and rewards will be capped for scores above 9.4. Scores less than 8.6 will receive a penalty and penalties will be capped for scores below 8.4.
Implementation	Segment PSR and LCT responses to survey from beginning of RIIO-ED2. These changes will be incorporated into the RIGs. No changes to the survey channel (telephone interviews).

Rationale for consultation position

Targets

5.11 We are proposing a fixed target score of 8.9 across all three surveys. This is based on average performance data from the last four years of RIIO-ED1. We think that using data over this time period to set the target score will allow the improved performance customers have experienced in RIIO-ED1 to be embedded into a BAU level of service for RIIO-ED2.

5.12 We considered whether we should omit performance data from 2020-21 when setting the proposed target. This is because the UK Government COVID lockdowns and restrictions over this period may have skewed DNO scores. We have however decided to include this data as DNO average scores for this financial year are within two standard deviations of the 4-year average. We consider that any changes to the scores that occurred during this period are not statistically significant.

5.13 We will review the survey scores for the current financial year (2021/22) once these have been submitted by DNOs in June 2022, and may consider a change to the proposed target score at Final Determinations if this data materially impacts the current 4-year average.

Deadband

5.14 We do not consider it necessary to reward companies for maintaining their current average performance, or to reward small performance improvements around this, as DNOs have received substantial rewards for attaining these performance levels in RIIO-ED1. We expect these levels to be maintained or improved upon in RIIO-ED2 and believe that companies that score significantly above the average target should be rewarded and those that fall significantly below should be penalised to prevent deterioration of current performance.

5.15 We propose to introduce a deadband between 1 standard deviation above and below the target score as this represents a notable improvement or deterioration in performance. Scores that fall between 8.6 and 9.2 (inclusive) will receive zero reward or penalty.

Financial Incentive

5.16 We propose to set the maximum reward and penalty scores at 1 standard deviation above and below the deadband. This means that the maximum reward that DNOs can achieve will be set at a score of 9.4 and the maximum penalty will be set at a score of 8.4.

5.17 We believe that these thresholds will incentivise DNOs to make performance improvements – just under half (6/14) DNO licence regions would be eligible for a small reward if existing service levels are maintained; the remaining DNOs would be incentivised to improve their performance to start earning rewards. Only the most ambitious DNOs would receive the maximum reward if they meet their proposed RIIO-ED2 targets.

5.18 Rewards and penalties of up to +/-0.40% RoRE will apply linearly within their respective bands.[109]

Implementation

5.19 We expect companies to continue reporting on all survey results (PSR and non-PSR responses combined) as well as LCT responses through the RRPs. We will update the RIGs later this year to allow DNOs to separately report the survey results for these customers.

5.20 We have also reviewed the results from the trial that DNOs are undertaking to assess how changes to the survey channel (which were widened to include SMS and email in addition to the current telephone interview) affect the survey scores given by customers.

5.21 The results to date show that very few customers are choosing to use these new channels to submit their survey results and in cases where they do, the scores provided are more likely to be skewed to the extreme ends of the score range. Therefore, we do not intend to include additional survey channels for RIIO-ED2.

Next Steps

5.22 In our Storm Arwen report we said that we would:

- work with DNOs to develop additional reporting metrics for communication channels such as websites, applications and social media
- consider how these new reporting metrics should fit into the RIIO-ED2 price control
- review the incentive framework for customer service, in relation to call-backs, to ensure that it drives overall benefits for consumers.

5.23 We do not expect that these recommendations will impact the proposals set out above in relation to the target, deadband or financial incentives of the BMCS, as these are based on historical DNO performance. However, we recognise that they could result in minor changes to the incentive methodology and/or the associated RIGs.

[109] The proposed incentive value of +/- 0.40% RoRE aligns with our SSMD position for the incentive strength to be +/- 1% base revenue, as set out in paragraph 5.6. Please see "Creating consistency in baselines for ODI incentive rates, caps, or collars" in section 10 of the Finance Annex for how this has been calculated.

5.24 We will need to work with DNOs to develop reporting metrics that will give us assurance that customers can expect good customer service no matter which channel they use to contact their network operator. We will also work with DNOs to develop options that will incentivise the right company behaviours in relation to call-backs.

Consultation questions

Core-Q29. Do you agree with our proposed target and thresholds for the deadband, maximum reward and penalty?

Core-Q30. Do you agree with our proposed approach to working with DNOs to implement Strom Arwen actions related to customer satisfaction?

Complaints metric

Complaints Metric	
Purpose	To ensure DNOs maintain good performance in their handling of complaints
Benefits	Having a penalty-only incentive to monitor complaints resolution will ensure consumers' complaints are dealt with quickly and effectively

Background

5.25 In our SSMD, we decided to:[110]

- retain the Complaints Metric as a penalty only ODI-F in RIIO-ED2, including the scope, existing indicators[111] and the overall incentive strength of -0.5% base revenue
- set RIIO-ED2 targets, and maximum penalty scores, that reflect RIIO-ED1 performance improvements by applying fixed targets using industry average performance data over the most recent years of RIIO-ED1.

5.26 In this section, we are consulting on our proposed target score and maximum penalty score.

[110] RIIO-ED2 SSMD Annex 1, Paragraph 4.45 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

[111] Complaints performance is measured against four weighted indicators, based on the percentages of: Complaints unresolved after one day (10%), Complaints unresolved in 31 days (30%), Repeat complaints (50%), the number of Energy Ombudsman decisions that go against the DNO (as a percentage of total complaints) (10%).

Approach to target setting

5.27 The approach we used to develop our proposed thresholds is consistent with the approach we used to develop our consultation position for the CSS. This is set out above at paragraphs 5.11 to 5.13.

5.28 We considered four options in relation to the target and the maximum penalty score. The options we considered are set out in Table 12. Options 2-4 were not considered to be appropriate as the penalty range was either too narrow or too wide to provide DNOs with sufficient incentive to make performance improvements.

Table 12 Complaints Metric Target Setting Options

Option	Maximum penalty	Target
1	8.0 Max score attained in the last 6 years	2.8 Average sector performance in the last 6 years
2	5.1 Max score attained in the last 4 years	2.2 Average sector performance in the last 4 years
3	2.7 Upper Quartile of Performance in the last 4 years	2.2 Average sector performance in the last 4 years
4	3.3 50% above the target	2.2 Average sector performance in the last 4 years

Consultation Position

Output parameter	Consultation position
Target	Target of 2.8
Financial Incentive	Scores inclusive of the range from 2.9 to 8.0 will be penalised.

Rationale for consultation position

Target

5.29 We have proposed a fixed target score of 2.8. This is based on average performance data in the last six years of RIIO-ED1. We think that using data over this time period to set the target score will allow the improved performance that customers have experienced in RIIO-ED1 to be embedded into a BAU level of service for RIIO-ED2.

5.30 We note that this is slightly different to the approach that we have used for the customer satisfaction surveys where we have based the target on the last four years of average performance data. We have opted to base the Complaints Metric target on a broader period of data because improvements made by most DNOs in this area were weighted towards the last two or three years of RIIO-ED1 and we think that only using the last four years of data will not provide an accurate average of performance across RIIO-ED1 and, accordingly, would skew the RIIO-ED2 target. We note that in 2020/21, some DNOs have scored near our proposed target and we think that setting it at this level will be sufficient enough to drive performance improvements.

5.31 We will review the Complaints Metric scores for the current financial year (2021/22) once these have been submitted by DNOs in June and may consider a change to the proposed target score at Final Determinations if this data materially impacts the current 6-year average.

Financial Incentive

5.32 We propose to set the maximum penalty scores at 8.0. This means that DNOs that score that fall above 2.8 and below 8.0 will be penalised. 8.0 is the highest score[112] that has been attained by a DNO in the last six years and we believe that this threshold will embed the performance improvements customers experienced in RIIO-ED1 and will prevent DNO performance from deteriorating in RIIO-ED2.

5.33 Penalties will apply linearly between the target score and maximum penalty score. Please see "Creating consistency in baselines for ODI incentive rates, caps, or collars" in section 10 of the Finance Annex for our proposal to set the maximum penalty of this incentive to -0.20% RoRE.

[112] The higher the score, the less adept the DNO is at resolving complaints.

Consultation questions

Core-Q31. Do you agree with our proposed target and maximum penalty score?

Removal of stakeholder engagement and consumer vulnerability incentive

5.34 In our SSMD[113] we said that we would remove the Stakeholder Engagement and Consumer Vulnerability (SECV) incentive for RIIO-ED2, as these areas are being considered through other incentives in price control.

5.35 Our assessment of Business Plans through the BPI takes account of the quality of engagement carried out by DNOs in developing their plans. More detail on this can be found in Chapter 9 of the Overview document. With regards to consumer vulnerability, we are proposing a package of measures to ensure DNOs embed the progress they have made in the current price control in RIIO-ED2. More detail on this can be found in the next section of this Chapter.

[113] RIIO-ED2 SSMD Annex 1, Paragraphs 4.54, 4.55 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Support for consumers in vulnerable situations

5.36 Ensuring energy companies support and protect consumers in vulnerable situations is a priority for Ofgem. Our RIIO-ED2 methodology supports network companies to deliver the key vulnerability priorities associated with the DNOs' activities to protect those whose wellbeing is most at risk during a loss of supply and to help those in, or at risk of, fuel poverty.[114] As the energy system becomes smarter, cleaner and more flexible, DNOs will also need to consider how their role in protecting the interests of vulnerable consumers may change.

5.37 In this section, we set out our consultation position on the RIIO-ED2 package of vulnerability measures. This includes:

- our assessment of the Vulnerability Strategies and baseline expectations[115]
- Consumer Vulnerability Incentive (ODI-F)
- Consumer Vulnerability Incentive Annual Report (ODI-R).

5.38 Our SSMD set out a package of outputs to support consumers in vulnerable situations in RIIO-ED2.[116] In line with our SSMD position, we have developed a package for consultation which is supported by minimum standards and new incentives to hold companies to account within period and encourage best practice initiatives, which exceed the levels of service expected from a DNO.

5.39 We set out our decision to introduce a principles-based Licence Obligation in our SSMD to hold DNOs accountable for the minimum service they provide to consumers in vulnerable situations and to ensure this support is embedded throughout their BAU operations. We will be consulting on this separately as part of the RIIO-ED2 licence consultation.

5.40 We have set out our consultation positions on bespoke output proposals relevant to the vulnerability output area in the company annexes.

[114] We introduced these three primary areas of focus in our SSMD and set out that these should be addressed within the vulnerability strategies.
[115] RIIO-ED2 SSMD Annex 1 Paragraphs 6.32 - 6.41, Appendix 3 Paragraphs A3.3 - A3.6 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[116] RIIO-ED2 SSMD Annex 1, Paragraph 6.32 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Vulnerability strategies and associated principles and baseline expectations

Vulnerability strategies and associated principles and baseline expectations	
Purpose	To ensure that DNOs provide the appropriate support and services to customers in vulnerable situations in RIIO-ED2
Benefits	To support the delivery of services by the companies, which build on the extent and quality of service delivered in RIIO-ED1 where the DNOs' competence and opportunity for customer interaction puts them in the best-placed position to deliver support

Background

5.41 In our SSMD, we introduced a minimum requirement in Stage 1 of the BPI for vulnerability strategies to be part of DNOs' Business Plans. These strategies must set out activities the DNO plans to undertake to fulfil its role in supporting customers in vulnerable situations in RIIO-ED2.[117,118]

5.42 Following our assessment of the vulnerability strategies, we are satisfied that all DNOs passed the BPI minimum requirement and that the proposals outlined in the strategies should lead to positive outcomes for consumers in vulnerable situations, embed best practice achieved in RIIO-ED1 and satisfy the vulnerability key principles and baseline expectations.

Consultation position

Output parameter	Consultation position
Baseline funding for Consumer Vulnerability activities	We propose to accept all the DNOs' vulnerability strategy proposals with the following exceptions which we propose to remove from baseline funded allowances: • The repair and replacement of gas boilers; • The installation of energy efficiency measures; and • The training for in-house employees in delivering advice on energy efficiency/savings, low carbon technology and upskilling customers on digital skills.

5.43 We set out our intention to fund DNOs to deliver the vulnerability strategies through baseline allowances, where they are well justified. Our view is that in several instances it is unclear why the DNO is best placed to deliver or why the proposed scope and scale is appropriate. Our view is that providing baseline

[117] RIIO-ED2 Business Plan Guidance Paragraph 3.9 RIIO-ED2 Business Plan Guidance | Ofgem
[118] The vulnerability strategy is a common requirement and will form part of the common Consumer Vulnerability Incentive (ODI-F).

funding for these activities will extend the scope of the DNOs' role into areas where they may not be the best placed organisation to act.

5.44 Stakeholders have raised similar concerns which we have taken into account in our consultation position. The RIIO-ED2 Challenge Group noted that DNOs have not consistently and compellingly set out their rationale for different activities in a way which is clearly rooted in Ofgem's RIIO-ED2 SSMD.[119] Similarly, Citizens Advice's Call for Evidence response noted the risk that accepting all proposals could lead to "scope creep", expanding the DNOs' role, resulting in a new baseline level for consumer vulnerability activity. The consumer body added that there is inadequate evidence that DNOs are best placed to carry out some activities proposed across all DNOs' vulnerability strategies.

5.45 In alignment with our SSMD position and in light of the concerns raised by stakeholders, we propose to accept all the DNOs' vulnerability strategy proposals with the exception of three areas.

- the repair and replacement of gas boilers - we note that several DNOs have included proposals relating to boiler replacement and repairs. DNOs do not have an emergency role in gas safety or in isolating and condemning unsafe boilers; therefore, we do not consider that providing funding through RIIO-ED2 for repair and replacement services is appropriate[120]
- the training of in-house employees in delivering advice through workshops - we note that some DNOs have requested funding to train in-house employees to deliver advice through workshops on energy efficiency, low carbon technology and digital skills. We consider that where these costs do not relate to the DNO utilising its network of partnerships for referral services to deliver such advice and teaching, they should be excluded from baseline allowances. This does not extend to DNOs' training of staff in identifying consumer vulnerability and in operating referral channels or signposting support to customers
- the installation of energy efficiency measures - we do not think DNO funding should include the installation of energy efficiency measures as Government funding is available - such as the Energy Company Obligation (ECO) in

[119] In line with our SSMD position that we expect DNOs to support vulnerable consumers where the DNOs' competence and opportunity for consumer interaction puts them in the best-placed position to deliver that support.
[120] The RIIO-GD2 allowance for consumers in vulnerable situations and carbon monoxide safety (VCMA) includes the scope for the repair/replacement of condemned boilers so that GDNs engineers don't leave those most in need without heating.

England and Wales, the Green Homes Scheme in England and the Home Energy Efficiency Programmes (HEEPS) in Scotland. DNOs should make use of referral channels and signposting this support to customers.

5.46 We note our intention to work with DNOs and wider stakeholders through policy working groups to ensure costs associated with the above points are removed consistently across DNOs.

Consultation question

Core-Q32. Do you agree with our proposal to remove the activities proposed from DNOs' baseline allowances?

Consumer Vulnerability Incentive (ODI-F)

Consumer Vulnerability Incentive	
Purpose	To ensure companies are held accountable for delivering their strategies and the baseline expectations within-period and incentivise them to develop ambitious and best practice initiatives
Benefits	To support DNOs' provision of the appropriate support and services for consumers in vulnerable situations and evolve their role in response to emerging risks and issues

Background

5.47 In our SSMD,[121] we said that we will introduce an ODI-F in the form of an ex post evaluation to assess companies' performance against our key principles and baseline expectations, and the delivery of their vulnerability strategies. We did not specify how the incentive would operate, including the frequency of assessment of the Consumer Vulnerability Incentive, and said we would consult on this at Draft Determinations.

5.48 We set out our decision that it would be appropriate for penalties to apply where a DNO's performance falls demonstrably below the baseline expectations and that the potential for rewards would be appropriate where it can be shown that the DNO has exceeded the baseline expectations.[122]

[121] RIIO-ED2 SSMD Annex 1, Paragraph 6.42 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[122] RIIO-ED2 SSMD Annex 1, Paragraph 6.43 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Consultation position

Output parameter	Consultation position
Financial incentive framework	Ex post assessment of performance against targets set against five metrics, underpinned by an independent assurance check process.
Incentive value	+/- 0.2% RoRE, applied through weighted metrics[123]
Frequency of assessment	End of years 2 and 5
Reporting requirements	Performance against metric targets Regularly Reported Evidence Independent Assurance report Report detailing outcome of independent assurance checks
Reward/penalty methodology	Reward/penalty for each metric calculated based on performance against ex ante targets and the weighting of each metric in the overall calculation of rewards/penalties. The methodology relevant to each metric is set out below.

Table 13 Proposed parameters for each metric within the Consumer Vulnerability Incentive

Metric	Weighting	Minimum requirement	Metric parameters
PSR reach	40%	• PSR Reach reported in line with the common methodology • Confirmation that the DNO has cleansed PSR customer data at least every 24 months.	• Deadband applied from 50% to 75% • Reward cap - 90% • Penalty collar - 35%
Value of fuel poverty services delivered (NPV)	15%	• Net Present Value (NPV) reported using the common Social Value Framework	• Bespoke DNO baseline targets with the application of a 10% upside/downside dead band • Reward cap 20% above the baseline targets • Penalty collar 20% below the baseline collar

[123] The proposed incentive value of +/- 0.2% RoRE aligns with our SSMD position that financial exposure should remain similar to the SECV in RIIO-ED1 which is +0.5% of base revenue. See Finance Annex, paragraph 10.170 to 10.190 for detail of base revenue to RoRE conversion.

Metric	Weighting	Minimum requirement	Metric parameters
Value of low carbon transition support services delivered (NPV)	15%	• Net Present Value (NPV) reported using the common Social Value Framework	• Bespoke DNO baseline targets with the application of a 10% upside/downside dead band • Reward cap 20% above the baseline targets • Penalty collar 20% below the baseline collar
Average customer satisfaction for customers who receive fuel poverty services (CSAT score)	15%		• Common baseline target: 9/10 • Reward cap: 9.5/10 • Penalty collar: 8.5/10
Average customer satisfaction for customers who receive low carbon transition support services (CSAT score)	15%		• Common baseline target: 9/10 • Reward cap: 9.5/10 • Penalty collar: 8.5/10

Rationale for consultation position

Financial incentive framework

5.49 We propose introducing a new Consumer Vulnerability Incentive through which we will assess DNOs' performance against targets set against five outturn performance metrics. We also propose to introduce minimum requirements within the incentive framework and have set these out in relation to each metric below.

5.50 Our view is that a quantitative approach to assessment, which uses an automatic mechanism to determine whether a reward or penalty should be applied, should be based on assessing DNOs' performance against common defined metrics. We think this is the appropriate approach for the following reasons:

- it delivers increased certainty for both network companies and wider stakeholders on the outcome of the incentive assessment
- it makes the assessment process more transparent in relation to the application of any rewards or penalties
- it holds DNOs to account by allowing for simpler comparison of performance across companies
- it reduces administrative burden for both the DNOs and Ofgem in assessing performance within period.

5.51 We are proposing that the incentive is based on a set of defined, relevant, quantitative metrics. Implementing stretching but achievable targets set to clearly evidence company performance within period and enable rewards and/or penalties to be applied based on robust evidence. The metrics are based upon the three primary areas of focus outlined in our SSMD which DNOs were required to address as part of their vulnerability strategies.[124]

5.52 We are proposing the following metrics for inclusion within the vulnerability incentive scorecard and set out further detail in the sections below:

- the proportion of customers registered on a DNO's PSR out of the total eligible in its region(s) (PSR Reach)
- the value delivered as a result of fuel poverty support services
- the value delivered as a result of supporting customers at risk of being left behind in the energy system transition
- customers' satisfaction survey targeted at customers who receive fuel poverty support services and support services to ensure no one is left behind in the energy system transition.

5.53 We recognise that the value of services delivered by the DNOs interlinks with the volume of services that are delivered. To avoid the risk of duplicating rewards and penalties where metrics are not mutually exclusive of each other, we are including a measurement of volume within the annual reporting requirement and we are not financially incentivising this measure. This is described later in this section.

[124] DNOs were required to address: vulnerability during a loss of supply; being in, or at risk of, fuel poverty; and the risk of being left behind by the energy system transition towards net zero.

Incentive value

5.54 The proposed incentive value of +/- 0.2% RoRE has been calibrated relative to the overall incentive package for RIIO-ED2. This confirms our position in our SSMD that the financial exposure to the companies should remain similar to the SECV incentive within the RIIO-ED1 period. This is an annual figure which will be applied cumulatively following assessment at the end of years 2 and 5.

5.55 We consider that this represents a proportionate level of risk and reward based on our ability to assess DNO performance in a consistent and comparable way through the proposed use of common metrics.

5.56 Citizens Advice's view, as expressed in their response to the Call for Evidence, is that the incentive should hold DNOs to account on the delivery of their strategy commitments by using only penalties for under-delivery. We consider that a symmetrical incentive is the most appropriate because, while we agree that failing to meet the metric targets, and accordingly also failing to deliver on the vulnerability strategy, should result in a penalty, we also think it is proportionate to reward DNOs for exceeding in their delivery of strategy commitments and the associated incentive targets. This is because we consider that going above and beyond to respond to emerging issues and delivering additional value to consumers should be rewarded in order to incentivise this behaviour.

Frequency of assessment

5.57 We propose that DNOs' performance is assessed at the end of years 2 and 5 for this incentive.

5.58 The Year 2 assessment would consider DNOs' performance against the metric targets at the end of Year 2 for the PSR Reach metric, and those relating to the value of services delivered. The two Customer Satisfaction (CSAT) metrics would reflect the average customer satisfaction for customers who have received a support service over the first two years of the price control.

5.59 The assessment of DNOs' performance at Year 5 would consider performance from beginning of Year 3 to the end of Year 5 only.

5.60 A stage-gate approach would take stock of DNOs' delivery of their strategies and associated value for consumers at the appropriate point, where these can be measured and incentivised through the applicable outcomes-based metrics.

5.61 We propose to introduce an independent assurance process to underpin the financial incentive. This will provide assurance to Ofgem and wider stakeholders that DNOs' scores against the targets are comparable and reliable. The scope of independent assurance is set per metric below.

5.62 We consider that the DNOs should appoint a common independent assurance provider, following a joint tender process, to be in place by the end of 2023.

5.63 The independent assurance company would provide Ofgem and the DNOs with a report detailing each DNO's performance against a defined set of criteria at the time of the DNOs' assessment (end of years 2 and 5) under this incentive. A DNO would need to pass the criteria relevant to the metric to be eligible for any reward associated with their performance against that metric.

5.64 While the independent assurance company will provide a report detailing the outcome of its assessment, we would make the final decision on whether a DNO has met the minimum requirements.

5.65 Through the working groups we have developed with the DNOs some initial assessment criteria for the minimum requirements. We will continue to work with the DNOs in working groups to develop that assessment criteria as well as the process for independent assurance reporting. We will consult on these criteria and the independent assurance reporting process as part of a consultation on the incentive guidance document ahead of Final Determinations.

PSR Reach metric

Output parameter	Consultation position
Metric definition	PSR reach is the total number of households registered on the PSR out of the total number of PSR eligible households in a company's region, represented as a percentage.
Weighting within incentive scorecard	40%
Deadband	Introduce a performance dead band between 50% and 75% PSR Reach to drive performance improvements for all DNOs while embedding 50% as a minimum level expected in RIIO-ED2.
Performance cap and penalty collar	Penalties will increase linearly between the lower limit of the deadband (50%) and the penalty collar of 35%. Rewards will increase linearly between the upper limit of the deadband (75%) and the reward cap of 90%.

Table 14 PSR reach metric proposed DNO targets and dead band

Metric	Reward cap	Dead band upper limit	Dead band lower limit	Penalty collar
PSR Reach	90%	75%	50%	35%

Scope

5.66 This metric seeks to incentivise a DNO to increase the total percentage of households registered on its Priority Services Register (PSR) out of the total number of households eligible to be registered in its region ("PSR Reach"). PSR eligibility is determined in line with the common methodology developed by the DNOs through the policy working groups.

Metric weighting

5.67 This metric will have a weighting of 40% within the incentive. We consider it appropriate for this metric to carry the greatest weight in this incentive for two reasons:

- we have confidence that the methodology that supports DNOs' reporting against this metric is directly comparable across all companies
- registering customers eligible for the PSR is a fundamental aspect DNOs' support for customers in vulnerable situations and, in particular, representative of a DNO's ability to provide effective support to vulnerable customers during a loss of supply. In RIIO-ED2 we expect companies to have a mature, well-developed approach to management, promotion and maintenance of the PSR in line with Principle 1 of the vulnerability baseline expectations.[125,126]

5.68 Therefore, we consider it appropriate for this metric to carry substantial weight in the incentive due to the importance of the DNOs' role in effectively supporting vulnerable customers during a supply interruption via the PSR and the confidence we have in this metric in revealing comparable performance across the DNOs relating to the consumer outcome, which is directly within the DNOs' control (that is, being registered and able to receive the necessary support).

[125] Under their existing obligations, DNOs are required to establish and maintain a Priority Services Register, including maintaining procedures to identify PSR eligible customers and offering to add them to the PSR.
[126] RIIO-ED2 SSMD Annex 1, Appendix 3, Paragraph A3.3 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Minimum requirement for reward under the PSR Reach metric

5.69 To be eligible for any reward associated with PSR Reach performance, we propose that DNOs must pass both of the following minimum requirements relevant to this metric:

- confirmation that the common methodology for reporting PSR reach has been followed
- confirmation that the DNO has cleansed PSR customer data at least every 24 months.

5.70 We consider it important for there to be added scrutiny within period of how DNOs measure and report their PSR Reach performance as part of this incentive. This will provide Ofgem and wider stakeholders with the assurance that the common methodology has been followed and that DNOs' performance is directly comparable.

5.71 In alignment with the baseline expectations, DNOs should have a data and information strategy in place to meet the specific needs of vulnerable consumers, this should include how DNOs maintain their PSR database. All DNOs included commitments which met, and in some cases exceeded, the expectation for PSR customer data to be checked every 24 months. As the impact of these data checks directly impacts PSR reach, including where customers may be removed from the PSR, we consider it appropriate to hold DNOs to account through a minimum requirement for carrying out these checks.

5.72 We will continue to work with the DNOs and wider stakeholders through working groups to develop the criteria for the independent assurance assessments within period, prior to the beginning of RIIO-ED2.

PSR Reach proposed metric parameters

5.73 There is not a common PSR Reach starting point across the DNOs and this is reflected in the varying levels of ambition of the targets proposed by DNOs. We recognise however that all DNOs' targets are supported by extensive stakeholder and customer engagement. We are concerned that there are regional differences in the level of PSR support provided. For example, some companies are proposing that up to two thirds, or more, of customers in their region who are eligible for the PSR can expect to be registered and receiving the associated support services by

the end of RIIO-ED2.[127] In contrast, almost half of eligible PSR customers in regions covered by other DNOs are expected to still be unregistered and not in receipt of relevant services offered by their DNO.

5.74 In order to address the disparity in the PSR targets proposed by DNOs we are proposing to implement a common deadband for all companies. Performance that falls within the deadband will mean that the DNO is not exposed to penalties or rewards.

5.75 We consider the dead band will help to standardise DNO performance in this area by facilitating a minimum level of PSR Reach, across DNOs, by the end of RIIO-ED2, while also continuing to drive in period improvements in performance for companies which have higher targets and/or better starting positions for RIIO-ED2. The deadband will ensure that all companies are stretched to deliver additional value to consumers and avoid rewarding companies for average performance. This is in line with our approach to only reward companies where significant performance improvements are made and it can be evidenced they have exceeded the baseline expectations.

5.76 We consider that the deadband should be implemented between all DNOs' performance of 50% and 75% PSR Reach. We think this would allow for a fair and proportionate level of minimum performance to be achieved by all companies by the end of RIIO-ED2.

5.77 We are proposing to set the lower limit of the deadband at 50% to reflect that all but one company is performing above this level currently. That level would embed RIIO-ED1 performance as the enhanced minimum standard we expect for RIIO-ED2 and companies who fail to deliver at least this level of service would receive a penalty.

5.78 We propose to set the upper limit of the deadband at a coverage level of 75% PSR Reach for all DNOs. The highest performing DNOs are currently close to achieving this and plan to exceed this level within period. We want high performing DNOs to reach the targets set out in their vulnerability strategies and be incentivised to continue to improve in this area. We also consider that there are performance improvements to be made for all DNOs in this area in RIIO-ED2 and that delivery above 75% will deliver additional value to consumers.

[127] The targets proposed by the DNO for PSR Reach are provided in the company specific annexes.

5.79 We are also proposing to introduce a reward cap and penalty collar for this metric to protect both companies and consumers from any excessive losses or gains. We recognise that it is impossible to achieve 100% PSR Reach. Vulnerability can be transient in nature, meaning that customers can meet the definition of vulnerable for temporary periods of time. We also recognise that there will always be some eligible customers who do not consent to being added to the PSR. Therefore, we propose to set the cap at 90%, as a highly ambitious but achievable reward. We propose to apply the penalty collar at a coverage level of 35% PSR Reach for all DNOs. We consider that the collar should apply symmetrically on the downside to protect against excessive underperformance.

Value of support services delivered metrics

Output parameter	Consultation position
Metric definition	Value of services delivered by DNO or Representative, relating to fuel poverty and in ensuring no one is left behind by the energy system transition, where a service has been provided or a job has been completed.
Weighting within incentive scorecard	• 15% for value of fuel poverty services delivered • 15% for value of low carbon transition services delivered
Baseline target	Bespoke baseline targets for each DNO. These targets are set out for each DNO in the company specific annexes.
Deadband	Introduce a performance deadband 10% above and below each DNO's baseline target to drive performance improvements and for DNOs to adapt to respond to emerging issues while recognising that this a new framework for calculating value, providing some protection for consumers and companies around the targets.
Performance cap and penalty collar	Penalties will increase linearly between the lower limit of a DNO's deadband and the penalty collar, applied a further 10% below the deadband (20% below the baseline target) Rewards will increase linearly between the upper limit of a DNOs' deadband and the reward cap, applied a further 10% above the deadband (20% above the baseline target)

Table 15 Value of support services delivered metric parameters

Metric	Reward cap	Dead band upper limit	Baseline target	Dead band lower limit	Penalty collar
Value of fuel poverty services delivered (NPV)	20% above baseline target	10% above baseline target	Bespoke baseline target per DNO	10% below baseline target	20% below baseline target

Metric	Reward cap	Dead band upper limit	Baseline target	Dead band lower limit	Penalty collar
Value of low carbon transition support services delivered (NPV)	20% above baseline target	10% above baseline target	Bespoke baseline target per DNO	10% below baseline target	20% below baseline target

Scope

5.80 These two metrics seek to measure the value delivered to consumers through DNOs' delivery of their vulnerability strategies. Each metric is focused on a category of DNOs' support services:

- metric 1 - supporting those in, or at risk of, fuel poverty
- metric 2 - supporting those at risk of being left behind by the energy system transition.

5.81 The value would be measured using the common Social Value Framework developed by the DNOs with Sia Partners. The DNOs have used this framework to forecast how they expect to deliver value to these consumers through the activities outlined in their vulnerability strategies. The values are calculated using a Social Return on Investment (SROI) model which inputs the number of consumers provided with the DNOs' services, the cost of the services delivered, and the value delivered. This produces outcomes in the form of a NPV and an SROI value.

5.82 We consider it appropriate to use NPV as the measure of value within this metric rather than SROI value. This is because NPV is simpler to measure and holds DNOs to account in delivering the forecasted value associated with the delivery of their vulnerability strategies. It also creates an incentive for DNOs to deliver more services, or larger scaled services to provide additional value to consumers.

5.83 Through the policy working groups we have outlined that we expect only initiatives to feed into the tool, and hence the incentive, where the value delivered is from services delivered via an individual interaction with a customer which is of direct benefit to that customer.

5.84 We have reviewed new NPV and SROI targets and the supporting rationale for them provided by the DNOs for these values. That review is ongoing and we will

ensure that the DNOs' targets related to value are independently assured using the common Social Value Framework ahead of publishing our Final Determinations.

5.85 We recognise that there is currently a difference in understanding across DNOs in relation to calculating forecasts for the delivery of social value in RIIO-ED2 and consider that further work can be done ahead of Final Determinations to ensure that DNOs' targets can be compared on a like-for-like basis.

Metric weighting

5.86 We are proposing to use two metrics to measure the value DNOs deliver. Each metric will have a weighting of 15% within the incentive.

5.87 We consider that the value delivered to customers through the DNOs' services is an important area to measure and incentivise. We want to drive DNOs to consider the needs of their customers and provide services which deliver most value. We also see it appropriate to allow DNOs to be rewarded for identifying emerging issues in their regions and acting to support consumers at risk.

5.88 However, as the forecasting of value being delivered and reporting within period utilises a new tool, the Social Value Framework, the two metrics (relating to fuel poverty and low carbon transition support) should be weighted lower than that of the PSR Reach metric. While the tool seeks to ensure consistency and comparability in how DNOs measure and report, we want to protect both the companies and consumers against the risk of excessive under or over performance by giving each of these metrics a 15% weighting and understanding how the tool works over RIIO-ED2.

Minimum requirement for reward under the value of services delivered metrics

5.89 To be eligible for any reward under the two metrics which measure the value of services delivered, we propose that DNOs must pass the minimum requirement which confirms to us and wider stakeholders that the common methodology for measuring and reporting the value of the services delivered has been followed.

5.90 We consider it important for there to be added scrutiny within the price control period of how DNOs measure and report against these metrics as part of this incentive. This assurance, checked and confirmed by an independent assurance company, will clarify that the common methodology has been followed and that DNOs' performance is directly comparable.

5.91 We will continue to work with the DNOs and wider stakeholders through working groups to develop the criteria for the independent assurance assessments prior to the beginning of RIIO-ED2.

Value of services delivered metric parameters

5.92 We are proposing to set bespoke targets for each company which are in line with the targets proposed in their individual vulnerability strategies and/or submitted as part of the resubmission of targets in line with the common definition/calculation (based on the vulnerability strategy commitments).

5.93 We recognise the value of support services delivered by DNOs in relation to fuel poverty and low carbon transition support will differ substantially due to the difference in volume and size of support services being delivered by each DNO due to the varying needs of its regions, prevalence of vulnerability and stakeholder/customer needs. We think that rewards should apply where companies outperform their targets and penalties should apply where companies fail to meet their targets.

5.94 We propose to introduce a deadband 10% above and below each DNO's baseline target. Performance that falls within the deadband will mean that the DNO is not exposed to penalties or rewards. The deadband will ensure that all companies are stretched to deliver additional value to consumers and avoid rewarding companies for average performance. This is in line with our approach to only reward companies where significant performance improvements are made and it can be evidenced they have exceeded the baseline expectations. As the Social Value Framework is a new methodology, we think some protection should be given to companies and consumers around the baseline targets.

5.95 We propose to introduce caps and collars through a consistent methodology across companies to protect consumers, and companies, for the same reasons set out above in paragraph 5.79.

<u>Customer satisfaction for customers who receive vulnerability support services (fuel poverty and low carbon transition support)</u>

Output parameter	Consultation position
Metric definition	The measure of the satisfaction of customers who receive a delivered service from their DNO or its representative which supports: • Fuel poverty; and

Output parameter	Consultation position
	• Low carbon transition (in ensuring that no one is left behind in the energy system transition). Measured through an independently administered survey.
Metric weighting	Fuel poverty services CSAT metric: 15% Low carbon transition services CSAT metric: 15%
Baseline target	9/10 baseline target for both surveys.
Performance cap and penalty collar	Penalties will increase linearly between the baseline target (9/10) and the penalty collar (8.5/10) Rewards will increase linearly between the baseline target (9/10) and the reward cap (9.5/10).

Scope

5.96 We are proposing two new customer satisfaction (CSAT) surveys as part of the vulnerability incentive. Within the surveys, customers will be asked how satisfied they are with the service received from their DNO, or its representative, in delivering vulnerability support.[128]

5.97 DNOs will report their CSAT scores, for the purpose of the incentive, at the end of years 2 and 5. At Year 2 the CSAT score (out of 10) will be an average of the scores reported by customers over years 1 and 2. At the end of Year 5, the CSAT score (out of 10) will be an average of the scores reported by customers over years 3, 4 and 5 of RIIO-ED2.

5.98 The survey will be administered independently by the same market research company who coordinate the data collection for the CSS. This ensures that no consumer is burdened by an excessive number of surveys across different output areas.

5.99 The development on the survey script, including the placement of the 'killer question',[129] will be continued in the working group and the final survey script will be consulted on as part of the guidance for this incentive.

Metric weighting

5.100 We propose that the two CSAT metrics will have a weighting of 15% each within the incentive, for a total of 30% weighting.

[128] This support is specifically for those in, or at risk of, fuel poverty or at risk of being left behind by the energy system transition to net zero.
[129] The 'killer question' is the question within the survey which asks the consumer how satisfied they are with the DNOs' service. The scores (/10) for this question are measured for the purpose of this incentive.

5.101 We consider the CSAT metrics important within the incentive framework for understanding and capturing customers' views towards the support they receive from their DNO or its representative. We also recognise the risk that DNOs could attempt to deliver support services to those who do not want the support or be light-touch in the support they deliver and we consider a CSAT survey metric will be effective to mitigate these risks and drive DNOs to put the customers' needs at the heart of what they do.

5.102 We recognise that these are new CSAT surveys for the purpose of this incentive with no directly attributable historical data, we therefore feel it is appropriate to weight these metrics less than the PSR Reach metric.

CSAT proposed metric parameters

5.103 We propose a baseline target of 9/10 for all companies for both surveys; for fuel poverty services and those that support customers in the energy system transition (eg. with low carbon technology). We intend to set a common baseline target for all DNOs to reflect that consumers across GB should receive a consistently high standard of service. These are new CSAT surveys for RIIO-ED2 and there is no historical data to inform a baseline target.

5.104 We consider that the target should be set no lower than that of the CSS target for RIIO-ED2 (8.9/10). DNOs should look to embed learnings from the BMCS in RIIO-ED1 to maintain a high level of service. We also anticipate high levels of customer satisfaction in this area, given the value forecasted for customers in receipt of these services.

5.105 We note that the majority of DNOs have provided RIIO-ED1 scores and targets for RIIO-ED2 in relation to the satisfaction of PSR customers during power cuts in their vulnerability strategies. All DNOs who included this information are currently performing above 9/10 in RIIO-ED1 and are targeting between 9.3 and 9.5/10 for RIIO-ED2. As these targets relate to the satisfaction of a similar, and often overlapping group of customers, we consider that the same level of service should be expected across DNOs' vulnerability support services. We therefore propose a baseline target of 9/10 as a stretching and achievable target.

5.106 We propose to introduce a reward cap and penalty collar for these metrics to protect both companies and consumers from any excessive losses or gains. We recognise that this is a new incentive area and that the likelihood of achieving above 9.5/10 is remote, we therefore think that 9.5 is an achievable and

stretching reward cap. We propose to apply the penalty collar at 8.5/10, symmetrical to the upside reward cap. We do not consider that DNOs will achieve scores less than this level based on review of CSS performance for consumers in vulnerable situations.

Consultation questions

Core-Q33. Do you agree with our proposals for the Consumer Vulnerability ODI-F?

Core-Q34. Do you agree with the performance metrics we are proposing to include in the incentive and the approach to setting targets and associated deadbands, performance caps and penalty collars? If not, please explain why and give details of your preferred alternative.

Annual Vulnerability Report (ODI-R)

Annual Vulnerability Report	
Purpose	To ensure companies are held accountable for delivering their strategies and the baseline expectations within-period through transparent means
Benefits	To support greater ambition and drive DNOs to evolve their role in response to emerging vulnerability issues within period

Background

5.107 In our SSMD, we stated that regardless of the frequency of assessment during the price control, we consider annual reporting an important facet of the approach to ensuring DNOs are both accountable and ambitious in the delivery of their vulnerability strategies and the baseline expectations.[130]

Consultation position

5.108 We have set out our proposal to assess DNOs' performance in relation to financial incentive at the midpoint and end of the price control period in the previous section. We are proposing, in addition, companies should submit a yearly report to Ofgem and publish that report on its website for interested stakeholders.

Output parameter	Consultation position
Reporting requirements for the	• yearly performance update on the financial incentive metric targets • additional regularly reported evidence

[130] RIIO-ED2 SSMD Annex 1, Paragraph 6.45 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Output parameter	Consultation position
Annual Vulnerability Report	• how the common social value framework is being used to inform decision-making and prioritisation within period • progress update in delivering the bespoke vulnerability strategy commitments • how DNOs are preparing customers for winter, including information of how they plan to effectively support those vulnerable during a loss of supply.

Rationale for consultation position

5.109 We consider that an annual report would drive DNOs to make annual improvements to their service delivery consistently throughout the price control period, providing assurance to us and wider stakeholders that they are delivering their strategy commitments and meeting the baseline expectations within period. We see five key areas that the report should cover:

- progress against incentive metric targets - to allow us and wider stakeholders to track DNOs' progress on a reputational basis outside of the financial incentive assessment
- regularly reported evidence (RRE) - to track progress against further quantitative measures we view as important inputs. These include the frequency of DNOs' PSR data cleanse, the CSS score for PSR customers who have experienced a power cut, and the volume of services delivered which support those in, or at risk of, fuel poverty and those at risk of being left behind in the energy transition
- how the Social Value Framework is used within the DNO business - to understand the usefulness of the framework within period in DNOs' decision-making and prioritisation of services
- progress in delivering vulnerability strategy commitments - to provide further detail to supplement the financial incentive metrics and provide assurance to both Ofgem and wider stakeholders of DNOs' delivery of their bespoke strategy commitments within period
- DNOs' plans for supporting customers over the winter period (winter preparedness plans) - to ensure that DNOs have in place robust winter preparedness plans to effectively support customers vulnerable to a loss of supply.[131]

[131] We concluded from our Storm Arwen review that we consider there to be an enduring role for DNOs in submitting elements of their winter preparedness plans to us each year. Final report on the review into network' response to Storm Arwen (ofgem.gov.uk).

Next steps

5.110 We will consult on the full structure and scope of the annual report as part of the incentive guidance document.

Consultation questions

Core-Q35. Do you agree with our proposal for the Annual Vulnerability Report ODI-R?

Core-Q36. Do you agree with the proposed content of the annual report? If not, please explain why and give details of your preferred alternative.

Provide a quality service for consumers seeking a connection

5.111 Enabling the transition to net zero will require a rapid increase in connections to the electricity distribution network, for example to accommodate EV chargepoints and domestic HPs as well as more distributed generation like solar panels.

5.112 The UK Government's recent British Energy Security Strategy confirmed their intention to work with Ofgem to speed up connections to the local electricity distribution networks. Accordingly, we need to ensure that appropriate obligations and incentives are in place before LCT deployment significantly ramps up in scale.

5.113 Customers requesting a new or upgraded electricity connection rely on the DNO to provide them with an efficient, high-quality service. However, the type of services a customer requires may depend on the size or type of connection they seek. This in turn may impact upon how performance should be measured and incentivised.

5.114 For connections at the lower voltages - also known as 'minor connections' - the connections process can be reasonably straightforward. For these customers, we think the most important areas to incentivise are customer satisfaction and the time it takes to connect to the electricity distribution network.

5.115 For connections at higher voltages, generation customers and other unmetered connections - also known as 'major connections' - customers' requirements can be different and more bespoke to individual projects. We also note that some larger customers, depending on their location, may be able to choose between using a DNO or an alternative connections provider. The type of services that customers require, and the presence (or otherwise) of competition, should all be considered when setting price control outputs and incentives.

5.116 This section sets out our proposals to ensure DNOs provide a quality service for all consumers seeking a connection in RIIO-ED2.

Connections element of the customer satisfaction survey (minor connection customers)

Connections element of the customer satisfaction survey	
Purpose	The connections element of the customer satisfaction survey helps to drive improvements in the quality of service that DNOs provide to customers seeking a minor connection.
Benefits	Rewards will encourage DNOs to deliver exceptional customer service while penalties protect consumers against poor performance.

5.117 In our SSMD[132] we said that we would retain the connections element of the CSS in RIIO-ED2. This is discussed in the earlier sections of this chapter.

Time to Connect incentive (minor connection customers)

Time to Connect incentive (minor connection customers)	
Purpose	To incentivise DNOs to reduce the average connection time for customers seeking a minor connection to the distribution network
Benefits	Rewards and penalties will help reduce the time it takes to connect customers seeking a minor connection to the distribution network

Background

5.118 In RIIO-ED1, we introduced the Time to Connect (TTC) incentive to speed up the process of connecting smaller, or minor, customers (connections at the lower voltages) to the network.[133] Under the incentive, connection time is measured in two ways. The 'time to quote' (TTQ) is the time from the DNO receiving the initial application to issuing a quotation. The 'time to connect' is the time from the customer accepting the quotation to the connection being completed.

5.119 Our SSMD set out our proposals for the TTC incentive in RIIO-ED2.[134] We did not confirm the exact level of reward and penalty score, or the deadband, in our SSMD and said we would consult on this approach at Draft Determinations.

[132] RIIO-ED2 SSMD Annex 1, Paragraphs 5.11 RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[133] TTC applies to single service low voltage connections (LVSSA) and small project demand connections (LVSSB) segments.
[134] RIIO-ED2 SSMD Annex 1, Paragraphs 5.14 to 5.43 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Consultation position

Output parameter	Consultation position
Baseline target methodology	A common target based on the most recent four-year average and applicable to all DNOs.
Target	LVSSA TTQ - 4.38 working days LVSSB TTQ – 7.32 working days LVSSA TTC – 36.38 working days LVSSB TTC - 45.65 working days
Incentive value	Introduce penalties and set symmetrical financial exposure of +/-0.15% RoRE.[135]
Rewards/ penalties	Rewards/penalties will be capped at +/-50% of the target value.
Deadband	A +/-20% deadband will be applied.

Rationale for consultation position

Setting the target

5.120 Our SSMD confirmed that we would set the target using the most recent four years' worth of data. For Draft Determinations, this includes performance data up to the sixth Regulatory Year of RIIO-ED1, 2020-21. We will confirm final targets at Final Determinations when we will use performance data up to 2021-22. The targets we propose for RIIO-ED2 represent an improvement on RIIO-ED1 performance.

Setting the maximum reward and penalty scores

5.121 The current maximum reward in RIIO-ED1 is set at +30% of the target. When setting the maximum reward and penalty scores for RIIO-ED2, we are mindful that some DNOs would achieve the maximum reward from the outset in some categories with no extra effort. We think all DNOs should be seeking to continually improve the service to their customers where possible. Increasing the level at which maximum rewards are paid should provide an incentive for the DNOs to do this. This approach ensures that frontier performers will be driven to continue to improve the service to their customers which will drive up the industry average and lead to better performance through baseline funding over time. We think therefore that it is in the interests of consumers to increase the maximum reward score beyond the RIIO-ED1 level. However, setting the maximum reward too high

[135] The proposed incentive value of +/- 0.15% RoRE aligns with our SSMD position to apply a symmetrical financial exposure of +/- 0.4%. See Finance Annex for detail of base revenue to RoRE conversion.

could make it unachievable. At +50% no DNO is already achieving the target in any category (although some are close) ensuring that there is still an incentive to improve performance. On this basis, and noting our SSMD position to set financial exposure symmetrically, we consider that the maximum reward or penalty limit should be set at +/-50% of the target.

5.122 Our SSMD said that we consider it is appropriate to apply a penalty to guard against the risk of performance deterioration in RIIO-ED2, especially as RIIO-ED1 consumers paid for these improvements, and drive further consistency in performance.

5.123 While the overall average has improved over RIIO-ED1, there are differences between individual company performances (and in some cases, between the time to quote and connect for the same company). All customers deserve good service and should not receive different levels of service because of where they live. We do not consider there to be justifiable reasons for why performance is different across the DNOs. All DNOs should be seeking efficiencies in processes to improve connection timescales in RIIO-ED2. We think it therefore is appropriate that risk of penalty also applies to companies who are performing consistently below the industry average, even if their performance remains static.

Setting the deadband

5.124 We propose to introduce a deadband. On one hand, we think this incentivises companies to do more for their customers to earn a reward. On the other, it provides protection against unexpected behavioural change because of factors like the Access and Forward-looking Charges Significant Code Review or net zero materially alters connection activity in these segments.

5.125 We propose setting the deadband at +/-20% of target. The advantage of a wider deadband is that DNOs potentially have to deliver greater improvements to achieve a reward, and provides increased protection to DNOs against a penalty if the Access and Forward-looking Charges Significant Code Review and net zero drive much more connections activity. The advantage of a narrower deadband is that there is a narrower band of performance that has no financial consequence, so DNOs may be more likely to feel investment could be rewarded or avoid penalty. Our proposal attempts to strike a balance between these two outcomes.

Consultation questions

Core-Q37. Do you agree with setting the maximum reward and penalty limit at +/- 50% of the target?

Core-Q38. Do you agree with setting a deadband of +/-20% of the target?

Major Connections Incentive

Major Connections Incentive	
Purpose	To ensure DNOs deliver quality services to customers seeking major connections in RIIO-ED2
Benefits	An improvement in major connection customers' overall satisfaction with DNOs in providing connections to their networks

Background

5.126 In our SSMD we outlined principles and baseline expectations for how DNOs should deliver services to major connections customers and improve service standards. As a minimum requirement of Stage 1 of the BPI, DNOs had to produce a major connections strategy that aligned with these expectations.

5.127 We also set out that we would hold DNOs to account for the delivery of their major connection strategies through a financial ODI.

5.128 To support our assessment of performance and ability to compare DNOs, we said we would use common metrics where possible and that DNOs would need to propose specific, quantifiable, and well-justified performance measures within their Business Plans. We also said that DNOs would be required to report annually on the delivery of their strategy, including performance against any metrics.

Assessment of Major Connections Strategies

5.129 Following our assessment of the companies' major connections strategies, we were satisfied that all DNOs passed the Stage 1 minimum requirements.

5.130 We were also satisfied that all major connections strategies were developed with sufficient stakeholder input. This ensured that the level of service, defined through the baseline expectations, considered the needs of the connection customers in each of the DNO's respective regions.

5.131 Strategies that strongly considered the potential for increased levels of connections in RIIO-ED2 were generally forward thinking and of a higher quality. DNOs who adopted that approach clearly defined what was required to improve their services to meet the increased demand in connections over RIIO-ED2.

5.132 In our SSMD, we stated that the major connection strategies would only have to be produced in respect of contestable and non-contestable work for the relevant market segments (RMS) that have not demonstrated evidence of effective competition. Where competition had been demonstrated in a RMS, the strategy should consider non-contestable services only.

5.133 We were pleased to see the approach taken by the majority of DNOs to improve the level of service to all customers, regardless of the level of competition in the RMS. These strategies presented holistic deliverables to benefit all customers, and suggested performance metrics that would measure the success of delivery across all customers.

5.134 As a minimum requirement of Stage 1 of the BPI, DNOs had to include relevant performance measures in their major connections strategy. DNOs took different approaches to this, with each DNO proposing to demonstrate their performance either through a series of metrics and associated targets or a single metric and target attributed to each distinct area of the baseline expectations. We were satisfied that these were generally well-defined metrics.

5.135 Customer satisfaction was frequently stated as a viable performance measure across all DNOs' strategies. This informed our approach to designing the Major Connections Incentive.

5.136 We engaged with DNOs through a series of working groups to consider the viability of a customer satisfaction metric and develop a common approach to assessing this. We believe that developing a common metric and approach across all DNOs will enable customers across GB to benefit from a consistent standard of service.

5.137 Each DNOs' CEG supported the major connections strategies, noting that they were generally comprehensive and of good quality. SSEN's customer satisfaction target score was questioned by their CEG because SSEN had not provided them with supporting evidence to allow the CEG to verify the historical data behind this. Our view is that we are comfortable that SSEN's customer satisfaction score is

based on historical data, that their approach is in line with other DNOs and it is sufficiently ambitious.

Our consultation positions

Output parameter	Consultation position
Incentive type	ODI-F with reputational reporting.
Incentive value	The ODI-F will be a maximum penalty exposure of 0.35% of RoRE and applied to performance in the Major Connections Customer Satisfaction Survey. This is calculated by applying a 0.1% base revenue penalty rate per RMS.[136] The penalty will be calculated based on the number of RMS where effective competition has not been demonstrated. DNOs will be required to produce an annual report detailing customer satisfaction scores, progress against the delivery of their major connections strategies and timeliness.
Baseline target methodology	For the Major Connections Customer Satisfaction Survey, weighted average target based on major connections strategies' customer satisfaction target.

5.138 Our proposals for the major connections ODI are to:

- introduce the Major Connections Customer Satisfaction Survey (MCCSS): an independent survey provider will survey major connections customers against the key service areas identified in our baseline expectations. Performance against this is proposed to be subject to a financial penalty
- introduce the Major Connections Annual Report (MCAR): the report will detail the progress made against the delivery of milestones set out in the DNO's major connections strategy, including any improvements made to the connections process over the RIIO-ED2 period. Additionally, annual MCCSS performance must be included in the MCAR
- introduce reputational reporting against a series of timeliness metrics, which are to be published in the MCAR.

5.139 Where effective competition has been demonstrated, we permit DNOs to charge an unregulated margin and limit the application of direct regulation in the form of price control incentives on service provision. This is because we consider that

[136] Please see "Creating consistency in baselines for ODI incentive rates, caps, or collars" in section 10 of the Finance Annex for our proposal to translate this incentive to 0.35% RoRE.

competition can be a more effective way of delivering improvements in customer service and efficiency than direct regulation. Furthermore, we do not want price control arrangements that only apply to DNOs, for the provision of contestable connections, and not their competitors to distort competition in the market.

5.140 Where competition exists, we do not want any incentive(s) to distort it. Therefore, our proposed incentives will primarily apply for services where effective competition does not exist, and for services provided to third parties where effective competition has not been demonstrated.

Rationale for Consultation Position

Major Connections Customer Satisfaction Survey

5.141 In companies' major connections strategies, we required all DNOs to propose specific, quantifiable, and well-justified performance measures. Based on our review and subsequent development of the incentive, we consider a customer satisfaction metric the most appropriate for evaluating a DNO's level of service.

5.142 We are therefore proposing to incorporate a standardised customer satisfaction survey for all DNOs – the MCCSS. We want to ensure that the MCCSS provides a strong incentive for DNOs to deliver a quality service to customers, in a period where we are likely to see an increase in the levels of major connections. The MCCSS will therefore be the element of the incentive that will be subject to a financial penalty, to ensure that DNOs deliver a high-quality service across all RMS.

5.143 Our view is that standardising the approach taken to evaluate customer satisfaction across all DNOs, will provide an accurate and comparable representation of the DNO’s level of service. We also consider that standardising the approach will drive a consistent level of service regardless of where a customer chooses to connect.

5.144 To achieve this we are therefore proposing that DNOs appoint an independent survey provider to survey customers against the key service areas identified in our baseline expectations – pre-application, the application process and the delivery phase.

5.145 More details on the MCCSS, such as the survey script, process to appoint an independent survey provider, and details of the Major Connections Annual Report will be set out and consulted on in Major Connections Guidance Document.

Scope of the MCCSS

5.146 We propose that the MCCSS applies to:

- all services in the RMS where a DNO has not demonstrated evidence of effective competition
- non-contestable services provided to third parties in those RMS where DNOs have demonstrated evidence of effective competition.

5.147 We believe that it is necessary to apply the MCCSS to all services in an RMS where a DNO has not demonstrated evidence of effective competition to ensure these customers' interests are protected.

5.148 We consider it is appropriate to include non-contestable services provided to third parties in RMS where DNOs have demonstrated evidence of competition within the scope of the MCCSS. Given that the non-contestable services provided to third parties are a key element of the connections process, we believe that incorporating these services into the MCCSS will result in a comprehensive incentive where DNOs are incentivised to maintain a high-level of service across all RMS.

5.149 For these customers, we believe that it would be most appropriate to survey on satisfaction around the timeliness of information provision and overall satisfaction with the level of service. We will engage with stakeholders before Final Determinations to identify how the survey should be designed in the most appropriate way to capture this aspect of service provision. All other non-contestable services will be captured and incentivised through the MCAR.

5.150 We propose that the MCCSS not apply to contestable connections completed by the DNO in RMS where a DNO has demonstrated evidence of effective competition. This is because we consider that where a DNO has fairly competed for a connection, it is not appropriate to apply direct regulation, as competition can be a more effective way of delivering improvements in customer service.

5.151 Finally, the obligation on DNOs to comply with the Competition in Connections (CiC) Code of Practice will be remain in place. This obligation also requires DNOs to publish a report annually to demonstrate compliance with the CiC Code of Practice.

Target setting and application of penalty

5.152 As set out in paragraph 5.134, the DNOs' major connections strategies proposed performance metrics, including customer satisfaction target scores. These target scores have been developed with stakeholder input and historical performance and have been endorsed by the DNO's relevant CEG. We are proposing to use these figures to collate a target score by deriving the mean average of all DNO targets.

5.153 Alternatively, we considered solely using historical data however this was not feasible due to a lack of standardisation in previous data collection or aligning to the CSS target, which we considered while simple would be inappropriate as minor connections customers have different requirements.

5.154 We are also proposing to implement a collar. The introduction of a collar recognises that, for major connections service provision, a common, mechanistic metric was not in place for RIIO-ED1. Thus, as this is a new incentive and there is some uncertainty around how it would function in practise, we believe that implementing a collar would allow for DNOs to grow accustomed to the regulation. We propose to increase the score at which the collar applies over the course of RIIO-ED2 to ensure an increasingly high standard of service.

5.155 The effect of the collar would be that, in Year 1 of the price control, the DNO would not incur a penalty if they scored at least 8/10. In Year 2, we propose to raise the collar to 8.1/10. We believe that this allows for sufficient headroom for DNOs and stakeholders to get accustomed to this new metric, while still maintaining sufficiently challenging scores in the first year.

5.156 After this, the collar would narrow further. In years 3, 4, and 5, we propose increasing the threshold to 8.3, 8.5 and 8.7 respectively. This progression is to ensure that the DNOs make continuous improvements to service provision.

5.157 Under our proposals, the penalty will be applied on a binary all-or-nothing basis. That is, DNOs will either face the maximum penalty (taking into account the number of eligible RMS) or none. We did consider whether the penalty could increase as the score approaches the collar, reaching a maximum only when the collar is breached. This could have the advantage of better reflecting the level of performance – poorer performance from a DNO would be reflected in a stronger penalty. We note however the current Incentive on Connections Engagement (ICE) does not have a scaled or ratcheted penalty. This approach provides a strong incentive on DNOs to meet their customers' expectations. We will however

continue engagement with the DNOs on this and other aspects of the incentive design in the working groups leading up to Final Determinations.

5.158 We recognise that there are concerns with implementing a new customer satisfaction metric for major connections where actual performance is still uncertain, due to the lack of a standardised customer satisfaction metric in RIIO-ED1. This is another reason why we have proposed the introduction of a collar.

5.159 A concern highlighted to us was that customers in RMS where there is a higher volume of activity, may be prioritised over customers in smaller RMS. A further concern highlighted to us, in relation to sample sizes, was the fact that sample sizes would not be as large as sample sizes for minor connections customers, where the CSS is currently active.

5.160 We would like to gather more information on the likelihood and scale of this concern. Following our review of these responses, if we consider the concern to be material, we propose to explore the possibility of implementing an appeals mechanism to mitigate this potential issue.

5.161 Our concern with this proposed mechanism is that it has the potential of infringing on the mechanistic nature of the MCCSS. This is why we propose to only implement it if we see justification as to why there is a significant likelihood that this concern will be realised.

5.162 Table 16 below summarises the information set out above.

Table 16 Target setting for the Major Connections Incentive

DNO	Pre-app target	App process target	Post app target	DNO aggregated target	Common MCCSS target	Collar scores				
						Year 1	Year 2	Year 3	Year 4	Year 5
ENWL	8.5	8.5	8.5	8.5	8.9	8.0	8.1	8.3	8.5	8.7
NPg	9	9	9	9						
WPD	9	9	9	9						
UKPN	9	9	9	9						
SPEN	9	9	9	9						
SSEN	9	9	9	9						

Incentive rate application

5.163 We are proposing to apply a maximum penalty exposure rate of 0.35% RoRE. In practice, we propose that the penalty that each DNO could face will be calculated based on the number of RMS where effective competition has not been

demonstrated, either through the Distribution Price Control Review 5 (DPCR5) Competition Test (the 'Competition Test') or recent competition review.[137] DNO specific penalties are set out in the relevant company annex. We consider that the proposed incentive amount is sufficient to result in DNOs actively seeking to understand and meet the needs of existing and future connections customers.

5.164 Under this proposal, the incentive strength will remain at a similar level to ICE for major connections in RIIO-ED1. However, in RIIO-ED1 this was translated into £m values that were fixed through the price control. The finance annex sets out a proposal for how the £m values are determined (see section "Creating consistency in baselines for ODI incentive rates, caps, or collars" in Chapter 10 of the Finance Annex).

5.165 We note the concerns raised by DNOs that this approach may not reflect the value of a RMS and therefore provide DNOs with a disproportionately large or small incentive to engage with connection customers in some market segments. Our view is that splitting the penalty according to market value would risk failing to account for the need for engagement with specific market segments or the value of engagement with potential connection customers. Fixing the incentive rate will ensure that customers in all RMS are given equal priority and will avoid incentivising performance in one RMS at the expense of another.

5.166 Additionally, as proposed by some DNOs, we do not think that fixing the value of the penalty based on a previous year's data would be appropriate as that could result in an incentive amount that did not reflect the actual market value in the current year.

Application of rewards

5.167 In our SSMD and decision to review competition in the electricity connections market we noted we would explore the application of rewards, as a part of the RIIO-ED2 major connections incentive, to encourage a high level of service.[138]

5.168 Following more detailed development of the design of the incentive, we do not think it would be appropriate to permit upside financial incentives through the incentive. We are concerned that providing rewards to DNOs for excellent

[137] Consultation on our review of competition in the electricity distribution connections market | Ofgem
[138] See here for our review of competition decision document, where we set this out.

customer service in a market where competitors exist, and will not be eligible for the same rewards, could have the effect of distorting competition.

Major Connections Annual Report

5.169 Alongside the MCCSS, we will require DNOs to publish the MCAR annually. We consider the MCAR will strengthen the incentive and enable stakeholders to track and monitor DNO performance across RIIO-ED2, with greater context. This will be monitored reputationally and DNOs are encouraged to use this to demonstrate the improvements made to their connections service.

5.170 DNOs would be required to publish their performance on the MCCSS for each RMS within the MCAR, providing all stakeholders with visibility of their service to all connection customers, and mitigating any concerns of larger RMS being prioritised over smaller ones.

5.171 In addition to this, the MCAR should be used to provide updates on the delivery of the commitments and deliverables stated within the DNOs' major connections strategies. These outputs are a key area against which DNOs are funded and the MCAR aims to track the progress of delivery.

5.172 Importantly, requiring DNOs to report on the delivery of their major connections strategies will give us confidence that a baseline level of service is being delivered to all customers throughout RIIO-ED2.

Reporting on timeliness

5.173 The TTC incentive currently exists for minor connections only. Given the lack of historical data in this area and the complexity of major connections, we decided in our SSMD not to expand the scope of the TTC incentive.

5.174 Timeliness of the delivery of both quotations and connections for major connections however remains a key element of the connections process. We are therefore proposing to introduce reputational reporting of timeliness, within the MCAR, to ensure that stakeholders have sight of DNOs performance in relation to the timescales taken for the end-to-end connections process of major connections customers.

5.175 We are proposing that DNOs will be required to report on the following timeliness metrics, reputationally, across all RMS:

- Time to Quote: is the time from the DNO receiving the initial application to issuing a quotation
- Time to Connect: is the time from the customer accepting the quotation to the connection being completed. DNOs will calculate the average time in working days, measured between 'site ready' and the connection being made in the RMS in the relevant regulatory year. 'Site ready' would include the premises access to site being possible in a safe and secure way, and with all land rights and consents agreed.

5.176 We are aware of concerns of Time to Quote and Connect numbers varying across RMS, given the complexity and diversity in major connections. To mitigate any confusion in the interpretation of these figures by interested stakeholders, we propose to require any reporting on timeliness to be outlined on a per-RMS level. We believe that this would provide clarity and context to all interested stakeholders.

5.177 We will engage with DNOs through working groups leading up to Final Determinations and the development of the RIGs to explore how this can be achieved. We aim to use the data we collect over the RIIO-ED2 price control to design incentive arrangements for the next price control, to set accurate targets and drive performance improvements in the timeliness and efficiency of DNOs connecting major connections customers.

Consultation questions

Core-Q39. Do you agree with our proposed design of the Major Connections incentive?

Core-Q40. Do you agree with our proposed approach to target setting and applying the penalty?

Core-Q41. Do you agree with our proposal to require reputational reporting of timeliness metrics for all RMS?

Connections guaranteed standards of performance (all connection customers)

Background

5.178 In our SSMD[139] we confirmed we intended to retain the existing Connections Guaranteed Standards of Performance (GSoP) for all connections customers in

[139] RIIO-ED2 SSMD Annex 1, Chapter 5 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

RIIO-ED2.[140] We considered it appropriate to adjust the payment amounts to account for inflation to the start of RIIO-ED2, and then index payments to inflation against a baseline level of January 2023.

5.179 We also stated, and respondents agreed, that the Connections GSoP have worked well for consumers in providing minimum expectations of the service levels that DNOs will deliver. We did, however, remain open to views on whether any amendments need to be made to some elements of the standards.

5.180 Finally, we said we will work with DNOs to establish the text that will form part of the Connections GSoP for updating payment amounts and the associated caps, taking learnings from the equivalent process in RIIO-GD2.

Consultation position

Output Parameter	Consultation position
Updating payments	We will update payments for inflation (CPIH) subject to the timing of a wider review.
Distributed Generation Standards Direction (SLC15A)	We will retain the existing Standard Licence Condition 15A for now but keep this under review subject to the outcome of any wider review.
Connections GSoP review	Extend the review of Connections GSoP beyond RIIO-ED2 (but would still include both updating payments for inflation and incorporating Distributed Generation Standards).

Rationale for consultation position

5.181 In line with our SSMD, we consider the payment levels are appropriate and do not need updating beyond an adjustment to account for inflation.[141] This is because payment levels were last reviewed as part of setting RIIO-ED1. The payment amounts are intended to acknowledge the inconvenience customers have experienced because of the standard not being met, rather than reflect the value customers may place on that inconvenience. On this basis, we consider the payment levels to be appropriate once amended to account for inflation.

5.182 Standard Licence Condition 15A (Connection Policy and Connection Performance) of the Standard conditions of the Electricity Distribution Licence makes provision for us to issue a direction for the purposes of ensuring there are standards of

[140] For the avoidance of doubt, these are separate to the GSoPs on interruptions, voltage quality, and customer interactions discussed from paragraph 6.105 to 6.114 of this document.
[141] RIIO-ED2 SSMD Annex 1, Paragraphs 5.70 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

performance in place for Distributed Generation (DG) Connections that are equivalent to the standards of performance prescribed for demand connections. This is necessary because the current drafting of the Electricity (Connection Standards of Performance) Regulations 2015 only refers to demand connections.

5.183 If we are amending the Connections GSoP to update the payment amounts for inflation, we think there may also be merit in extending the drafting of the Connections GSoP to include both demand and DG connections. This would remove the need for the Authority to issue a separate DG Standards Direction.

5.184 Our SSMD said that we considered the Connections GSoP remain fit for purpose for RIIO-ED2 and play an important protection for customers against unacceptable levels of connections service.[142] Stakeholders agreed and did not put forward any changes to the existing standards or propose new ones. However, we are mindful that RIIO-ED2 will be a period of transition and we can expect to see a significant increase in connection activity as new low carbon technologies are rolled out. Furthermore, we note Government's recent British Energy Security Strategy which said they will work with Ofgem to speed up connections to the local distribution networks.[143] We maintain that consumers should be able to have a minimum standard they can expect from their DNO, yet note in a number of cases there is no standard for the overall (ie end to end) time to connect.

5.185 As we plan to update the Connections GSoP payment amounts for inflation, as well as potentially incorporating the DG Standards Direction into the legislation, we are considering whether to extend the scope of reviewing the Connections GSoP more broadly in this context. The scope of the review of the Connections GSoP could therefore be widened to include, but is not necessarily limited to, the prescribed periods, scope of activities and exemptions described in the Connections GSoP.

5.186 While we would want to expedite this area of work as much as possible, there are challenges in conducting and completing such a review in time to implement changes to the Connections GSoP for the start of RIIO-ED2. Further, we think it could introduce confusion if there are multiple changes to the Connections GSoP in quick succession. We are therefore proposing to consolidate the changes proposed in our SSMD as part of a wider review and progress it as a single piece of work.

[142] Annex 1 Paragraph 5.80 of RIIO-ED2 Sector Specific Methodology Decision | Ofgem
[143] British energy security strategy - GOV.UK (www.gov.uk)

We consider this could be implemented by April 2024, minimising any adverse impact of a delay.

5.187 We will work with DNOs to explore what this review would entail in practice, as well as continuing to explore other ways that overall performance and the time to connect can be improved.

Consultation questions

Core-Q42. Do you agree with our proposal to launch a wider review of the Connections GSoP (that is, beyond updating the payment amounts for inflation and incorporating standards for DG customers)?

Core-Q43. Do you have any views on what else could be done to help speed up connections to the distribution network and or develop a standard for the overall (ie, end to end) time to connect?

Removal of the ICE

5.188 In our SSMD, we decided to remove the ICE and replace it with a new framework to ensure DNOs deliver quality services to major connections customers in RIIO-ED2. Our decision and rationale for removing ICE and introducing the Major Connections Incentive is set out in Annex 1 Chapter 5 of our SSMD.

6. Maintain a safe, resilient and reliable network

Section Summary

This chapter sets out our proposals to ensure the DNOs continue to drive improvements in network reliability and to ensure that key network assets are maintained, repaired and replaced to ensure long term safety and resilience, including in relation to severe weather.

It also sets out our assessment of proposals to support workforce planning and to ensure the networks improve their cyber resilience and the physical security of key network sites.

Overview

6.1 The most valuable service that DNOs provide to consumers is an uninterrupted supply of electricity. Reliability has therefore been a key priority for Ofgem over recent price controls, which has included a range of measures to ensure DNOs continue to improve their performance.

6.2 Closely related to this, the actions network companies take in managing their networks must ultimately deliver safe and resilient network services to ensure the distribution networks can meet the needs of consumers, both now and in the future.

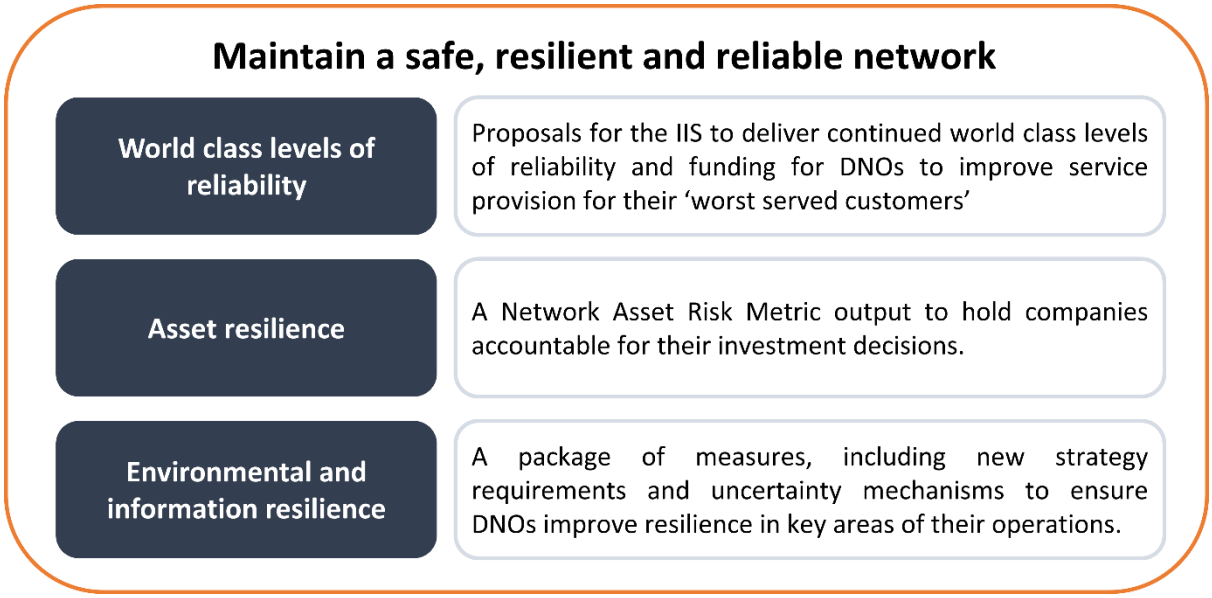
6.3 The resilience of the electricity networks has been in sharp focus through recent months, with a number of storm events bringing significant disruption to customers. In late November 2021 Storm Arwen resulted in over 1m customers losing power. Approximately 40,000 customers were without supply for more than three days, and nearly 4,000 customers were off supply for over a week. This was followed by a number of other severe weather events through the winter period, including Storm Eunice in February 2022, which resulted in over 1.7m households experiencing a disruption to their electricity supplies.

6.4 The networks need to remain resilient to a range of existing and emerging threats. This resilience encompasses the physical condition of the assets, as well as the capacity to withstand external threats such as severe weather events, including wind damage or flooding of key sites, or cyber-attack.

6.5 Our proposals in this chapter build on the outputs that we set out in our SSMD. There are two strands to how we propose to ensure a safe, resilient and reliable network is maintained:

- proposals for a package of measures to ensure DNOs continue to maintain world class levels of reliability through the Interruptions Incentive Scheme (IIS), the GSoPs, and how DNOs improve service provision to their 'worst served customers'
- our proposals for a series of measures to increase the long-term safety and resilience of the network in response to a range of existing and emerging risks and to help support the transition to net zero.

Figure 10 An overview of Chapter 6



Maintain world class levels of reliability

6.6 The actions that network companies take in efficiently managing their networks in RIIO-ED2 should deliver reliable network services for existing consumers, as well as safeguarding the reliability of the network for the future. The most valuable service a DNO provides to consumers is an uninterrupted supply of electricity. As electricity demand is expected to grow in order to meet net zero, reliability will continue to be critical for consumers.

6.7 In light of this, we must therefore consider how the needs of consumers may be impacted and how the price control can ensure the DNOs continue to maintain

world class levels of reliability. There are three key components of our approach to ensuring high levels of network reliability:

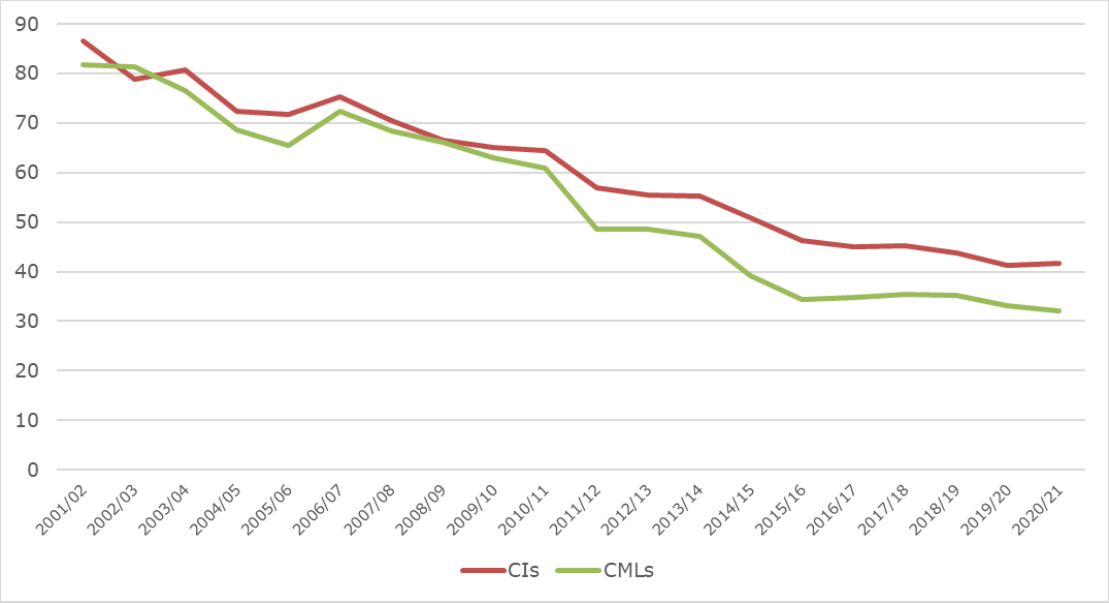
- the IIS
- the GSoPs
- how DNOs improve the service provided to their 'worst served customers'.

6.8 In this section we outlined our proposed approach to these component parts.

Interruptions incentive scheme (IIS)

6.9 The IIS seeks to incentivise the DNOs to improve network reliability beyond the level that is funded through baseline. Since its introduction in 2001/02, the IIS has been a very effective tool for incentivising DNOs to reduce the frequency (measured by customer interruptions (CIs)) and duration (measured by customer minutes lost (CML)) of interruptions experienced by average customers, as illustrated in Figure 11 below.

Figure 11 GB CI and CML weighted average over time



6.10 When developing the IIS, we did not quantify what we thought the "right" level of reliability should be for each DNO. Instead this should be revealed at the point where the incentive is no longer strong enough to encourage a DNO to make further improvements because the reward earned for each CI or CML improvement does not outweigh the cost incurred to deliver the improvement.

6.11 In RIIO-ED1, we introduced a revenue cap of 2.5% of the RoRE. This set the maximum improvements each DNO is incentivised to make, regardless of whether other low-cost improvements are available beyond the cap level. The effect of this is to establish the 'right' level of reliability, rather than allowing it to be revealed by the IIS methodology.

6.12 At the beginning of RIIO-ED1, the majority of DNOs significantly outperformed against their targets, which meant they earned large rewards or hit the reward limit under the cap. However, actual annual improvements have generally been lower than in previous price controls, with greater volatility between years, which suggests that the ability for the DNOs to consistently make improvements has begun to taper off. This is illustrated in Figure 12 and Figure 13, which show the year-on-year percentage change in CIs and CMLs (negative percentages mean the performance was better than the year before).

Figure 12 RIIO-ED1 year-on-year percentage change in CIs

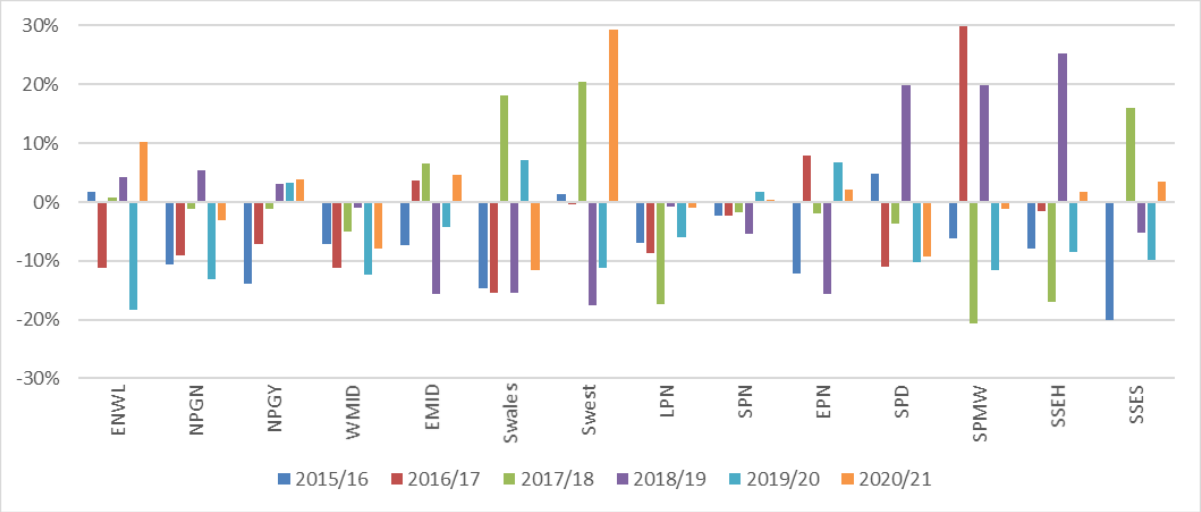
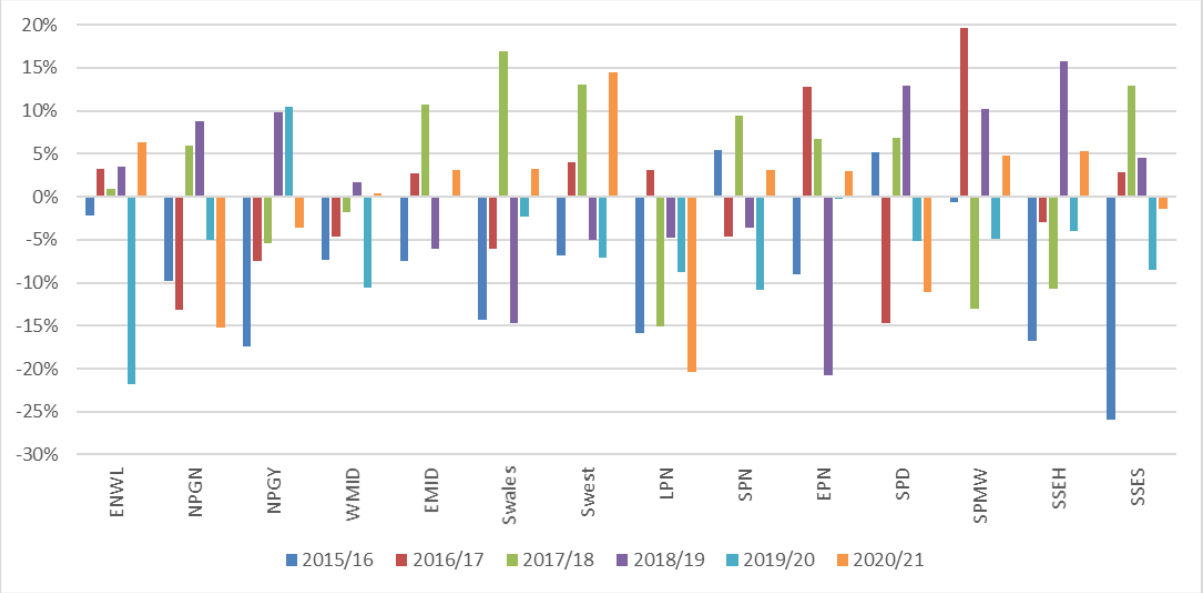


Figure 13 RIIO-ED1 year-on-year percentage change in CMLs



6.13 In the Safety, Resilience and Reliability Working Group (SRRWG) and bilateral meetings, some DNOs have said that it is the current incentive rates and revenue cap that are limiting the future improvements they would otherwise make, and we need to increase them so they can improve reliability further. However, the scale of the rewards the DNOs have earned (over £980m in RIIO-ED1) has been criticised by some stakeholders who think the IIS has been too generous. CEPA's

2018 review of the RIIO framework also noted that the IIS was the largest source of excess returns for the DNOs over the first two years of RIIO-ED1.[144]

6.14 The Business Plans submitted by the DNOs identified that their customers were generally supportive of greater reliability, as evidenced by the engagement undertaken with them. We note, however, the Challenge Group's comments in its report on the final DNO plans that Ofgem should consider whether the IIS methodology and the DNOs' response to it is driving good value, particularly given affordability pressures and demand for investment in other areas. In addition, in a letter to us setting out their views on network reliability in RIIO-ED2, Citizens Advice suggested that customers may not have understood the cost of further improvements (ie through payment of IIS rewards) and so it cannot be assumed they wanted improved levels of reliability at any cost.

6.15 Accordingly, any proposals for the IIS in RIIO-ED2 need be considered against this context of whether changes should be made to drive further reliability improvements. Factors we have considered include:

- what customers said in their engagement with the DNOs, as part of their Business Plan development, and the extent to which they understood what improvements in their reliability would mean with regards to the number and duration of interruptions they experience where they live
- the extent that customers understood the costs associated with additional reliability improvements
- the extent that decarbonisation activities, such as electrifying heat and transport, will change the trade-off customers make between additional reliability and costs
- whether an incentive will always be the right option for driving reliability improvements
- criticisms about the significant rewards earned by DNOs in RIIO-ED1 and the extent that this was due to the timing of setting targets vs. the actual improvements delivered, rather than the cost of each improvement delivered.

6.16 During discussion at the SRRWG and in bilaterals, the DNOs have not indicated that they cannot make further reliability improvements, although the extent that they think they are possible varies by DNO. For example, one DNO has said further reductions in CIs and CMLs will become more challenging, as they reach

[144] https://www.cepa.co.uk/images/uploads/documents/cepa_review_of_the_riio_framework_and_r iio-1_performance.pdf

the end of their programme to rollout HV automation across their network, which is an activity that has significantly contributed to reductions in CIs and CMLs across all the DNOs. However, our view is that we need clear evidence of how much customers would value and be willing to pay for additional improvements, before we make changes to increase the rewards DNOs can earn.

6.17 We recognised in paragraph 7.38 of our SSMD (Annex 1) that changing electricity usage means there is a need for updated research on VoLL to ensure any figure accurately reflects expectations across GB. However, for RIIO-ED2, we are proposing to update VoLL in line with the approach taken for the other sectors, rather than undertaking research in advance of RIIO-ED2. We think that any such future research, ie in advance of RIIO-ED3, would also be an opportunity to engage further with customers on their desire for greater reliability and their willingness to pay for it, if further improvements are at much higher cost than those delivered under the IIS.

Consultation position

6.18 In our SSMD we set out our decisions on the different elements of the IIS. We have considered these in light of our further thinking on future network reliability and are consulting on changes to some elements.

Output Parameter	Consultation position
Value of lost load	Update incentive rates to reflect updated VoLL and actual CML performance. Move to an asymmetric incentive with a cap of 100BPs of RoRE and a collar of 250BPs of RoRE
Unplanned interruptions target setting	Retain improvement factors to ensure DNOs strive to deliver further reliability improvements Amend the CML methodology to be consistent with the CI methodology Disallow all QoS funding relating to IIS targets
Planned interruptions target setting	No change to our SSMD position

Value of lost load (VoLL)

VoLL	
Purpose	VoLL is a representation of the value that customers place on security of supply. It feeds into many areas of the price control, including the IIS, Cost-Benefit Analysis and the Network Asset Risk Metric.
Benefits	Gives a consistent indication of how much customers value the services provided by the DNOs under the price control.

Background

6.19 In our SSMD[145] we said that we would:

- introduce a single figure for VoLL across GB for the IIS, updating the RIIO-ED1 figure in line with inflation
- use the RIIO-ED1 calculation to translate VoLL into IIS incentive rates, using the latest view of average consumption and GB CMLs
- continue with the RIIO-ED1 symmetrical revenue cap for the IIS, set at 250 RoRE basis points.

Consultation position

Output parameter	Consultation position
VoLL for IIS	No change to our SSMD position on having a single VoLL value across GB, which has been updated for inflation Undertake a review of VoLL, in advance of RIIO-ED3 so that it reflects changing electricity usage
Incentive rates	No change to our SSMD position
Financial	Reduce cap to 100BPs of RoRE Retain collar of 250BPs of RoRE

VoLL for IIS

6.20 VoLL is a key input into several areas in the price control, including for the IIS calculations. We have not seen any new evidence to suggest that a GB-wide VoLL

[145] RIIO-ED2 SSMD Annex 1 Paragraphs 7.35 to 7.45 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

should not continue being used and so we do not intend to change from our SSMD position.

6.21 However, as we noted in our SSMD, research carried out by ENWL highlighted the need for widespread, coordinated research into updated customer expectations to ensure any figure accurately reflects expectations from across GB. In particular, we think there are two, potentially conflicting positions on customers' willingness-to-pay (WTP) for further network reliability that need careful consideration:

- changes in working arrangements that started due to COVID measures, electrification of heat and transport and other factors mean that customers may place greater value on minimising interruptions
- since its introduction, the IIS has driven significant improvements in average reliability across GB, with some DNO regions now having world leading performance. The marginal benefit of additional reliability improvements could be decreasing for the average customers in these regions, reflecting the quality of the service they already receive.

6.22 During the course of RIIO-ED2, we are proposing to work with the network companies across all sectors and other stakeholders to undertake a review of VoLL, including whether there are benefits to regional VoLL figures and how this translates into customers' WTP. We are proposing to update VoLL to reflect the outcome of this review in advance of RIIO-ED3.

Incentive rates

6.23 In our SSMD, we decided that our RIIO-ED1 approach to translating VoLL into incentive rates was still fit-for-purpose. However, in addition to the proposed change to VoLL, we said that we should update the average customer demand and GB CML figures to reflect most recent values. Our rationale for not applying alternative values was that these values best represent customers' most recent experience.

6.24 Some DNOs have argued that these incentive rates are now too low and no longer cover the cost of further reliability improvements. Quality of Service[146] (QoS) data the DNOs report to us shows that the cost to achieve reductions in CIs and CMLs has been far lower than the rewards that they have earned over RIIO-ED1 and,

[146] Costs where the primary purpose is to improve performance against the IIS targets or to improve the overall fault rate per km of the distribution network.

although we recognise additional improvements may become more expensive to deliver, we have not seen any evidence that this is currently the case.

6.25 We think that increasing incentive rates creates a risk that we would simply be increasing the reward that a DNO earns for improvements they would already have made, because we will be setting targets for RIIO-ED2 in advance of the start of the price control. We also note that, if we increase the incentive rates alongside reducing the revenue cap (discussed in the Financial section below), this would further reduce the number of improvements that a DNO would be incentivised to make, as fewer improvements would fit under the revenue cap.

6.26 As noted in paragraph 6.12 we are also mindful that the marginal benefit of each improvement could actually be reducing, rather than increasing, which would mean customers are unwilling to pay for greater incentive rates to receive additional improvements. Without evidence from the DNOs that customers were presented with and understood the cost implications of even fewer interruptions, we do not think there is a good case to increase incentive rates.

6.27 We have not seen any evidence that there will no longer be an incentive for the DNOs to make any performance improvements unless the incentive rates are changed. We have also not received any evidence that latest demand and CML values are not the best figures to include in the incentive rate calculations, either because customers are unwilling to pay as much for further improvements or value greater improvements to the extent that they would pay more for them. Accordingly, we do not propose to change from our SSMD position.

Financial

6.28 We introduced a revenue cap in RIIO-ED1 to manage risk around the DNOs outperforming their targets because they were set at the strategy decision stage and to reflect the eight-year price control.[147] In our SSMD, we decided that we would retain the revenue cap because we believed it had worked well to protect customers from DNOs earning excessive rewards. We also said that the downside collar protects DNOs from excessive penalties.

6.29 We have reviewed our SSMD position to keep the cap the same as for RIIO-ED1 to consider whether we think it needs to be increased, decreased or even removed.

[147] We had removed the revenue cap in DPCR5 and just retained the penalty collar on the basis that the mechanism was mature.

We recognise that, although a cap limits the cost to customers, it also reduces the number of improvements a DNO is incentivised to make. When reaching a position on the revenue cap, we need to trade off the benefit of additional reliability against the cost to customers to achieve it.

6.30 Although we are proposing to set targets a year later than we did for RIIO-ED1 and applying improvement factors, there could still be potential for DNOs to earn rewards for performance improvements that they have already achieved (where their performance is better than the targets, based on averages). Additionally, as noted in paragraph 6.24, the DNOs' reporting shows that they have spent much less on reliability improvements than the rewards they can earn, which means customers have paid more for each improvement than the cost.

6.31 We also note that the IIS is just one of the incentives available to the DNOs over the price control while incentives are just one element of the overall price control package. When we consider price control in the round, the IIS is a significant source of potential outperformance and its size relative to other incentives could result in DNOs choosing to focus on reliability improvements at the expense of other customer benefits, such as totex efficiency and customer service.

6.32 We think that reducing the upside revenue cap will help address the concerns about the rewards that can be earned, while still allowing for some further improvements to be made by DNOs, before the cap is reached. Therefore, we are proposing to lower the upside revenue cap to 100BPs of RoRE. Given the incentive rates per CI and CML improvement are much lower than even the reduced revenue cap, we expect that the IIS will still incentivise DNOs to continue making improvements over RIIO-ED2. Note that, if the cost of improvements exceeded the incentive rates, then we would expect that the DNOs would make fewer improvements, but this would not be due to the revenue cap.

6.33 We considered whether we also need to reduce the collar so that the calibration of the incentive cap and collar remains symmetrical (ie a DNO's downside exposure would also be limited to 100BPs of RoRE). We are proposing not to do this for the following reasons:

- we consider that the cost to consumers from small deteriorations in reliability performance could be disproportionately higher than the benefit from an equivalent level of improvement

- we want to maintain a strong incentive for DNOs to avoid their reliability performance deteriorating where they reach the cap, even if they no longer have an incentive to continue improving it
- based on the DNOs' performance since the IIS was introduced, we think the risk that a DNO will underperform to the extent that they are at risk of reaching the cap is very low
- changes we are proposing to make to the CML target setting methodology will further mitigate the risk of DNOs falling into penalty over the five-year price control period.

6.34 Our proposal, therefore, is to introduce an asymmetric cap for RIIO-ED2 with an upside cap of 100BPs and downside collar of 250BPs of RoRE.

Other options we considered

6.35 We considered several other options for target setting that could potentially mitigate some of the issues with the current methodologies. However, in each case we think they would introduce other issues.

6.36 In our SSMD, we ruled out changing the target setting methodologies, including moving to rolling targets for unplanned CIs and CMLs,[148] because we felt that any alternatives would introduce their own drawbacks, such as loss of performance comparability. Moving to rolling targets based on each DNO's own average performance could potentially reduce the risk that DNOs are able to significantly outperform against their targets, due to when targets are set. If this was the case, it would provide an alternative means of addressing the reasons why we are proposing to reduce the revenue cap to 100BPs of RoRE. However, because targets are set on four or ten year averages, we think that it would require sustained outperformance to make the targets change significantly during the five year price control period, which we consider to be unlikely, given the volatility in RIIO-ED1 performance.

6.37 We could estimate a declining cost curve that reflects how we think the amount that customers value increasing reliability declines, as improvements are made. Under this option, it would be possible for a DNO to make a greater number of improvements before they reach the revenue cap, but it could also reduce the total number of improvements a DNO could make, where they become more expensive over time. The main issue with this option is calculating the declining

[148] Planned targets are already based on rolling average performance.

cost curve so it reflects the amount that customers value additional improvements, as the base level of reliability improves over time. There is a risk that this would introduce significant complexity, without being accurate enough to better represent customer preferences than a simpler approach.

6.38 Finally, the DNOs or other stakeholders may provide evidence in response to our Draft Determinations, which demonstrates that customers understand the cost of greater improvements and still want greater reliability. We would consider this, as part of our review of consultation responses and how it might affect our proposed positions on incentive rates, the cap and collar and the target setting methodologies.

Consultation questions

Core-Q44. Do you have evidence that customers would be willing to face an increase in their bills to also receive an increase in their reliability, including that they understand the actual cost and how this translates into average power cuts?

Core-Q45. Do you have evidence of the cost of reliability improvements and the impact that lowering the revenue cap will have on them being achieved?

Core-Q46. What are your views on moving to an asymmetric cap and collar?

Core-Q47. Are there alternatives to reducing the revenue cap that you think would better balance increases in reliability and the cost to consumers than reducing the revenue cap?

Unplanned interruptions target setting

Unplanned interruptions target setting	
Purpose	To set challenging targets that drive improved reliability across all DNOs for both Customer Interruptions (CI) and Customer Minutes Lost (CML)
Benefits	Incentive drives DNOs to invest to reduce the number and duration of outages on the network

Background

6.39 In our SSMD we said:

- we will use the RIIO-ED1 target setting model to set unplanned interruptions targets

- unplanned interruptions targets will be set at the lower of the modelled values and a DNO's latest performance (known as the "ratchet")
- we will provide provisional targets at Draft Determinations, which will be finalised with 2021-22 performance data when available.

6.40 Given the views expressed by the DNOs and other stakeholders that we have described above, and our consideration of how our incentive package fits within the wider price control, we decided to revisit the methodologies in more detail to ensure we still agreed with our SSMD positions. We engaged AFRY[149] to support us with modelling the impact of the issues raised by the DNOs and other amendments we considered.

Consultation position

Output parameter	Consultation position
Timing of setting final targets	No change to our SSMD position
The ratchet	Do not apply a ratchet, due to introduction of additional complexity for marginal benefit
CI target setting methodology	No change to our SSMD position
CML target setting methodology	Move from RIIO-ED1 methodology of targets based on lower quartile performance to average individual DNO performance (consistent with the CI methodology)
Improvement factors	Retain RIIO-ED1 factors: 0.5% for frontier DNOs and 1.5% for the others
QoS funding	No allowance for QoS activities, except for those relating to Worst Served Customers

Rationale for consultation position

Final target setting

6.41 In our SSMD we said that we believe it is appropriate to provide a provisional view of the unplanned targets as part of Draft Determinations, based on performance

[149] https://afry.com/en/about-us

up to and including the 2020/21 reporting year. We also said we expected to publish final targets around February 2023, once we have performance data for 2021/22, to ensure targets are set using the latest data available. Our SSMD position was influenced by the National Audit Office's recommendations about the need to use the latest data when setting targets.[150] Although we recognised that the DNOs' business plans are influenced by their unplanned interruptions targets, we did not think they needed the exact final targets to do this. Instead, we said that setting the methodology would allow the DNOs to anticipate their RIIO-ED2 targets.

6.42 We continue to think that setting targets as late as possible in the price control setting process will help to mitigate the risk that DNOs will be able to easily outperform their targets and earn rewards without delivery of many performance improvements. We have not received any further evidence from ongoing engagement with the DNOs and other stakeholders to change from our SSMD position on the timing of when final targets will be set.

The ratchet

6.43 In our SSMD we decided to apply a ratchet to address the risk of DNOs starting RIIO-ED2 ahead of their 2023/24 targets. This is achieved by comparing the target produced by the target setting model and a DNO's latest performance and using the lower value as the starting target. We also said in our SSMD[151] that it was appropriate to take the average of a DNO's performance over the last four years of available data when determining latest performance. This would minimise the risk of a particularly stormy or calm year distorting the view of a DNO's performance, while also being consistent with the target setting methodology.

6.44 However, using a four-year average to determine a DNO's latest performance under the ratchet means that there will only be minor differences between the two targets (our analysis show this is approximately 1-3%). These differences are due to:

- the fact that EHV and 132kV targets are based on ten-year, rather than four-year averages, to smooth out the impact of more volatile data at higher voltages. This is because EHV and 132kV faults tend to be less frequent but have an impact on a greater number of customers than HV and LV

[150] https://www.nao.org.uk/wp-content/uploads/2020/01/Electricity-networks.pdf
[151] RIIO-ED2 SSMD, Annex 1, Paragraph 7.16 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

- application of improvement factors to the first-year targets, which are not applied to a DNO's latest performance.

6.45 In addition, if a DNO has been able to reduce the number and/or duration of interruptions in 2022/23 (the year after we have set targets), then they may still start the price control ahead of the first-year target because their average performance is poorer than the final year. As set out in our SSMD, we still think it is reasonable to use average, rather than final year performance to determine targets, because it mitigates the risk of an unusual year distorting a DNO's targets, including potentially better performance in the final year than the DNO usually delivers.

6.46 Our proposal to change the CML methodology (refer to paragraph 6.51 for this discussion) to be consistent with the CI methodology means both measures are now based on average performance. Given the differences in targets with and without the ratchet are due to methodological choices, rather than DNO performance, we no longer propose to introduce a ratchet, because we do not think the marginal benefit (if any) outweighs the additional steps we would need to take to:

- separately calculate each DNO's average CI and CML performance using the target setting models approach that is based solely on their own average performance
- apply a final step in the target setting models to determine if the modelled targets or a DNO's own average performance is lower and substitute the average performance, if that is the case.

6.47 If we receive evidence in response to our consultation that results in us retaining separate CI and CML methodologies, we may propose to introduce the ratchet for setting CML targets.

CI target setting methodology

6.48 In our SSMD we decided that the RIIO-ED1 methodology would produce challenging targets that would continue to drive the DNOs to improve the reliability of their networks. We considered alternative methodologies, such as basing targets on rolling averages, rather than them being fixed at the start of the price control but decided that all alternatives risked introducing their own drawbacks.

6.49 We continue to think that the CI methodology achieves the intent of the incentive by driving the DNOs to make improvements that exceed their average performance through the application of improvement factors and incentive rates. We considered whether we should make changes so the targets are tougher. However, as discussed earlier in this section, the IIS has already driven significantly better performance across GB since its introduction in 2001/02. If the incentive is no longer sufficient to encourage the DNOs to keep making large improvements, then this represents the incentive functioning as expected.

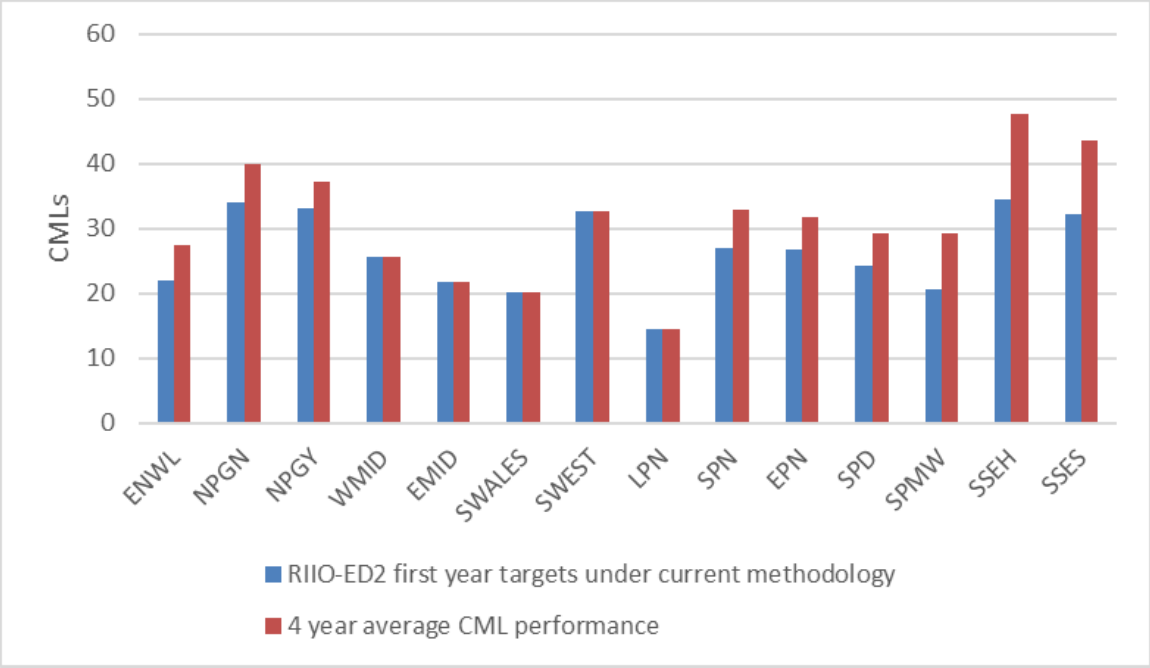
6.50 We have not received any evidence from the DNOs or stakeholders to suggest we should move from our SSMD position. Accordingly, we are proposing to maintain the RIIO-ED1 methodology of targets based on average individual DNO performance at the start of the price control, updated annually with improvement factors.

CML target setting methodology

6.51 Rather than being based on average performance, the CML targets in RIIO-ED1 are based on lower quartile performance set by frontier DNOs. The difference in the methodology is because we thought that each DNO should be incentivised to deliver best-practice responses to interruptions (ie restore customers as quickly as possible) independently of how many interruptions occur on its network.

6.52 Over RIIO-ED1, some DNOs have significantly improved their CML performance, driving down the lower quartile benchmark. As a result, the other DNOs who have not improved their performance as much will see a much more significant step change in their RIIO-ED2 targets than was the case RIIO-ED1, as illustrated in Figure 14. Note that this refers to the improvement they will need to make to avoid a penalty and they would need to make even more significant improvements to earn rewards.

Figure 14 RIIO-ED2 CML targets against performance under current methodology



6.53 In their responses to our SSMC and more recently at working groups and bilaterals, a number of DNOs have raised concerns with the step change in targets, with at least one DNO facing such a significant increase that they expect to start the price control in a penalty position, despite only missing their CML targets once during RIIO-ED1. Along with their concerns about the targets, the DNOs have suggested alternatives to the current CML methodology to help mitigate this impact, with the main proposal being to align it with the CI methodology, which sets targets based on each DNO's own average performance. We worked with AFRY to assess the options suggested by the DNOs to understand the impact on rewards and whether other alternatives would be more suitable.

6.54 As well as incentivising the DNOs to make reliability improvements, the IIS is designed to ensure performance does not deteriorate, which means it is an intentional feature that DNOs could face penalties, if they underperform against their targets. We also note that some DNOs are concerned that the step change in targets will make it much tougher for them to maximise their rewards than in RIIO-ED1, rather than that they will face penalties.

6.55 Despite this, we thought that it was important to revisit the CML methodology to check whether we still agree with the assumptions that influenced the original design and test some aspects that have been highlighted by the step change in targets. The assumptions are:

- DNOs should all be able to deliver the same restoration times across the network (ie achieve lower quartile performance) and, if this is the "right" restoration speed across GB, then each DNO's costs and incentive rate must allow for convergence at the same point, before the cost outweighs the reward
- targets should represent the performance a DNO is funded for through baseline, with the incentive intended to encourage them to drive further improvements or avoid any deterioration in performance. Setting targets in line with lower quartile performance would only be consistent with this, if we thought each DNO has been funded through baseline to deliver a level of outperformance over RIIO-ED1 that means they all reach a lower quartile level of reliability
- related to this, where a DNO has met its targets in RIIO-ED1 (ie has delivered the performance we fund it for through baseline), it is reasonable that the DNO should face much tougher targets in RIIO-ED2 because of how other DNOs have performed. Taking the example of SSEN, they beat their CML targets and earned rewards in every year but once each for SSEH and SSES, but, because WPD group and LPN made much greater improvements, SSEN are at risk of starting RIIO-ED2 in a penalty position.

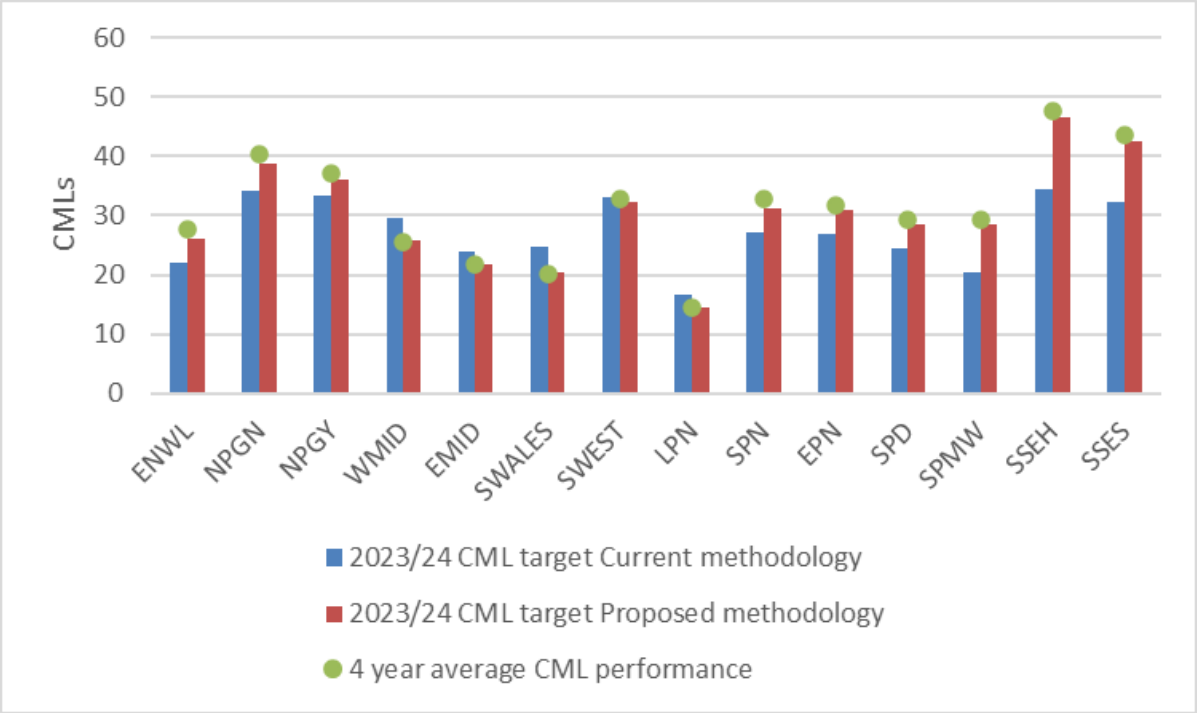
6.56 Our assessment of whether using lower quartile performance to set CML targets achieves our policy objectives does not mean our view is that DNOs which are not lower quartile no longer have to try to improve their reliability performance. What we are considering is:

- whether we think that DNOs should be able to improve at the same rate (at a minimum) and that performance will converge over time. If this is not the case, then it would be proportionate for targets to be based on each DNO's own average performance adjusted by improvement factors, which is consistent with the CI methodology. This will still drive DNOs to deliver improvements above their annual target level each year in order to earn rewards and will penalise them if their performance deteriorates
- what the value would be for putting DNOs into a penalty position, if their rate of improvement is already tapering off under the more generous RIIO-ED1 revenue cap, which suggests they are unlikely to be able to make significant further improvements, even if a penalty exists to try and drive them towards this.

6.57 We have modelled the impact on targets of moving to a methodology that bases targets on individual average DNO performance. The modelling shows that all but lower quartile DNOs would have less challenging targets at the start of RIIO-ED2 compared to the current CML methodology, with the most significant impact being in SSEN's regions. This can be seen in

6.58 Figure 15.

Figure 15 Change in RIIO-ED2 first year CML unplanned targets Current to Proposed methodology



6.59 We think that changing to a similar methodology to CI target setting is more reflective of DNOs' RIIO-ED1 performance and likely improvements in RIIO-ED2, given most of the DNOs' performance over the most recent years of RIIO-ED1. Although we do not know with certainty how many more CI and CML improvements each DNO is able to make, the design of the IIS still limits the risk of significant outperformance because:

- we would set targets around Final Determinations, which is later than we did during RIIO-ED1
- the majority of DNOs have seen their performance taper off over the past few years
- we would still apply improvement factors that will be higher for DNOs who are below the benchmark

- reducing the revenue cap means the upper limit of rewards that a DNO can earn is significantly lower than it was during RIIO-ED1.

6.60 Finally, as we discuss in more detail in paragraph 6.31 above, the RIIO-ED2 incentive package needs to be considered as part of the entire price control. In RIIO-ED2 we are proposing to make changes, such as reducing the cost of capital and introducing the RAM (described in the Finance Annex), that will help manage the extent that DNOs are able to significantly outperform across the price control, including against incentives.

6.61 Having weighed up the risk of outperformance and impact on future improvements, we are proposing to move to basing CML targets on average individual DNO performance. We consider that this approach will still drive the DNOs to deliver improvements for their customers but recognises that there may, in certain circumstances, be a limited value to consumers from any marginal improvements remaining under the IIS.

Improvement factors

6.62 We introduced improvement factors as part of RIIO-ED1 to try and mitigate the risk of the DNOs making late improvements that were not reflected in the targets and to ensure that the DNOs did not stand still over the longer price control period. In our SSMD we said that we would retain the RIIO-ED1 improvement factors for RIIO-ED2:

- CI methodology - we set the improvement factors at 0.5% for frontier DNOs, which we considered to be reflective of the natural improvement rate DNOs could sustain over RIIO-ED1, and 1.5% for the other DNOs to encourage them to catch up
- CML methodology – all DNOs faced the same improvement factors, set at 3% for HV and 1% for LV, EHV, 132kV.

6.63 We considered whether to remove improvement factors, which would mean the DNOs would no longer have to continue making reliability improvements to avoid falling into penalty territory, but we are proposing to retain them because:

- applying incentive rates to the starting year targets helps to reduce the potential for DNOs starting the price control ahead of their targets
- as noted in the previous section on changes to the CML methodology, retaining improvement factors will help to manage the risk of outperformance.

6.64 We also think that the improvement rate should still be higher for DNOs who are below the benchmark to ensure their customers see greater minimal improvements.

6.65 We propose to retain these improvement factors over RIIO-ED2, to continue incentivising the DNOs to make improvements. As part of making the CML methodology consistent with the one for CIs, we propose that there should also be consistency in the improvement factors with both methodologies applying CI improvement factors of 0.5%/1.5%.

QoS funding

6.66 In RIIO-ED1 we did not allow QoS funding[152] for slow track DNOs,[153] due to concerns about the risk of double rewards, where a DNO received funding to make reliability related improvements that would then earn them IIS rewards.

6.67 All DNOs except for UKPN have requested QoS funding for RIIO-ED2, to carry out activities such as HV automation, which they say is needed to help them meet their IIS targets. ENWL requested QoS funding to deliver reliability improvements for vulnerable customers but, given a customer's classification as vulnerable is not influenced by the interruptions they face, we think it is likely that any improvements would contribute fully to IIS performance against targets in the same way as any other reliability improvements.

6.68 We understand that for most DNOs, their request for QoS funding is to enable them to maximise their rewards, rather than to meet their targets (ie avoid penalties). In these cases, we do not propose to approve QoS funding, because it would create the risk of double rewards, as we do not know how expensive their QoS costs would be. In addition, providing QoS funding would undermine the rationale underpinning the IIS that when a DNO reaches the point that the cost of improvements is greater than the incentive rates, which are based on VoLL, this is the level of reliability that customers are willing to pay for.

6.69 At least one DNO has argued that they need QoS funding in order to avoid starting RIIO-ED2 in a penalty position for CMLs, due to the targets being based on lower quartile performance. Although providing QoS funding in these cases would not

[152] This refers to costs associated with installing new or replacing existing assets where the primary purpose is to reduce average number of customers or time they are affected or overall faults.
[153] In ED1, we proposed that DNOs who provided high quality business plans would be "fast tracked", which meant we would accept their plan and agree their price control early. We refer to DNOs who were not fast tracked as being "slow tracked", which means they had to resubmit their plans.

create a risk of double rewards, if a DNO has delivered poor performance, then we do not think they should receive funding to avoid paying the penalties that are intended to drive them to improve reliability.

6.70 However, as previously discussed in the section on changes to the CML methodology, we were not convinced that the lower quartile methodology accurately reflects how DNOs have performed over RIIO-ED1. The outcome of this assessment is that we are proposing to base the CML targets on each DNO's average performance, which should remove the risk of DNOs starting RIIO-ED2 in a penalty position.

6.71 We therefore propose to disallow separate QoS funding, except for that separately identified as being in relation to Worst Served Customers, which we discuss in paragraph 6.120.

Consultation questions

Core-Q48. Do you agree with how we have characterised the operation of the current CML methodology and our reasons for changing to setting targets in line with our CI methodology?

Core-Q49. Do you agree with our rationale for retaining our RIIO-ED1 position on QoS funding? Can you provide any evidence that an alternative approach would not result in double rewarding alongside the IIS?

Planned interruptions target setting

Planned interruptions target setting	
Purpose	The IIS drives DNOs to reduce the number and duration of interruptions to supply. Targets are set to ensure planned interruptions to supply are kept to a minimum
Benefits	DNOs are incentivised to plan more efficiently to minimise the number and duration of outages they need to operate and maintain their networks

Background

6.72 In our SSMD we said that we would retain an ODI-F and continue with the RIIO-ED1 approach to setting targets, which is based on a rolling three-year average, with a two-year lag. We believed that this approach ensures that DNOs cannot allow their performance to deteriorate without facing a penalty and that it is sufficiently flexible to reflect changes in work programmes (ie lower revenue will be offset by comparatively easier targets).

6.73 We also said that we would retain the RIIO-ED1 weightings for planned interruptions when determining improvements, which is 50% of unplanned targets. We considered this weighting still reflected the relative value of planned targets for customers, as they can better plan for these, and will still help to deliver performance improvements.

Consultation position

Output parameter	Consultation position
Target setting methodology	No change to our SSMD position
Incentive rate weighting	No change to our SSMD position

6.74 We set out these parameters as part of our SSMD and have not received any new evidence from the DNOs or through stakeholder engagement to suggest they need to be amended.

Exceptional Events

Exceptional Events	
Purpose	Some circumstances that are beyond a DNO's control can have significant impacts on the networks. Performance under the IIS in these circumstances is discounted to recognise the impact of these events
Benefits	These adjustments to the IIS targets ensure the incentive is consistent with our expectations about the level of reliability that is funded under the price control

Background

6.75 In our SSMD we said we would retain the Severe Weather Exceptional Events (SWEE) mechanism but update the existing thresholds to reflect most recent performance. We also said we would set provisional targets at Draft Determinations, which would be finalised alongside final IIS targets in Final Determinations.

6.76 For the Other Exceptional Events (OEE) mechanism, we said we would:

- retain the mechanism but review and update the licence definition of OEE. This is because we consider the types of claims submitted in RIIO-ED1 had moved from the circumstances the mechanism was designed to cover
- work with the DNOs to develop a tiered approach to the thresholds, such as by introducing a first stage assessment for the DNOs to carry out pre-determined checks
- set thresholds proportionate to each DNO's size to ensure they are all offered the same protection.

6.77 We said we would provide an indicative approach to OEE thresholds as part of Draft Determinations.

Consultation position

Output parameter	Consultation position
SWEE threshold	Delay updating, until review of GSoP is concluded to ensure consistency
OEE eligible events	Amend to limit the scope to events arising from third party actions or foreign objects interfering with the network
OEE assessment process	No tiered assessment approach
OEE threshold	Retain consistent threshold, instead of moving to proportionate thresholds

SWEE threshold

6.78 We retain our SSMD position to update the SWEE thresholds[154] to reflect most recent performance, as the existing thresholds are based on data that pre-dates the start of RIIO-ED1. We published indicative SWEE thresholds for RIIO-ED2 in our SSMD that showed that a small majority of DNOs will have a lower threshold for SWEE, which means that they will be able to raise claims where there have been a smaller number of faults than under their current thresholds. This reflects reductions in their average number of faults, due to their investment in network resilience over RIIO-ED1.

[154] Set at eight times the daily average number of faults at HV and above.

6.79 Since we published our SSMD, there have been significant storms across GB, starting with Storm Arwen on 25 November 2021. One of the recommendations in our final report into how the DNOs performed during Arwen is that there should be a review of the severe weather related GSoP. The SWEE definition is the same as the Category 1 severe weather definition and our view is that they should remain aligned going forward. We are proposing to delay updating the SWEE thresholds, until we have finished our review of the GSoP to minimise the complexity and risk of errors that would be caused by different and changing thresholds.

OEE eligible events

6.80 In our SSMD, we flagged our concern that the types of claims being submitted by the DNOs had moved away from the circumstances that the mechanism was designed to cover and that it was appropriate to review and update the licence definition of OEE for RIIO-ED2. In order to propose the changes for the RIIO-ED2 licence, we:

- reviewed what the original purpose of the mechanism was
- categorised the events that the DNOs claimed for between 2015 and 2020
- assessed whether we thought the categories of claims aligned with the original purpose of the mechanism.

6.81 The mechanism is intended to protect the DNO from the impact of risks that are genuinely unusual or rare occurrences that are not a function of day-to-day network operations and which we would not expect them to build their networks to be fully resilient to. This is consistent with the examples set out in the licence which are "an incident on a Transmission System or other connected network, or from terrorism or vandalism".[155]

6.82 Of the categories of events that we identified in our assessment, we thought that three of them were not aligned with the original purpose of the mechanism, as they are not unusual or rare occurrences:

- operations and maintenance (five claims) – this generally refers to incidents where the DNO has taken one circuit out of service for planned maintenance and a fault has occurred on the other circuit, causing an outage

[155] As per CRC 2D, Appendix 3 Exceptionality requirements for other events.

- foreign objects (eight claims) – this refers to situations such as a bird strike or plant material on the lines
- weather related (two claims) – DNOs have submitted weather related incidents that did not meet the SWEE thresholds but met the OEE thresholds.

6.83 Our position is that the effect of the OEE in these cases is to transfer risks associated with operating the networks from the DNOs to customers, who are not receiving the base level of service they are paying for from the DNO. We presented our views at a SRRWG where the DNOs argued that requiring them to face the impact of incidents such as faults during planned outages would create an incentive for them to build their networks to have a greater degree of redundancy, which would be more expensive for customers. We do not consider this to be a credible risk, as the DNOs are only funded to deliver networks that meet the obligations set out, for example, in the relevant legislation and industry codes.[156]

6.84 However, we have further considered our initial assessment and note that the OEE only applies to the CIs and CMLs above specific thresholds,[157] which means that a DNO would still face the impact of the interruption on CIs and CMLs below their thresholds. Given this, we are now proposing not to specifically exclude the foreign objects category from the OEE definition, as we accept that the exceptionality is conferred by the impact of the event (where it is beyond the DNO's control), as reflected by the fact the exemption only applies to the CIs and CMLs above the threshold.

6.85 We do not think this is also true of events that occurred because of activities the DNO undertook as a normal part of operating and managing electricity networks, rather than being a risk that should be transferred to customers.

6.86 We also do not agree that the OEE was intended to provide a separate avenue for the DNOs to obtain exemptions for weather related events that do not meet the SWEE thresholds. If we thought the SWEE thresholds were not fit-for-purpose, then the right avenue for fixing that would be to update the SWEE thresholds in the licence condition. Therefore, we are proposing to amend the the licence condition so that it no longer applies to weather related events.

6.87 Our proposal is to amend the OEE definition to remove:

[156] Electricity Safety, Quality and Continuity Regulations, Engineering Recommendation P2, engineering technical reports, etc
[157] The RIIO-ED1 thresholds are set at 25,000 customers interrupted and/or 2 million customer minutes lost

- the provision in the licence for the DNOs to raise claims for incidents that occur during the normal operation of their network in RIIO-ED1
- the ability for DNOs to raise weather related claims under the OEE, where they do not meet the SWEE thresholds.

6.88 We believe these changes are consistent with the concerns we raised in our SSMC about the OEE mechanism being used for purposes that it was not intended to apply to. We have modelled the impact of these proposed changes on IIS performance and, as illustrated in Table 17 and Table 18, below this is extremely small.

Table 17 CI percentage change in performance when OEEs proposed as ineligible are included

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
ENWL	-	7.33%	5.11%	-	-	-
NPgN	-	-	0.83%	-	4.53%	-
NPgY	-	-	-	-	-	-
WMID	-	-	-	-	-	-
EMID	-	-	-	-	-	-
SWALES	-	-	-	-	-	-
SWEST	-	-	-	-	-	-
LPN	1.33%	-	-	-	-	-
SPN	3.37%	-	4.19%	-	-	-
EPN	-	-	-	-	-	-
SPD	-	-	-	-	-	-
SPMW	-	-	-	-	-	-
SSEH	-	-	-	-	-	-
SSES	-	-	-	-	-	-

Table 18 CML percentage change in performance when OEEs proposed as ineligible are included

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
ENWL	-	1.15%	2.63%	-	-	-
NPgN	-	-	3.90%	-	1.66%	-
NPgY	-	-	-	-	-	-

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
WMID	-	-	-	-	-	-
EMID	-	-	-	-	-	-
SWALES	-	-	-	-	-	-
SWEST	-	-	-	-	-	-
LPN	-	-	-	-	-	-
SPN	-	-	-	-	-	-
EPN	-	-	-	-	-	-
SPD	-	-	-	-	-	-
SPMW	-	-	-	-	-	-
SSEH	-	-	-	-	-	-
SSES	-	-	-	-	-	-

OEE assessment process

6.89 In our SSMD, we said that we would work with the DNOs to develop a tiered approach to the OEE thresholds where the DNOs would carry out pre-determined checks on events, before deciding whether to submit them to us. We believed this would streamline the process and ensure we can focus on claims that pass the first assessment carried out by the DNOs.

6.90 However, when we started working on identifying criteria for the pre-determined checks, it became clear that there was no difference between this and the assessment we were doing to identify qualifying events under the Licence Condition. For example, one criterion could be that the event could not fall under another mechanism, but in that case, it would be simpler and clearer to update the licence condition to specifically exclude weather related events.

6.91 Given this, we propose to modify the definition of an OEE in the RIIO-ED2 licence, which will avoid the additional complexity of introducing a tiered assessment process.

OEE threshold

6.92 In our SSMD, we noted that the current common thresholds mean that some DNOs may never meet them and be able to claim for an exceptional event. We said that we believed that setting thresholds that are proportional to each DNO's size would ensure they are all offered the same protection by the mechanism.

6.93 The SRRWG has produced analysis that demonstrates that, even if some DNOs do not trigger the OEE threshold, their financial exposure is similar to those DNOs that do trigger the threshold. This is because:

- all DNOs are exposed to the impact of the number of CIs or CMLs below the thresholds, even if they are given an OEE exemption
- both the OEE thresholds and the IIS incentive rates are scaled to reflect each DNO's customer numbers.

6.94 As a result, moving to proportionate thresholds that were then scaled by each DNO's customer numbers would introduce differences in the financial exposure faced by each DNO, benefitting those with smaller customer bases. This is because both their CI/CML thresholds (beyond which they can seek an exemption) and their incentive rates (applicable to the CI/CMLs below the threshold only) would be lower than for larger DNOs.

6.95 Given that common thresholds result in similar financial exposure for all DNOs, while proportionate thresholds would introduce differences in the financial exposure, we propose to retain the common OEE thresholds.

Consultation questions

Core-Q50. Do you have any examples of situations where fault-related interruptions could be genuinely "exceptional" and how these could be separately identified from those that occur during planned works?

Core-Q51. Do you agree with our assessment of the OEE thresholds and the financial impact on each DNO?

Short interruptions (SIs)

Short interruptions (SIs)	
Purpose	To ensure DNOs take action to minimise the frequency of interruptions to supply that last three minutes or less.
Benefits	DNOs would be encouraged to make improvements to their performance on interruptions below three minutes long, which are not captured under the IIS

Background

6.96 In our SSMD we said that we would consider options for a minimum standard around SIs and that we considered a starting point could be to set it at eight times the GB average number of short interruptions per customer per year. We expected to outline the proposed standard in Draft Determinations, informed by the DNOs' Business Plans, and incorporate it into the GSoP.

6.97 Since we published our SSMD, we have worked with the QoS working group to identify a robust and comparable dataset to support development of an SI minimum standard. However, after significant work, we only have one complete year of data, which we think is insufficient to develop a minimum standard, given year-on-year volatility due to severe weather and other incidents.

Consultation position

Output parameter	Consultation position
Minimum standard	We do not propose to develop a minimum standard for RIIO-ED2
Annual reporting	DNOs to report agreed SI dataset annually as part of the regulatory reporting process

Minimum Standard

6.98 Through the QoS working group the DNOs provided data and analysis on SIs. Using this as the basis, we have agreed with the working group, that going forward the DNOs will report annually on:

- the breakdown of SIs by type of interruption (eg auto re-close, planned manual SI, loss of infeed due to generator) and voltage level, where available
- the sum of customer interruptions and customer minutes lost from different types of SIs
- the breakdown by system or manual count
- the number of customers affected by multiple SIs from zero to more than 50 SIs.

6.99 In our SSMD we recognised that we would need to consider development of a minimum standard in the context of the quality and robustness of historical data. Although the DNOs have reported SI data to us covering a number of years, which

we used to support discussions with the SRRWG around improving SI performance, there are differences in the robustness and comparability of the data. This is because, as mentioned above, the ability to produce SI data differs by DNO, which means that, even with significant effort, across all of the DNOs they have only been able to produce a complete dataset for 2020/21. Although we could base thresholds for a minimum standard on this data, it is highly likely that it will be significantly higher or lower than the actual number of SIs occurring over RIIO-ED2, as we do not have enough information to smooth out the impact of exceptional events.

6.100 In addition to data limitations, there are several other practical challenges with introducing a minimum standard for SIs:

- under the Multiple Interruptions (MI) standard, a customer is entitled to a payment of £70, if they experience at least four interruptions of more than three hours for each. Payments for SIs would need to reflect the comparative inconvenience of a threshold number of interruptions between one second and three minutes. It is not clear what level we should set the payment at or whether the cost to reduce SIs even outweighs the benefit to customers.
- we said in our SSMD that we expected that customers would need to claim payments under an SI minimum standard, which is what happens under the MI standard.

6.101 We think further work is needed to determine:

- how feasible it is that customers would track a large number of SIs, in order to raise a claim with the DNO, once the threshold has been exceeded
- whether there are other options that would put more responsibility on the DNOs.

6.102 Some stakeholders have expressed support for measures relating to SIs being included in RIIO-ED2, including several of the DNOs' CEGs. In addition, although customers did not indicate strong support during Business Plan development, S&C Electric wrote to us setting out some of the potential impacts that SIs can have, such as loss of business while systems reboot, the time needed for renewable generation to restart and the inconvenience to domestic customers of their router and other appliances resetting. Although we recognise that reducing SIs is likely to become more important to customers over time, due to the increasing dependence on electricity as heat and transport are electrified, we still do not

think that we should introduce measures, unless they are reflective of the cost or benefit to consumers.

6.103 As described in paragraph 6.17, we expect to do work to assess what further reliability improvements should look like, if they should still be driven by incentives, and the willingness customers have to pay for them. The outcome of this work would inform development of our RIIO-ED3 proposals. We think that development of a minimum standard or incentive for SIs should form part of this work.

Annual SI reporting

6.104 Although we are not proposing to introduce a minimum standard now, due to data and other practical limitations, we are mindful that we have said we think it is important to have better information on SIs for several years, including proposing a programme of work in our DPCR5 final determinations to better record and report short interruptions.[158] We are proposing that the DNOs will report to us annually in their regulatory reporting packs (RRP) on the agreed dataset over RIIO-ED2, which will provide transparency on how the DNOs are performing on SIs and for a robust basis for setting a minimum standard or an incentive for RIIO-ED3.

Guaranteed standards of performance (GSoP)

Guaranteed standards of performance (GSoP)	
Purpose	To ensure a set of common, minimum standards apply to DNOs with respect to interruptions, voltage quality, and customer interactions
Benefits	Ensures consumers are compensated if minimum service levels are not met

Background

6.105 In our SSMD we said that we had not seen evidence that suggested the existing arrangements were unfit for purpose and needed changing. We also said we would consider any evidence presented thorough the DNOs' Business Plans that warranted a change to any individual standards.

6.106 We also said we believed it was appropriate to update the payment amounts to account for inflation at the start of the price control and that indexing payments to

[158] https://www.ofgem.gov.uk/sites/default/files/docs/2009/12/fp_2_incentives-and-obligations-final_0.pdf

inflation should continue during the price control. This included rounding payments to the nearest £5, which was introduced for RIIO-GD2.

6.107 Finally, we would review the drafting of the GSoP to improve clarity and transparency, including additional consultations if necessary.

6.108 Since our SSMD was published, GB experienced several severe storms, including Storm Arwen, which had such a significant impact on customers that it triggered both Ofgem and BEIS to launch reviews into how the DNOs performed during and after the storm. Storm Eunice had such a significant impact that it triggered the Category 3 threshold, which was the first instance of this happening.

6.109 In Chapter 7 of our final report on Storm Arwen,[159] we recommended that we commission a review to identify amendments that recognise the impact of extended interruptions on customers. The review should include:

- assessing if a compensation cap is still appropriate and, if so, what the right level is
- consideration of the current payment structure and develop alternative options (eg inclining payments)
- assessing whether the thresholds for different storm categories are fit for purpose
- developing options for improving the accuracy of customer data, to make the process for compensation payments more efficient.

6.110 Further information about the outcomes of our Storm Arwen report are set out in Chapter 13 of the Overview Document for these Draft Determinations.

Consultation position

Output parameter	Consultation position
Inflation adjustments	No change to our SSMD position
Timing of GSoP review	Undertake separately to the RIIO-ED2 price control setting process
Scope of GSoP review	• Simplification of GSoP drafting • Inflation rate adjustments • Severe weather categories

[159] https://www.ofgem.gov.uk/publications/storm-arwen-report

	• Timing, level and cap on payments

Inflation adjustments

6.111 The approach to inflation adjustments is the same as has been implemented for the GDNs as part of GD2. The SRRWG suggested that the methodology might be difficult to manage on an ongoing basis, but the GDNs have not raised any issues with applying the new approach to inflation adjustments. Given this, we are not aware of any new evidence to indicate we should move from our SSMD position. However, we propose that this will be implemented as part of the wider review of the GSoP, which we expect will result in changes to the payment levels associated with severe weather events.

Scope of GSoP review

6.112 In addition to identifying a new approach to inflation adjustments and the action to review of severe weather-related payments and caps as recommended in our Storm Arwen report, we propose to retain our SSMD position to improve the clarity and transparency of the GSoP. Following Storm Arwen, we heard from customers that there was confusion about whether they were eligible for compensation and how much they were entitled to, with some saying it contributed to their stress regarding the storms. This has highlighted the importance of customer-related information being easy to understand, and that the GSoP could be improved.

Timing of GSoP review

6.113 We have historically reviewed the GSoP as part of the price control setting process, but it is not essential that we do it at this time, as the GSoP are set out in a separate Statutory Instrument rather than in the special conditions of the licence.[160] We think the level of interest in our review of the severe weather-related Standards could be significant, which could affect the timeframes within which any changes are delivered. Although we could proceed separately with changes to the inflation rates and simplifying the GSoP, we think is sensible to undertake a single set of changes, due to the interrelationship between the different elements and the process that needs to be followed to amend the Statutory Instrument.

[160] https://www.legislation.gov.uk/uksi/2015/699/body/made

6.114 As a result we propose that the GSoP review, with its widened scope, is carried out separately to the RIIO-ED2 process.

Worst served customers (WSC)

Worst served customers (WSC)	
Purpose	Reduce the number of interruptions experienced by those customers who experience an unusually poor service from their DNO
Benefits	Improves network reliability for customers who currently receive significantly below average levels of service

Background

6.115 In our SSMD[161] we confirmed:

- we would update the common definition of a WSC and remain focused on interruptions on the HV network
- we would move to ex ante funding and introduce a PCD
- our view that the DNOs are best placed to establish the appropriate level of performance improvement that should be delivered through the dedicated schemes they identify through engagement with their stakeholders and consumer groups.

6.116 We also decided that we would consider performance improvements proposed by the DNOs alongside their requests for funding and work with the DNOs to refine the definition of a WSC, based on findings from their stakeholder research.

Approach to assessment

6.117 The DNOs submitted Engineering Justification Papers (EJPs) as part of their Business Plans setting out their approach to identifying applicable WSC, the impacted circuits and the schemes they would undertake to address them. Our initial review of the EJPs identified that each DNO has determined their own level of improvement, size of schemes, and point in time when they are going to do the works, as we said they could in our SSMD. However, even if the DNOs' proposed outcomes are different within each region, we still expect each DNO to present a

[161] RIIO-ED2 SSMD Annex 1, Chapter 7 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

robust, well-evidenced approach that gives us confidence that they will be able to deliver improvements for their WSC over RIIO-ED2.

6.118 Our Engineering team reviewed the EJPs and identified different areas where each DNO needed to provide additional information to support our assessment. These included:

- clarifying how they identified WSC to then identify the relevant schemes
- how they calculated the amount of baseline allowances they requested
- how their approach would be flexible to accommodate annual changes in the number and location of WSC
- optioneering they undertook to identify investments that best balanced improvements and costs.

6.119 We have assessed the updated EJPs to decide whether the DNOs have sufficiently robust processes to support their baseline funding requests and give us confidence that their investments will provide benefits for their WSC.

Consultation position

Output parameter	Consultation position
Funding mechanism	Ex ante UIOLI allowance
Totex baseline allowances	Modelled WSC costs, as set out in Table 19.
Reporting and monitoring framework	Common measures must be reported via the RRPs: • Annual WSC numbers • Schemes identified during the year and connected WSC • Progress with schemes underway (where these are multi-year) • Final cost upon project delivery

Funding mechanism

6.120 We said in our SSMD that we would move to ex ante funding for WSC, supported by a PCD. However, our proposal is that WSC should be delivered under an ex ante UIOLI allowance, supported by a governance and reporting framework that ensures the DNOs are delivering benefits to their WSC. Our proposed change from a PCD is because:

- WSC are based on a rolling definition, which means the annual number of WSC can vary significantly, regardless of whether the DNO has carried out any investment to address their WSC
- the PCD outcomes would be set out in a Licence Condition. Even if the deliverables were generic (eg a set number of schemes), there is limited scope for them to flex upwards, if a greater number of WSC or some in different locations are identified during the price control period
- the DNOs are not incentivised to address WSC under the IIS, because the cost of improvements would be greater than the rewards that could be earned (due to the small number of customers impacted and/or the cost of the investment). This means that, without a specific mechanism, they are likely to continue facing poorer service than other customers. We do not want the funding mechanism to be a barrier to WSC receiving service improvements.

6.121 The advantage of a UIOLI allowance is that, if the DNOs do not spend it on achieving specific outcomes, any remaining allowances are returned to us at the end of the price control period, without a sharing factor being applied. This means that we can provide sufficient funding to allow the DNOs the flexibility to make improvements for additional WSC identified during RIIO-ED2, without an undue impact on customer bills.

totex baseline allowances

6.122 We have reviewed the updated EJPs provided by the DNOs and are satisfied that they each have an appropriate methodology for identifying and costing projects for improving service for WSC. Given this, we are proposing to allow modelled costs (refer to Chapter 7 for an explanation of how the disaggregation methodology impacts on requested costs), as set out in Table 19:

Table 19 WSC modelled costs (£m, 2020/21 prices)

DNO	Total RIIO-ED2 costs
ENWL	18
NPgN	1
NPgY	3
WMID	1
EMID	-
SWALES	1

DNO	Total RIIO-ED2 costs
SWEST	1
LPN	-
SPN	11
EPN	15
SPD	5
SPMW	8
SSEH	18
SSES	3
Total	86

6.123 There are several ways that the UIOLI allowance can be provided to the DNOs:

- provide the full allowance and clawback any unspent funding, and potentially make an adjustment where funding is determined by us to have not been spent for the purpose it is provided (in this case not spent on improving reliability for WSC)
- profile the allowance across the price control and clawback any unspent funding through the annual iteration process (AIP)
- not provide any allowance upfront but, as part of the AIP, provide funding for costs incurred that year to improve reliability for WSC
- a hybrid option, such as giving the DNOs part of their allowance upfront then providing additional funding that still falls within their total UIOLI allowance under the AIP for other activities to support WSC.

6.124 Our proposal is to provide the funding to the DNOs upfront without an adjustment process to clawback at the end of the price control. We think that this gives the DNOs the most flexibility to increase or reduce their programme of work, in response to changes in the number and location of WSC, while the governance document (referred to below in paragraph 6.128) will ensure funding is used for the purposes it is provided for. We are not proposing to include an end-of-period adjustment mechanism to allow us to clawback funds that we assess as not being spent for the specified purpose, because we:

- set out a clear definition of what a WSC is in our SSMD and will make it clear in our governance document that investments need to benefit them

- recognise that, because customers can fall in and out of being WSC between years, a DNO may identify activities to support WSC who no longer qualify when the work is complete
- want to avoid our funding mechanism being a disincentive for DNOs to carry out works for WSC, which may be the case where a DNO is uncertain whether they will be able to keep the allowance.

6.125 We expect that the additional flexibility provided by a UIOLI allowance may encourage some DNOs to revise their approach to WSC, resulting in them requesting higher allowances. Where this is the case, we will work with those DNOs through bilateral engagement to finalise their allowances and updates to their EJPs to reflect changes in their proposed works in advance of Final Determinations.

Governance document

6.126 We recognise that the WSC mechanism in RIIO-ED1 may have made it difficult for DNOs to be able to demonstrate three years of evidence of benefits for the WSC the scheme was delivered for, because customers can fall in and out of the definition.

6.127 Along with moving to ex ante allowances, we are proposing to introduce a governance framework that addresses the challenges with the RIIO-ED1 framework by recognising that WSC numbers and locations can vary between years, while also ensuring that the DNOs invest in schemes that provide benefit to customers who qualify (or qualified at the time the work was planned) as being WSC. We think this more pragmatic approach will ensure DNOs only consider schemes that will benefit WSC, while recognising that, even if a customer is not "worst served" in one year, they will still be "very badly" served, due to their network assets, and may fall back into the definition in a future year, if not addressed.

6.128 We will work with the DNOs through the SRRWG and other stakeholders through targeted engagement to develop the governance document that we propose will form an Associated Document under the licence, and that we will consult on as part of the formal licence consultation. This will set out how we propose to monitor the WSC outcomes and the information the DNOs will need to provide to us, as part of their RRP, including key common metrics that we are proposing will be:

- annual WSC numbers – broken down by location to enable us to track progress with reducing the WSC/improving service across circuits
- schemes identified during the year and connected WSC – rather than requiring three years of post-construction benefit, we will expect DNOs to confirm the number of WSC at the time the scheme is identified and the expected benefit
- expected CI benefit – all CI improvements contribute to IIS performance and, with a UIOLI allowance there is a risk that the DNOs will carry out improvements where the key driver for the works is to maximise IIS rewards. Reporting on the number of WSC and the expected CI impact will ensure that DNOs' investments are focused on delivering improvements for WSC. However, we do not necessarily want to deter the DNOs from carrying out works that only improve outcomes for a small number of WSC, because it also delivers for other customers
- progress with schemes underway – to enable the DNOs to invest in more lasting improvements than those that can be achieved within a year, we are supportive of works that may take more than one year to deliver. This reporting will enable us to track progress and costs
- final cost upon project delivery – to identify whether the DNOs have used their allowances to deliver benefits to WSC, we need to know how much they are spending each year. This would be reported on a per project and cumulative basis.

Consultation questions

Core-Q52. Do you agree with our proposal not to have an end-of-period adjustment mechanism? If not, what criteria should we use to determine whether a DNO has used its allowance for WSC, without it creating uncertainty?

Core-Q53. Are there any other areas or metrics that we should include in our governance framework?

Ensure long-term safety and resilience

6.129 DNOs must deliver safe and resilient network services to ensure the distribution networks can meet the needs of consumers, both now and in the future.

6.130 The networks need to remain resilient to a range of existing and emerging threats. This resilience encompasses the physical condition of the assets, as well as the capacity to withstand external threats such as flooding of key sites or cyber-

attack. We have a range of measures in place in the current price control that ensure DNOs manage and mitigate the risks to their networks and our proposed arrangements for RIIO-ED2 build on these measures as well as learn from progress in other RIIO sectors.

6.131 There are three main strands to our approach to ensuring DNOs deliver safe and resilient networks: asset resilience (as measured through the NARM); environmental resilience; and information and other resilience. Activities carried out under one strand of our approach to delivering resilient networks may also support other strands of resilience. For example, asset resilience activities may also deliver environmental resilience benefits. In this chapter, we discuss our proposals for each of these areas in turn.

Asset resilience: Network Asset Risk Metric

Network Asset Risk Metric	
Purpose	If a network company does not appropriately manage their assets, the risk of those assets failing will generally increase over time. To keep the network asset risk, ie the consequence of asset failure and the likelihood of a failure occurring, within reasonable bounds, network companies are funded to carry out asset management activities such as replacement and refurbishment.
Benefits	Helps to ensure that network companies appropriately manage their existing network assets and maintain the risk of asset failure within acceptable bounds.

Background

6.132 Network asset risk relates to the consequence of failure of a network asset and the likelihood of a failure occurring. If a network company does not maintain, replace, or refurbish its assets, the likelihood of them failing will generally increase over time, and so would the risk of the consequence of failure materialising. To keep network asset risk within reasonable bounds, network companies are funded to carry out asset management activities such as replacement or refurbishment.

6.133 In our SSMD,[162] we decided that in RIIO-ED2, the Network Asset Risk Metric (NARM) would be used as the output to hold companies accountable for their investment decisions. We also made the following decisions on NARM, confirming that we would:

- adopt a long-term risk measure as the NARM output measure

[162] RIIO-ED2 SSMD Annex 1, Chapter 8 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

- improve commonality of reporting by requiring DNOs to report against all asset register categories with the current Common Network Asset Indices Methodology (CNAIM)
- maintain the requirement for DNOs to produce Information Gathering plans (IGPs)
- require DNOs to work together to produce a guidance document to support data input for all conditions points and for all asset classes covered by the CNAIM
- require DNOs to work together to review the CNAIM to reflect the updates to the NARM framework
- use NARM as part of wider toolkit for the assessment and justification of asset intervention investment decisions
- use the equivalent RIIO-ED1 arrangements as the basis for development of the NARM incentive mechanism for RIIO-ED2.

6.134 In our SSMD, we also set out the following areas for further consideration ahead of Draft Determinations:

- review of the specific IGP arrangements around governance, revisions, and reporting
- consideration of an uncertainty mechanism to manage non-NARM related expenditure
- consideration of specific incentive arrangements around the deadband[163] and the penalty for unjustified under-delivery against the NARM output.

6.135 We have used companies' final Business Plan submitted views of the monetised risk reduction they expect to be delivered through their proposed investments to set their proposed Baseline Network Risk Outputs.

Our Consultation Position

Output Parameters	Consultation Position
Reviewing IGP arrangements	To retain requirements on the DNOs to produce an IGP which sets out how they will gather and record the information required to implement the CNAIM. This will be required to include the scope, form, and frequency of the data that will be collected in accordance with the CNAIM and the RIGs. We also propose to retain the ability to direct DNOs to modify their IGPs.

[163] The deadband is a range of outcomes around the output target for which there are no rewards or penalties.

Output Parameters	Consultation Position
Consideration of uncertainty mechanism to manage non-NARM related expenditure	Not to introduce an uncertainty mechanism for non-NARM related expenditure.
Incentive arrangements	To set the deadband around the NARM output at +/-5% and to retain the RIIO-ED1 penalty rate at 2.5% of avoided costs associated with unjustified under-delivery against the NARM output.
Baseline Network Risk Outputs	To set the NARM output in line with the DNOs' submitted views of the monetised risk reduction they expect to deliver.

Rationale for Consultation Position

Information Gathering Plans

6.136 We have been working closely with stakeholders through the Safety, Resilience and Reliability Working Group (SRRWG) reviewing the arrangements around IGPs. It was widely agreed that IGPs represent a key component of the NARM framework, and provide an important tool for measuring DNOs' performances on information gathering against what they have committed to, and as such, we propose to retain the requirements in RIIO-ED2 for companies to produce an IGP.

6.137 We have also been working closely with stakeholders through the Licence Drafting Working Group (LDWG) and have proposed specific licence drafting for RIIO-ED2 on IGPs which includes a requirement to produce them in accordance with the CNAIM and the RIGs. This will be consulted on in due course.

6.138 We will continue to work with stakeholders through the SRRWG and LDWG on the reporting requirements associated with IGPs and, subject to consultation, update the RIGs for RIIO-ED2 accordingly.

Non-NARM assets

6.139 In our SSMD, we stated our ambition to improve coverage of the NARM framework and the CNAIM and identified several high-level options for setting outputs for the Non-NARM assets not covered by the methodology.[164] We also noted that if we were not able to overcome the challenges associated with these options, then we would consider other price control mechanisms, such as uncertainty mechanisms.

[164] RIIO-ED2 SSMD Annex 1, Paragraph 8.62 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

6.140 Noting our intention to develop the NARM framework for RIIO-ED3 and beyond, and the challenges associated with the proposed options in our SSMD, we are not proposing to introduce any additional uncertainty mechanism for non-NARM assets at this stage. Non-NARM assets represent approximately 34% of the total asset replacement and refurbishment expenditure, on average, and while material, it is our view that our cost assessment approach detailed in Chapter 7 has set a robust allowance and that there are not sufficient levels of uncertainty around this investment to merit the introduction of an uncertainty mechanism at this time. We will continue to work with stakeholders on this through the SRRWG and will keep it under review for RIIO-ED3.

Deadband

6.141 We propose to set a deadband at +/-5% around the baseline network risk outputs, beyond which DNOs will be required to provide justification for over- or under-delivery. We also propose to retain a penalty rate of 2.5% of the funding adjustment in the case of an unjustified under-delivery. This is consistent with the RIIO-ED1 mechanism, and we have not seen evidence to suggest that a different deadband or penalty rate would be more appropriate for RIIO-ED2. We have discussed these proposals with stakeholders through the SRRWG and LDWG and there was broad support for the proposed rates.

Baseline Network Risk Outputs

6.142 As part of their Business Plans, DNOs submitted their proposed Baseline Network Risk Outputs that will be delivered through their proposed NARM related asset replacement and refurbishment activities.

6.143 Through CNAIM, there is a well-developed relationship between the volumes of NARM-related asset replacement and refurbishment activity that DNOs carry out, and the risk point reduction that is subsequently delivered. Our cost assessment approach, which is detailed in Chapter 7, combines both totex and disaggregated benchmarking. In our totex benchmarking, we do not propose any pre-modelling workload adjustments on NARM-related asset replacement and refurbishment volumes, instead we use workload and activity drivers within the model to explain forecast costs. Our disaggregated benchmarking approach does, however, propose some specific volume adjustments to NARM-related activities as a result of our approach qualitative review, as detailed in Chapter 7. This reflects our view on the supporting evidence and justification provided by the DNOs and protects

consumers against the potential costs arising from any inefficient delivery of output targets.

6.144 To derive the Baseline Network Risk Output, we considered reflecting any proposed volume disallowances associated with each NARM-related asset intervention against DNOs' submitted views of their Baseline Network Risk Outputs. However, it is our view that any volume adjustments proposed within the disaggregated modelling should not translate to a lowering of the Baseline Network Risk Output to be delivered. This reflects our assessment of the mix of asset intervention activities likely to be undertaken by DNOs to maintain asset risk on their networks. For example, in RIIO-ED1 all DNOs are on track to deliver their risk point output, with several DNOs deploying a materially higher proportion of refurbishment interventions to replacement activies relative to their forecast. We consider that the NARM framework in RIIO-ED2 will continue to give DNOs sufficient flexibility to innovate, manage their assets appropriately and deliver their outputs.

6.145 Accordingly, we propose to set the NARM output in line with the DNOs' submitted views of the monetised risk reduction they expect to deliver. We consider that setting the output at this level protects consumers against the potential harm of potentially inefficient delivery and/or deteriorations in overall asset management and resilience.

6.146 We welcome views on this and propose to continue working with the SRRWG on this issue ahead of Final Determinations.

6.147 Table 20 below summarises the risk movements and the proposed Baseline Network Risk Outputs for each DNO.

Table 20 Summary of Risk Movements (£R, 2020/21 prices)

Network	Risk Movement due to Asset Replacement	Risk Movement due to Refurbishment	Risk Movement due to HVP	Total Risk Movements	Adjustments	Draft Determinations Proposed Baseline Network Risk Output
ENWL	317,198,424	99,446,841	-	416,645,265	-	416,645,265
NPgN	371,441,415	20,164,013	-	391,605,428	-	391,605,428
NPgY	342,995,716	50,651,697	-	393,647,413	-	393,647,413

Network	Risk Movement due to Asset Replacement	Risk Movement due to Refurbishment	Risk Movement due to HVP	Total Risk Movements	Adjustments	Draft Determinations Proposed Baseline Network Risk Output
WMID	468,833,320	50,954,240	-	519,787,560	-	519,787,560
EMID	344,440,116	60,214,222	-	404,654,338	-	404,654,338
SWALES	321,240,337	41,471,245	-	362,711,582	-	362,711,582
SWEST	589,422,171	37,749,040	-	627,171,211	-	627,171,211
LPN	193,433,823	3,623,569	-	197,057,392	-	197,057,392
EPN	441,382,784	32,946,389	-	474,329,173	-	474,329,173
SPN	888,080,716	12,411,123	-	900,491,839	-	900,491,839
SPD	337,334,112	22,008,306	-	359,342,418	-	359,342,418
SPMW	396,990,197	57,249,045	-	454,239,242	-	454,239,242
SSEH	185,463,231	6,039,900	26,996,225	218,499,356	-	218,499,356
SSES	649,826,528	35,486,901	-	685,313,429	-	685,313,429

Storm Arwen Review

6.148 In the Overview document we set out the actions being taken forward from the recently published review into the networks' response to Storm Arwen and the potential implications for the RIIO-ED2 price control. A number of actions could have implications for the implementation of our NARM framework.

6.149 In terms of the DNOs' approach to asset resilience activities, we want to ensure DNOs prioritise spending on resilience to severe weather and will be considering how best to achieve this within the NARM framework. This could include, for example, some asset specific conditions or constraints aimed at protecting key exposed infrastructure and increase overall network resilience to severe weather events. We will consider this position alongside the relevant reviews being undertaken in response to Storm Arwen ahead of Final Determinations.

Consultation Questions

Core-Q54. Do you agree with our proposed approach on NARM?

Environmental Resilience

Climate Resilience

Climate Resilience	
Purpose	To ensure DNOs consider the risks and impacts of climate change to their networks and take appropriate steps towards mitigation and adaptation
Benefits	Ensures security of supply is maintained, even in adverse weather conditions

Background

6.150 Storm Arwen brought widespread disruption to the UK in November 2021 and was described by the Met Office as one of the most powerful and damaging winter storms of the latest decade.[165] Over 1m customers lost power and nearly 4,000 customers were off supply for over a week. After Storm Arwen, the UK experienced five more major storms, including Storm Eunice. While the impact of Storm Eunice was resolved faster than Storm Arwen, 1.7m households still experienced an interruption that lasted more than three minutes.

6.151 Severe weather events such as Storms Arwen and Eunice are likely to become more common as the effects of climate change are felt. It is imperative that all DNOs are well prepared and that their networks remain resilient to a range of climate risks, both now and in the future.

6.152 Assessing and responding to climate risks is the responsibility of DNOs and an increasingly important part of network resilience. The RIIO-ED2 price control framework will provide DNOs with, for example, funding for flood resilience measures as part of their baseline allowances.

6.153 In addition to this, in our SSMD we also said that DNOs must:[166]

- submit a climate resilience strategy as part of their RIIO-ED2 Business Plans, which would be assessed as part of the BPI

[165] https://www.metofficegov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2021/2021_07_storm_arwen.pdf
[166] RIIO-ED2 SSMD Annex 1, Chapter 8 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

- ensure that their climate resilience strategy inform their programmes of work
- establish a working group focused on climate resilience.

6.154 We are not consulting on any additional proposals relating to climate resilience. In this section, we provide an assessment of the climate resilience strategies submitted by the DNOs.

Approach to reviewing climate resilience strategies

6.155 When reviewing the climate resilience strategies we assessed whether:

- DNOs' strategies are based on a central case that considers a range of plausible climate change projections. This central case has been agreed by all DNOs and other relevant stakeholders such as the UK Met Office
- DNOs have considered a range of risks that at a minimum include, a rise in mean UK temperatures, changes in precipitation levels and wind speeds, sea-level rises and lightning
- DNOs have assessed the impact of these risks on their networks
- DNOs strategies have included an adaptation pathway which include clear adaptation tipping points[167] and trigger points[168]
- DNOs have established or committed to establish governance structures that will monitor climate related risks and ensure that any actions that need to be undertaken, are incorporated into wider programmes of work, that can be funded and delivered through RIIO-ED2 or over the longer term
- DNOs are contributing to cross-sector work on climate resilience to identify the risk of cascade failures across interconnected infrastructure and share best practice and expertise.

Assessment of climate resilience strategies

6.156 All DNOs submitted a climate resilience strategy as part of their RIIO-ED2 Business Plan and have met the climate resilience related BPI Minimum Requirements.

6.157 All DNOs based their strategies on the most recent set of climate model projections, UK Climate Projections 18 (UKCP18).[169] All DNOs considered the most

[167] Tipping points establish the conditions under which an action or policy is no longer effective at delivering the required level of resilience.
[168] Trigger points mark the necessary lead in time for a decision to be made and implemented, to ensure resilience is maintained.
[169] https://www.metofficegov.uk/research/approach/collaboration/ukcp

challenging scenario set out in Representative Concentration Pathway (RCP) 8.5, which corresponds to a global mean temperature rise of 4.3°C by 2100. NPg, ENWL and SPEN also considered more moderate scenarios including RCP 2.6, 4.5 and 6.0.

6.158 Through the Energy Networks Association (ENA), DNOs have undertaken an industry-wide risk assessment on climate change.[170] Most DNOs based their strategies on the risks identified through this analysis and assessed the impact of these risks to their networks. SPEN was the only DNO that went beyond this to identify additional risks relevant to their network. All DNOs apart from WPD and ENWL evidenced that they have assessed these impacts over the short term (current climate), medium term (2050s) and long term (2080s).

6.159 While all DNOs had a section on adaptation plans or pathways in their strategies, we consider that most DNOs only outlined at a high-level, the mitigation measures they have implemented or will implement as required. Only one DNO, SPEN, set out an adaptation pathway which established tipping points, trigger points and a range of action that the DNO could pivot to, to ensure resilience levels are maintained.

6.160 Most DNOs set out the governance structures or processes they have in place or will put into place, to regularly monitor and evaluate climate related risks on an ongoing basis. Only ENWL and NPg did not evidence these in their strategies.

6.161 All DNOs highlighted the importance of cross-sector collaboration and identified a range of key stakeholders they engage with or will need to engage with, to identify interdependencies which could impact their networks.

Next steps

6.162 We expect all DNOs to implement their climate resilience strategies over the course of RIIO-ED2 and to continue to working with each other through the climate resilience working group to cooperate on research, scenario planning and sharing best practice.

[170] https://www.energynetworks.org/assets/images/CCRA3%20report%20v1.0%20final.pdf

Severe weather 1-in-20

Severe weather 1-in-20 funding mechanism	
Purpose	A new funding mechanism to allow for the recovery of efficient costs directly incurred as a result of a storm event that meets severe weather 1-in-20 thresholds.
Benefits	To avoid including uncertain spend in baseline allowances, and instead address additional costs if they eventuate.

Background

6.163 A severe weather ('SW') 1-in-20 event is classified as an event where a DNO experiences 42 times its mean daily faults[171] within a 24-hour period. Historically,[172] we have provided DNOs with a SW cost allowance to deal with storms that meet these thresholds.

6.164 In this section, we are consulting on our proposal to treat SW 1-in-20 costs as a variant totex allowance rather than a fixed allowance in RIIO-ED2.

Approach to policy development

6.165 To help us develop this proposal we analysed SW 1-in-20 costs over DPCR5 and RIIO-ED1 to date. We also engaged with DNOs via the relevant working group.

6.166 We considered 2 other funding approaches for SW 1-in-20 costs:

- use-it-or-lose-it allowance - this option provides DNOs with an allowance for SW 1-20 activity, which can only be utilised if a DNO experiences a storm that meets SW 1-in-20 thresholds. Any underspend is removed at the end of RIIO-ED2, and a 50% sharing factor is applied to any overspend
- re-opener - this option provides DNOs with zero allowance for RIIO-ED2. DNOs can trigger the re-opener if they experience a storm that meets SW 1-in-20 thresholds and request for their allowance to be adjusted to account for

[171] Across its high voltage network or above.

[172] In DPCR4, Ofgem introduced a cost allowance for improvements in restoration times following severe weather events. This was to cover an efficient level of compensation payments and fault costs relating to these events. DNOs were able to use this allowance either to reduce the chance of such events occurring, to manage the impact of the events through faster customer restoration or to buy storm insurance cover. Please refer to our Final Proposals for Electricity Distribution Price Control Review 4 document which is available here Distribution Price Control Review - Final Proposals | Ofgem

costs retrospectively incurred. Ofgem has the ability to scrutinise costs for efficiency.

6.167 We do not think these funding mechanisms are appropriate for SW 1-in-20 costs. This is because providing ex ante funding for unlikely weather events via a use it or lose it allowance will result in DNOs returning allowances with interest throughout RIIO-ED2.

6.168 Conversely, a re-opener could affect DNOs confidence in recovering incurred costs which could have a knock-on impact to the level of response provided during a SW 1-in-20 storm and be detrimental to customer welfare.

Our consultation position

UM parameter	Consultation position
Funding approach	DNOs to pass through efficient SW 1-in-20 costs as a variant totex allowance. DNOs are provided with zero allowance for SW 1-in-20 activity. In the event that a DNO experiences a SW 1-in-20 storm, efficient costs associated with the event can be reported and a true-up will be calculated by the Price Control Financial Model for the next charging period.

Rationale for consultation position

6.169 SW 1-in-20 events have a 5% chance of occurring in a given year. This means that there is a high likelihood that a DNO will not experience a SW 1-in-20 storm in RIIO-ED2 and consequently will not require funding for SW 1-in-20 activity over this period. Providing DNOs with a fixed allowance for SW 1-in-20 storms does not take into account the uncertain nature of these events.

6.170 In RIIO-ED1, DNOs that have not experienced a SW 1-in-20 storm to date are eligible to keep 50% of their unused allowance via the sharing factor. In our RIIO-ED2 SSMC, we said that the purpose of the sharing factor is to provide companies with a strong incentive for companies to operate efficiently.[173] However, in the case of SW 1-in-20 activities, DNOs are being indirectly rewarded for the fact that

[173] RIIO-ED2 SSMD Overview, Chapter 1 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

a storm that meets these thresholds has not occurred in their licensed area. We think that DNOs should only be rewarded for events that are within their control.

6.171 Passing through SW 1-in-20 costs as a variant totex allowance will enable DNOs to adjust allowances for costs incurred by a DNO, only in the event that they experience a SW 1-in-20 storm. We believe that this approach will prevent DNOs from being indirectly rewarded for events that are outside their control.

6.172 Costs associated with SW 1-in-20 events are largely driven by the extent of damage to the DNOs network, which are in part outside the DNOs control. As such we think it is justifiable for DNOs to be able to recover some costs through our proposed mechanism. We propose to define the activities that DNOs can pass through SW 1-in-20 costs as variant totex allowance. Expenditure that is consistent with these activities will be considered as efficient.

6.173 We have considered setting an annual cap on the amount that each DNO can adjust its allowances by in a regulatory year. This would protect consumers from higher costs being passed through, if the frequency or impact of storm events increases over the price control.

6.174 Our current position is to not set a cap. This is because SW 1-in-20 costs have historically been low[174] and, because the frequency and impact of severe weather are not expected to significantly increase over the course of RIIO-ED2.[175] We would welcome stakeholder views on this point.

Next steps

6.175 We propose to work with DNOs through the relevant working group, to define the activities that DNOs can pass-through SW 1-in-20 costs.

Consultation questions

Core-Q55. Do you agree with our proposal to pass through SW 1-in-20 costs as a variant totex allowance rather than a fixed allowance in RIIO-ED2?

[174] Highest reported costs by a DNO is £9.7m. This was submitted by SSEH in 2015. Average annual SW 1-in-20 costs is £1.4m across DPCR5 and RIIO-ED1 to date.
[175] Climate change data shows a lack of any observed trends between changes in UK storminess (https://rmets.onlinelibrary.wiley.com/doi/10.1002/joc.7285). Additionally, current projections forecast that climate change impacts will likely be seen towards the latter end of the 21st century (https://www.metofficegov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_headline_findings_v3.pdf).

Core-Q56. Do you agree with our proposal to not set a cap for the amount that DNOs can adjust their allowance by, in the event they experience a SW 1-in-20 storm?

Information and Other Resilience

Workforce resilience

Workforce resilience	
Purpose	To encourage DNOs to have a resilient workforce
Benefits	Requiring each DNO to prepare and report their progress against a workforce resilience strategy will ensure they focus on important issues around diversity and inclusion, workforce attraction and retention, staff wellbeing and having a future focused workforce.

Background

6.176 In our SSMD[176] we decided that we:

- would not introduce specific output measures or incentives for workforce resilience, as we recognised these could constrain the DNOs in their efforts to develop the most effective resourcing strategies to meet their specific needs.
- would request DNOs to present robust, sustainable workforce strategies as part of their Business Plans
- would set out further detail on potential areas to be included in the DNOs' workforce resilience strategies in our BPG
- recognised the value of increasing transparency of the DNOs' workforce resilience data through consistent external reporting and strongly encouraged the DNOs to work together with their CEGs and wider industry bodies to agree appropriate metrics and a common approach to reporting on the metrics.

6.177 In our BPG, we said that the requirement for the DNOs to submit workforce resilience strategies as part of their Business Plans would be a minimum requirement under Stage 1 of the BPI. The strategies would need to:

- demonstrate how the DNO would develop a modern, diverse, high-quality, well-trained workforce that is fit for the future

[176] RIIO-ED2 SSMD Annex 1, Paragraphs 8.124 to 8.126 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

- refer to the extent of any engagement with the CEG, trade unions and other relevant stakeholders that informed their strategy.

6.178 Although we did not prescribe the contents of the strategies, we said that the DNOs should consider how their approaches would lead to:

- improving inclusion, diversity and equality
- improving workforce satisfaction
- improving workforce motivation and productivity
- attracting people to the energy sector and developing the skills needed for a technology driven, low carbon energy system
- upskilling and multi-skilling the existing workforce
- ensuring the health, safety and mental wellbeing of the workforce.

Review of workforce resilience strategies

6.179 All DNOs submitted a workforce resilience strategy as part of their RIIO-ED2 Business Plan. Although all the DNOs have met the workforce resilience-related BPI Minimum Requirements, there was considerable variation in the extent that each DNO considered all the issues we set out in the BPG and none of the strategies included very much information on how they will achieve the changes they propose to implement.

6.180 All of the DNOs have considered ways they can improve the diversity and inclusion (D&I) across their workforce, their workforce characteristics and how they can change this in the future. ENWL and NPg have both prepared separate D&I plans, which include D&I proposals and measures, while SPEN and SSEN's workforce resilience strategies include detailed discussion on D&I. We note that SSEN, UKPN and WPD have not proposed specific measures to track their progress with implementing D&I-related changes and would encourage them to update their strategies to include D&I measures.

6.181 The DNOs have not all proposed individual workforce-related measures. However, we note that they are working with the National Skills Academy for Power (NSAP)[177] to develop common metrics that they will all report on. This is discussed further in paragraphs 6.185 to 6.188 below.

[177] https://www.euskills.co.uk/about/the-group/national-skills-academy-power/

6.182 All of the DNOs have indicated that they will need significantly more staff to manage the energy transition and identified their proposals for recruiting, upskilling and retaining staff. None of the DNOs have set out a contingency plan, if they are unable to recruit the estimated number of staff, or the impact that would have on their delivery. We would expect that the DNOs have considered such a significant potential risk as part of their BAU risk management and will work with them to understand this, as part of our engagement on the common metrics.

6.183 All the DNOs have provided some evidence of their engagement with their stakeholders on workforce resilience. In general, stakeholders ranked this as less of a priority than other issues, such as network reliability and vulnerability, but they recognised it was still important. WPD provided the most limited evidence of how they engaged with stakeholders, with the detail mainly set out in an annex describing a specific workshop they had on workforce resilience.

6.184 The CEGs have all commented on the DNOs' strategies and how they were engaged during development, including robust challenge and discussion that generally led to amendments to the strategies. We note that WPD's CEG had several concerns with the DNO's final strategy, including that it was unclear how WPD would deliver workforce transformation or measure the outcomes. The Challenge Group did not specifically comment on the workforce resilience strategies in its final report.

Common workforce resilience metrics

6.185 The DNOs are working with Energy & Utility Skills to develop common workforce metrics that they will all report on. The metrics being considered include:

- workforce characteristics - gender, ethnicity, disabilities, age ranges
- resourcing - number of applicants, time to fill, percentage filled internally vs external hires
- skills development - employee participation in upskilling, multiskilling or new skill training
- retention - retirement age, voluntary staff turnover, length of service, reasons for leaving, redundancy, reasons for absenteeism.

6.186 In the first half of 2022, the DNOs have been working with NSAP on pilot exercises concerned with measuring, monitoring and ensuring workforce resilience. Data from the pilot exercises shows that, while data relating to current workforce characteristics is generally available from all DNOs, more work is needed to

ensure that appropriate data collection and reporting is carried out against the other metrics in the framework.

6.187 Over the remainder of 2022 and into 2023, the DNOs will seek to develop and refine the metrics further and agree upon a final set of metrics and definitions. Over the course of RIIO-ED2, each DNO will work towards enabling their own data collection and reporting systems so that they can provide as much of the necessary data as possible to enable measurement against all of the metrics. Once the final set of metrics are agreed, the NSAP proposes to roll the framework out more widely across the energy sector.

6.188 We are pleased that all DNOs have signed up to develop and report on a common set of metrics that will enable both them and stakeholders to track their progress with achieving the activities they have identified in their strategies. We will continue to engage with the DNOs on the development and implementation of the final metrics and reporting process.

6.189 Although we are not consulting on any additional proposals relating to workforce resilience, we recognise there is stakeholder interest in this area and wanted to set out our assessment of the strategies that the DNOs are implementing and the work they are undertaking to develop reporting metrics.

Physical Site Security Re-opener

Physical Site Security Re-opener	
Purpose	To adjust revenues following Government mandated changes to network site security requirements
Benefits	DNOs are compliant with Government security requirements

Background

6.190 DNOs are responsible for a number of sites that are considered by the Government as Critical National Infrastructure (CNI). Through the Physical Security Upgrade Programme (PSUP), DNOs work with the Department for Business, Energy and Industrial Strategy (BEIS) and the Centre for the Protection

of National Infrastructure (CPNI) to identify CNI sites and implement measures that enhance their physical security.[178]

6.191 In our SSMD,[179] we said that we would:

- include a re-opener for physical site security. Our rationale for this is that DNOs' activities in this area are influenced by external factors, such as changes in Government policy, the development of new security standards or revisions by BEIS to the CNI list. Providing a re-opener means that DNOs' allowances may be adjusted where there are significant changes in the relevant physical site security requirements
- have two windows for this re-opener: one within the price control (at the mid-point), and one at the end of the price control.

6.192 We are consulting on our proposed scope, trigger, dates for the re-opener windows and also our proposal to have no materiality threshold for the physical site security re-opener.

Our Consultation position

UM parameter	Consultation position
Scope	Physical site security investments made as part of the PSUP.
Trigger	Change to DNO's scope of work which is caused by: • a change in CNI status of a DNO site • change in Government requirements or policy relating to physical site security.
Re-opener window	Two re-opener application windows available: • 24 January 2026 and 31 January 2026 • 24 January 2028 and 31 January 2028
Materiality threshold	No materiality threshold proposed.

[178] While information relating to the PSUP programme is considered sensitive for national security reasons, you can find further information on generic physical security guidance provided by CPNI here: https://www.cpni.gov.uk/physical-security

[179] RIIO-ED2 SSMD Annex 1, Chapter 8, page 128 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Rationale for consultation position

Scope

6.193 We propose that this re-opener mechanism is only for physical site security investments made as part of the PSUP. This is because these investments will be driven by Government requirements and we consider these to be out of the DNOs' control.

Trigger

6.194 Following the publication of our SSMD, we have engaged with BEIS to identify potential changes to physical security policy which could affect DNOs' planned scope of work in RIIO-ED2. BEIS highlighted two key areas: changes to the CNI allocation of a DNO site[180] and a change to Government policy or requirements in relation to physical site security.

6.195 We propose to have a re-opener to adjust allowances where DNOs identify a change to their scope of work, as a direct result of a change in CNI status of any of their sites, or a change in Government policy or requirements relating to physical site security.

6.196 To trigger the re-opener during the application window, we propose that DNOs should submit a report to us, which provides the evidence set out in the associated licence condition.

Re-opener Window

6.197 We are aware that BEIS is in the process of updating its CNI list. Therefore we consider a need for both mid-period and end-period re-opener application windows, to provide certainty of allowed funding to DNOs where they have been informed of a change in the CNI status of their assets or of other changes in security requirements.

Materiality Threshold

6.198 We are proposing that there is no materiality threshold for physical site security re-openers. Activities in this area are carried out to reduce and mitigate threats

[180] If a site is allocated a higher CNI category, the DNO may be required to install new physical security measures to comply with government requirements.

relating to national security. Therefore, we do not think it is appropriate that physical site security projects must meet a materiality threshold.

Consultation questions

Core-Q57. Do you agree with our proposed approach to the physical site security re-opener?

Electricity System Restoration Re-opener (previously known as Black Start)

Electricity System Restoration Re-opener	
Purpose	To adjust revenues following any changes to network requirements for Electricity System Restoration
Benefits	DNOs have systems and processes in place to enable the restoration of power, following an event that results in the full/partial shutdown of the electricity system

Background

6.199 Electricity System Restoration (ESR) is the process that would be implemented in the event of a full or partial shutdown of the national electricity transmission system. It requires distribution substations to be re-energised and reconnected to each other in a controlled way, to re-establish a fully interconnected system.

6.200 In 2020, BEIS established a new Electricity System Restoration Standard (ESRS),[181] which the ESO needs to comply with by no later than 31st December 2026. In our SSMD,[182] we said that we would include a re-opener for ESR in RIIO-ED2 to allow DNOs' allowances to be adjusted where NGESO requires DNOs to undertake additional activities to ensure that the ESRS can be met.

6.201 We are consulting on the scope, trigger, re-opener window dates and also our proposal to have no materiality threshold for the ESR re-opener.

[181] The ESRS requires ESO to have sufficient capability and arrangements in place to restore 60% of regional demand within 24 hours and 100% of Great Britain's electricity demand within five days.
[182] RIIO-ED2 SSMD Annex 1, Chapter 8, page 128 RIIO-ED2 Sector Specific Methodology Decision | Ofgem

Consultation position

UM parameter	Consultation position
Scope	Limited to costs relating to new obligations for ESRS. This includes changes to Distribution Code requirements for ESRS or obligations under distribution restoration contracts.
Trigger	DNO triggered by submission of a report during the re-opener window. Authority triggered outside the re-opener window.
Re-opener window	One re-opener application window available: • 24 June 2024 to 28 June 2024.
Materiality threshold	No materiality threshold proposed.

Rationale for consultation position

Scope

6.202 We propose to have a re-opener to adjust allowances where DNOs identify a change to their scope of work, as a direct result of new obligations placed on them by NGESO in relation to the ESRS.

6.203 Our engagement with NGESO suggests that any new obligations will likely be placed on DNOs through distribution code modifications or distribution restoration contracts. Given that these obligations will be driven by NGESO's requirement to comply with the ESRS, we consider them to be out of the DNOs' control.

6.204 NGESO is still in the process of establishing the capabilities, level of resilience and restoration services it will need from DNOs to ensure it can meet its obligations by the 31 December 2026 deadline. Therefore there is too much uncertainty around scope, timing and costs of DNO obligations to include associated activities in baseline allowances.

Trigger

6.205 To trigger the re-opener during the application window, we propose that DNOs should submit a report to us providing the evidence set out in the associated licence condition.

6.206 Given the uncertainty around the timing of some DNO obligations, we also propose that the Authority may trigger the ESR re-opener outside of the application window. We could consider triggering the re-opener where NGESO communicates to us that it intends to put additional obligations on DNOs. We plan on setting out this process more formally in the re-opener guidance document.

Re-opener window

6.207 Since publication of our SSMD, our engagement with NGESO suggests that any code modifications related to the ESRS are expected to be published by September 2023. We are also aware that NGESO may need to procure additional restoration services from DERs and these contracts are likely to be awarded by 31 December 2023.

6.208 We believe that a re-opener window in June 2024 will give DNOs sufficient time to identify and cost any changes to their scope of work as a result of code modifications or distribution restoration contracts and; ensure that DNOs implement any changes as quickly as possible and support NGESO compliance with the ESRS by 31 December 2026.

Materiality Threshold

6.209 We propose that there is no materiality threshold for the ESR re-opener. Activities in this area are carried out to enable compliance with the ESRS and reduce impacts relating to one of the highest rated risks in the Government's National Security Risk Assessment.[183] Therefore, we do not think it is appropriate that projects must meet a materiality threshold.

Consultation questions

Core-Q58. Do you agree with our proposed approach to the ESR re-opener?

Telecommunications resilience

Telecommunications resilience	
Purpose	DNOs need to be able to appropriately communicate with their staff and customers and control their assets to operate their networks. Resilient

183 The National Security Risk Assessment (NSRA) is carried out by Government every 2 years. It provides an assessment of the likelihood and potential impact of a range of malicious and non-malicious national security risks. The public version of the NSRA can be found here: https://www.gov.uk/Government/publications/national-risk-register-2020

	telecommunications are particularly important in relation to widespread power outages and ESR.[184]
Benefits	Ensures security of supply is maintained, even during the loss of the public telecommunications network.

Background

6.210 Both the energy sector and telecommunication (telecoms) sector are undergoing periods of rapid change. The energy sector is looking to decentralise and implement a smart grid that will help facilitate Government's commitments to net zero.[185] In parallel, the existing public switched telephone network (PSTN) is being gradually replaced with a newer digital technology known as 'voice over internet protocol' (VoIP),[186] which will have less resilience.

6.211 DNOs currently use the PSTN network to control their assets and communicate with their staff and customers. The replacement of the PSTN is expected to be completed by 2025 and all DNOs will need to have migrated their telecoms lines to an alternative solution by this time. The Office of Communications (Ofcom) is currently exploring a potential solution which proposes to allocate DNOs and other utility companies with a proportion of radio spectrum for operational purposes such as controlling their assets and communicating with their staff and customers.[187]

6.212 In our SSMD,[188] we said that we would retain the existing RIIO-ED1 approach of providing DNOs with appropriate funding for telecoms resilience activities through baseline allowances. We also said that we would monitor any developments in relation to PSTN switch off and review whether this arrangement is still appropriate at Draft Determinations.

[184] DNOs will be largely reliant on their own telecommunication networks to restore power as public telecommunication networks could experience significant disruption in these scenarios.
[185] https://assets.publishing.servicegov.uk/Government/uploads/system/uploads/attachment_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf
[186] Voice over Internet Protocol (VoIP), is a technology that allows you to make voice calls using a broadband Internet connection instead of a regular (or analog) phone line.
[187] Please refer to pg. 23 of Ofcom's Spectrum Roadmap document: https://www.ofcom.org.uk/__data/assets/pdf_file/0021/234633/spectrum-roadmap.pdf
[188] Please refer to Annex 1 of our SSMD document for more information (pg. 130): https://www.ofgem.gov.uk/publications/riio-ed2-sector-specific-methodology-decision

Consultation Position

Output parameter	Consultation position
Funding Mechanism	To retain our SSMD position and fund DNO telecoms resilience activities through baseline allowances.

Rationale for consultation position

6.213 We have not noted any significant developments in relation to PSTN switch-off or the allocation of radio spectrum between the publication of our SSMD and Draft Determinations. Therefore, we believe that our SSMD position is still appropriate and we are proposing to fund DNO telecoms resilience activities through baseline allowances.

6.214 Following publication of our SSMD, we have engaged with Ofcom. Ofcom has indicated that it is unlikely to make a decision on the allocation of radio spectrum during RIIO-ED2. Even in the optimistic scenario where spectrum is allocated to DNOs late in the price control, key details such as who will own the infrastructure and how it will be operated will still need to be resolved before they can establish the scope and cost of telecoms resilience enhancements. Therefore we believe that DNOs will be better placed to seek investment for resilient telecoms projects in RIIO-ED3.

Consultation questions

Core-Q59. Do you agree with our approach to fund DNO telecoms resilience activities through baseline allowances?

Cyber Resilience Operational Technology[189] (OT) and Cyber Resilience Information Technology[190] (IT)

Cyber Resilience OT and Cyber Resilience IT	
Purpose	To reduce risk, improve cyber resilience and response outcomes on the networks and comply with relevant regulations
Benefits	Ensure the DNOs are managing risks posed to the security of the network and information systems, and preventing and minimising the impact of incidents on these essential services to ensure a safe and resilient network

[189] Operational Technology are network and information systems that are considered necessary to the delivery of essential services, for example Supervisory Control and Data Acquisition Systems (SCADA).
[190] Information Technology are network and information systems that are used within business functions, for example word processing.

Background

6.215 Cyber security and resilience are vital to the provision of energy in GB. There is a need for continued investment to manage the risks on networks and information systems, as we recognise the consequences of potential cyber-related incidents on consumers.

6.216 Due to national security concerns, we have set out our rationale for our proposed cyber resilience OT and IT allowance in confidential annexes, which have been sent directly to the DNOs.

6.217 In our SSMD, we decided that:

- DNOs must submit separate cyber resilience IT and cyber resilience OT plans, as part of their Business Plans that follow on from their self-assessment of how they expect to perform against the National Cyber Security Centre Cyber Assessment Framework (NCSC CAF)[191]
- we would provide appropriate baseline allowances for cyber resilience. Any allowances in relation to IT would be subject to the TIM, and any allowances in relation to OT would be provided on a UIOLI basis
- we would include outcome based PCDs for both cyber resilience IT and cyber resilience OT to ensure the DNOs are held to account for non-delivery of measures they identify in their plans
- we will also include a mid-period re-opener window to allow DNOs an opportunity to update their cyber resilience IT and OT plans.

Consultation position

UM parameter	Consultation position
Cyber Resilience OT	• Two re-opener windows for all DNOs available in Year 1 (2023/24), and Year 3 (2025/26) of the price control period. • Allowance subject to ongoing monitoring as part of outcome based PCDs and a UIOLI mechanism. • No materiality threshold.
Cyber Resilience IT	• Two re-opener application windows for all DNOs available in Year 1 (2023/24), and Year 3 (2025/26) of the price control period. • Allowance subject to ongoing monitoring, as part of outcome based PCDs. • No materiality threshold and no aggregation.

[191] NCSC Cyber Assessment Framework

Re-openers for Cyber Resilience OT and IT

6.218 In our SSMD we proposed to only apply a mid-period re-opener window for RIIO-ED2 because the DNOs have had more time to prepare their cyber resilience plans than the other sectors. Instead, we are now proposing to retain the Year 1 re-opener window that we applied in the other sectors to enable the DNOs to submit a request for additional allowances, in addition to the mid-period re-opener window that we decided in our SSMD. Due to the sensitive nature of cyber resilience, we discuss our rationale in the DNO-specific confidential annexes.

6.219 For all DNOs, both for cyber resilience OT and IT, we propose two re-opener windows during which the DNOs can trigger by submitting requests during the following windows:

- Year 1 - 1 April 2023 - 7 April 2023
- Year 3 - 1 April 2025 - 7 April 2025.

6.220 We propose that we will also be able to direct new application windows or a trigger re-opener ourselves at any time.

6.221 We propose that DNOs can submit cyber resilience OT and IT mid-period re-opener applications to propose adjustments to their allowed expenditure, outputs and delivery dates to cover matters including (as appropriate):

- new projects capable of producing measured risk reduction and improving NCSC CAF outcomes on their networks and information systems, to comply with The Security of Network and Information Systems Regulations 2018[192]
- significant changes to levels of risks or threats
- new statutory or regulatory requirements relating to cyber resilience OT and IT.

6.222 We are proposing that there is no materiality threshold for cyber resilience OT and IT re-openers. Cyber resilience OT and IT activities are carried out to reduce and mitigate threats relating to national security. Therefore, we do not think it is appropriate that projects must meet a materiality threshold.

[192] This is applicable for cyber resilience OT re-openers only.

PCDs for Cyber Resilience IT and OT

6.223 We are proposing to apply PCDs to the DNOs' cyber resilience IT and OT allowances. However, where we are proposing to only provide Year 1 allowances upfront, we will not apply project-specific PCDs and, instead will apply a general one, requiring the DNOs to use their allowances to improve their cyber resilience. Should we decide to provide additional cyber resilience IT and OT allowances in response to re-opener applications, we will determine as part of that process the PCDs that apply to that funding. The DNOs will be required under the Cyber Resilience Licence Condition to report progress delivering any PCDs that are set, as part of bi-annual reporting to Ofgem's Cyber Advisory team on 31 January (for the preceding April-September) and 31 July (for the preceding October-March). This reporting is in addition to the reporting the DNOs must undertake to comply with their NIS obligations and the requirement for all evaluative PCDs to report to us the year after the delivery date.

Proposed 'use it or lose it' allowance for cyber resilience OT

6.224 In addition to setting PCDs, we are proposing to provide the cyber resilience OT allowances under a use it or lose it (UIOLI) mechanism because of the level of uncertainty around the costs under the evolving cyber-risk landscape. We propose that, following assessment of the DNOs' delivery against their PCDs, we will assess their spend against their UIOLI allowances. The cyber resilience OT allowances will not be subject to the TIM, reflecting that the newness and uncertainty regarding OT solutions means we do not want the DNOs to focus on efficiencies, but instead on identifying the best solutions.

6.225 In considering whether the cyber resilience OT UIOLI allowance has been spent in a proportionate, appropriate and efficient way, we will consider factors including whether the DNO has:

- engaged and reported progress regularly with Ofgem, and considered any guidance between Draft Determinations and the Year 1 re-opener window, and throughout the RIIO-ED2 price control
- used the Year 1 re-opener window to propose improved plans and solutions, including a more mature programme of activities
- for Cyber Resilience OT plans, demonstrated risk reduction, improvements in compliance with NIS regulations incorporating the NCSC CAF outcomes, and programme milestone achievements

- demonstrated organisational, governance, and senior stakeholder support for Cyber Resilience OT plan.

6.226 We are not proposing to apply a UIOLI allowance to cyber resilience IT because requirements are more mature and the DNOs should already be investing to mitigate IT security-related risk as part of their business-as-usual IT activities. Cyber resilience IT allowances will be subject to the TIM to incentivise the DNOs to find the most efficient solutions.

Consultation Questions

Core-Q60. Do you agree with our proposal to assess the cyber resilience IT and OT plans against our BPG and RIIO-2 re-opener guidance?

Core-Q61. Do you agree with our proposed re-opener windows for cyber resilience OT and IT?

Core-Q62. Do you agree with our proposal to apply a UIOLI allowance to cyber resilience OT to manage the uncertainty around costs?

7. Delivering at lowest cost to energy consumers

Section Summary

This Chapter provides an overview of our approach to assessing DNOs' forecast totex and developing a view of efficient costs that will form our proposed baseline totex allowance for RIIO-ED2.

Introduction

7.1 A key part of the RIIO-ED2 price control is setting totex allowances for DNOs. totex allowances are a material component of customers' bills now and in the future, and it is important that customer bills reflect efficient costs.

7.2 As set out in our SSMD,[193] and building on our approach from RIIO-ED1 and that taken in the recent RIIO-2 price controls for transmission and gas distribution settled in 2020, we have applied a toolkit approach to our assessment of DNOs' forecast totex.

7.3 In developing our proposed approach, we have used information drawn from:

- companies' BPDTs submitted in December 2021
- information provided in response to supplementary questions (SQs)
- stakeholders' feedback from our RIIO-2 SSMC
- discussions with DNOs at cost assessment working groups (CAWGs)
- independent reviews and reports commissioned by Ofgem.

7.4 We have also undertaken a combination of engineering and economic reviews to help inform our position. Where DNOs' costs and needs cases are not fully justified and the case for inclusion in the RIIO-ED2 price control is inadequate, we have proposed removing costs. Further details on our engineering assessment can be found in the company annexes.

[193] RIIO-ED2 Sector Specific Methodology Decision: Annex 2 Keeping Bills Low (SSMD) paragraph 2.7

Baseline totex allowances

7.5 Baseline totex allowances comprise all controllable costs,[194] including an ongoing efficiency challenge. Non-controllable costs, pass-through costs and Real Price Effects (RPEs), while included in overall allowed revenue recoverable by DNOs, are not included in baseline totex and are treated separately.

7.6 Our proposed baseline totex for each DNO is presented below in Table 21, together with submitted baseline totex, and the corresponding differences.

Table 21 RIIO-ED2 submitted totex vs. proposed totex (£m, 2020/21)[195]

DNO Group	DNO	Submitted totex	Proposed totex	Difference	Difference (%)
ENWL	ENWL	2,015	1,640	375	-18.6%
NPg	NPgN	1,392	1,129	264	-18.9%
	NPgY	1,837	1,521	316	-17.2%
WPD	WMID	1,939	1,588	351	-18.1%
	EMID	2,062	1,697	365	-17.7%
	SWALES	1,144	953	192	-16.8%
	SWEST	1,762	1,343	419	-23.8%
UKPN	LPN	1,445	1,323	123	-8.5%
	SPN	1,551	1,394	158	-10.2%
	EPN	2,466	2,137	328	-13.3%
SPEN	SPD	1,676	1,451	225	-13.5%
	SPMW	1,721	1,477	244	-14.2%
SSEN	SSEH	1,406	1,087	319	-22.7%
	SSES	2,826	2,199	627	-22.2%
Total		25,244	20,939	-4,305	-17.1%

7.7 In summary:

- total DNO submitted totex for RIIO-ED2, post cost exclusions and reallocations, and excluding RPEs, ongoing efficiency, non-controllable and pass-through costs, is £25.2bn
- our view of modelled totex is £23.2bn before post-modelling adjustments, catch-up efficiency and ongoing efficiency are applied. This represents an 8% reduction between our modelled totex and DNOs' submitted totex, post normalisations and adjustments

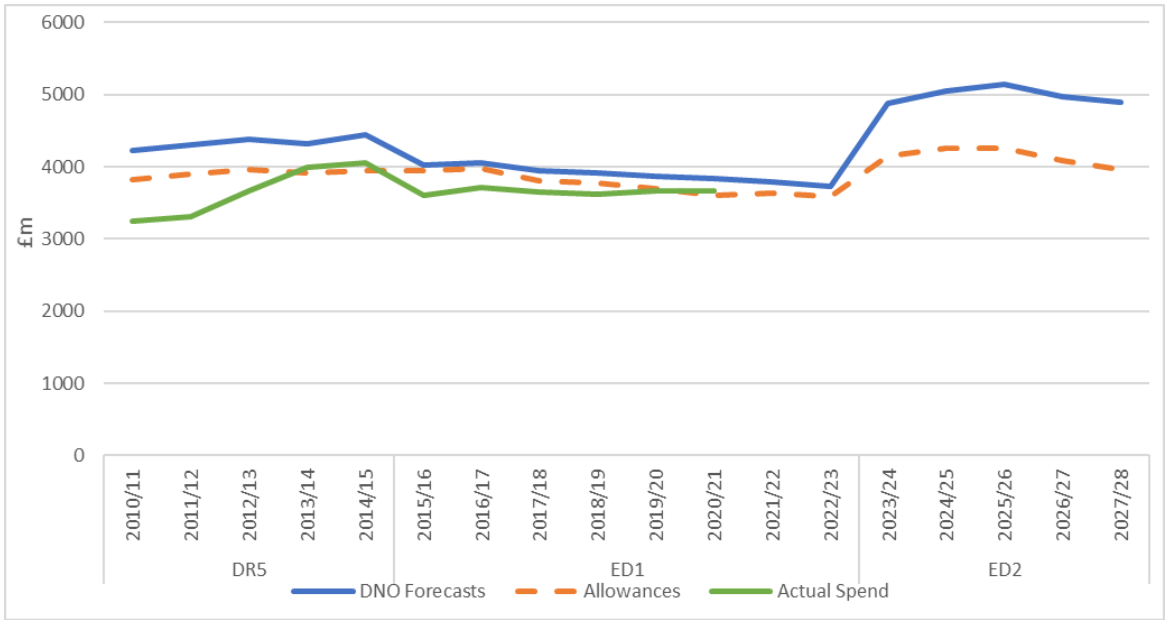
[194] Baseline totex allowances also includes the baseline components of uncertainty mechanisms.
[195] Submitted totex is net costs, including our cost exclusions and reallocations and excluding RPEs, ongoing efficiency, non-controllable costs, and pass-through costs. Proposed totex is net costs, excluding RPEs, non-controllable costs, pass-through costs, but includes Ofgem's view of ongoing efficiency and is before post-modelling adjustments for uncertainty mechanisms.

- we apply a demand driven post-modelling adjustment which results in a £0.7bn or -3% adjustment on modelled totex. This post-modelling adjustment has been applied to set modelled costs for all DNOs based on a common net zero compliant scenario
- our catch-up efficiency challenge results in a further downwards adjustment of £0.3bn or -1% compared to submitted totex, post normalisations and adjustments
- the ongoing efficiency challenge drives a final downwards adjustment of £1.3bn or 5% of submitted totex, post normalisations and adjustments.
- The final proposed totex of £20.9bn represents an overall reduction of £4.3bn or 17.1%.

7.8 Overall, we have found the UKPN DNO group to be most efficient on average, often representing the frontier networks across our benchmarking. It is our view however, that there is considerable room for efficiency improvement by most DNOs.

7.9 Figure 16 below shows DNOs' totex forecasts, the totex allowances that we have set, and the actual spend incurred by DNOs over DPCR5 and RIIO-ED1. Overall, we have observed a significant step change in forecast expenditure relative to RIIO-ED1 and DPCR5, which has presented a challenge for our cost assessment, discussed in more detail in the following sections.

Figure 16 Totex Forecasts, Allowances and Actuals from DPCR5 to RIIO-ED2 (£m, 2020/21 prices)



7.10 As noted in Chapter 3, RIIO-ED2 is likely to play an unprecedented role in shaping the local electricity distribution networks, with the transition to net zero driving an increasing need for investment in the networks to respond to higher demand for electricity. There are other important factors at play for RIIO-ED2, including the digitalisation of the networks, as detailed in Chapter 4, driving increasing investment in monitoring and the increasing requirements on network and environmental resilience, as set out in Chapter 6.

Approach to Cost Assessment

7.11 In our SSMD[196] we set out the objective of cost assessment, which is to develop our view of the efficient level of costs which will enable DNOs to carry out their activities and deliver an appropriate level of outputs for consumers.

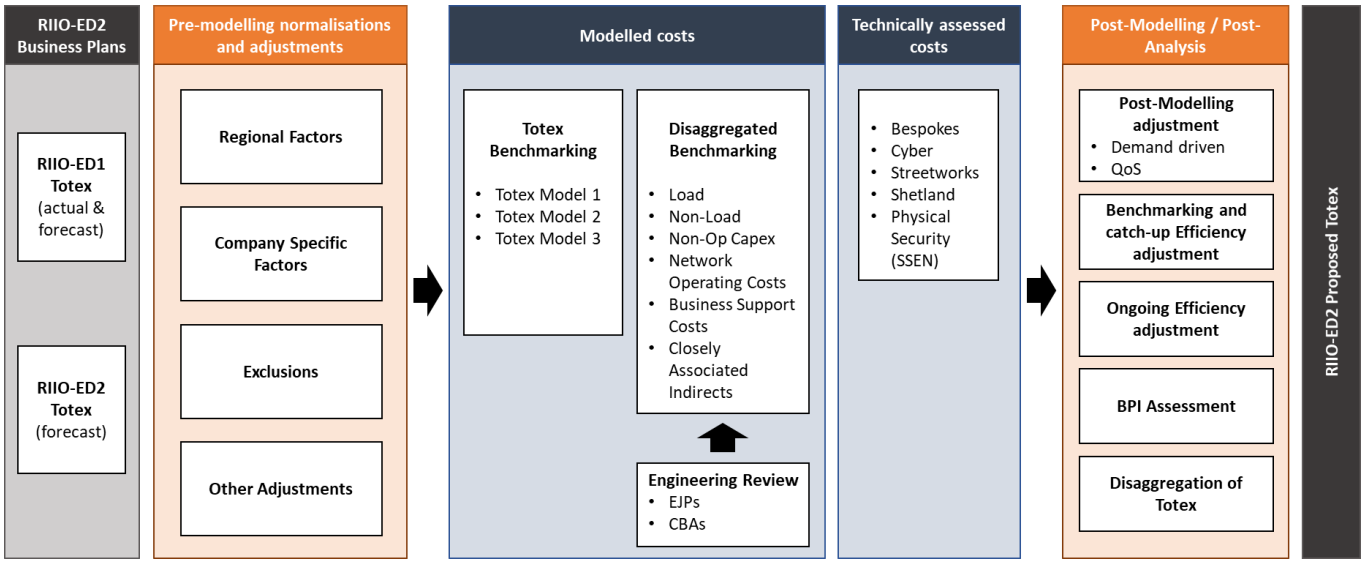
7.12 For RIIO-ED2 we propose to use a combination of aggregated (totex) and disaggregated (activity-level) benchmarking to assess DNO costs, supported by technical assessment where benchmarking is not suitable, such as where costs are company or project specific.

7.13 We think there are significant benefits to this toolkit approach, in that our totex benchmarking has the advantage of gauging overall business efficiency by accounting for trade-offs between different activities, while our activity-level benchmarking allows us to adopt a more tailored approach to specific activity areas, thereby gaining additional insight into specific workload volumes and unit costs. We recognise that no model is perfect, and so having different techniques and approaches to analysing Business Plans helps with the overall reliability of our modelling suite, especially in the context of RIIO-ED2, where there are significant challenges associated with the forecast step change in costs linked to the transition to net zero. This toolkit approach also ensures that no single approach is deterministic in our assessment of the efficiency of DNO expenditure.

7.14 Figure 17 provides a visual representation of our overall process.

[196] SSMD paragraph 2.6

Figure 17 RIIO-ED2 cost assessment process map



7.15 We have sought to ensure that our approach to totex benchmarking for RIIO-ED2 builds on regulatory precedent, is consistent with the wider GB energy network sector, and where appropriate utilises cost assessment tools that have been used in other regulated utility sectors. In doing so, we have explored the use of totex models that capture a more disaggregated view of cost drivers ('bottom-up' totex models) as well as a more aggregated view of cost drivers ('top-down' totex models).

7.16 In this Chapter we set out in more detail the specific approach we have taken on normalisations and adjustments, totex and disaggregated benchmarking, combining our modelling approaches, and the application of catch-up and ongoing efficiency challenges.

Details of our proposed assessment approach

7.17 We set totex allowances on a net basis, ie excluding any costs DNOs can recover directly from third parties such as when a new customer contributes towards the cost of their network connection. However, DNOs reported both gross (ie including customer contributions) and net costs in their RIIO-ED2 Business Plans, and since the level of costs recovered from third parties can vary between DNOs, gross costs provide a consistent starting point.

7.18 At RIIO-ED1 and RIIO-GD2 we benchmarked costs on a gross, rather than net, basis as we considered that the level of efficiency is better assessed on the overall costs incurred by networks, independently of how these costs are funded. We

think assessing costs on a gross basis is still appropriate and have therefore adopted this approach at RIIO-ED2. Following our cost assessment process, we convert modelled costs from gross to net based on the data reported in DNO Business Plans.

7.19 To ensure costs are benchmarked on a comparable basis, we undertake a normalisation process aimed at making any necessary adjustments to company submitted data to ensure they are consistent. These normalised costs are then assessed using our totex and disaggregated benchmarking models, with the results referred to as "modelled costs". Our modelled costs comprise approximately 96% of DNOs' forecast controllable costs on average, with the remainder assessed using other, non-comparative, methods such as technical assessment.

7.20 Our RIIO-ED2 modelling suite consists of three totex benchmarking models, and one disaggregated benchmarking model. We have utilised regression analysis for all three of our totex cost models, as well as in some of the activity-level benchmarks that comprise our disaggregated cost model. Unit cost analysis, run rate and ratio analysis, and engineering and expert review are the remaining tools used in our disaggregated assessment.

7.21 The results from our three totex and one disaggregated cost models are then combined to create a single view of modelled costs. In combining these models, we have assigned equal weight to our totex and disaggregated modelling streams, ie 50% on each, with each of the three individual totex models receiving an equal share of the 50% weight assigned to totex.

7.22 We apply a demand driven post-modelling adjustment to all modelled costs to account for the varying levels of forecast demand growth across DNO Business Plans. This rationale and approach that we have taken in applying this adjustment is explained further in the following sections.

7.23 The totex element of the modelled costs, with the post-modelling adjustment applied, is then subject to a benchmarking (catch-up) efficiency adjustment based on DNOs' relative performance. This challenges relatively less efficient DNOs to catch up to the most efficient DNOs. The disaggregated element of the modelled costs is not subject to a benchmarking efficiency adjustment because we consider that the substantial technical input into our activity-level assessment already captures a sufficient level of cost efficiency. For RIIO-ED2 we are proposing to set

the efficiency challenge using a glide path from the 75th to the 85th percentile over a three-year period, consistent with our approach at RIIO-GD2.

7.24 In addition to our catch-up efficiency challenge, we also expect an efficient DNO to achieve ongoing productivity improvements over time. To establish an appropriate level of ongoing efficiency improvement for RIIO-ED2, we consider the performance of other comparable sectors. We are proposing an ongoing efficiency adjustment for DNOs over the RIIO-ED2 period of 1.2% annually on totex. This is applied to our view of modelled costs to derive our proposed view of baseline totex allowances for each DNO.

7.25 Table 22 below provides a breakdown of our step-by-step cost assessment approach for each DNO.

Table 22 Breakdown of our proposed cost assessment approach (£m, 2020/21 prices)[197],[198]

DNO Group	DNO	Submitted totex	Modelled totex	Demand driven adjustment	Catch-up efficiency	Ongoing Efficiency	Proposed allowed totex
ENWL	ENWL	2,015	1,794	-27	-24	-102	1,640
	NPgN	1,392	1,263	-47	-16	-71	1,129
NPg	NPgY	1,837	1,706	-67	-22	-96	1,521
	WMID	1,939	1,773	-65	-22	-98	1,588
	EMID	2,062	1,910	-84	-24	-105	1,697
	SWALES	1,144	1,069	-44	-13	-59	953
WPD	SWEST	1,762	1,472	-28	-18	-83	1,343
	LPN	1,445	1,423	2	-21	-82	1,323
	SPN	1,551	1,527	-25	-21	-86	1,394
UKPN	EPN	2,466	2,329	-29	-32	-132	2,137
	SPD	1,676	1,611	-49	-21	-90	1,451
SPEN	SPMW	1,721	1,659	-70	-20	-91	1,477
	SSEH	1,406	1,224	-54	-16	-67	1,087
SSEN	SSES	2,826	2,456	-90	-30	-137	2,199

[197] Baseline totex allowances also includes the baseline components of uncertainty mechanisms.
[198] Submitted totex is net costs, including our cost exclusions and reallocations and excluding RPEs, ongoing efficiency, non-controllable costs, and pass-through costs (except NTCC). Proposed totex is net costs, excluding RPEs, non-controllable costs, pass-through costs (except NTCC), but includes Ofgem's view of ongoing efficiency and is before post-modelling adjustments for uncertainty mechanisms.

DNO Group	DNO	Submitted totex	Modelled totex	Demand driven adjustment	Catch-up efficiency	Ongoing Efficiency	Proposed allowed totex
Total		25,244	25,244	-677	-300	-1,299	23,216

Key Challenges in Cost Assessment for RIIO-ED2

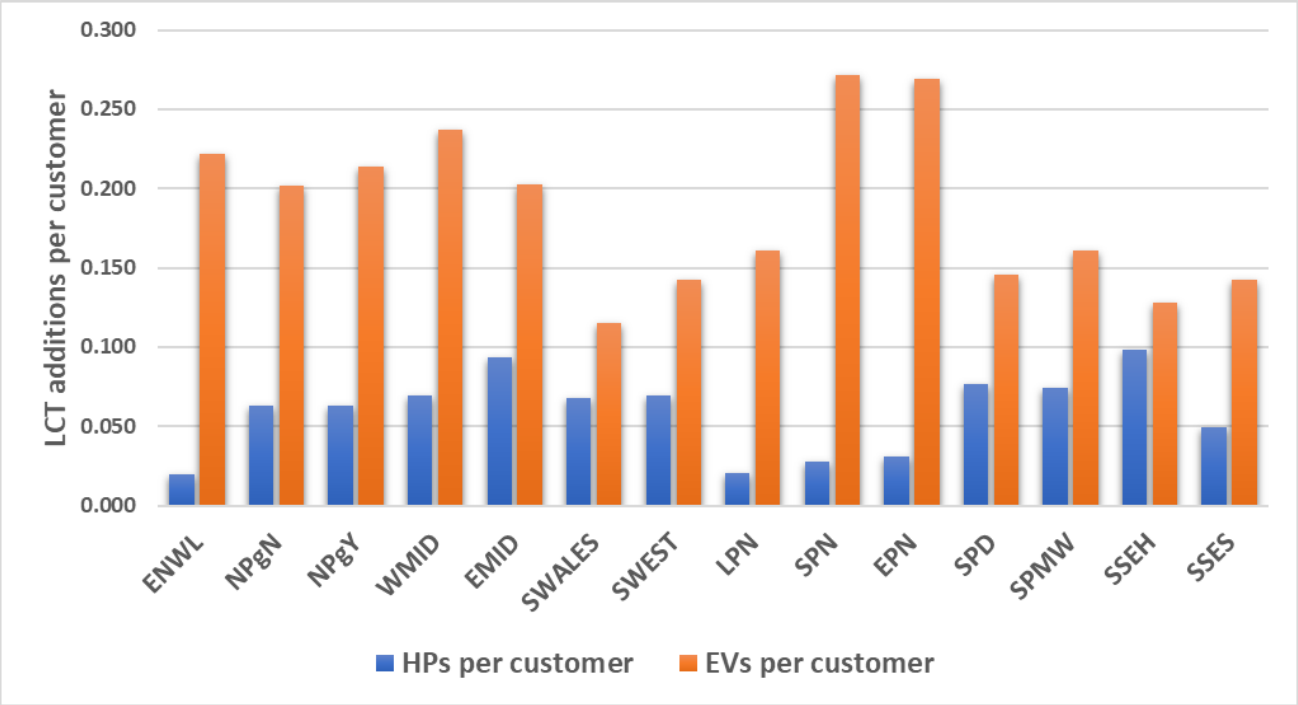
7.26 In our SSMD,[199] we set out that our cost assessment methodology would enable the investment needed to support decarbonisation while delivering world-class levels of reliability and ensuring that costs for consumers are as low as possible. In developing our approach to cost assessment for RIIO-ED2, we have had to address a number of key challenges, including:

- accounting for differing forecast assumptions and demand scenarios, particularly related to the uptake of EVs and HPs, that underpin DNOs' forecast expenditure over RIIO-ED2
- ensuring that our assessment is technology neutral given DNOs have a diverse set of tools at their disposal for managing supply and demand on their local networks – for example where flexibility and active network management offer alternatives to traditional network reinforcement
- accounting for any strategic investment that may be required to support decarbonisation targets but also ensuring that this is achieved at lowest cost to consumers.

7.27 As shown in Figure 18, there is significant variation in the DNOs' forecast uptake of LCTs in RIIO-ED2, which has implications on the level of network investment required. It also impacts multiple cost categories, such as LRE and Closely Associated Indirects (CAI), making different assumptions across DNOs challenging to isolate.

[199] SSMD pg.7-8

Figure 18 RIIO-ED2 forecast LCT additions per customer by DNO



7.28 To account for different LCT uptake assumptions across DNOs, we considered a range of different totex benchmarking approaches including expanding the range of cost drivers used in our regressions to include activity/demand drivers. The types of cost drivers considered range from more exogenous demand drivers, such as uptake of EVs, HPs and the amount of electricity flowing through the networks (ie units distributed), to workload related drivers, such as capacity released.[200]

7.29 We also explored whether the DNO costs most heavily impacted by these different forecast assumptions could be isolated and assessed separately from those base costs that are more stable over time. This is similar to Ofwat's approach in the water sector of assessing enhancement costs separately from base costs. Specifically, we looked at separating DNO expenditure into:

- 'BAU' costs which would include operating expenditure for the existing scale of businesses, such as maintenance and replacement expenditure to ensure reliability
- expenditure related to new outputs, driven by new connections and uptake of LCTs over the RIIO-ED2 price control period

[200] Capacity released is a measure of the additional capacity available as a result of reinforcement activities where one asset is replaced with an asset of greater capacity, eg if a DNO replaces a 50kVA transformer with a 200kVA transformer then the capacity released is 150kVA.

- anticipatory spending related to preparing the network for future expected load growth beyond RIIO-ED2.

7.30 However, the challenge with separating out base expenditure from new output and strategic investment is identifying a well-defined set of costs associated with each category. There is also the risk of the assessment not capturing interactions between these different categories. We have therefore not adopted this approach at RIIO-ED2.

7.31 To enable a more nuanced assessment of the cost areas most sensitive to different forecast assumptions, we considered the use of middle-up econometric models that pool related activities together yet are more disaggregated than our totex models. We found that the middle-up models perform less well than the totex models in terms of explanatory power and model diagnostic tests, which may indicate that the middle-up models are not capturing important interactions between different cost pools. We have therefore not included middle-up models in our assessment approach at RIIO-ED2. Our analysis of various middle-up models is discussed in Appendix 4.

7.32 Using a combination of top-down (totex) and disaggregated (activity-level) cost models is consistent with our approach at RIIO-ED1. Furthermore, different companies have different views on the most appropriate mix of models, with some supporting greater use of top-down modelling and others supporting the inclusion of disaggregated modelling. There are strengths and weaknesses with both approaches, for example while top-down modelling is effective at handling interactions and trade-offs between activities, disaggregated modelling allows for a more targeted assessment of individual activities. We therefore propose to use a combination of top-down and disaggregated cost models at RIIO-ED2.

Normalisations and Adjustments

Overview

7.33 This section explains our proposals for regional and company-specific factors. It also explains the data adjustments, normalisations and reclassifications we have made to the submitted data prior to our cost modelling.

7.34 To ensure that our cost benchmarking is carried out on a comparable basis, company-submitted data may need to be adjusted to correct for inconsistencies and external effects. For example, to exclude costs that are unsuitable for

comparative assessment, or to remove costs associated with work that we are either separately assessing or have been rejected as part of our needs case assessment. Any adjustments we make to our model input data are then applied to both our aggregated (totex) and disaggregated (activity-level) cost models. These adjustments fall into the following categories:

- Regional factors: applied when operating in certain regions attracts higher or lower costs than elsewhere;
- Company-specific factors: applied when the inherent characteristics of a particular network attract higher costs than others;
- Exclusions: applied when costs are inappropriate for comparative benchmarking because they are only incurred by a small number of DNOs, where costs are not explained by the cost drivers used in our cost models, or where there is a substantial change in the nature of costs between RIIO-ED1 and RIIO-ED2; and
- Other adjustments: applied to costs that are reclassified from one activity to another, are reclassified from memo table reporting to cost activity reporting, or relate to work that we have decided to separately assess.

Regional Factors

7.35 DNOs may incur additional efficient costs due to factors that are outside of their control and are either unique to, or disproportionately affect, the region in which they operate. In our SSMD,[201] we explained that the onus was on DNOs to justify any regional factor claims, and confirmed that in doing so, the factor must be clearly defined and outside of their control.

7.36 In RIIO-ED1, we applied a regional labour cost adjustment that normalised labour costs across all DNOs based on three distinct regions in GB: London, the South-East, and elsewhere - ie a three-region approach. In doing so, we applied a pre-modelling reduction to the labour component of each applicable DNO's costs, which was subsequently reversed following our benchmarking and the application of efficiency adjustments.

7.37 In their RIIO-ED2 Business Plan submissions, three companies submitted claims for a regional labour cost adjustment (UKPN, SPEN and SSEN). Both SPEN and SSEN claimed that labour costs in Scotland are higher than the national average,

[201] SSMD Annex 2, pg.24 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf

and therefore proposed expanding the three-region approach to include Scotland, either through a more granular 11-region approach,[202] or by including Scotland in the three-region approach alongside the South-East. NPg argued that regional labour adjustments may be unnecessary in RIIO-ED2 and that the Office for National Statistics' (ONS) Annual Survey of Hourly Earnings (ASHE) data used by Ofgem at RIIO-ED1 materially overstates its magnitude relative to alternative sources.

7.38 We have considered the claim that Scotland should be subject to a regional labour cost adjustment, as well as the use of ONS ASHE data as a benchmark for regional wages. Our analysis of historical regional wage differentials based on ASHE data indicates that London remains a clear outlier compared to the rest of the country, with the effect extending to the South-East. We are not satisfied that there is sufficient and compelling new evidence to indicate that this has changed over time, specifically since RIIO-ED1 and RIIO-GD2.

7.39 As we explained in our RIIO-GD1 Final Determinations, we consider that there is sufficient mobility of labour to mitigate wage differentials throughout GB, however productivity and cost of living factors in London, and to a lesser extent in the South-East, lead to persistent wage inequality across these three regions. Therefore, we think it remains appropriate to apply a pre-modelling adjustment based on the three-region approach, which is also consistent with our approach at RIIO-ED1 and RIIO-GD2.

7.40 Labour indices are based on ASHE data calculated at the 2-digit Standard Occupational Classification (SOC) level. In line with our view at RIIO-ED1 and RIIO-GD2, we consider that the alternative data sources suggested are more limited and less robust.

7.41 In line with our approach at RIIO-ED1, we have used notional (ie industry average) occupational weightings when applying the regional labour adjustment to individual activity areas. This helps ensure we do not reward a potentially inefficient DNO, which is consistent with our approach for RPEs. In applying the regional adjustment to DNO costs, we have set forecast regional cost indices equal to their five-year historical average.[203]

[202] London, South-East, Scotland, East, North-West, North-East, South-West, Wales, East Midlands, West Midlands, and Yorkshire and The Humber.
[203] We set indices from 2021/22 to 2027/28 equal to their 2016/17 to 2020/21 average.

7.42 Our methodology for calculating the regional labour cost adjustments is explained further in Appendix 5.

7.43 SSEN claimed that they incur higher costs on their SSEH network due to the region being sparser than elsewhere in the country - specifically due to longer driving times, more remote depots and out-posted staff, the need for a private mobile radio network, load managed areas, and North of Scotland Resilience (NoSR) – with the average annual cost increasing by over 235% between RIIO-ED1 and RIIO-ED2.[204] We propose to treat SSEH's NoSR costs through a re-opener in RIIO-ED2 rather than ex-ante funding and so have removed historical and forecast costs prior to cost modelling.[205]

7.44 Notwithstanding the pre-modelling exclusion of NoSR costs, we do not think sparsity is unique to SSEH and instead may impact other DNOs to some extent. Furthermore, without controlling for sparsity (pre-modelling or within-modelling), we would expect any impact on SSEH's cost efficiency due to sparsity to lead to a material difference in benchmarking efficiency performance between SSE's two networks, yet this is not the case even after adjusting for company-specific factors. Therefore, we do not consider there to be a need to apply a sparsity adjustment at RIIO-ED2.

Company Specific Factors

7.45 To ensure that our cost benchmarking is carried out on a comparable basis, we have excluded some costs prior to benchmarking where companies have provided sufficient evidence that they incur higher efficient costs due to the inherent nature of their network(s). Where we have accepted a claim, either partially or fully, we have applied the adjustment to aggregated (totex) and disaggregated benchmarking (activity-level) models.

7.46 We have previously set out the following criteria for company-specific factor claims at RIIO-ED2, which we have used in our assessment at Draft Determinations.

- Material: the cost exceeds 0.5% of gross unnormalised RIIO-ED2 totex.

[204] As reported in SSE's final RIIO-ED2 Business Plan, SSEH's sparsity costs increase from an annual average of £4.4m in RIIO-ED1 to £14.9m in RIIO-ED2. Over half of this increase is due to North of Scotland resilience.
[205] We have excluded £23.1m of SSEH's RIIO-ED2 costs for North of Scotland Resilience via a pre-modelling adjustment, with the remaining £21.8m of RIIO-ED2 costs reallocated to Worst Served Customers.

- Unique: the cost lacks comparators over the modelled time-period or is limited to a single DNO or a small number of DNOs.
- Exogenous: the cost is outside management control or has been mitigated where possible.
- Discrete: the cost is independent of other adjustments and has a clear spend boundary.
- Excluded from driver(s): the factor is excluded from the cost driver(s) used in our benchmarking models.

7.47 Where appropriate, depending on the nature of each claim, we have sought to test both the engineering and economic rationale in assessing each claim's performance against the above criteria.

7.48 As shown in Table 23, four companies (comprising six networks) submitted a total of 13 company-specific factor claims for RIIO-ED2. While the remaining two companies, WPD and NPg, referred to factors that they considered affect their efficient costs, we have not included these in our assessment of company-specific factors because no costs were assigned to them.

Table 23 Company-specific factor claims and associated costs (source for submitted costs: BPDT sheet M25, full price control period, 20/21 prices).

DNO	Company-Specific Factor Claim	Submitted RIIO-ED1 (£m)	Submitted RIIO-ED2 (£m)	Accepted RIIO-ED2 (£m)
ENWL	Additional efficient costs of a small company model	184.0	115.0	0.0
EPN	Nature of streets	13.8	8.7	0.0
EPN	Network-Specific Factors	14.2	5.5	0.0
EPN	Permitting and Traffic Management	0.3	0.2	0.0
LPN	Nature of streets	57.0	39.5	32.3
LPN	Network-Specific Factors	133.8	53.6	44.2
LPN	Permitting and Traffic Management	21.3	16.0	0.0
SPMW	SP Manweb CSF	178.3	116.8	116.8
SPN	Nature of streets	10.7	6.8	0.0
SPN	Network-Specific Factors	27.8	14.4	12.1
SPN	Permitting and Traffic Management	0.1	0.1	0.0

DNO	Company-Specific Factor Claim	Submitted RIIO-ED1 (£m)	Submitted RIIO-ED2 (£m)	Accepted RIIO-ED2 (£m)
SSEH	Islands	148.5	159.1	123.2
SSEH	Shetland Related Costs	0.0	99.8	0.0
All	Total	789.8	635.4	328.6

ENWL

7.49 ENWL claimed that as a consequence of being the only company to operate a single network (singleton), they incur additional efficient costs above those networks operating as part of a group model. ENWL highlighted several benefits resulting from their singleton status, which they estimated to be between £34m and £68m p.a., specifically the additional information it makes available to Ofgem, increased innovation, and greater competition. ENWL argued that their singleton status increases their business support and closely associated indirect costs, which include a fixed component that, unlike other DNO groups, ENWL is unable to spread across multiple DNOs. ENWL's claim of £23m p.a. was selected from a modelled range between £7m and £97m p.a.[206]

7.50 We do not think the relationship between operating model and fixed costs is unique to ENWL, nor do we think this is entirely exogenous. ENWL submitted a similar claim at RIIO-ED1, which we rejected. As we explained at our Final Determinations in RIIO-ED1, despite ENWL being the only singleton company in the GB electricity distribution sector, fixed costs are incurred by all DNOs, rather than being unique to ENWL, and we think this argument remains valid at RIIO-ED2. Rather than being an inherent characteristic of ENWL, and therefore a company-specific factor, fixed costs affect all DNOs to varying degrees. While scale may affect fixed costs, we do not think the number of DNOs in a group is entirely exogenous given the potential for groups to acquire or divest networks. Furthermore, while we propose to reject ENWL's claim on the above grounds, it is also noted that group fixed costs do not in any event have clear boundaries and are not readily and objectively identifiable. This is demonstrated by the wide range of techniques used in ENWL's valuation and the corresponding wide range of possible costs. We also note that our proposed position is consistent with our approach in the gas distribution sector, in which we do not apply any such pre-

[206] ENWL commissioned Oxera to support quantifying the cost impact of this claim. Oxera used five modelling methods giving a range of estimates of £7m to £97m p.a. From this they identified a narrower "reasonable" range of £17m to £67.5m by taking the averages of the upper and lower bounds of across the modelling methods.

modelling adjustment despite the sector including both singleton and group models.

UKPN

7.51 UKPN submitted three company-specific factor claims, each comprised of multiple elements that affect all three of their DNOs to varying degrees. Where we have accepted a UKPN claim, either fully or partially, we have reduced the excluded amount to avoid a double count with our separate regional wage adjustment.[207]

Nature of Streets

7.52 UKPN claimed that the increased cost and complexity of excavating and reinstating surfaces in and around London is unique to their networks, primarily due to the increased presence of special surface types, including red and green tarmacs used for bus lanes and specialist footway paving stones. The claim comprised two main elements, each affecting all three UKPN networks:

- Type of carriageway surface
- Type of footway surface

7.53 We accept UKPN's argument that the relatively higher volume of special surfaces in London compared to elsewhere will lead to increased excavation and reinstatement costs. We are satisfied that UKPN has mitigated these costs in RIIO-ED2 and with the methodology they have employed to estimate the incremental component of these costs compared to other DNOs. However, while UKPN claimed costs for Nature of Streets for all three of their DNOs, only LPN satisfies our materiality threshold, and therefore we propose to reject the claim for SPN and EPN.

Network-Specific Factors

7.54 UKPN claimed that the following factors either uniquely or disproportionately affect the efficient cost of operations in and around London:

- Confined space and tunnel costs
- Cable pit costs and link boxes
- Congestion charges

[207] In adjusting for the regional wage component of LPN's claim, we have applied LPN's regional wage index to the labour component of each activity impacted by the claim.

- Shift system costs

7.55 UKPN claimed that they incur additional costs due to the prevalence of confined spaces and tunnels in London, specifically the need to access, inspect and repair such structures, which requires specialist resources. This component of UKPN's claim aligns with two factors submitted at RIIO-ED1 as part of their Operations and Tunnels claims.

7.56 UKPN claimed that they incur additional costs in London due to the volume and size of cable pits and link boxes, because the network is entirely underground and highly interconnected. This component of UKPN's claim aligns with a factor submitted at RIIO-ED1 as part of their Operations claim.

7.57 UKPN incurs congestion charges, which are levied by Transport for London, to operate vehicles in parts of inner-London.[208] This component of UKPN's claim aligns with a factor submitted at RIIO-ED1 as part of their Transport and Travelling claim, though the Congestion Charge and ULEZ charging zone have both increased over the past few years.

7.58 As distinct from the regional wage adjustment, UKPN claimed that due to the low number of employees living in London, and a high proportion of overnight working, they employ a central London shift system, which requires payment of a premium on wages compared to those staff who in other regions would simply be on call at home. This component of UKPN's claim aligns with a factor submitted at RIIO-ED1 as part of their Network Strategy claim.

7.59 We accept that these factors affect operations in London disproportionately. We have compared UKPN's costs over time and between price control submissions and are satisfied that UKPN has mitigated these costs in RIIO-ED2. Furthermore, we are satisfied with the methodology UKPN has employed to estimate the incremental component of these costs compared to other DNOs. However, while UKPN claimed costs for Network-Specific Factors against all three of their DNOs, only LPN and SPN satisfy our materiality threshold, and therefore we propose to reject the claim for EPN. While we accept this claim for LPN and SPN, we have reduced the cost of all components except Congestion Charging to account for our separate regional wage adjustment.

[208] The Congestion Charge, which applies to Central London, and the Ultra Low Emission Zone (ULEZ), which covers all areas within the North and South Circular Roads.

Permitting and traffic management

7.60 UKPN submitted a company-specific factor claim for additional costs due to parking bay suspensions, and lane rental and permit schemes. These three cost items are included in the Streetworks category, which we have already excluded from our totex modelling for separate assessment, and therefore we have not adjusted for these costs as part of our company-specific factor assessment.

SSEN

7.61 SSEN submitted a company-specific factor claim to account for the additional costs that arise from serving islands on their SSEH network. This claim comprised the following components:

- Deployed staff prior to forecast severe weather events
- Helicopters
- Island flights, accommodation and ferries
- Submarine cable team
- Submarine cables
- Remote island generation

7.62 SSEH submitted a separate claim for Shetland related costs, however since these costs are already excluded from our totex modelling for separate assessment, we have not included this claim in our company-specific factor assessment.

7.63 SSEN claimed that they incur additional costs due to the need to relocate staff to islands prior to severe weather events in anticipation of transport disruptions. SSEN also claimed that they incur additional costs for helicopters, island flights, accommodation and ferries, and a further cost of £1.5m p.a. to run a dedicated submarine cables team, which is new to RIIO-ED2. The average annual cost due to these factors increased from £0.38m p.a. to £2.29m p.a. between RIIO-ED1 and RIIO-ED2.

7.64 We do not think SSEN has clearly explained or justified the need for, or materiality of, these costs, nor what attempts have been made to mitigate them in RIIO-ED2. The cost breakdowns provided fail to demonstrate market testing, or internal or external benchmarking, nor do they provide sufficient detail to enable a robust analysis of the underlying inputs or assumptions. Some costs were not clearly distinguished between different components of the overall claim, with some costs, such as helicopters, referenced by multiple components and therefore potentially

duplicated. Furthermore, serving island communities is not entirely unique to SSEH, yet the methodology for estimating the incremental impact to SSEH compared to other DNOs is unclear. We therefore propose not to include these four components of SSEN's Islands claim.

7.65 SSEN claimed that it incurs additional operation and maintenance costs due to its extensive submarine cable portfolio in Scotland, which serves 59 islands via 111 cables off the north and west coasts. Annual costs for this component of SSEN's claim increase from £13.1m in RIIO-ED1 to £22.8m in RIIO-ED2.[209] SSEN submitted a similar claim at RIIO-ED1 for subsea cables with an equivalent annual cost of £9.0m. While we accept that SSEH has a larger population of submarine cables compared to other DNOs, we do not think the evidence provided justifies the substantial increase in costs between periods, especially since SSEH has delivered a programme of proactive subsea cable replacement in RIIO-ED1 focused on the highest risk assets. Having analysed the trend of submarine cable costs over time and the correlation between those costs and underlying activity volumes, we do not think such a material increase is justified. We have therefore reduced the value of SSEH's claim to align with the trend of asset additions plus disposals over the modelled time-period. In doing so, we have set a base year in 2021 that captures the average annual cost over the six preceding years (2016 to 2021) and rolled that base cost forward in line with the growth rate of submarine cable additions plus disposals.

7.66 SSEH operates seven remote island generation sites to provide backup supply to their island customers in the event of a submarine cable failure. SSEN claimed that they incur increased costs due to the inspection, maintenance, repair and replacement of the diesel generators and buildings associated with these facilities. We accept that this infrastructure plays an important role in ensuring security of supply to island communities and recognise that it affects SSEH disproportionately compared to other DNOs. We have compared SSEH's costs over time and between price control periods and are satisfied that SSEN has sought to mitigate costs in RIIO-ED2. We therefore propose to accept this component of SSEN's Islands claim in full.[210]

[209] SSE reduced the value of their Submarine Cables claim in an April 2022 BPDT resubmission, from an initial cost of £36.3m p.a.
[210] The Remote Island Generation costs in BPDT sheet M25 are higher than those recorded in sheet C8. To avoid a negative post-normalisation figure feeding into our benchmarking models, we have reduced the value of the claim to align with sheet C8. We will work with SSEN following Draft Determinations to address this potential inconsistency.

SPEN

7.67 SPEN claimed that the interconnected, or meshed, configuration of their Manweb network results in additional operation, maintenance and modernisation costs, totalling £23.4m annually in RIIO-ED2. SPEN highlight that this legacy feature of the network's original design provides embedded benefits, including increased reliability and adaptability. SPEN provided a detailed breakdown of its costs, along with a clear explanation of the nature of spend and how it has evolved since RIIO-ED1. We accept that the unique configuration of SP Manweb will result in higher efficient costs, and as a legacy characteristic is sufficiently outside management control. We have compared SP Manweb's costs over time and between price control submissions and are satisfied that SPEN has mitigated these costs in RIIO-ED2. We therefore propose to accept this company-specific factor in full.

Exclusions

7.68 It is our view that costs should be included in our modelling whenever possible in order not to weaken the benefits of benchmarking, and that costs should only be excluded when there is a strong rationale for doing so and when the issues cannot be addressed through other benchmarking choices.

7.69 In RIIO-ED1 and RIIO-GD2, we excluded some company submitted costs during the normalisation process. In consultation with DNOs through the CAWG, we set out our proposed criteria for cost exclusions in RIIO-ED2, which we have used in our assessment at Draft Determinations:

- Is the cost outside the control of the company and treated as pass-through?
- Can the cost be explained by the cost drivers in a totex model?
- Is the cost covered by a bespoke UM or CVP?
- Is the cost excludable?

7.70 In their RIIO-ED2 Business Plan submissions, several DNOs proposed cost exclusions. Based on an assessment against the above criteria, we rejected several of these claims and propose to exclude only the following costs from our benchmarking and subject them to a separate technical assessment:

Table 24 Costs excluded from totex modelling

Cost area	Rationale for exclusion
Transmission Connection Point (TCP) Charges	Identified as pass-through costs.
Quality of Service (QoS)	Not adequately explained by cost driver. These costs were excluded at RIIO-ED1 as it was deemed not to be adequately explained by cost driver. Costs are well defined/independent cost activities but are not incurred by all DNOs for RIIO-ED2.
Physical Security	Not explained by cost driver. The classification of sites as CNI is driven by the Government and is outside DNOs' control.
Rising and Lateral Mains (RLM)	Not adequately explained by cost driver. These costs were excluded at RIIO-ED1 as it was deemed not to be adequately explained by cost driver and only affected a small number of DNOs. There continues to be a significant discrepancy in reporting, and approach taken to RLMs by DNOs.
BT 21st Century (BT21CN)[211]	Most DNOs have finished this programme of work and there are no costs forecast for RIIO-ED2.
Worst Served Customers	Not adequately explained by cost driver. Significant variance between DNOs and funded through a UIOLI.
Streetworks	Not adequately explained by cost driver. These costs were also excluded at RIIO-ED1 as it was deemed not to be adequately explained by cost driver. Different charging mechanisms in different areas and not fully within control of the company.
Green Recovery	Green Recovery expenditure has already been separately assessed and approved.
Cyber Security	Significant change in the equivalent level of costs between the RIIO-ED1 and RIIO-ED2 periods.
Severe Weather 1 in 20	Severe weather events are outside of DNOs' control. They will vary in size and materiality and for this reason will be difficult to forecast accurately for any company. Cost drivers such as Modern Equivalent Asset Value (MEAV) will have very little correlation with the required cost.

7.71 This set of exclusions represents around 4% of RIIO-ED2 submitted Gross totex.

[211] The programme to rollout BT's next generation communications network which replaces Public Switched Telephone Network PSTN with a Digital Internet Protocol (IP).

Other Adjustments

7.72 We have considered and applied two other types of normalisation adjustments for DNOs' submitted costs:

- Reallocations between cost activities, where we view a cost to be reported in the incorrect activity and require it to be reallocated for consistency in benchmarking; and
- Reallocations of costs that have been reported in BPDT memo tables instead of BPDT activity tables (tables C2 to CV39), where we view the costs to be part of the DNO's Business Plan scenario and require it to be reallocated for consistency in benchmarking.

Reallocation between cost activities

7.73 We identified one required reallocation between cost activities in the BPDT activity tables. We have reallocated SSEH's forecast costs for Quality of Service & North of Scotland Resilience (NoSR) (CV15) into the Worst Served Customers activity (CV19) for consistency.

Reallocations from memo tables

7.74 All DNOs have submitted cost forecasts in memo table M13 for their proposed uncertainty mechanisms, however in reviewing DNOs' BPDTs, we have found that DNOs have taken different interpretations of the guidance for completing this table.

7.75 For WPD, UKPN and SPEN, our understanding is that the costs for proposed uncertainty mechanisms represent upper range or separate spend forecasts above what has been forecast and submitted in the BPDT activity tables (tables C2 to CV39) under each DNOs' Business Plan scenario. ENWL, NPg and SSE have, in contrast, allocated portions of their forecast spend under their Business Plan scenarios into memo table M13 for some cost activities.[212]

7.76 Our view is that DNOs should include a complete picture of their forecast spend under their Business Plan scenario in the BPDT activity tables (tables C2 to CV39) that comprise their baseline submitted costs, regardless of whether they are also

[212] We have been informed by DNOs' descriptions of how they have forecast costs and completed memo table M13 for uncertainty mechanisms in their Business Plans (ENWL Annex 29; NPg Annex 4.5; SSE Annex 10.1) as well as SQs to confirm our understanding.

proposing some costs to be funded through uncertainty mechanisms. If driver data (such as EV charger and HP installations) and/or indirect costs reported in DNOs' BPDTs are based on the DNOs' Business Plan scenario, the complete costs associated with the Business Plan scenario should be included to provide a comparable baseline. If a portion of costs forecast under a DNO's Business Plan scenario are included in M13 and as a result, excluded from their baseline submitted costs, then their baseline costs for those activities will be understated relative to their forecast driver data and benchmarking between DNOs will be biased.

7.77 We consider that it would be inconsistent to exclude costs reported by ENWL, NPg and SSEN in their M13 tables from our totex and disaggregated cost modelling. We have therefore reallocated these costs from their M13 tables to the relevant cost activities for these DNOs' baseline submitted costs.

7.78 The costs that we have reclassified from M13 for ENWL, NPg and SSEN are:

- ENWL: £89m of forecast costs for LRE uncertainty mechanisms and £97m of forecast costs for diversions, tree cutting (ash dieback) and environmental reporting (PCBs);
- NPgN: £58m of forecast costs for LRE uncertainty mechanisms;
- NPgY: £135m of forecast costs for LRE uncertainty mechanisms;
- SSEH: £7m of forecast costs for LRE uncertainty mechanisms; and
- SSES: £45m of forecast costs for LRE uncertainty mechanisms.

7.79 Given the materiality of these reclassifications, we propose to work with the affected DNOs and the rest of the CAWG to ensure that the normalisations applied are achieving greater comparability and consistency for DNO Business Plans. As part of this, we will consider requesting these DNOs to resubmit BPDTs with the identified costs reallocated to activity tables (tables C2 to CV39) for Final Determinations.

7.80 Additionally, we have applied some reclassifications from memo table M21 – Bespoke Activities. Where a proposed bespoke project has not been accepted for technical assessment and has a funding request that is not already included in submitted costs (in the BPDT activity tables), we reclassify project costs into baseline unless the costs would be unsuitable for benchmarking. This reclassification is applied pre-modelling for both the totex and disaggregated models.

7.81 The following proposed bespoke activities in M21 have been reclassified:

- SPEN: 'Network Loss Reduction and Safety Enhancement' and 'Community Energy' projects; and
- SSEN: 'Embedded whole systems support services for local authorities' project.

Technically assessed and excluded costs

7.82 For projects that have been accepted as bespokes, we treat the associated project costs as technically assessed items and do not include the costs in the totex or disaggregated benchmarking. For bespoke projects that have costs already included in a DNO's submitted costs (in BPDT tables C2 to CV39), we remove the project costs pre-modelling. Similarly, for cost activities that we identify for technical assessment, we remove these costs pre-modelling so they are not included in benchmarking. We have technically assessed Physical Security activity costs, SSEH's Shetland costs, Streetworks and Cyber security.

7.83 We have also excluded DNOs' submitted costs for the QoS & NoSR (see paragraph 7.43), Severe Weather 1 in 20, and Diversions Rail Electrification activities due to our proposed funding approaches for these activities. All three activities are proposed to have nil ex ante funding, with a re-opener applicable for Diversions Rail Electrification and a pass-through mechanism proposed for Severe Weather 1 in 20 costs incurred. The submitted costs for these activities are excluded pre-modelling, for both the totex and disaggregated assessments.

Summary of Other adjustments

7.84 Table 25 below summarises the normalisations and other adjustments made to the totex and disaggregated models. Numbers are shown on a net basis for comparability, but in practice the adjustments were applied to gross costs.

Table 25 Summary of Normalisations and Adjustments

DNO	RIIO-ED2 Net submitted costs in BPDTs	Normalisations	RIIO-ED2 normalised submitted	Excluded cost activities	Technically Assessed in submitted costs	RIIO-ED2 Net normalised costs (modelled component)	Total Technically Assessed	RIIO-ED2 Net submitted costs
	£m	£m	£m	£m	£m	£m	£m	£m
ENWL	1,772	186	1,959	-22	-	1,937	78	2,015
NPgN	1,346	58	1,404	-12	-6	1,386	6	1,392
NPgY	1,761	135	1,896	-59	-8	1,829	8	1,837
WMID	1,953	-	1,953	-14	-2	1,937	2	1,939
EMID	2,080	-	2,080	-17	-2	2,061	2	2,062
SWALES	1,150	-	1,150	-6	-1	1,144	1	1,144
SWEST	1,781	-	1,781	-19	-1	1,761	1	1,762
LPN	1,445	-	1,445	-	-	1,445	-	1,445
SPN	1,532	-	1,532	-3	-	1,529	23	1,551
EPN	2,419	-	2,419	-6	-	2,413	52	2,466
SPD	1,682	7	1,688	-18	-1	1,669	7	1,676
SPMW	1,730	7	1,737	-23	-1	1,713	9	1,721
SSEH	1,416	11	1,427	-33	-71	1,323	82	1,406
SSES	2,794	53	2,847	-27	-29	2,791	36	2,826
Total	24,862	457	25,319	-260	-121	24,938	306	25,244

Consultation questions

Core-Q63. Do you agree with our proposed approach to pre-modelling normalisations and adjustments?

Totex Benchmarking

Overview

7.85 In this section we provide a high-level summary of one of the key tools in our cost assessment toolkit, totex benchmarking, and the associated modelling choices and results.

Model Specification

7.86 The options we considered for our approach to totex benchmarking DNOs' RIIO-ED2 Business Plans included:

- totex models specified in a similar way to the RIIO-ED1 cost assessment (top-down / bottom-up Composite Scale Variables (CSVs))
- models that use LCT and other demand/workload variables as 'activity drivers' in the regressions
- middle-up regression models, either as a replacement or alternative view alongside full totex models.

7.87 After testing a variety of models, we propose to use a range of approaches for the totex models acknowledging that there is no single, definitive approach for assessing comparative efficiency particularly given the changing environment facing DNOs in RIIO-ED2.

7.88 The findings from our middle-up regression modelling are presented in Appendix 4 along with a discussion of their potential implications. The efficiency scores from the middle-up models are broadly in line with the totex models, which reassures that our totex models are robust. However, the middle-up models we tested perform less well against model diagnostic tests. In particular, the R-squared is materially lower than in the totex regressions. At this stage we did not consider it appropriate to set allowances based on the middle-up approach.

7.89 As discussed above, to determine efficient totex allowances for each of the DNOs, we used three totex regression models for our Draft Determinations:

- Model 1: a regression with a bottom-up CSV, a time trend for the whole period (RIIO-ED1 and RIIO-ED2) and a forecast time trend.

- Model 2: a regression with a top-down CSV, capacity released,[213] a time trend for the whole period (RIIO-ED1 and RIIO-ED2) and a forecast time trend.
- Model 3: a regression with a top-down CSV and a Composite LCT uptake variable based on an equal weighting of the cumulative number of HPs and the cumulative size of EV chargers.

7.90 For all three models we used a pooled Ordinary Least Squares (OLS) estimator with clustered robust standard errors as our estimation technique. This is consistent with our approach at RIIO-ED1 and helps to support as transparent and replicable an approach to benchmarking as possible, particularly within a context where we needed to make a number of other substantial changes to our benchmarking approach. We also used a range of models and both top-down and disaggregated assessments, rather than a single approach, to gauge how different approaches may impact on the relative efficiency of the DNOs plans.

7.91 The table below summarises the key features of each of these models. The sections which follow explain the decisions and process we followed to select these three totex benchmarking models for Draft Determinations.

Table 26 Summary of totex benchmarking models

Modelling choices	Model 1	Model 2	Model 3
Regression estimation method	Pooled OLS Cobb-Douglas	Pooled OLS Cobb-Douglas	Pooled OLS Cobb-Douglas
Cost drivers used in CSV	MEAV[214] Customer numbers Total faults Peak demand Capacity released Length OHL Total network length Spans cut ONIs faults	MEAV (73%) Customer numbers (11%) Total faults (9%) Peak demand (7%)	MEAV (73%) Customer numbers (11%) Total faults (9%) Peak demand (7%)

[213] The gross capacity released through conventional and innovative reinforcement interventions. This is the sum of activity volumes (MVA) reported in CV1 and CV2 for capacity constraints affecting substations, substation groups, pole-mounted transformers, and ground-mounted transformers.
[214] Modern Equivalent Asset Value.

Modelling choices	Model 1	Model 2	Model 3
Activity/demand driver	-	Capacity released	Cumulative number of HPs Cumulative size of EV chargers
Choice of data for model estimation	2016-2028	2016-2028	2022-2028
Time trend specification	Whole period time trend Forecast time trend	Whole period time trend Forecast time trend	-

Selection of Cost Drivers and Regression Models

7.92 We developed a robust cost driver and model selection process to respond to the challenges raised in the DNOs' Business Plan submissions regarding decarbonisation and DNOs' different demand scenario assumptions.

7.93 We have taken on board the DNOs' proposals for cost drivers put forward in the Business Plan submissions and the CAWGs. As discussed above, we were particularly conscious of the need for the models to have the capacity to control for the varying levels of demand forecasts, activities linked to scenario planning and local factors that may influence individual DNOs. This involved the following process:

Updating the RIIO-ED1 model specifications

7.94 We started with updating the RIIO-ED1 top-down and bottom-up model specifications using the most recent data and assessed the robustness of the results against statistical tests and economic rationale. We found that the models performed relatively well at predicting current/historical levels of spending. However, the RIIO-ED1 models did not perform as well at predicting levels of spending in RIIO-ED2. This implied that changes in the model specifications were needed to account for the additional costs DNOs indicated they expect to face in RIIO-ED2 to accommodate the network development required to meet decarbonisation objectives.

Developing a short list of appropriate cost drivers.

7.95 For the totex models, we identified a set of appropriate cost drivers that are relevant to the costs being considered from either an economic or an engineering perspective.

7.96 Alongside scale variables that are frequently used for econometric benchmarking (eg MEAV, network length), we particularly focused on the choice of demand/activity drivers that can control for the additional demand or associated workload that DNOs will need to undertake. We considered a range of cost drivers including purer exogenous, output-based drivers (eg customer numbers, units distributed, number of additional and cumulative HPs/EVs, cumulative size of EV chargers).

7.97 We also considered activity drivers that are more within the control of the DNOs. We explored the use of capacity released as the cost driver to capture the different need for network reinforcement across DNOs in response to LCT uptake.

7.98 We tested various combinations of these variables, including both annual levels and growth rates (eg customer growth rates).

Totex model selection approach.

7.99 Due to the small number of data points and issues with highly correlated cost drivers (ie multi-collinearity), we did not use a general-to-specific selection approach, starting with a regression with many drivers and eliminating drivers based on statistical performance / economic rationale. Instead, we focused on choosing appropriate drivers for the top-down and bottom-up CSV and testing potential alternatives from the listed cost drivers. Alongside the traditional totex drivers, we focused on the choice of demand/activity driver to control for the changing environment.

7.100 We assessed the models using the following criteria:

- Economic/technical engineering rationale: whether the driver(s) are sensible and relate appropriately to the cost being assessed.
- Parameter significance, sign and magnitude: whether the coefficients of the variables are statistically significant (from zero) at least to the 10% level of significance and have plausible signs and magnitudes.
- Statistical tests: whether the regressions pass the statistical tests, including the pooling test, Ramsey Reset test and tests for normality and

heteroskedasticity. The key statistical tests are the Ramsey Reset and Pooling tests, as we use clustered robust standard errors to control for potential heteroskedasticity.

- Adjusted R-squared: whether the statistical fit of the regression is reasonable.[215]

7.101 We describe the choice of cost drivers in each of the totex models in more detail in Appendix 6 and the results of the statistical tests in Appendix 7.

Model 1 – Bottom-up CSV

7.102 Our first model is similar to the RIIO-ED1 bottom-up totex model, which aggregates cost drivers used in the activity-level analysis into a single composite driver (see Appendix 8 on calculation of the CSV).

7.103 Where no obvious activity level driver existed, we used the scale variable weighted MEAV (that captures the composition of the network asset base) as the driver for the residual cost elements. We consider that this approach takes into account the relative importance of each cost driver based on our knowledge of DNOs' costs. The drivers used are largely similar to the RIIO-ED1 CSV. We used capacity released for reinforcement instead of units distributed as the driver for reinforcement spend, as we consider this better controls for the step up in reinforcement activities the DNOs forecast and for differences in demand scenarios. We also used customer numbers for connections instead of units distributed.

7.104 This bottom-up CSV model provides a degree of consistency with the approach used at RIIO-ED1. We have included capacity released as the cost driver associated with reinforcement spend to capture the different need for network reinforcement across DNOs in response to LCT uptake, general load growth and distributed generation related reinforcement. However, as the bottom-up CSV is dominated by scale variables, MEAV in particular, the impact of demand-related drivers in this totex model is limited by the weight placed on these variables in the bottom-up CSV. The impact of growth in LCTs and demand drivers is more

[215] The R-squared reflects the proportion of the variation in costs that is predictable from the drivers in the model. The adjusted R-squared is a modified version of R-squared that has been adjusted for the number of predictors in the model. In other words, if you add more 'less useful' variables to a model, adjusted R-squared will decrease. If you add more 'useful variables', adjusted R-squared will increase.

explicitly captured by the use of demand/activity variables, which are not constrained in the CSV, in the other two totex models.

Model 2 and 3 – Top-down CSV

7.105 Our second and third model use a top-down CSV driver, based on 73% weight on MEAV, 11% weight on customer numbers, 9% weight on total faults and 7% weight on peak demand. Alongside the CSV, we also included an explicit demand/reinforcement driver to capture the impact on DNO costs of LCT uptake (and other reinforcement drivers) and controlled for the different demand scenarios based on which the DNOs' Business Plans have been prepared. The weights assigned to each cost driver in the top-down CSV were determined as follows:

- A cost driver was assigned to each high-level cost area.
- Weights for each cost area were calculated based on the industry average proportion of totex used in the totex regressions.
- Weights for the cost areas assigned to each cost driver were summed up to calculate the overall cost driver weight in the top-down CSV.

7.106 In RIIO-ED1, the CSV for the top-down totex model consisted of customer numbers and MEAV. To derive the weight applied to each element in RIIO-ED1, we used a statistical regression technique. We tested this approach for RIIO-ED2, using 2016-2028 data in the regression to determine the weights. However, this approach did not produce plausible results, as the weight on customer numbers became negative when we included forecast data. We therefore required a different approach for our RIIO-ED2 modelling and so derived weights based on a spend proportion of totex approach.

7.107 Compared to the RIIO-ED1 approach, we have also expanded the range of cost drivers used in the top-down CSV:

- The use of MEAV and customer numbers accounts for the scale of DNO networks.
- In addition, total faults and peak demand control, to some extent, account for the level of activity and changes in the external environment in which the DNOs have to operate.

7.108 We also found that the models perform better when the top-down CSV is combined with additional explanatory variables that capture some of the strategic challenges of RIIO-ED2.

7.109 We included capacity released alongside the top-down CSV in the second totex model. We used average capacity released over each price control period as the explanatory model to smooth out variations in annual capacity released numbers. This means there is no within control period variation for the variable, but there is variation across DNOs and across control periods.

7.110 We acknowledge that this driver is endogenous and under DNOs' control. However, we also acknowledge that the sole use of exogenous drivers to account for load growth and LCT uptake may not reflect the reinforcement requirements that LCT growth places on individual DNOs depending on the degree of utilisation of the existing network (alongside other factors). With the inclusion of capacity released in our totex model, we aim to control for the different demand scenarios assumed by DNOs in their Business Plan forecasts while also reflecting the network specific impact that these demand scenarios may have.

7.111 In the third totex model, we included a composite variable measuring LCT uptake alongside the top-down CSV. The LCT uptake composite variable includes the cumulative number of HPs and cumulative size of EV chargers for each DNO region, equally weighted. HPs and EVs are expected to contribute to future demand, and therefore to reinforcement requirements on DNOs' networks. The fact that LCT connections are likely to be a material driver of future costs was also supported by DNOs' Business Plan submissions.[216] The use of such exogenous variables is generally preferred due to the fact that they are not under the control of the company.

7.112 We also explored including LCT uptake within the CSV. However, this would constrain the impact of LCT uptake on costs by a pre-determined weight on the LCT driver within the CSV. To identify the direct impact of LCT uptake on totex, we considered it more appropriate to include LCTs in totex as a driver alongside the CSV, particularly because LCTs are a key driver for demand impacts. Additionally, a CSV is meant to solve the issue of multicollinearity (ie high correlation between scale variables). We found that forecast LCT uptake is not highly correlated with the drivers in the CSV (ie MEAV, customer numbers, faults and peak demand),

[216] For example, a number of DNOs highlight in their load related expenditure annexes to their plans the key impact of LCT uptake on reinforcement and peak demand requirements across the network.

therefore we do not consider it problematic to regress LCTs separately alongside the CSV.

7.113 In their Business Plans, the DNOs reported data on number of EVs, number of EV chargers and size of EV chargers (in MW). Analysis of the data submitted by DNOs showed that DNOs used different assumptions regarding the demand impact of increasing EV penetration as measured by the kW size of EV chargers per EV addition. This is mostly driven by differences in the forecast number of EV chargers expected to be installed for each EV addition. As the number of chargers dictates the number of EVs that can be plugged in at a given time, we use a charger-based metric to capture the potential impact on peak demand. We consider that the overall size of EV chargers provides a good indication of the expected impact of EV uptake on DNO networks as it captures both the effect of the number of chargers and the average size per charger.

MEAV

Historical adjustments to MEAV

7.114 MEAV is one of the most significant cost drivers in our cost assessment and as noted above, is used across all three of our totex models. MEAV is calculated for each DNO and is the product of asset volumes and costs and helps explain the size and scale of DNOs' networks. Typically, a larger network will have a higher MEAV and a higher totex allowance requirement to manage and operate that network.

7.115 Our analysis of DNOs' submitted MEAV identified material volatility in some of the historical trends, largely as a result of DNOs' data cleansing activities. This could cause issues for the robustness of our totex benchmarking, and as such we devised a method to smooth out these jumps in the historical data.

7.116 The approach involves back-calculating asset volumes from the end of the RIIO-ED2 period, as per the following formula:

$$Smooth\ asset\ volumes_{(Year=N-1)} = Asset\ volumes_{(Year=N)} + Asset\ disposals_{(Year=N)} - Asset\ additions_{(Year=N)}$$

7.117 This approach was widely supported by DNOs through the CAWG and results in a more consistent, less volatile MEAV, which helps to improve the overall statistical performance of our totex benchmarking.

MEAV exclusions

7.118 Another important aspect of MEAV relates to what should be included and excluded within it. This has been the topic of significant discussion and debate through the CAWGs. In RIIO-ED1, the following assets were excluded from the calculation of MEAV:

- Rising and lateral mains (RLM) and LV Services associated with RLM,
- Batteries at ground mounted HV substations, 33kV substations, 66kV substations, and 132kV substations,
- Pilot wire overhead, and pilot wire underground,
- Cable tunnels (DNO owned), and cable bridges (DNO owned),
- Electrical energy storage.

7.119 In RIIO-ED1, these costs were excluded from MEAV and our totex benchmarking because there was concern over the robustness and quality of data associated with these assets and the consistency with which this information was reported across DNOs. For RIIO-ED2, we propose to include all categories listed above in the calculation of MEAV. It is our view that DNOs have had sufficient time since the start of RIIO-ED1 to improve the robustness and quality of the data they report against these asset categories, and the same inconsistencies that we observed when setting RIIO-ED1 should no longer exist.

7.120 Despite the continued exclusion of the RLM cost activity from our totex benchmarking, we believe it is correct to include the RLM asset categories in the MEAV cost driver to capture the impact of associated indirect costs. Other activities such as Operational IT&T, CAIs, and Business Support Costs that may contain associated RLM costs are not only included in our totex benchmarking, but some of these activity areas also use MEAV as a cost driver in our disaggregated modelling. It is therefore important that MEAV, as a key cost driver, reflects the fact that not all costs associated with RLMs have been explicitly excluded from our cost assessment.

7.121 Another related change from RIIO-ED1, when calculating MEAV, is the use of an equivalent unit cost for the LV Service (UG) and LV Service (RLM) asset categories. In RIIO-ED1, the unit cost for LV Service (RLM) was roughly a quarter of that used for the LV Service (UG) category. For RIIO-ED2 we propose to set the equivalent unit cost for LV Service (RLM) at the same rate as that for LV Service (UG). It is our view that this approach reduces the risk associated with any inconsistent reporting between DNOs.

7.122 Likewise, costs associated with the Protection asset class and Civil Works have not been fully excluded from the totex assessment for RIIO-ED2. Therefore, we propose to include the substation batteries, pilot wire, and cable tunnel and bridge asset categories in the calculation of MEAV. For all DNOs, the electrical energy storage category has zero asset volumes across all years, and hence has no impact on MEAV.

Demand Drivers

7.123 Demand drivers, as noted above, seek to capture the costs related to LCT uptake and other drivers of reinforcement. They help control for the different demand scenarios adopted by the DNOs when benchmarking their RIIO-ED2 Business Plans. The demand drivers used across our totex and disaggregated benchmarking include DNOs' outturn and forecast volumes of LCTs, and the total capacity released across the primary and secondary network.

7.124 DNOs reported the number and size (MW) of yearly additions of EV chargers, HPs, solar PV, and distributed generation in their Business Plan submissions. Additional data on DNOs' baseline scenario forecasts of EVs (vehicles and chargers) and HPs was provided following an SQ on 09/02/2022. Further detail on this data can be found in Appendix 9.

7.125 As a result of missing historical data, we combined DNOs' reported volumes with historical data from external sources to produce a more complete dataset of cumulative EV and HP volumes. For EVs, national data was sourced from the Department for Transport vehicle licence statistics.[217] For HPs, we used a dataset[218] containing estimates for UK ground-source and air-source HPs for the period (2013 – 2019). Where necessary, data was apportioned to DNO licence area using an estimate of the percentage split by region from the volume of EVs and HPs recorded against grid supply points in FES 2021.[219]

7.126 This combined EV dataset was used to infer EV charger volumes where necessary using an average vehicle to charger ratio for each DNO. This ratio was computed from the data received in the SQ responses described in 7.1234.

[217] Data sourced is BEV/PHEV, 2011 - 2021 (VEH0132) from https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-tables
[218] Data downloadable from UK: number of heat pumps in operation 2019 | Statista. The original source is Heat pumps barometer 2020 - EurObserv'ER (eurobserv-er.org)
[219] Downloadable Future Energy Scenarios resources | National Grid ESO

7.127 As described in 7.112, the cumulative total size of EV chargers and the cumulative number of HP additions were the key demand driver used in totex model 3.

Time Periods

7.128 For all models we considered alternative time periods for estimating the parameters in our regression models. This included running regressions for the historical years of DPCR5 (2011-2016) and RIIO-ED1 (2016-2021) only, forecast data only (2022-2028) and for the full 18-year period of DPCR5, RIIO-ED1 and RIIO-ED2 (2011-2028). Our choice of time period was based on the quality of the underlying data and the appropriateness of the models based on the criteria discussed in our model selection process above.

7.129 For the first and second totex model, we used six years of historical cost data (2016-2021) and 7 years of forecast data (2022-2028) for estimating our cost models for RIIO-ED2. Using historical data has the benefit that it captures the historically observed relationship between costs and drivers while forecasts rely on assumptions made by the DNOs in their Business Plans. However, a model based on historical data only may not adequately estimate the additional costs DNOs face due to taking on DSO responsibilities and new activity/growth on the electricity distribution network (eg the uptake of LCTs). Therefore, we consider that making use of forecast data where possible helps our assessment take into account the change in relationship between cost and drivers, particularly in light of the expected changes in the sector.

7.130 We include two time-trends in the first and second totex model to account for unobserved time effects. We considered a single time trend not suitable as OE and RPEs are embedded in the historical data, but not in the forecast data. The two time trends also capture potential other exogenous factors such as changes in service quality. The forecast time trend is positive and significant in both models, suggesting an increase in totex over time (everything else equal). This allows for a gradual increase in costs in RIIO-ED2, allowing DNOs to increase expenditure to adjust for the changing environment.

7.131 For the third totex model, we only use forecast data (2022-2028). We did not consider it to be appropriate to use historical data for the composite LCT variable due to the availability/robustness of the EV and HP data. Additionally, when including LCT additions in the regression, using only forecast data is more appropriate given the level of growth in these technologies in the DNO Business

Plans during RIIO-ED2. In this model we do not use a time trend as OE and RPEs are not embedded in the forecast costs.

Econometric Model Results

7.132 For our regression model estimation results please refer to Appendix 7.

Consultation questions

Core-Q64. Do you agree with our approach to totex benchmarking?

Disaggregated Benchmarking

7.133 As noted in our SSMD,[220] activity-level assessment or disaggregated benchmarking is an essential part of the toolkit approach we propose for RIIO-ED2. Compared to assessing costs at the totex level, looking at costs at a granular level allows for a more focused analysis of cost drivers. However, with disaggregated benchmarking there is a risk of interpreting genuine differences in business strategies and/or cost allocation as differences in efficiency.

7.134 We sought to address this risk in two ways. First, where deemed appropriate we aggregated costs to account for potential trade-offs in the analysis, resulting in a less complex suite of models compared to RIIO-ED1. Second, for the disaggregated assessment we set the efficiency benchmarks for the individual activities at either median or average level, rather than the 75th percentile or higher.

7.135 After describing how the Engineering Justification Paper (EJP) review fed into our cost assessment, the remainder of this section covers our proposed approach to disaggregated modelling. For each cost activity or area, we describe the assessment technique and rationale for its choice. Table 27 summarises the proposed approach. Overall, we used unit cost analysis to assess 39% of submitted costs, ratio benchmarking for 23% of submitted costs, regression analysis for 36% of submitted costs and qualitative / other assessment for the remaining 2%. We note that, where relevant, we applied regional factor and company specific factor adjustments ahead of carrying out the benchmarking exercise. Moreover, in most cases we used both RIIO-ED1 and RIIO-ED2 data for

[220] SSMD Annex 2, pg.38 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf

the assessment, to maximise the dataset representing DNOs' current and future costs.

7.136 All tables presented in this section show the proposed net allowances for the relevant cost activity or area. These are the result of the combination of the disaggregated modelling with totex modelling results, the application of the ongoing efficiency challenge and the subsequent implementation of our proposed methodology for allowance disaggregation. As such, the figures presented reflect the overall proposed position for Draft Determinations rather than the specific outcome of the disaggregated modelling.

Table 27 Summary of proposed disaggregated modelling approach by cost activity or area

Cost area	Assessment technique	Benchmark	Time Period
LOAD RELATED EXPENDITURE			
Primary reinforcement	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2
Secondary reinforcement	Unit cost analysis	Industry median	RIIO-ED2
Fault level reinforcement	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2
Connections	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2
New Transmission Capacity Charges (NTCC)	Qualitative Assessment	N/A	N/A
NON-LOAD RELATED EXPENDITURE			
Asset Replacement	Unit cost analysis. Volumes assessment: aged-based model, run rate analysis, and qualitative review	Industry median	RIIO-ED1+RIIO-ED2
Asset Refurbishment	Unit cost analysis. Volumes assessment: aged-based model, run rate analysis, and qualitative review	Industry median	RIIO-ED1+RIIO-ED2
Civil Works (Asset Replacement Driven)	Ratio benchmarking	Industry median	RIIO-ED1+RIIO-ED2
Civil Works (Condition Driven)	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2

Cost area	Assessment technique	Benchmark	Time Period
Diversions (excl. Rail Elec.)	Unit cost analysis	Industry median	RIIO-ED2
Diversions (Rail Elec.)	N/A	N/A	N/A
Operational IT & Telecoms	Ratio benchmarking (together with Non-Operational and BS IT & Telecoms)	Industry median	RIIO-ED1+RIIO-ED2
Legal & Safety	Ratio benchmarking	DNO's median	RIIO-ED1+RIIO-ED2
Overhead Line Clearance	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2
Black Start	Qualitative assessment	N/A	N/A
Quality of Service and North of Scotland Resilience	N/A	N/A	N/A
Physical Security	Qualitative assessment	N/A	N/A
Flood Mitigation	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2
Rising and Lateral Mains	Unit cost analysis	DNOs' median	RIIO-ED1+RIIO-ED2
Worst Served Customers	N/A	N/A	N/A
Losses	Unit cost analysis	Industry median	RIIO-ED2
Environmental Reporting	Unit cost analysis	Industry or DNO's median	RIIO-ED1+RIIO-ED2
PCBs	Unit cost analysis	DNOs' median	RIIO-ED1+RIIO-ED2
High-Value Projects (HVPs)	Qualitative assessment	N/A	N/A
NON-OPERATIONAL CAPITAL EXPENDITURE			
Non-Operational Property	Ratio benchmarking (together with Property Management)	Industry median	RIIO-ED1+RIIO-ED2
Small Tools, Equipment, Plant and Machinery (STEPM)	Ratio benchmarking	Industry median	RIIO-ED1+RIIO-ED2
Non-Operational IT & Telecoms	Ratio benchmarking (together with Operational and BS IT & Telecoms)	Industry median	RIIO-ED1+RIIO-ED2

Cost area	Assessment technique	Benchmark	Time Period
Vehicles and Transport	Ratio benchmarking (together with CAI Vehicles and Transport)	Industry median	RIIO-ED1+RIIO-ED2
NETWORK OPERATING COSTS			
Faults and Occurrences Not Incentivised (ONIs)	Regression analysis	Industry average	DPCR5+RIIO-ED1+RIIO-ED2
Tree Cutting	Unit cost analysis	Industry median	RIIO-ED1+RIIO-ED2
Severe Weather 1 in 20	N/A	N/A	N/A
Repairs, Inspections and Maintenance	Ratio benchmarking	Industry median	RIIO-ED1+RIIO-ED2
NOCs other	Dismantlement: Ratio benchmarking Remote generation opex: Qualitative assessment Substation electricity: Unit cost analysis	Industry or DNOs' median	RIIO-ED1+RIIO-ED2
Smart Meter Rollout	Unit cost analysis	Industry median	RIIO-ED2
CLOSELY ASSOCIATED INDIRECT (CAI) COSTS			
CAIs (network design and engineering, project management, system mapping, engineering management and clerical support, stores, network policy, control centre, call centre, wayleaves, operational training)	Regression analysis	Industry average	RIIO-ED1+RIIO-ED2
CAI Vehicles and Transport	Ratio benchmarking (together with Non-Operational Vehicles and Transport)	Industry median	RIIO-ED1+RIIO-ED2
Streetworks	Growth rate index	2019-2021 as base years	N/A
BUSINESS SUPPORT (BS) COSTS			

Cost area	Assessment technique	Benchmark	Time Period
Core BS (human resources and non-operational training, finance and regulation, insurance, fines and penalties, CEO)	Regression analysis	Average	RIIO-ED1+RIIO-ED2
BS IT & Telecoms	Ratio benchmarking (together with Operational and Non-Operational IT & Telecoms)	Industry median	RIIO-ED1+RIIO-ED2
Property Management	Ratio benchmarking (together with Non-Operational Property)	Industry median	RIIO-ED1+RIIO-ED2

EJPs Review

7.137 The engineering review of the EJPs was an important input to the activity level analysis. The purpose of the EJPs is to provide justifications for load related and non-load related investments and act as a decision support tool, which is open to scrutiny and challenge, in conjunction with other appropriate means of justification for investment decisions.

7.138 As a minimum requirement under Stage 1 of the BPI, DNOs were required to produce and submit EJPs in accordance with the EJP Guidance.[221] They were produced for projects or aggregated investment programmes aimed at reinforcing the network, improving asset health or network performance.

7.139 We received 676 EJPs across all of the licensees. Each EJP was reviewed and where necessary cross referenced against other supporting documents. In our EJP Guidance we said that we would form a view on the following aspects:

- The overall need for the investment, and the suitability of the supporting evidence.
- The efficiency of the engineering solution and the proposed volumes, which included any arguments and evidence from licensees for enhanced solutions.
- The maturity and confidence associated with costs, and arguments for enhanced costs.

[221] Guidance - Engineering Justification Papers for RIIO-ED2

- The deliverability of the proposed investments and the risk of non-delivery or stranding of assets.

7.140 Within our review of the EJPs we had three primary outputs:

- To assess whether DNOs have followed the EJP guidance and met the minimum requirements.
- To advise on the justification for volumes feeding into the relevant cost assessment models for RIIO-ED2, and where appropriate, to recommend alternative volumes.
- To advise on outputs which had EJPs to support their justification (eg environment, load related expenditure).

7.141 Our engineering assessment, which also considered additional information gathered via the SQ process and site visits, provided a view on each EJP which was aggregated into three broad outcomes:

- Justified – The needs case, optioneering and preferred solution was judged to be proportionate and deliverable.
- Partially Justified – The evidence presented only justifies a portion, but not all, of the proposed investment. Areas of concern may also be present in optioneering, proportionality and deliverability.
- Unjustified – There was insufficient evidence to suggest the proposal has a valid needs case. There was likely to be significant concerns about optioneering, preferred solution, proportionality or deliverability.

7.142 While we may have provisionally determined that an EJP is Partially Justified or Unjustified, this does not necessarily correlate to us making asset management decisions for the licensee. Furthermore, such an assessment does not determine that works are not needed, rather it is an assessment that the licensee has not been able to sufficiently demonstrate that their proposition is economic or efficient.

7.143 Within the disaggregated models, we implemented cost and volume recommendations where possible and in line with cost methodology or policy inputs. For example, the engineering assessment for each of the DNOs' EJPs related to condition-based asset replacement and refurbishment was used to directly inform the volume recommendations used as inputs within the RIIO-ED2 disaggregated modelling. Specifically, if we deemed the relevant EJP to be Justified, our volume recommendation for the asset category equates to the

submitted volumes from the DNOs. If we have deemed the relevant EJP to be Unjustified, we recommend that no volumes are provided for the asset category. For Partially Justified EJPs, we have utilised the information available to us on the licensee's historical performance, as well as run rate and age-based modelling outputs, to inform our proposed volumes for each of the relevant asset categories.

7.144 More details on our assessment of the EJPs can be found in the company specific annexes.

Load Related Expenditure

7.145 Load Related Expenditure (LRE) refers to the investment required to ensure the network has sufficient capacity to accommodate the load on it. As demand growth drives LRE, a key challenge for assessing LRE is ensuring that sufficient investment is made to meet future demand and to protect consumers' interests from unnecessary investment.

7.146 The DNOs' Business Plans, and their forecasts for LRE, are based on each DNO's own forecast view of demand patterns for their network area in RIIO-ED2. As a result, our assessment of LRE has had to consider forecast costs based on different levels of anticipated demand growth. As set out in our SSMD,[222] our view is that there is a requirement for some ex-ante totex allowance for LRE, as well as the uncertainty mechanism funding package that has been developed (as set out in Chapter 3). Our disaggregated assessment of LRE has both informed and taken into account this funding approach.

7.147 For our disaggregated cost assessment of LRE we have conducted our analysis at each of the LRE activity levels. The LRE activity categories considered are:

- Primary Reinforcement
- Secondary Reinforcement
- Fault Level Reinforcement
- Connections
- New Transmission Capacity Charges (previously referred to as transmission connection point (TCP) charges)

[222] SSMD Annex 2, paragraph 5.12 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf

7.148 Some DNOs also submitted High Value Projects (HVPs) relating to LRE activities. We address these in our High Value Projects assessment section.

7.149 Flexibility cost forecasts have also been submitted as part of the primary and secondary reinforcement activities. In line with our SSMD position,[223] we have considered the potential for flexibility to reduce reinforcement costs in our flexibility assessment and have reviewed EJPs and Cost Benefit Analyses (CBAs) for supporting rationale and justification. Our proposed approach for the assessment of flexibility is to accept submitted costs, unless deemed Unjustified from EJP and CBA reviews. Given flexibility costs will be funded ex-ante and are also subject to totex benchmarking, we consider this to be the appropriate approach to incentivise using flexibility solutions to minimise costs over time, while reducing the risk of over-funding.

7.150 On Load Indices (LIs), we set out in our SSMD[224] our ambitions to develop this area further, to enable our assessment of utilisation and risks, and to enable us to set robust network outputs. We propose to utilise LIs as a support tool in assessing any re-opener submissions, as set out in Chapter 3. We have also used LI substation maximum demand in our LRE assessment for primary reinforcement, having concluded from our analysis that it is a relevant cost driver. This is consistent with most SSMC respondents being broadly supportive of the use of LIs as a view of network utilisation and drivers for primary network reinforcement.

Primary Reinforcement

Background

7.151 Primary reinforcement covers reinforcement activity undertaken to resolve capacity constraints on the Primary Network (33kV and above).

7.152 At RIIO-ED1, we used a disaggregated unit cost-based assessment, with different methods used for N-1 and N-2 primary reinforcement.[225] For N-1 reinforcement we calculated efficient unit costs and volumes. Unit costs for RIIO-ED1 were benchmarked by the average percentage adjustment calculated from the difference between:

[223] SSMD Annex 2, paragraph 5.25 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf
[224] SSMD Annex 2, paragraph 5.26 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf
[225] Work carried out on the network required to maintain or restore compliance with ER P2/7 or avert future non-compliance for first circuit outages (n-1) or second circuit outages (n-2).

- DNO views of unit costs in scheme papers and Ofgem's expert view of unit costs
- DNOs' forecast unit cost (£k/MVA) and the industry median unit cost
- DNOs' ratio of forecast unit cost (£k/MVA) to their historical unit cost, and the industry median ratio

7.153 For N-1 reinforcement volumes the ratio of a DNO's volumes for forecast capacity added relative to the increase in demand above substation firm capacity was benchmarked at the industry average. For N-2 primary reinforcement schemes we used an Ofgem expert view of unit costs to assess reinforcement schemes.

Consultation position

Cost area	Consultation position
Primary Reinforcement	We propose to apply a unit cost adjustment for DNOs that is calculated as the average percentage adjustment of the difference between: DNO and industry median unit cost (£k/MVA) for all substation reinforcement costs (including N-1, N-2 reinforcement and flexibility) for the RIIO-ED2 period; and DNO and industry median ratio of forecast cost per MVA of firm capacity added and historical cost per MVA of firm capacity added (Primary Network MEAV/total substation firm capacity). We propose to benchmark DNO ratios of forecast capacity added relative to the forecast increase in maximum demand above substation firm capacity and apply a volume adjustment to DNOs with a ratio higher than the industry upper quartile ratio. We propose to accept costs for Other Reinforcement Activities as submitted.

Rationale for consultation position

7.154 We consider that the RIIO-ED1 assessment method for primary reinforcement remains suitable for RIIO-ED2. However, we are proposing to develop some aspects of the assessment method based on our analysis and data available. Reinforcement costs and volumes (in mega volt amperes (MVA)) for capacity constraints affecting substations and substation groups are reported by constraint type (N-1, N-2), intervention type (conventional - substation, conventional - circuit, and innovative), and voltage (LV, HV, 33kV, 66kV, 132kV). Other substation constraint costs and volumes (in number of schemes) are reported by intervention type. DNOs also submit costs for Flexibility and Other Reinforcement Activities. Where costs and volumes relate to a named substation or substation group scheme, this data is also recorded in the respective LI table.

7.155 We tested different assessment methods for primary reinforcement including regression analysis with and without other LRE categories (see Appendix 9) and unit cost analysis using different levels of aggregation and cost driver inputs. The asset installation and disposal data by individual primary reinforcement scheme (N-1 or N-2) used in RIIO-ED1 is not reported for RIIO-ED2, making this aspect of the RIIO-ED1 unit cost assessment no longer applicable for RIIO-ED2.

7.156 For capacity constraints affecting substations and substation groups we find that, except for N-1 conventional reinforcement, a relatively small amount of historical and forecast data is available. We consider that aggregated cost and volume data for capacity constraints affecting substations and substation groups produces a more complete and robust view of the overall £k/MVA unit costs for substation reinforcement. We were not able to assess N-2 schemes in the same manner as the RIIO-ED1 approach. Furthermore, our analysis did not suggest a clear difference between the range of £k/MVA unit costs for N-2 schemes and those for N-1 schemes. Given this, we propose to assess primary reinforcement at an aggregated level. We also included flexibility costs for unit cost benchmarking in aggregate to provide a complete and comparable view of required reinforcement, given flexibility procurement acts as a substitute for reinforcement expenditure.

7.157 We consider the cost of delivering one MVA of capacity from reinforcement to be comparable across DNOs. As such, we consider the RIIO-ED1 unit cost assessment approach of benchmarking DNOs' forecast unit cost (£k/MVA) to the industry median unit cost to be the appropriate assessment method to include for RIIO-ED2. We propose to use RIIO-ED2 forecast data for unit costs because, given the inclusion of flexibility costs,[226] only the RIIO-ED2 period provides a complete and consistent comparison across all DNOs for benchmarking. Like RIIO-ED1, we are also of the view that the unit cost assessment should factor in the efficiency of DNOs' forecast costs of adding capacity compared to their historical costs and those of other DNOs.

7.158 Thus, we propose to apply unit cost adjustments for primary reinforcement using a similar approach to RIIO-ED1, with adjustments for each DNO calculated as the average of:

- The difference between the DNOs' RIIO-ED2 unit costs and the industry median RIIO-ED2 unit cost. Unit costs were calculated based on aggregated

[226] Some DNOs do not report flexibility costs in RIIO-ED1.

costs and volumes for all primary reinforcement except for Other Reinforcement Activities, and an adjustment is only applied if the DNO unit cost is higher than the industry median; and

- The difference between the DNO and industry median ratio of forecast cost per MVA of firm capacity added and historical cost per MVA of firm capacity added. We calculate the historical cost per MVA of firm capacity added by dividing 2020/21 primary network MEAV by the current substation firm capacity on the network (as of 31 March 2021, from the Load Indices) at the start of RIIO-ED2 for each DNO. An adjustment was only applied if the DNO ratio is higher than the industry median.

7.159 We consider substation maximum demand to be a key driver for required primary reinforcement expenditure in RIIO-ED2. To assess the efficiency of primary reinforcement volumes (MVA) we consider benchmarking forecast capacity added between DNOs to be the appropriate approach, similar to RIIO-ED1. We propose to benchmark DNOs to the industry efficient ratio of forecast capacity added relative to the forecast increase in maximum demand above substation firm capacity. We calculate the ratio of forecast capacity added in RIIO-ED2 to maximum demand growth (in MVA) in RIIO-ED2 for each DNO, using data aggregated from all relevant schemes reported in the Load Index tables for maximum demand growth. We propose to use the upper quartile ratio across DNOs as the industry efficient ratio. A volumes-based adjustment to DNO costs is only applied where a DNO's ratio is above the industry efficient ratio, and is applied to total primary reinforcement costs excluding Other Reinforcement Activities.

7.160 Our EJP review was used as a qualitative reference but the recommendations do not directly feed into the disaggregated model at this stage. We cross-checked our view of primary reinforcement workload forecasts from the qualitative assessment of EJPs against the volume adjustments resulting from our aggregate workflow analysis of the LI tables described above. Our qualitative assessment supports the proposed volume adjustments. Post Draft Determinations, any additional model development may look to further include outputs from the EJP review.

7.161 We recognise that the ratio of capacity added relative to demand growth will never be 1:1 as the amount of capacity released will be dictated by the size of substation equipment required for reinforcement. We also recognise that this adjustment potentially penalises strategic investment where the reinforcement work is anticipatory ahead of load growth expected in RIIO-ED3 or later. However,

the industry upper quartile benchmark used is a ratio of roughly 5:1, allowing for greater reinforcement requirements relative to the actual demand growth expected in period.

7.162 Furthermore, given comparable levels of utilisation and LI risk across the industry, we would expect a degree of consistency between DNOs regarding this ratio and the implied efficiency of proposed workloads for RIIO-ED2. Given the focus on the efficiency of conventional reinforcement work, we also believe it helps to incentivise the use of flexibility to address constraints on the primary network. Therefore, we consider it to be a reasonable adjustment to derive efficient workloads.

7.163 We propose to qualitatively assess Other Reinforcement Activities as we do not consider these costs to be suitable for benchmarking. No adjustments have been made to Other Reinforcement costs for Draft Determinations.

Table 28 Primary Reinforcement modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	20	16	-4	-19%
NPgN	22	18	-4	-19%
NPgY	43	36	-7	-16%
WMID	66	55	-12	-18%
EMID	57	47	-10	-18%
SWALES	59	49	-10	-17%
SWEST	79	60	-19	-24%
LPN	82	75	-7	-8%
SPN	25	22	-2	-9%
EPN	64	55	-9	-13%
SPD	56	49	-7	-13%
SPMW	51	44	-7	-14%
SSEH	41	32	-9	-21%
SSES	114	90	-24	-21%
Total	778	649	-130	-17%

Consultation questions

Core-Q65. Do you agree with our proposed assessment approach for primary reinforcement?

Core-Q66. Do you agree with the application of a volume adjustment based on the industry average ratio of forecast capacity added relative to the forecast demand growth above firm capacity? If not, what do you consider to be a better approach to assessing the efficiency of a DNO's proposed workload for primary network reinforcement?

Secondary Reinforcement

Background

7.164 Secondary reinforcement is work carried out on the secondary network (HV and LV) to enable new load growth. The activities included in secondary reinforcement cover:

- Transformer and circuit reinforcement
- Proactive service reinforcement
- Flexibility services and Other Reinforcement Activities

7.165 At RIIO-ED1, we used different assessment methods for LCT and non-LCT reinforcement. For LCT reinforcement we used a unit-cost based assessment, using an industry median unit cost calculated using eight-year RIIO-ED1 forecasts. LCT reinforcement volumes were benchmarked to the industry median forecast of network interventions per MW of LCTs connected, using eight-year RIIO-ED1 forecasts. Costs for unbundling of shared service cables were subject to a separate technical assessment. For non-LCT reinforcement we benchmarked costs by adjusting for each DNO's proportion of MEAV relating to the secondary network compared to the industry median, and the relative size of each DNO's secondary network compared to other DNOs by adjusting against the industry median secondary network MEAV. Results were cross-referenced with the efficiency of the RIIO-ED1 unit costs per MVA of capacity added across the secondary network (benchmarked to the industry median).

Consultation position

Cost area	Consultation position
Secondary Reinforcement	We propose using a disaggregated unit cost assessment with benchmarked volumes for transformer, circuit and proactive service reinforcement. Unit costs were disaggregated by asset category (pole and ground mounted transformers; LV Service (UG), LV Service (OHL), and metered Cut outs for proactive service reinforcement) or voltage (HV and LV circuits). We used the industry median for RIIO-ED2 for transformers and circuits and our expert view of unit costs for proactive service reinforcement. We benchmarked volumes to LCT additions: For transformer reinforcement we use the industry average ratio of proposed MVA capacity released relative to the forecast size in MW of LCT additions. For circuit reinforcement we use the industry average ratio of proposed km added relative to the forecast number of LCT additions. For proactive service reinforcement we use the industry average ratio of LV Service interventions relative to the forecast number of EV charger and HP additions. DNOs' volumes are adjusted if above the industry average ratio. We propose to use separate technical assessment for flexibility services and other reinforcement activities.

Rationale for consultation position

7.166 In determining what assessment approach to use for secondary reinforcement, we have sought to:

- Identify the most suitable assessment method for a disaggregated modelling view; and
- Align with the intentions and requirements of the proposed LRE funding package.

7.167 One of the key challenges for assessing secondary reinforcement is the level of uncertainty regarding the level of LCT-related demand growth to materialise in RIIO-ED2 and therefore, how much reinforcement will be required. We have also had to take into account the different demand pathways adopted by DNOs in their Business Plan scenarios.

7.168 We have tested a number of different assessment methods for secondary reinforcement and analysed cost drivers in detail. We are of the view that increased investment in the secondary network is likely to be required in RIIO-ED2, primarily driven by LCT-related demand growth. As such, we see forecast demand growth to be a more relevant cost driver to use for assessing secondary

reinforcement in RIIO-ED2 than network scale (as used for non-LCT reinforcement in RIIO-ED1), and this is supported by our driver analysis (see Appendix 9).

7.169 While we found strong correlations in regression testing for secondary reinforcement, we have found the same drivers to be relevant as for the overall totex modelling. We have concluded that regression analysis would be insufficiently different from totex modelling to assess efficiencies at a more disaggregated level within secondary reinforcement and would not sufficiently account for differences in DNO demand scenarios (see Appendix 9).

7.170 We consider it appropriate to determine an efficient view of unit costs and volumes for most of secondary reinforcement and best aligned to the proposed LRE funding package. We have analysed unit costs for the secondary reinforcement categories at different levels of aggregation and over time, and conclude that unit costs are comparable for the proposed volume driver categories. We see benchmarking of volumes to demand growth for these cost categories, similar to the RIIO-ED1 approach for LCT reinforcement, to be the appropriate method for assessing the efficiency of the volume of activity proposed across different DNO demand scenarios.

7.171 Overall, given the proposed volume drivers would be funded as variant allowances with the ability to flex up and down, our view is that modelled costs as the starting point should be based on efficient, benchmarked unit costs and volumes and represent a more consistent range of expenditure across industry.

7.172 Therefore, we propose to use a disaggregated unit cost-based assessment for transformer, circuit and proactive service reinforcement. We propose to assess volumes by benchmarking the efficiency of each DNO's proposed workload relative to their forecast of demand growth. This will link LCT volumes and the associated demand growth to a certain level of required network reinforcement, ensuring consistency with monitoring for the volume driver mechanism going forward in RIIO-ED2.

7.173 We find forecast unit costs in RIIO-ED2 for transformer and circuit reinforcement to be generally decreasing compared to RIIO-ED1. We take the industry median unit cost by sub-category (pole mounted and ground mounted for transformers; LV and HV for circuits), using the five-year RIIO-ED2 forecasts to be efficient unit costs. Not all DNOs report historical circuit reinforcement volumes in km, so only the RIIO-ED2 period provides a complete view of unit costs. Meanwhile, for substation reinforcement, the RIIO-ED2 £k/MVA unit cost was considerably lower

than in RIIO-ED1. We use transformer volumes of capacity released in gross MVA. We do not find there to be sufficient data or difference in unit costs to disaggregate between conventional and innovative interventions.

7.174 For proactive service reinforcement, we use the expert view unit costs determined from the asset replacement assessment for the three asset sub-categories (LV Service (UG), LV Service (OHL), and Cut outs).

7.175 Our view of efficient unit costs proposed to be used for the disaggregated assessment and the capacity and LV services volume drivers (see Chapter 3) funding are reported in Table 29.

Table 29 Secondary Reinforcement Unit Costs (2020/21 prices)

Reinforcement Category	Sub-category / Asset	Units	Unit Cost
Capacity constraint affecting substation	Pole-mounted transformer	£'000/MVA	103.9
	Ground-mounted transformer	£'000/MVA	70.8
Capacity constraint affecting circuit	LV circuit	£'000/km	120.4
	HV circuit	£'000/km	102.6
Proactive service reinforcement	LV Service (OHL)	£'000/each	0.47
	LV Service (UG)	£'000/each	1.42
	Cut out (metered)	£'000/each	0.25

7.176 We propose to assess efficient volumes for transformer, circuit and proactive service reinforcement as follows:

- Transformer reinforcement: We take efficient volumes to be the industry average ratio of capacity released per MW of LCT additions[227] in the five-year RIIO-ED2 period (ie a DNO's forecast capacity released (MVA) relative to their forecast MW of LCT connections in RIIO-ED2). DNO's with a ratio above the industry average are adjusted down.

[227] For the secondary reinforcement assessment, the total size of LCT connections for each DNO is computed from their DNOs' forecasts of the size of EV chargers, heat pumps, solar PV, and distributed generation expected to connect to the secondary network in RIIO-ED2. This data is sourced from BPDT memo table M20 and SQ responses. More detail on the secondary reinforcement model can be found in Appendix 9.

- Circuit reinforcement: We take efficient volumes to be the industry average ratio of circuit km added relative to the number of forecast LCT additions in the five-year RIIO-ED2 period. DNO's with a ratio above the industry average are adjusted down.
- Proactive service reinforcement: To set a consistent baseline intervention rate, we calculate an industry average ratio of LV service interventions relative to the number of EV chargers and HPs connected, using the five-year RIIO-ED2 forecasts. DNO's with a ratio above the industry average are adjusted down.

7.177 We propose to assess flexibility services and other reinforcement activities separately, similar to the treatment of unbundling of shared service cables in RIIO-ED1, as we do not consider these activities to be suitable for benchmarking individually or in aggregate with other secondary reinforcement activities. From our engineering review, a post-benchmarking qualitative adjustment was applied for SPN and EPN to exclude costs associated with another reinforcement scheme.

7.178 The disaggregated modelled costs represent a £244m (16%) reduction on submitted costs. We believe this provides an efficient starting point that reduces the risk of overfunding and will allow the volume drivers to manage uncertainty in period. It is worth noting that RIIO-ED2 modelled costs represent an increase of 240% on annual average RIIO-ED1 spend, substantially reducing the risk of underfunding.

Table 30 Secondary Reinforcement modelled costs (£m, 2020/21 prices)[228]

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	228	192	-36	-16%
NPgN	108	87	-21	-19%
NPgY	249	206	-43	-17%
WMID	120	98	-22	-18%
EMID	101	83	-18	-18%
SWALES	70	58	-12	-17%
SWEST	83	63	-20	-24%

[228] For completeness, the secondary reinforcement allowances for ENWL, SPN, and EPN include amounts for separately assessed bespoke outputs (see Table 25).

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
LPN	42	38	-4	-9%
SPN	83	74	-9	-10%
EPN	128	112	-16	-12%
SPD	132	114	-18	-14%
SPMW	88	76	-13	-14%
SSEH	15	12	-3	-22%
SSES	51	40	-11	-21%
Total	1,498	1,253	-244	-16%

Consultation questions

Core-Q67. Do you agree with our proposed assessment approach for secondary reinforcement?

Core-Q68. Do you agree with the level of disaggregation and period of data used to calculate the unit costs listed in the table above for transformer reinforcement, circuit reinforcement and proactive service reinforcement?

Fault Level Reinforcement

Background

7.179 Fault Level reinforcement covers work carried out on the existing network where the primary objective is to alleviate fault level issues associated with switchgear or other equipment.

7.180 For RIIO-ED1 we used a disaggregated unit cost-based assessment for fault level reinforcement. We conducted two unit cost benchmarking assessments, using median industry unit costs by voltage and DNO unit costs for each individual fault level scheme type, and applied the higher of the two. Unit costs were calculated using eight-year RIIO-ED1 forecasts and volumes were accepted as submitted by each DNO. We also applied qualitative adjustments to some DNOs.

Consultation position

Cost area	Consultation position
Fault Level Reinforcement	We propose using both an industry median unit cost by voltage and by individual asset type, using RIIO-ED1 and RIIO-ED2 data,

Cost area	Consultation position
	and taking the higher of the two unit cost-modelled approaches for each DNO. We propose to exclude ENWL from this unit cost benchmarking and use their individual multi-year RIIO-ED1 and RIIO-ED2 unit cost for each category We propose to accept the volumes as submitted by each DNO but propose to apply qualitative adjustments to SSES for outlier volumes in RIIO-ED2 that we view as unjustified.

Rationale for consultation position

7.181 We consider unit cost benchmarking to still be the most appropriate disaggregated assessment approach for fault level reinforcement for RIIO-ED2. We tested unit cost modelling using different levels of aggregation, both for asset and scheme type and voltage, and concluded that more aggregated unit costs were not appropriate and there is insufficient data to disaggregate between conventional and innovative schemes.

7.182 We consider both a unit cost assessment by individual fault level activity (switchboard and circuit, by voltage) and by voltage to account for boundary issues to be appropriate assessment approaches, and propose to use the RIIO-ED1 approach of allowing the higher modelled cost of the two. We take the industry median unit cost using the 13-year RIIO-ED1 and RIIO-ED2 forecasts to be efficient unit costs.

7.183 In RIIO-ED1 we applied a qualitative adjustment to ENWL to account for variation in their interpretation of volumes. We find that there continues to be significant differences in ENWL's reported volumes compared to other DNOs for RIIO-ED2. We propose to exclude ENWL from the unit cost benchmarking and use ENWL's thirteen year RIIO-ED1 and RIIO-ED2 unit costs for each modelled category. ENWL also have cost efficiencies applied through their submitted 'Smart and Flex' adjustments.

7.184 Two fault level reinforcement projects were excluded as unjustified based on our EJP review: SPN's Croydon Grid 33kV Switchboard Replacement and EMID's Coventry 132kV Fault level Reinforcement. We removed the costs and associated volumes pre-unit cost benchmarking.

7.185 Run rate analysis of fault level reinforcement scheme volumes shows that volumes are variable year-to-year, but overall most DNOs are forecasting volumes for RIIO-ED2 within a similar range to previous periods. However, SSES appears to have outlier RIIO-ED2 volume forecasts for some activity categories, that are

inconsistent with their DPCR5 and RIIO-ED1 volumes and other DNOs. We propose to accept DNO volumes as submitted but apply qualitative adjustments post-benchmarking to SSES volumes for switchboard HV and EHV and circuit HV.

Table 31 Fault Level Reinforcement modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	32	26	-6	-19%
NPgN	37	30	-7	-18%
NPgY	22	19	-4	-16%
WMID	10	8	-2	-19%
EMID	36	30	-6	-17%
SWALES	3	2	0	-15%
SWEST	11	8	-2	-23%
LPN	1	1	0	-8%
SPN	12	11	-1	-10%
EPN	5	5	-1	-14%
SPD	14	12	-2	-13%
SPMW	17	15	-2	-13%
SSEH	0	0	0	-20%
SSES	52	41	-11	-21%
Total	251	207	-44	-18%

Consultation questions

Core-Q69. Do you agree with our proposed assessment approach for fault level reinforcement?

Core-Q70. Do you agree with our proposed adjustments to account for outlier volumes data for ENWL and SSES?

Connections

Background

7.186 Connections refers to the provision of new or upgraded network points of connection which can be metered or unmetered connections with the end customer. It includes reinforcement costs associated with the connections work.

7.187 For RIIO-ED1 we used a disaggregated unit cost-based assessment for Connections, using assessed DNO unit costs and volumes for each voltage level. Unit costs were calculated using the average of the industry eight-year RIIO-ED1 median and DNO's own or industry DPCR5 median unit cost. Volumes were calculated using DNO annual average volumes for 2013-14 and 2014-15. Qualitative adjustments to volumes and unit costs were also applied.

Consultation position

Cost area	Consultation position
Connections	We propose using an industry median unit cost per connections activity voltage and connection type using RIIO-ED1 and RIIO-ED2 data, and using the number of Meter Point Administration Numbers (MPANs) connected as the cost driver. We propose to accept the MPAN volumes as submitted by each DNO.

Rationale for consultation position

7.188 We consider the RIIO-ED1 assessment method for connections to be the most appropriate approach to use for RIIO-ED2, with some updates proposed based on our view of cost drivers and unit costs for RIIO-ED2. The assessed cost and volume data on connections (connection costs inside the price control) is collected by connection type and voltage, and unit costs are calculated for each activity category.

7.189 We conducted analysis of connections unit cost modelling using either MPANs (or points of connection (POC)) connected or projects completed as cost drivers and tested different levels of disaggregation. At RIIO-ED1, connection types were grouped by voltage (the highest voltage worked on rather than the end voltage of the connection) and whether they were demand or generation connections. We propose to use a higher level of disaggregation for the RIIO-ED2 assessment where all connection type categories are benchmarked separately. This is to account for the considerable variation found in average unit costs for connection

types within the same RIIO-ED1 voltage category as well as within the same end voltage category.[229]

7.190 As part of our regression analysis for LRE we also tested assessing connections with reinforcement cost categories, however we did not find a strong enough correlation including connections to progress this assessment approach.

7.191 We have concluded that industry unit costs based on £k/MPAN (or POC) are more suitable to use for RIIO-ED2, compared to projects completed that was used as the cost driver in RIIO-ED1. Comparison of unit costs calculated on a per MPAN basis rather than per project completed demonstrated that the use of MPANs or points of connection results in greater consistency across industry, and therefore a more robust view of an appropriate industry average unit cost.

7.192 We do not consider there to be any structural factors driving higher unit costs for RIIO-ED2 but recognise unit costs can vary with connections of different scope. As such, we propose to use a RIIO-ED1 and RIIO-ED2 multi-year median industry unit cost.

7.193 Costs for reactive unlooping and fuse upgrades are excluded from the connections unit cost modelling for Draft Determinations and are accepted as submitted. The treatment of reactive unlooping and fuse upgrades is expected to be updated for Final Determinations, to align with the secondary reinforcement assessment of proactive unlooping.

7.194 Like reinforcement LRE, we expect connections activity to continue to increase in RIIO-ED2 driven by demand growth, as well as driven by growth in distributed generation connections. As each DNO has submitted connections volumes forecasts based on their own planning scenarios, and volumes data reported is limited to MPANs (or POC) connected and number of projects completed, we did not consider there to be a reasonable approach for benchmarking or calculating efficient volumes. We propose to accept volumes as submitted for each DNO.

7.195 Table 32 shows our view of modelled costs compared to DNOs' submitted costs. Our efficient view of RIIO-ED2 connections costs is £157m lower than DNO forecast costs.

[229] For example, the RIIO-ED2 industry median unit cost for LV end connections involving HV work is £3.7k/MPAN. This is significantly less than the median unit cost of £129.8k/MPAN for HV end connections involving only HV work, as well as roughly double the unit cost of other LV end connection types.

Table 32 Connections modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	22	18	-4	-19%
NPgN	63	45	-18	-28%
NPgY	89	62	-26	-30%
WMID	44	36	-8	-18%
EMID	123	101	-22	-18%
SWALES	28	23	-5	-17%
SWEST	41	31	-10	-24%
LPN	51	47	-4	-9%
SPN	31	28	-3	-10%
EPN	66	57	-9	-13%
SPD	35	30	-5	-14%
SPMW	18	15	-3	-14%
SSEH	47	37	-10	-22%
SSES	147	117	-31	-21%
Total	803	646	-157	-20%

Consultation questions

Core-Q71. Do you agree with our proposed assessment approach for connections?

New Transmission Capacity Charges (NTTC)

Background

7.196 New Transmission Capacity Charges (NTCC) are the charges payable for projects initiated by the DNO for increased capacity at existing transmission connection points or for new transmission connection points, but carried out by transmission licensees.

7.197 At RIIO-ED1 consultants carried out an engineering review of the DNOs' forecasts for the NTCC-equivalent cost activity, then called TCP charges. We based our results on their qualitative assessment.

Consultation position

Cost area	Consultation position
New Transmission Capacity Charges (NTCC)	We propose to qualitatively assess NTCC costs for the disaggregated assessment. This category is proposed to be excluded from the totex benchmarking.

Rationale for consultation position

7.198 We consider a qualitative review of DNOs' NTCC forecasts to be the appropriate approach for RIIO-ED2, similar to the RIIO-ED1 approach for TCP. We propose to retain a pass-through mechanism for TCP in RIIO-ED2, and a NTCC benchmark modelling assessment is not considered appropriate.

7.199 As part of our qualitative assessment, three EJPs have been identified as relating to NTCC (from UKPN, SPEN and SSE) and have been reviewed. These EJPs are significant contributors to the forecast growth in NTCC expenditure in RIIO-ED2 (submitted Total Net Costs of £85m for RIIO-ED2, compared to £42m for RIIO-ED1). No costs have been disallowed from these EJPs from our engineering review.

7.200 Overall, no reductions in NTCC expenditure are made in our disaggregated assessment.

Table 33 NTCC modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	-	-	-	-
NPgN	4	3	-1	-18%
NPgY	-	-	-	-
WMID	3	2	-1	-19%
EMID	6	5	-1	-18%
SWALES	5	4	-1	-18%
SWEST	4	3	-1	-26%
LPN	5	4	0	-10%
SPN	12	11	-1	-10%
EPN	1	1	0	-15%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SPD	21	18	-3	-14%
SPMW	2	1	0	-13%
SSEH	22	17	-5	-22%
SSES	2	1	0	-22%
Total	85	71	-14	-17%

Consultation questions

Core-Q72. Do you agree with our proposed assessment approach for NTTC expenditure?

Non-Load Related Expenditure

Asset Replacement

Background

7.201 Asset replacement is an activity undertaken by DNOs to remove existing assets and install new assets. The primary driver for asset replacement is asset condition, but obsolescence, safety, and environmental factors are also considered.

7.202 At RIIO-ED1, our approach combined a bespoke age-based model (the survivor model), run rate analysis and qualitative assessment to determine our efficient view of volumes. A median unit cost analysis and expert review was used to determine our efficient view of unit costs. We applied a ratchet where required.[230]

7.203 Approximately 67% of RIIO-ED2 forecast asset replacement spend sits within the NARM. Asset replacement activity that does not sit within NARM is referred to as Non-NARM. Our approach on NARM is set out in Chapter 6.

[230] A ratchet is where we compare Ofgem modelled costs to DNO submitted costs and set the modelled output as the lower of the two.

Consultation position

Cost area	Consultation position
Asset replacement	We propose to use an industry median unit cost per asset category based on RIIO-ED1 and RIIO-ED2 data, as well as expert review. We propose to use a combination of age-based modelling, run rate analysis and qualitative review to assess volumes.

Rationale for consultation position

Volume assessment

7.204 Consistent with the approach that was used in RIIO-ED1, we have taken a toolkit approach to assessing asset replacement volumes in RIIO-ED2. This consists of:

- Age-based modelling
- Run rate analysis
- Qualitative review

Age-based modelling

7.205 The age-based asset model, as per the RIIO-ED1 model, is based on survivor model principles, and calculates implied asset lives from actual replacement volumes using a distribution of the cumulative probability of failure, for individual DNOs and for the industry as a whole.

7.206 The main inputs to the model are the current age profile and life assumptions. The current age profile is the number of assets that remain in service from the years in which they were installed. The life assumptions or asset lives indicate the likelihood of asset failure based on age.

7.207 The model itself uses several sets of disposal values rather than one to infer asset lives. We used the aggregate age profile across all DNOs to reduce volatility in the implied lives due to the different DNOs' age profiles. The first two sets of disposal values are based on actual replacement volumes in the period 2014-21 for each DNO and for the industry, while the other set is based on the forecast replacement volumes for the last two years of RIIO-ED1 and the RIIO-ED2 period for the industry. The three sets of implied lives provide different estimates for replacement volumes. This is due to a combination of the change in asset lives and each DNO's age-based profile. We consider that all profiles offer valuable

information and could not find sufficient objective reasons to choose one over the other, so we used all in our assessment.

7.208 Similar to RIIO-ED1, not all assets were subject to age-based modelling. This is because not all asset categories are suitable for this type of assessment as a result of lack of historical data, such as overhead pole line conductor.

Run rate analysis

7.209 Our run rate assessment is based on DNO submitted disposal volumes as a proportion of DNO assets in service. We applied the industry median benchmark over the RIIO-ED1 and RIIO-ED2 period to represent the efficient replacement volumes.

Qualitative review and combination of model results

7.210 We recognise that our modelling has some limitations and may not fully take account of additional, and potentially relevant factors. For example, the implied life approach underpinning the age-based modelling makes no adjustments for the condition of the assets, only age. To address this, it was important that we overlaid our quantitative assessment with a qualitative review.

7.211 Where a DNO provided robust evidence to support higher volumes than suggested by the model, we made appropriate adjustments based on engineering review. The types of supporting evidence we considered for departures from modelled volumes were:

- EJPs
- NARM asset specific condition information and evidence of poor or worsening performance
- evidence of type of faults, failure modes and safety issues

7.212 Our final view of volumes are based on the outcome of a line by-line qualitative assessment, considering submitted volumes, the age-based modelling, and our run rate analysis. Further detail can be found in the EJP Review Section and Company Specific Annexes.

7.213 Where the DNOs' forecasts are above any of the volume assessment outputs, three key questions are considered:

- Has the DNO proposed using a substitute asset, eg plastic underground cables for paper underground cables?

- Has the DNO provided additional evidence as to why the volumes are higher, eg a higher level of deterioration than age would indicate?
- Are there complementary assets which have been allowed, eg LV poles for LV conductor?

7.214 For substitution of an asset, we considered the following questions:

- Has the DNO indicated lower disposal volumes than replacement volumes (indicating that it is disposing of assets elsewhere)? If the disposals are lower than replacement volumes is the aggregate modelling volume for the substitutes greater than the DNO's proposed replacement volumes?
- If aggregate volumes are not sufficient are there other reasons to increase volumes?
- If proposed volumes are accepted has sufficient evidence (eg a CBA) been supplied to support higher unit costs?

7.215 If the asset class does not have readily identifiable substitutes and the DNO's proposed volumes are higher than indicated by the modelling, we undertook the following:

- In most cases a review of the run rate and qualitative evidence by our Engineering Hub.
- An assessment of evidence provided by the DNO supporting the higher volumes.

7.216 Following this review, if we were satisfied the DNO could justify the volumes, we allowed the submitted volumes. If we were not satisfied, we took the lower of the submitted volumes, age-based modelling volumes and the run rate assessment.

7.217 For NARM assets, we also carried out a risk point analysis, which considered the cost per risk point reduction on an asset and asset category level. While this review did not feed into our quantitative unit cost assessment it was considered as part of our overall qualitative review.

Unit cost assessment

7.218 We set our initial view of unit costs based on median unit cost analysis. We overlaid this assessment with a qualitative expert review of unit costs.

7.219 In determining unit costs, we made use of blended actual and forecast unit costs. Under certain circumstances, where an asset category can be combined eg LV

cable types, a combined, blended unit cost was applied. Within asset replacement there are instances where DNOs may dispose of an asset but then replace it with a similar but not identical asset. We grouped assets where we consider these substitutions take place and applied a blended unit cost to account for this substitutability.

7.220 The age-based modelling and run rate analysis uses data predominately derived from asset disposals. However, our expert view of unit costs was derived from submitted asset additions. In all but seven asset classes, a weighting factor was applied to the expert view unit cost to determine the final unit cost used in the modelling. To determine the expert unit cost, actual, forecast, and modelled cost was assessed.

Table 34 Asset Replacement NARM modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	166	134	-31	-19%
NPgN	150	122	-28	-19%
NPgY	177	148	-29	-17%
WMID	220	180	-40	-18%
EMID	220	181	-39	-18%
SWALES	129	107	-21	-17%
SWEST	234	178	-56	-24%
LPN	177	162	-15	-9%
SPN	188	169	-19	-10%
EPN	252	218	-34	-13%
SPD	146	127	-19	-13%
SPMW	190	163	-26	-14%
SSEH	108	84	-24	-22%
SSES	192	151	-41	-21%
Total	2,548	2,124	-424	-17%

Table 35 Asset Replacement Non-NARM modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	68	55	-13	-19%
NPgN	88	72	-16	-19%
NPgY	86	72	-14	-17%
WMID	92	75	-17	-18%
EMID	70	58	-12	-18%
SWALES	37	31	-6	-17%
SWEST	78	59	-19	-24%
LPN	9	9	-1	-9%
SPN	13	12	-1	-10%
EPN	21	18	-3	-14%
SPD	73	63	-10	-13%
SPMW	83	71	-12	-14%
SSEH	60	47	-13	-22%
SSES	131	103	-28	-22%
Total	910	744	-165	-18%

Consultation questions

Core-Q73. Do you agree with our proposed assessment approach on asset replacement?

Refurbishment

Background

7.221 Asset refurbishment is defined as a one-off activity undertaken on an asset that is deemed to be close to end of life or is otherwise not fit for purpose that extends the life of that asset or restores its functionality.

7.222 At RIIO-ED1, we used a qualitative assessment to set our efficient view of volumes. We applied our view of unit costs based on median unit cost analysis and technical review.

7.223 Similar to asset replacement there is refurbishment activity that sits within NARM and refurbishment activity that does not, referred to as Non-NARM.

Consultation position

Cost area	Consultation position
Asset Refurbishment	We propose using an industry median unit cost per asset category based on RIIO-ED1 and RIIO-ED2 data. We propose setting volumes based on both quantitative and qualitative assessment.

Rationale for consultation position

Volume assessment

7.224 Consistent with the approach that was used in RIIO-ED1, we have taken a toolkit approach to assessing refurbishment volumes in RIIO-ED2. This consists of:

- age-based modelling
- run rate analysis
- qualitative review

Age-based modelling

7.225 As with the asset replacement assessment, we used the same age-based modelling based on survivor model principles to set volumes. The model was designed around the assumption that industry asset lives can either be maintained at the levels achieved in the past or longer lives can be achieved in the future through improved asset management.

Run rate analysis

7.226 Our run rate assessment is based on DNO submitted volumes as a proportion of DNO assets in service. We applied the industry median benchmark over the RIIO-ED1 and RIIO-ED2 period to represent the efficient replacement volumes.

Qualitative review and combination of model results

7.227 Where a company provided robust evidence to support higher volumes than suggested by the model, we made appropriate adjustments based on engineering review. The types of supporting evidence we considered for departures from modelled volumes were:

- EJPs

- NARM specific asset condition information
- evidence of poor or worsening performance
- evidence of type faults, failure modes and safety issues

7.228 We applied qualitative adjustments to modelled asset replacement volumes based on a technical assessment of the above.

7.229 Our final proposed volumes are the result of a line by-line qualitative assessment. For further detail please refer to the EJP review section of company specific annexes.

7.230 Similar to our approach for asset replacement, for NARM related refurbishment, we also carried out some risk point analysis, which considers the cost per risk point reduction on an asset and asset category level. While this review did not feed into our quantitative unit cost assessment it was considered as part of our overall qualitative review.

Unit cost assessment

7.231 We divided the DNOs' view of unit cost for refurbishment by their asset replacement unit cost. We then took the mean of these results across all DNOs and multiplied it by the asset replacement expert view of unit cost to give a unit cost for refurbishment. We used the mean unit costs for each DNO from the combination of both RIIO-ED1 and the RIIO-ED2 periods to take account of any differences in approach between the two price control periods.

7.232 The age profile modelling uses data derived from asset disposals. However, our expert view of unit costs was derived from submitted asset additions. In all asset classes, an average and a weighting factor was applied to the expert view unit cost to determine the final unit cost used in the modelling. To determine the expert unit cost, actual, forecast and ratio modelled costs were assessed.

Table 36 Refurbishment NARM modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	30	24	-6	-19%
NPgN	4	3	-1	-18%
NPgY	9	7	-1	-16%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
WMID	9	8	-2	-18%
EMID	9	7	-2	-18%
SWALES	14	12	-2	-17%
SWEST	13	10	-3	-24%
LPN	2	2	0	-8%
SPN	14	13	-1	-10%
EPN	10	9	-1	-13%
SPD	5	5	-1	-13%
SPMW	14	12	-2	-14%
SSEH	1	1	0	-23%
SSES	17	13	-4	-21%
Total	152	126	-26	-17%

Table 37 Refurbishment Non-NARM modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	25	20	-5	-19%
NPgN	21	17	-4	-19%
NPgY	34	29	-6	-17%
WMID	37	30	-7	-18%
EMID	20	17	-4	-18%
SWALES	16	13	-3	-17%
SWEST	21	16	-5	-24%
LPN	2	1	0	-8%
SPN	2	2	0	-10%
EPN	2	2	0	-13%
SPD	18	16	-2	-13%
SPMW	28	24	-4	-14%
SSEH	19	14	-4	-22%
SSES	38	30	-8	-22%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
Total	283	231	-52	-18%

Consultation questions

Core-Q74. Do you agree with our assessment approach to refurbishment?

Civil Works - Asset replacement Driven

Background

7.233 Civil works driven by asset replacement covers civil works undertaken to replace or modify existing civils items primarily required to facilitate, or enable, asset replacement of plant assets. Activity costs are reported by voltage (being the operating voltage of the replacement plant assets with which the work is associated).

7.234 At RIIO-ED1 we used a unit cost-based assessment for asset replacement driven civil works with assessed volumes, modelled by asset class. Volumes were modelled based on median run rate as a percentage of the asset base and the industry median using eight years of RIIO-ED1 forecasts was used to set unit costs. Qualitative adjustments were also applied to some volumes. We used the same assessment approach for condition driven civil works and asset replacement driven civil works, but modelled the asset classes for these two activities separately.

Consultation position

Cost Area	Consultation position
Asset Replacement Driven Civil Works	We propose to use ratio benchmarking, using the ratio of total asset replacement driven civil works to total asset replacement costs. We propose to use an industry median benchmark ratio based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.235 The reporting breakdown for asset replacement driven civil works has changed somewhat since RIIO-ED1, and activity volumes (as used for the RIIO-ED1 unit cost-based assessment) are no longer reported. We also consider that, as these costs relate to civil works driven by plant asset replacement, our assessment method for RIIO-ED2 should reflect asset replacement as the cost driver.

7.236 We considered assessing asset replacement driven and condition driven civil works together but did not find a strong enough relationship in level of costs or common drivers, and we consider these costs best suited to separate assessment to reflect their different drivers.

7.237 We tested benchmarking at a more disaggregated level by voltage but found the cost ratio to be more variable between DNOs' and over time, and had concerns that there may be boundary or reporting differences between DNOs affecting the allocation of civil works costs to different voltages. We find the ratio of total condition driven civil works costs to total asset replacement costs for each DNO to be the most suitable for benchmarking, and take the industry median ratio using thirteen-year RIIO-ED1 and RIIO-ED2 data.

7.238 Our efficient view of RIIO-ED2 asset replacement driven civil works costs shown in Table 38 is £31m lower than DNO forecast costs. These modelled civil works costs represent 5% of total modelled asset replacement costs, which is consistent with our benchmarking analysis.

Table 38 Civil Works Asset Replacement Driven modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	9	8	-2	-19%
NPgN	10	8	-2	-18%
NPgY	14	12	-2	-16%
WMID	12	10	-2	-18%
EMID	23	19	-4	-18%
SWALES	9	7	-1	-17%
SWEST	17	13	-4	-24%
LPN	17	16	-1	-9%
SPN	11	10	-1	-10%
EPN	18	15	-2	-13%
SPD	14	12	-2	-13%
SPMW	13	11	-2	-14%
SSEH	7	5	-2	-22%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SSES	13	11	-3	-22%
Total	187	156	-31	-16%

Consultation questions

Core-Q75. Do you agree with our proposed assessment approach for asset replacement driven civil works?

Civil Works - Condition driven

Background

7.239 This activity covers civil works driven by the condition of civil items. DNOs report a breakdown of works carried out at indoor and outdoor substations as well as cable tunnels, cable bridges and LV street furniture. The detail of works carried out at each substation is recorded by voltage level (eg roofs, doors, enclosures and surrounds etc at LV, HV, EHV and 132kV).

7.240 At RIIO-ED1 we used a unit cost-based assessment for condition driven civil works with assessed volumes, modelled by asset class. Volumes were modelled based on median run rate as a percentage of the asset base and the industry median using eight years of RIIO-ED1 forecasts was used to set unit costs. Qualitative adjustments were also applied to some volumes. We used the same assessment approach for condition driven civil works and asset replacement driven civil works but modelled the asset classed for these two activities separately.

Consultation position

Cost area	Consultation position
Condition driven Civil Works	We propose using an industry median unit cost per asset class using RIIO-ED1 and RIIO-ED2 data. We propose to benchmark volumes by asset class using the ratio of annual average condition driven civil works volumes to their associated Total Asset Register asset volumes, using a RIIO-ED1 and RIIO-ED2 industry median.

Rationale for consultation position

7.241 We consider the RIIO-ED1 assessment method for condition driven civil works to be the appropriate approach to use for RIIO-ED2. Cost and volume data on this

activity is collected by asset class, with data on civil works at substations reported by voltage (33kV, 66kV, 132kV, HV Indoor and HV Outdoor).

7.242 As noted above, we considered assessing asset replacement driven and condition driven civil works together but did not find a strong enough relationship in level of costs or common drivers, and we consider these costs best suited to separate assessment to reflect their different drivers.

7.243 We find forecast unit costs in RIIO-ED2 to be increasing across asset classes compared to RIIO-ED1 but reasonably stable when considered across the DPCR5 to RIIO-ED2 period. We tested benchmarking condition driven civil works costs to MEAV given comments submitted by DNOs at SSMD on issues with the RIIO-ED1 assessment approach, but concluded this was not a suitable assessment approach.

7.244 We noted in our analysis that the activity was approached differently by DNOs depending upon their asset base, and that many DNOs have specific workstreams planned for RIIO-ED2 impacting their condition driven civil works forecasts. As such, we propose to retain the RIIO-ED1 approach of assessing unit costs and volumes by asset class. We propose to set efficient unit costs at each asset class using the RIIO-ED1 and RIIO-ED2 median.

7.245 Run rate analysis showed that annual volumes are forecast to decrease on average in RIIO-ED2, but with some substantial variation between DNOs in each asset class. We propose to benchmark volumes by asset class by determining an industry median ratio of annual average civil works volumes (using RIIO-ED1 and RIIO-ED2 data) to the total number of assets for the associated asset class in the Total Asset Register as at the end of RIIO-ED2 (2027-28).

Table 39 Civil Works Condition Driven modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	27	22	-5	-19%
NPgN	11	9	-2	-18%
NPgY	19	16	-3	-17%
WMID	27	22	-5	-18%
EMID	20	17	-4	-18%
SWALES	11	9	-2	-17%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SWEST	10	8	-2	-24%
LPN	12	11	-1	-8%
SPN	12	11	-1	-10%
EPN	15	13	-2	-13%
SPD	18	16	-2	-13%
SPMW	20	17	-3	-14%
SSEH	6	5	-1	-22%
SSES	22	17	-5	-21%
Total	231	192	-39	-17%

Consultation questions

Core-Q76. Do you agree with our proposed assessment approach for Condition Based Civil Works?

Diversions

Background

7.246 Diversions activity involves the moving of any electric lines or electrical plant to facilitate the extension, redesign, or redevelopment of any premises on which those assets are located and/or to which they are connected. The activity covers three categories:

- The conversion of wayleaves to easements, easements and injurious affection claims where a payment is made to retain an asset in situ.
- Network diversions due to wayleave terminations, termination of a lease or where a re-development clause exists within an existing easement or other consent documentation.
- Network diversions for highways work which are part funded by the DNO (as detailed in the New Roads & Streetworks Act (NRSWA)).

7.247 At RIIO-ED1 we used a disaggregated unit cost-based assessment for Diversions, using an industry median unit cost for each activity sub-category, by voltage. We calculated unit costs using RIIO-ED1 data and accepted volumes as submitted by each DNO.

Consultation position

Cost area	Consultation position
Diversions	We propose using an industry median unit cost per diversion activity category and voltage using RIIO-ED2 data. We propose to accept the volumes as submitted by each DNO.

Rationale for consultation position

7.248 We consider the RIIO-ED1 assessment method for diversions to be the appropriate approach to use for RIIO-ED2. Cost and volume data on diversions is collected at four different voltage levels (LV, HV, EHV and 132kV) for each of the three activity categories, and unit costs are calculated at each voltage, by activity category.

7.249 We find forecast unit costs in RIIO-ED2 to be generally stable or decreasing across activity and voltage categories compared to RIIO-ED1. Similar to RIIO-ED1, due to the project-based nature of diversions work, we consider forecast data as more reliable than historical data. Unit costs also continue to vary substantially between voltages and activity categories. As such, we propose to use the five-year RIIO-ED2 forecasts and set the efficient unit costs at the industry median unit cost at each voltage, by activity category.

7.250 Run rate analysis of diversions volumes showed that, overall, most diversions categories are forecast to have increased volumes in RIIO-ED2, in particular in LV, HV and EHV claims settled for conversion of wayleaves to easements, easements and injurious affection and LV diversions for highways. However, there are substantial differences in run rate trends between DNOs. Given this, and the difficulty in forecasting trends in diversionary activity, we conclude that industry volumes for diversions are not sufficiently comparable across DNOs to benchmark volumes. Thus, we propose to accept volumes as submitted by each DNO.

7.251 Table 40 shows our view of modelled costs compared to DNOs' submitted costs. Our efficient view of RIIO-ED2 diversions costs is £106m lower than DNO forecast costs, but 16% higher than RIIO-ED1 on an annual average spend basis. We consider this to be reflective of the expected increase in volumes of diversions claims in RIIO-ED2.

Table 40 Diversions modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	73	59	-14	-19%
NPgN	28	23	-5	-19%
NPgY	32	27	-5	-17%
WMID	64	52	-12	-18%
EMID	82	67	-14	-18%
SWALES	31	26	-5	-17%
SWEST	68	52	-16	-24%
LPN	23	21	-2	-8%
SPN	51	46	-5	-10%
EPN	91	79	-12	-13%
SPD	19	16	-2	-13%
SPMW	38	33	-5	-14%
SSEH	15	12	-3	-22%
SSES	97	76	-21	-21%
Total	711	588	-122	-17%

Consultation questions

Core-Q77. Do you agree with our proposed assessment approach for diversions?

Rail Diversions

Background

7.252 The activity of Rail Diversions predominantly relates to rail electrification of an existing railway line. The activity is in connection with Diversions, where the installation of rail electrification equipment requires the relocation or re-routing of DNO apparatus.

7.253 At RIIO-ED1, we funded this activity via a re-opener uncertainty mechanism, with no ex ante funding.

Consultation position

Cost area	Consultation position
Rail Diversions	We propose to set nil ex ante allowances.

Rationale for consultation position

7.254 We propose to retain the RIIO-ED1 re-opener mechanism for rail diversions for RIIO-ED2. Given this, we propose to provide nil ex ante funding for rail diversions. Only one DNO (ENWL) submitted forecasts for rail diversions in baseline costs for RIIO-ED2.

Consultation questions

Core-Q78. Do you agree with our proposed approach for Rail Diversions?

Operational, Non-Operational and Business Support Information Technologies and Telecommunications (IT&T) Costs

Background

7.255 Operational IT&T is the industrial control, communication, and monitoring systems that DNOs use to operate and manage their primary assets. It facilitates data collection, automatic operation from protection or software, and can include systems and equipment associated to:

- Substation RTUs
- Marshalling kiosks and receivers
- Communications for switching and monitoring
- Control centre hardware and software
- Cyber resilience associated to OT
- Monitoring equipment

7.256 Non-Operational IT&T reflects the systems and equipment not primarily used in the real time management of network assets. This includes:

- IT hardware
- Infrastructure and application software development
- Inclusive of initial costs relating to IT security
- Cyber resilience associated to information technology (IT)

7.257 IT&T Business Support costs refer to expenditure on operating and maintaining the operational and non-operational computer and telecommunications systems and applications.

7.258 At RIIO-ED1 we applied a quantitative and qualitative approach to assess Operational and Non-Operational IT&T costs together. We assigned a 25 per cent weight to the quantitative assessment and 75 per cent weight to the qualitative assessment, acknowledging limitations in the quantitative assessment. For the latter, we applied an industry median unit cost using MEAV as a driver and 13 years of data (DPCR5 and RIIO-ED1). A similar approach was taken for IT&T Business Support costs, but with quantitative and qualitative assessments equally weighted.

Consultation position

Cost area	Consultation position
Information Technologies & Telecommunications (IT&T)	We propose to use ratio benchmarking to assess IT&T costs, using MEAV as the cost driver and an industry median benchmark ratio based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.259 For RIIO-ED2, we assessed Operational, Non-Operational and Business Support Cost IT&T costs together and used MEAV to derive an industry median benchmark ratio on RIIO-ED1 and RIIO-ED2 data. We complemented the quantitative assessment with a qualitative engineering review of the DNOs' EJPs and IT&T strategies.

7.260 The RIIO-ED2 assessment differs from the RIIO-ED1 approach. For RIIO-ED1 we only assessed Operational and Non-Operational IT&T together, while IT&T Business Support costs were assessed separately. We think assessing Operational, Non-Operational and Business Support IT&T costs together is a sensible approach, as it accounts for potential capex/opex trade-offs. Similar to RIIO-ED1, we used a long time series (13 years) to account for the irregular nature of IT&T capex.

7.261 In line with RIIO-ED1 approach, for RIIO-ED2 we relied on both quantitative and qualitative assessment. However, instead of combining the results of two separate assessments, we used the engineering qualitative assessment as an input into the quantitative assessment. We think this approach enriches the disaggregated benchmarking exercise and makes it more robust.

7.262 Specifically, the qualitative engineering review considered the needs case, optioneering or preferred option and volumes deliverability. Where we considered that a needs case was not fully justified and/or had deliverability risks, we applied adjustments and exclusions pre- or post-modelling. However, we did not make any adjustments to costs related to data and digitalisation, recognising the importance of ensuring the delivery of the DNOs' digital agenda despite a certain degree of uncertainty on some of the projects submitted. See company annexes for more details on the EJPs review outcome.

7.263 Our modelled costs were reallocated to Operational, Non-Operational costs IT&T based on the ratio of submitted expenditure in these three areas. In the case of IT&T Business Support costs, the modelled costs were reallocated to Total Business Support Costs (see Table 66).

Table 41 Operational IT and Telecoms modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	78	64	-14	-19%
NPgN	39	32	-7	-18%
NPgY	56	47	-9	-16%
WMID	56	46	-10	-18%
EMID	75	61	-13	-18%
SWALES	44	36	-7	-17%
SWEST	61	46	-15	-24%
LPN	41	38	-3	-8%
SPN	70	62	-7	-10%
EPN	109	94	-15	-14%
SPD	105	91	-14	-13%
SPMW	117	101	-16	-14%
SSEH	40	31	-9	-22%
SSES	75	58	-16	-22%
Total	964	808	-157	-16%

Table 42 IT and Telecoms (Non-Op) modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	36	29	-6	-18%
NPgN	39	32	-7	-18%
NPgY	39	33	-6	-16%
WMID	71	59	-13	-18%
EMID	78	64	-14	-18%
SWALES	54	45	-9	-17%
SWEST	65	50	-15	-24%
LPN	54	50	-4	-8%
SPN	54	49	-5	-10%
EPN	85	74	-11	-13%
SPD	50	44	-7	-13%
SPMW	49	42	-7	-14%
SSEH	48	38	-11	-22%
SSES	90	70	-19	-21%
Total	812	678	-134	-17%

Consultation questions

Core-Q79. Do you agree with our proposed approach to assessing Non-Operational, Operational and Business Support IT&T costs?

Legal and Safety

Background

7.264 The activity of Legal and Safety relates to investment or intervention where the primary driver is to meet safety requirements and to protect staff and the public. The activity is broken down into subcategories as follows:

- site security – Broken down by voltage (HV, EHV and 132kV)
- asbestos management - Broken down into four categories (surveys and signage, containment or removal, meter position replacement and meter position containment)

- safety climbing fixtures
- fire protection
- earthing upgrades
- cable pits
- fire blankets – link box related
- shallow cables
- other

7.265 At RIIO-ED1, we accepted submitted volumes and applied a median unit cost at each voltage level using 13 years of actual and forecast data (DPCR5 and RIIO-ED1). We excluded asbestos management from the benchmark and applied a qualitative adjustment to one DNO's safety climbing costs. For Other Legal and Safety Costs we undertook a qualitative assessment.

Consultation position

Cost area	Consultation position
Legal and Safety	We propose to use ratio benchmarking to assess Legal and Safety (excluding Other costs), using MEAV as the cost driver and an industry median benchmark ratio based on RIIO-ED1 and RIIO-ED2 data. For Other costs, we propose to use a qualitative assessment.

Rationale for consultation position

7.266 We consider the RIIO-ED1 assessment method for Legal and Safety to be inappropriate for RIIO-ED2. This is because unit cost model outputs showed significant variations from submitted costs, regardless of the time periods applied. For all cost subcategories, except for Other Costs, we therefore propose to apply an industry median benchmark ratio using MEAV and 13 years of actual and forecast data (RIIO-ED1 and RIIO-ED2).

7.267 Our assessment was complemented by engineering review of the related EJPs. For details on the EJPs review outcome, see Chapter 3 of the company annexes.

7.268 For Other Costs, DNOs submitted many very heterogenous programmes. Due to the lack of comparable data, we discarded any modelling approach and opted for a qualitative assessment. Based on this assessment we propose to accept these costs in full.

Table 43 Legal and Safety modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	42	34	-8	-19%
NPgN	20	16	-4	-18%
NPgY	27	23	-4	-17%
WMID	9	8	-2	-18%
EMID	7	6	-1	-18%
SWALES	12	10	-2	-17%
SWEST	16	12	-4	-24%
LPN	20	19	-2	-9%
SPN	15	14	-2	-10%
EPN	19	17	-3	-13%
SPD	18	15	-2	-13%
SPMW	23	20	-3	-14%
SSEH	4	3	-1	-22%
SSES	10	8	-2	-21%
Total	244	204	-40	-16%

Consultation questions

Core-Q80. Do you agree with our proposed assessment approach for Legal and Safety?

Overhead Line Clearance

Background

7.269 The Overhead Line Clearance activity captures work required to rectify overhead line non-compliance with the Electricity Supply Quality and Continuity Regulations (2002) (as amended) regulations 17 and 18, for vertical and horizontal clearances, respectively.[231] This activity is broken down by voltage with DNOs reporting proposed works at LV, HV, EHV and 132kV levels.

[231] The Electricity Safety, Quality and Continuity Regulations 2002 (legislation.gov.uk)

7.270 At RIIO-ED1, we assessed these costs using an industry median unit cost at the subcategory level based on a 13-year period (DPCR5 and RIIO-ED1). We accepted DNOs' submitted volumes.

Consultation position

Cost area	Consultation position
Overhead Line Clearance	We propose using an industry median unit cost based on RIIO-ED1 and RIIO-ED2 data, complemented by engineering review to determine volume adjustments.

Rationale for consultation position

7.271 We consider the RIIO-ED1 assessment method for Overhead Line Clearance to be appropriate for RIIO-ED2.

7.272 We found forecast unit costs in RIIO-ED2 to be generally stable or decreasing across LV and HV compared to RIIO-ED1, with these two voltage levels making up 98% of total submitted Overhead Line Clearance costs. For EHV and 132kV, the majority of DNOs had either similar or lower unit costs for RIIO-ED2 compared to RIIO-ED1. EHV and 132kV has limited data, so a longer time series provides additional information. As such, we propose to use RIIO-ED1 and RIIO-ED2 data to set efficient unit costs at the industry median for each voltage.

7.273 The importance of the activity does not warrant any change to volumes submitted except for SSEN, who did not provide final volumes for this activity as part of the RIIO-ED2 Business Plan submissions, as at the time it had not received their latest Light Detecting and Ranging Surveys (LiDAR) flight data. As such, for Draft Determinations, we propose not to include SSEN's costs in the anticipation that volume data will be provided following the consultation. We propose to accept the other DNOs' submitted volumes, based on the submitted supporting documents which detailed their volume forecast methodology. In this respect, we note that most DNOs have based their forecasts on previous volumes or have introduced the use of LiDAR into their inspection regimes which ensures greater data accuracy.

Table 44 Overhead Line Clearances modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	9	7	-2	-18%
NPgN	13	11	-3	-19%
NPgY	9	8	-2	-17%
WMID	29	24	-5	-18%
EMID	17	14	-3	-18%
SWALES	18	15	-3	-17%
SWEST	58	44	-14	-24%
LPN	-	-	-	-
SPN	23	21	-2	-10%
EPN	35	30	-5	-13%
SPD	10	8	-1	-13%
SPMW	15	13	-2	-14%
SSEH	26	20	-6	-22%
SSES	34	27	-7	-22%
Total	297	243	-55	-18%

Consultation questions

Core-Q81. Do you agree with our approach to assessing Overhead Line Clearance costs?

Electricity system restoration (previously known as black start)

Background

7.274 The Electricity system restoration (ESR) activity includes the series of actions necessary to restore electricity supply to customers following a total or widespread partial shutdown of the GB Transmission System. ESR requires distribution substations to be re-energised and reconnected to each other in a controlled way to re-establish a fully interconnected system.

7.275 ESR expenditure is associated with initiatives to improve the resilience of both the distribution network assets and the key telecommunications systems, essential to

DNOs for the organisation and coordination of resources, to achieve Black Start Resilience. The activity is broken down into subcategories as follows:

- Sites Resolved - Black Start Resilience of Protection Batteries achieved at EHV and 132kV
- Sites Resolved - Black Start Resilience of SCADA Batteries achieved at EHV and 132kV
- Securing of Existing Telecommunications Infrastructure

7.276 At RIIO-ED1, for all ESR subcategories, we used industry median as a benchmark based on RIIO-ED1 data, as only forecast data was available. This was multiplied by submitted volumes to calculate the unit cost adjustment for each DNO.

7.277 For volumes, we took the lower of the submitted and modelled volumes, where the modelled volumes were the industry median percentage of all sites worked on (submitted volumes divided by total number of substations). This was multiplied by the submitted unit cost to give the volume adjustment (where DNOs had been disallowed volumes through our modelling).

Consultation position

Cost area	Consultation position
ESR	We propose to qualitatively assess ESR costs.

Rationale for consultation position

7.278 For RIIO-ED2 we propose to use engineering qualitative assessment based on review of supporting documents provided by each of the two DNOs' (SPEN and SSEN) that submitted costs under ESR. The decision to adopt an alternative approach to RIIO-ED1 is due to limited historical and forecast data for sub-categories, which prevents accurate benchmarking.

7.279 Based on engineering review of the supporting documentation provided by SPEN and SSEN, we propose to accept costs and volumes in full. Moreover, we propose a re-opener mechanism for ESR to address the fact that costs in this area may still arise during the price control period.

Table 45 ESR modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	-	-	-	-
NPgN	-	-	-	-
NPgY	-	-	-	-
WMID	-	-	-	-
EMID	-	-	-	-
SWALES	-	-	-	-
SWEST	-	-	-	-
LPN	-	-	-	-
SPN	-	-	-	-
EPN	-	-	-	-
SPD	3	2	0	-13%
SPMW	4	3	-1	-13%
SSEH	2	1	0	-21%
SSES	4	3	-1	-20%
Total	12	10	-2	-16%

Consultation questions

Core-Q82. Do you agree with our proposed approach to assessing ESR costs?

Quality of Service (QoS) and North of Scotland Resilience (NoSR)

Background

7.280 Quality of Service (QoS) denotes costs where the primary purpose is to improve performance against the IIS targets or to improve the overall fault rate per km of the distribution network.

7.281 North of Scotland Resilience (NoSR) costs are related to schemes undertaken with a focus on delivering improvements in the interruptions experience of the worst served customers served on specific circuits in SSEH.

7.282 At RIIO-ED1 fast track, WPD was allowed all of its submitted costs, including baseline allowances for QoS. For all other DNOs, at RIIO-ED1 slow track, we did not provide any baseline allowances for QoS, but we did provide an allowance for SSEN's NoSR costs.

Consultation position

Cost area	Consultation position
Quality of Service (QoS) and North of Scotland Resilience (NoSR)	We propose not to allow any ex ante allowance for all QoS costs relating to IIS targets. We have reclassified SSEN'S NoSR costs as Worst Served Customers costs.

Rationale for consultation position

7.283 We propose to disallow all DNOs' submitted QoS costs. For more details, see Chapter 6. Given that all DNOs are subject to a UIOLI allowance for Worst Served Customers at RIIO-ED2, we have reclassified SSEN's NoSR costs under this category.

Consultation questions

Core-Q83. Do you agree with our proposed approach to assessing QoS and NoSR costs?

Physical Security

Background

7.284 Physical Security costs relate to activities for sites designated as Critical National Infrastructure (CNI). The Secretary of State has initiated the Physical Security Upgrade Programme (PSUP), A BEIS-led national programme to enhance physical security at CNI sites.

7.285 At RIIO-ED1, we provided ex ante allowances, and implemented a re-opener mechanism when several sites were reclassified.

Consultation position

Cost area	Consultation position
Physical Security	We propose to qualitatively assess Physical Security costs.

Rationale for consultation position

7.286 For RIIO-ED2, we propose to use engineering qualitative assessment based on EJP submissions. For the two licensees that submitted Physical Security costs (ENWL and SSEN), the request was for Control Centres funding. Given the high variation in property types and associated costs, and the lack of sufficient data, we consider it would not have been appropriate to use benchmarking. We therefore opted for a detailed examination of costs, based on companies' EJP submissions, to determine whether funding could be justified.

7.287 Based on this qualitative assessment, we propose to accept ENWL's proposal but not include SSEN's due to lack of detail within the proposal, such as options considered and location of the control centre.

Table 46 Physical Security modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	5	4	-1	-20%
NPgN	-	-	-	-
NPgY	-	-	-	-
WMID	-	-	-	-
EMID	-	-	-	-
SWALES	-	-	-	-
SWEST	-	-	-	-
LPN	-	-	-	-
SPN	-	-	-	-
EPN	-	-	-	-
SPD	-	-	-	-
SPMW	-	-	-	-
SSEH	15	-	-15	-100%
SSES	29	-	-29	-100%
Total	49	4	-45	-92%

Consultation questions

Core-Q84. Do you agree with our proposed assessment approach for Physical Security?

Flood Mitigation

Background

7.288 The activity of Flood Mitigation covers physical and non-physical measures of flood prevention in place on a site and/or potential improvements that reduce the risk of flooding. The probability of flooding for each substation is identified in ETR 138 (q.v.). ETR 138 sets out to establish predicted flood depth and other key factors that determine which substations are "at risk" ie where the predicted depth of flooding is likely to cause damage to electrical assets at the substation resulting in the loss of supplies to customers.

7.289 The activity is broken down into subcategories as follows:

- Fluvial and Coastal at HV, EHV, 132kV and 275/400kV. Each of these four-voltage levels are broken down by ETR 138 flooding risk event level categories 1 in 100, 1 in 200 and 1 in 1000 events.
- Fluvial and Coastal Flooding Non-Site Specific Costs.
- Fluvial and Coastal Flooding Site Surveys at HV, EHV 132kV and 275/400kV.
- Pluvial at HV, EHV, 132kV and 275/400kV.
- Pluvial Flooding Non-Site Specific Costs.
- Pluvial Flooding Site Surveys at HV, EHV 132kV and 275/400kV.

7.290 At RIIO-ED1 we used a risk-based approach to assessing costs. We determined a risk delta based on calculating the risk of flooding at each substation before and after intervention. The delta gave credit to maintain the risk level at each substation, as well as risk reduction. We then calculated a unit cost of each risk point reduced/maintained and applied that to the delta. The unit cost was set as the lower of DNO's own cost per risk point reduced/maintained and the industry lower quartile based on DPCR5 and RIIO-ED1 data. We accepted volumes proposed by DNOs.

Consultation position

Cost area	Consultation position
Flood Mitigation	We propose using an industry median unit cost based on RIIO-ED1 and RIIO-ED2 data, complemented by engineering review to determine volume adjustments.

Rationale for consultation position

7.291 We propose to set an industry median unit cost using RIIO-ED1 and RIIO-ED2 data. We propose not to apply the risk-based approach used in RIIO-ED1. This is due to inconsistencies and incomplete data reported in the BPDTs.

7.292 We found forecast unit costs, in the majority of cases for RIIO-ED2, to be generally stable or decreasing across the various activities compared to RIIO-ED1. Given the general stability across the two price controls, we are of the view that it is appropriate to use 13-years of actual and forecast data in our assessment. We note however that regardless of the time period selected (RIIO-ED1, RIIO-ED2 or a combination of the two periods) the overall cost adjustments remain similar.

7.293 Based on the engineering review, we propose to accept costs and volumes submitted by all DNOs' except for WPD, where it was considered that the EJPs did not provide sufficient justification.

Table 47 Flood Mitigation modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	4	3	-1	-19%
NPgN	3	2	0	-18%
NPgY	3	3	-1	-17%
WMID	1	1	0	-18%
EMID	6	5	-1	-18%
SWALES	2	2	0	-17%
SWEST	2	1	0	-23%
LPN	2	2	0	-9%
SPN	5	5	-1	-10%
EPN	10	8	-1	-13%
SPD	5	5	-1	-13%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SPMW	4	4	-1	-14%
SSEH	1	0	0	-22%
SSES	24	19	-5	-21%
Total	72	60	-12	-17%

Consultation questions

Core-Q85. Do you agree with our proposed assessment approach for Flood Mitigation?

Rising and Lateral Mains

Background

7.294 Rising Lateral Mains (RLMs) are individual DNO's owned 3-phase cables or busbars, not laid in the ground, which run within or attached to the outside of a multiple occupancy building for:

- more than 3m vertically, or
- more than 3m horizontally, and
- to which several individual services are connected, usually via a distribution board.

7.295 The activity excludes undereaves or mural wiring (report under LV Service Associated with RLMs).

7.296 The activities reported are broken down into three categories:

- Assets associated with RLMs
- Inspections and Maintenance costs and volumes associated with RLMs
- Numbers of customers serviced by the RLM programme. This is broken down by customers in Houses, Flats and Multi-Storey properties.

7.297 At RIIO-ED1, we used forecast data to assess these costs and produce a DNO median unit cost using customer numbers as the cost driver.

Consultation position

Cost area	Consultation position
Rising and Lateral Mains	We propose using DNO median unit cost based on RIIO-ED1 and RIIO-ED2 data, complemented by engineering review. We propose to use the number of customers serviced by the RLM programme as a driver.

Rationale for consultation position

7.298 We consider the RIIO-ED1 assessment method for RLMs to be appropriate for RIIO-ED2. Cost and volume data on RLMs is collected for three different customer types (customers serviced in houses, flats and multi-Storey properties). As in RIIO-ED1, we propose to use the number of customers serviced by RLMs as a cost driver and set the benchmark at the DNO median unit cost level. As part of our analysis, we also undertook a unit cost assessment on assets and Inspections and Maintenance associated with RLMs. However, these were discounted due to gaps in data that produced unreliable results. We also considered an industry median unit cost approach, but due to variations in unit costs between DNOs, we discarded this approach as it resulted in large adjustments from submitted costs and thus not deemed to be robust.

7.299 As at RIIO-ED1, we note that, independently of the time period used, unit costs variation between DNOs was considerable enough to result in significant adjustments when applying an industry median. We therefore accept that costs and volumes do not lend themselves to industry benchmarking, as different DNOs will need to do more RLM works than others and costs associated with these works can vary considerably. Therefore, for RIIO-ED2 we propose to use individual DNOs' median unit costs. Moreover, for a more robust analysis, we propose to compute median unit costs using both RIIO-ED1 and RIIO-ED2 data. We note however that there are issues around consistency of RLM data reported by DNOs. We intend to raise a request to each DNOs for further data which will help ensure consistency.

7.300 Based on engineering review, we propose to make cost and volume adjustments for WPD and UKPN, whose EJPs did not provide sufficient justification. See company annexes for more details.

Table 48 Rising and Lateral Mains modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
ENWL	17	14	-3	-19%
NPgN	4	4	-1	-19%
NPgY	9	7	-1	-17%
WMID	1	1	0	-18%
EMID	1	0	0	-18%
SWALES	1	0	0	-17%
SWEST	0	0	0	-24%
LPN	-	-	-	-
SPN	5	5	-1	-10%
EPN	1	1	0	-13%
SPD	34	29	-5	-14%
SPMW	27	23	-4	-14%
SSEH	5	4	-1	-22%
SSES	24	19	-5	-22%
Total	129	107	-22	-17%

Consultation questions

Core-Q86. Do you agree with the proposed approach to assessing Rising and Lateral Mains costs?

Worst Served Customers (WSC)

Background

7.301 A customer experiencing on average at least four higher voltage interruptions per year, over a three-year period (ie 12 or more over three years, with a minimum of two interruptions per year) is classified as worst served.

7.302 At RIIO-ED1, a UIOLI allowance was provided, based on the number of worst served customers in each eligible DNO. DNOs proposed per cent reductions in the average number of higher voltage interruptions for worst served customers - measured over three full reporting years post commissioning, based on fully evidenced and supported decisions following stakeholder engagement. Costs were

logged up and funded ex post on a NPV neutral basis, provided that performance and eligibility criteria were met.

Consultation position

Cost area	Consultation position
WSC	We propose to accept WSC costs as submitted.

Rationale for consultation position

7.303 For RIIO-ED2, we propose to set an ex ante UIOLI allowance for WSC based on submitted costs. This includes SSEN's reallocated NoSR costs. For more details, see chapter Chapter 6.

Consultation questions

Core-Q87. Do you agree with our approach to assessing WSCs?

Losses

Background

7.304 These are costs where losses management is the primary driver of the investment or action. At RIIO-ED1, volumes were allowed where appropriately justified, and unit costs were set based on expert view for the relevant asset type. Where DNOs appropriately justified accelerating asset replacement or higher unit costs to deliver incremental losses benefits, we allowed the associated higher volumes or unit costs.

Consultation position

Cost area	Consultation position
Losses	For transformer replacement, we propose using the RIIO-ED2 expert asset replacement industry median unit cost for the relevant asset type. We propose using engineering review to determine volume adjustments. We propose to accept Other costs in full.

Rationale for consultation position

7.305 For transformer replacement, we consider the RIIO-ED1 assessment method to be appropriate for RIIO-ED2.

7.306 Seven DNOs have submitted costs and volumes against transformer replacement with loss reduction as the primary driver. We have carried out a unit cost assessment using the RIIO-ED2 expert asset replacement industry median unit cost for the relevant asset type. We consider this to be more appropriate than unit cost benchmarking solely using the costs in the Losses BPDTs table. DNOs have only submitted costs for the replacement of three different transformer types, resulting in a lack of comparability. Instead, we think that relying on the asset replacement approach allows us to reach a more robust view of the unit cost at which the replacement of each type of asset can be delivered efficiently.

7.307 Based on engineering review, we consider that there is no detailed needs case for WPD's 6.6/11kV pole-mounted transformer (PMT) replacement programme. We would have expected more comprehensive data comparing the losses of pre-1958 PMTs with modern PMTs. However, WPD has given no detail on the need to increase capacity for these PMTs, and discounted the baseline scenario of replacing transformers on a 'like-for-like' capacity and volume basis with very limited discussion of how or why the replacements units did not provide the reduced losses benefit. As such, we propose to disallow these costs.

7.308 We find the other costs in this area to be justified, so we propose to accept DNOs' submitted costs in full. These are UKPN's countering theft in conveyance costs, SSEN's costs related to Transformer Auto Stop Start (TAAS) and SPEN's CVP on network losses reduction.

7.309 Table 49 shows our view of modelled costs compared to DNOs' submitted costs. For Losses, the fourteen DNOs have collectively forecast £42m. Our efficient view of costs is £35m, resulting in a 16% reduction.

Table 49 Losses modelled costs (£m, 20/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	10	8	-2	-19%
NPgN	-	-	-	-
NPgY	-	-	-	-
WMID	1	1	0	-18%
EMID	1	1	0	-18%
SWALES	1	1	0	-17%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SWEST	1	1	0	-24%
LPN	1	1	0	-9%
SPN	0	0	0	-10%
EPN	1	0	0	-13%
SPD	15	13	-2	-13%
SPMW	8	7	-1	-14%
SSEH	1	1	0	-22%
SSES	1	1	0	-22%
Total	42	35	-7	-16%

Consultation questions

Core-Q88. Do you agree with our proposed assessment approach for Losses?

Environmental Reporting excluding PCBs

Background

7.310 This cost area includes the following activities:

- Undergrounding for Visual Amenity
- Non-Undergrounding Visual Amenity Schemes
- Oil Pollution Mitigation Schemes – Cables
- Oil Pollution Mitigation Schemes – Non-operational Sites
- Oil Pollution Mitigation Schemes – Operational Sites
- SF_6 Emitted Mitigation Schemes
- Noise Pollution
- Contaminated Land Clean Up
- Environmental Civil Sanctions

7.311 At RIIO-ED1, we used DPCR5 and RIIO-ED1 data to set the benchmark at the industry median unit cost. Our quantitative assessment was overlaid, and sense-checked by a qualitative assessment bespoke to each environmental category.

Consultation position

Cost area	Consultation position
Environmental reporting	For each environmental category, to use either the industry median or DNO own median unit cost, based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.312 We consider the RIIO-ED1 assessment method to be an appropriate approach to use for RIIO-ED2. We propose to allow the submitted volumes of work where an engineering assessment supports it.

7.313 As in RIIO-ED1, our quantitative modelling of unit costs is overlaid and sense checked by a qualitative assessment bespoke to each environmental category. Where we set industry median unit costs, we use RIIO-ED1 and RIIO-ED2 data. For most areas, we found forecast unit costs in RIIO-ED2 to be generally stable or decreasing across activity categories compared to RIIO-ED1. Given the stability across price controls, we consider it appropriate to use a longer time-period with the aim of providing more robust results. Where unit costs were not comparable, we either assessed costs using DNO own median unit costs, or accepted forecast costs as submitted.

7.314 Table 50 below summarises our assessment for each cost category.

Table 50 RIIO-ED2 proposals for Environmental Reporting

Category	Proposal for RIIO-ED2
Undergrounding for Visual Amenity[232]	Only WPD submitted costs for RIIO-ED2. We propose to accept submitted costs in full.
Non-Undergrounding Visual Amenity Schemes	As above.
Oil Pollution Mitigation Scheme - Cables	Only SSEN and WPD submitted costs, and unit costs are variable. We consider SSEN's and WPD's costs justified, so we propose to accept submitted costs in full.
Oil Pollution Mitigation Scheme - Operational Sites	Given the high variation in unit costs, we propose to assess these costs using DNO median unit costs.
Oil Pollution Mitigation Scheme - Non Operational Sites	Only SSEN submitted costs for RIIO-ED2. We consider the costs justified, so we propose to accept submitted costs in full.

[232] This category excludes activity for Visual Amenity projects undertaken under the Visual Amenity Use-it-or-lose-it allowance. This is also the case for Non-Undergrounding Visual Amenity schemes.

Category	Proposal for RIIO-ED2
SF_6 Emitted Mitigation Schemes	We propose to assess this category using industry median unit costs, except SSEN's costs which we consider unjustified. SSEN proposed a bespoke PCD for SF_6 asset replacement. Our consultation position for this proposal can be found in the SSEN Annex.
Noise Pollution	We propose to assess this category using industry median unit costs.
Contaminated Land Clean Up	Given the high variation in unit costs, we propose to assess these costs using DNO median unit costs.
Environmental Civil Sanction	No costs submitted.
Biodiversity/Biodiversity net gain	We consider ENWL, UKPN and SSEN costs justified, so we propose to accept submitted costs in full. We moved £0.5m of SPEN's biodiversity costs to baseline. For further information, please see Chapter 3.
Carbon offsetting or removal	We propose to disallow WPD, UKPN and SPEN costs on carbon offsetting and SSEN costs on carbon removal, as we consider them to be unjustified. For further information, please see Chapter 3.
Community energy	We moved costs submitted by SPEN as an ODI-F to baseline.

Polychlorinated Biphenyls (PCBs)

Background

7.315 During RIIO-ED1, three activities associated with the removal of Persistent Organic Pollutants (POPs), such as PCBs, from electrical assets were included in the Environmental Reporting activity. These were the removal of oil from assets that contain unacceptable levels of POPs, the testing of oil specifically carried out to determine levels of POPs, and the wholesale replacement of assets that contain, or (where not possible to test) are suspected of containing, unacceptable levels of POPs.

Consultation position

Cost area	Consultation position
PCBs	We propose to carry out a unit cost assessment using RIIO-ED1 and RIIO-ED2 data and set the benchmark at the DNO median unit cost.

Rationale for consultation position

7.316 The legal deadline for remediating the PCB affected assets comes into force after Year 3 of RIIO-ED2. Therefore, the RIIO-ED2 forecasts only provide three years of data. The RIIO-ED1 period does not provide data for all years due to differences in reporting and proposed work. To maximise the sample size, we propose to use both RIIO-ED1 and RIIO-ED2 to model an efficient unit cost. The work activities vary between DNOs, so we propose setting the benchmark at DNOs' median unit costs. We propose to accept submitted volumes as there is a legal driver to complete this work by a defined deadline.

7.317 As part of the RIIO-ED2 cost assessment, we propose that the Pole Mounted Transformer (PMT) replacement costs will be subject to a volume driver. Further information on this can be found in the 'Delivering an environmentally sustainable network' section in Chapter 3.

7.318 Table 51 shows our view of modelled Environmental Reporting costs compared to DNOs' submitted costs. The fourteen DNOs forecast they would spend £365m on environmental activity in RIIO-ED2, including PCB costs. We assessed the efficient level of expenditure to be £67m lower than submitted costs, resulting in an 18% reduction at the industry level.

7.319 The modelled costs shown in Table 51 currently include PCB PMT replacement costs that would be subject to the proposed volume driver. We intend to develop a disaggregated allocation methodology for Final Determinations in order to exclude these PCB PMT replacement costs from modelled ex ante Environmental Reporting allowances and instead include these costs separately in variant totex, in line with the structure of the volume driver.

Table 51 Environmental Reporting modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	28	23	-5	-18%
NPgN	22	18	-4	-18%
NPgY	24	20	-4	-16%
WMID	9	7	-1	-17%
EMID	8	6	-1	-17%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SWALES	4	4	-1	-16%
SWEST	8	6	-2	-23%
LPN	5	4	0	-7%
SPN	14	13	-1	-9%
EPN	34	29	-4	-12%
SPD	41	33	-8	-19%
SPMW	46	36	-10	-22%
SSEH	36	28	-8	-21%
SSES	87	69	-18	-21%
Total	365	298	-67	-18%

Consultation questions on Environmental Reporting, including PCBs

Core-Q89. Do you agree with our proposed assessment approach for environmental reporting?

Core-Q90. Do you agree with our proposed assessment approach for PCBs?

Non – Operational Capex

7.320 Non-Operational Capex relates to the capital costs incurred from activities that are unrelated to core activities, but essential to DNOs in being able to carry out these activities. Non-Operational Capex includes four activities:

- Property
- Small Tools, Equipment, Plant and Machinery (STEPM)
- IT&T (see Operational, Non-Operational and Business Support Information Technologies and Telecommunications (IT&T) Costs)
- Vehicles and Transport

<u>Property</u>

Background

7.321 Property relates to expenditure on new and replacement property assets which are not system or operational assets. This includes: premises used by people (eg stores, depots and offices) which are not operational premises (eg substations), office equipment, installation of Electric Vehicle Charging Points at these premises

and installation of fuel tanks at these premises, including pumps and monitoring equipment.

7.322 For the Property activity, in RIIO-ED1 we used ratio benchmarking with MEAV as the driver over the periods DPCR5 and RIIO-ED1.

Consultation position

Cost area	Consultation position
Property	We propose to use ratio benchmarking and assess Non-Operational Property costs and Property Management costs together, using MEAV as the cost driver and an industry median benchmark ratio based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.323 In line with RIIO-ED1 approach, for RIIO-ED2 we propose using MEAV as a driver to create an industry median unit cost based on RIIO-ED1 and RIIO-ED2 data. We propose not to continue to use the DPCR5 period as the property costs for that period substantially varied compared to more recent property prices.

7.324 At both SSMC and CAWG, it was suggested that Non-Operational Property could be assessed with Property Management costs within Business Support, to better reflect the relationship between the cost activities.

7.325 As part of our analysis, we considered stakeholder feedback and assessed Non-Operational Property and Property Management costs both together and separately. As assessing the two activities together confirmed a cost correlation, this is the approach we propose for RIIO-ED2.

7.326 Table 52 shows modelled costs for Non-Operational Property compared to DNOs' submitted costs. Modelled costs for Property Management have been included in Total Business Support modelled costs (Table 66).

Table 52 Non-Operational Capex - Property modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED modelled	Difference	Difference
	£m	£m	£m	%
ENWL	12	10	-2	-18%
NPgN	8	7	-1	-18%

DNO	RIIO-ED2 submitted	RIIO-ED modelled	Difference	Difference
NPgY	6	5	-1	-17%
WMID	12	10	-2	-18%
EMID	11	9	-2	-17%
SWALES	9	8	-2	-16%
SWEST	33	25	-8	-23%
LPN	12	11	-1	-8%
SPN	10	9	-1	-10%
EPN	21	18	-3	-13%
SPD	24	21	-3	-13%
SPMW	17	15	-2	-14%
SSEH	17	13	-4	-22%
SSES	18	14	-4	-22%
Total	211	175	-36	-17%

Consultation questions

Core-Q91. Do you agree with our proposed assessment approach for Property?

Small Tools and Equipment

Background

7.327 The activity Small Tools, Equipment, Plant and Machinery (STEPM) is the expenditure for items which are used to work on, assist, or test system assets. These items are not considered to be permanently connected to the network.

7.328 In RIIO-ED1 we assessed these costs via an engineering qualitive review. Following this, we accepted the submitted costs from each DNO.

Consultation position

Cost area	Consultation position
Non-Operational Capex - STEPM	We propose to use ratio benchmarking to assess STEPM, using MEAV as the cost driver and an industry median benchmark ratio based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.329 Different to RIIO-ED1, we propose using ratio benchmarking to assess STEPM, with MEAV as a driver and an industry median benchmark ratio based on RIIO-ED1 and RIIO-ED2 data. Compared to RIIO-ED1 where concerns were raised around reporting inconsistencies, we are more confident that submitted data are more comparable and thus propose a quantitative assessment for RIIO-ED2.

7.330 We think the supplementary qualitative review provides additional robustness to the approach, as it accounts for the individual DNOs' programmes of work.

Table 53 Small Tools and Equipment modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	23	19	-4	-19%
NPgN	14	11	-3	-18%
NPgY	15	13	-3	-17%
WMID	16	13	-3	-18%
EMID	18	15	-3	-18%
SWALES	7	6	-1	-17%
SWEST	13	10	-3	-24%
LPN	11	10	-1	-9%
SPN	10	9	-1	-10%
EPN	19	16	-2	-13%
SPD	5	5	-1	-13%
SPMW	6	5	-1	-14%
SSEH	9	7	-2	-22%
SSES	25	19	-5	-22%
Total	190	157	-33	-17%

Consultation questions

Core-Q92. Do you agree with our proposed assessment approach for STEPM?

Vehicles and Transport

Background

7.331 Vehicles and Transport relates to expenditure on new and replacement wheeled vehicles and generators which are not system assets but are utilised by the DNO or any other Related Party for the purposes of providing services to the DNO. This includes commercial vehicle fleet, mobile plant and generators.

7.332 In RIIO-ED1, the Non-Operational Vehicles and Transport activity was assessed together with the CAI Vehicles and Transport costs. This produced an industry median unit cost, calculated using the 13 years of data from DPCR5 and RIIO-ED1 periods, with MEAV as a driver.

Consultation position

Cost area	Consultation position
Vehicles and Transport	We propose to use MEAV ratio benchmarking and assess Non-Operational V&T costs and CAI V&T costs together, using the industry median as a benchmark and based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.333 We consider the RIIO-ED1 assessment method for Non-Operational Vehicles and Transport to be the appropriate approach to use in RIIO-ED2. The assessment continues to combine Non-Operational Costs Vehicles and Transport Costs and Closely Associated Indirect Vehicle Costs for assessment and modelling purposes. Aggregating these costs addresses any differences between different business operating practices.

7.334 For RIIO-ED2, we propose using MEAV as a driver to set the benchmark at the industry median unit cost. We propose using RIIO-ED1 and RIIO-ED2 data but not DPCR5 data. The exclusion of DPCR5 data was based on the introduction of transitional fleet changes seen in the RIIO-ED1 period, to an EV fleet, which was not seen in DPCR5.

7.335 We find that total forecast costs in RIIO-ED2 for Non-Operational Capex Vehicles and Transport increased compared to RIIO-ED1 due to the requirement to transition fleets to an Electric Vehicle capability. This also includes replacing temporary generators with non-fossil fuel alternatives. The increase in costs has

been adequately explained by the DNOs' associated plans and proposal papers, which have been subjected to a qualitative review.

7.336 As part of the assessment process, we considered using FTE (Full Time Equivilient member of staff) data as a driver. However, we discarded this approach because there was no direct correlation between FTE data and vehicle fleet sizes. Thus, we propose to continue to use MEAV as a suitable driver and apportion costs depending upon the DNO's operating size.

Table 54 Non-Operational Capex - Vehicles and Transport modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	23	18	-4	-19%
NPgN	16	13	-3	-18%
NPgY	17	14	-3	-17%
WMID	31	26	-6	-18%
EMID	39	32	-7	-17%
SWALES	27	23	-4	-16%
SWEST	32	25	-7	-23%
LPN	15	13	-1	-8%
SPN	22	20	-2	-10%
EPN	31	27	-4	-13%
SPD	6	6	-1	-13%
SPMW	6	5	-1	-13%
SSEH	7	5	-2	-22%
SSES	7	6	-2	-22%
Total	279	233	-46	-17%

Consultation questions

Core-Q93. Do you agree with our proposed assessment approach for Vehicles and Transport?

High-Value Projects (HVPs)

Background

7.337 In RIIO-ED1 we set a HVPs threshold for schemes forecast to cost £25m or more (in 2012-13 prices) and allowed costs for schemes specified and agreed with individual DNOs to be undertaken during RIIO-ED1 that were specified in the RIIO-ED1 Final Determinations or included during the price control period in accordance with CRC 3F (Arrangements for the recovery of uncertain costs) of the electricity distribution licence. At RIIO-ED1, we technically assessed HVP costs.

7.338 In our SSMD,[233] we did not set a threshold or a requirement for projects to be carved-out for reporting under HVP. A small number of project have however been submitted under the HVP cost category for RIIO-ED2.

Consultation position

Cost area	Consultation position
High Value Projects	We propose to respecify the HVP UM for non-load projects and qualitatively assess these projects for RIIO-ED2.

Rationale for consultation position

7.339 Following review of the DNOs submitted HVPs for RIIO-ED2, we propose to re-specify the HVP re-opener from RIIO-ED1 to focus on non-load projects. We believe our LRE uncertainty mechanisms are fit for purpose to manage uncertainty in this activity, however we recognise that there remains uncertainty around some higher value non-load projects.

7.340 We do not consider the submitted HVPs to be suitable for benchmarking due to their large, one-off nature. As such we propose to qualitatively assess the submitted HVPs in baseline forecasts for RIIO-ED2.

7.341 We note that SSEH submitted a HVP for submarine cables, however this has been assessed via our company specific factors assessment (see Company Specific Factors in this Chapter). Three other HVPs were submitted by ENWL, SWALES and SSES. We note that ENWL's project costs are forecast to be less than £25m total for RIIO-ED2.

[233] SSMD Annex 2, paragraph 8.33 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf

7.342 The EJPs for the three HVPs have been subject to engineering review. For SWALES' Abergavenny Northern Ring we find the project to be sufficiently justified. We note that for ENWL's Harker project there are ongoing discussions with National Grid Electricity Transmission (NGET), and that SSES's Fleet and Bramley substation investigations into a whole system option with NGET will remain ongoing into 2022. Accordingly, and we will continue to keep these proposals under review. We accept these costs as submitted for Draft Determinations but may review these projects further for Final Determinations in light of the scope and cost of work and proposals for the HVP re-opener.

Table 55 HVP RIIO-ED2 modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	22	18	-4	-18%
NPgN	-	-	-	-
NPgY	-	-	-	-
WMID	-	-	-	-
EMID	-	-	-	-
SWALES	30	25	-5	-18%
SWEST	-	-	-	-
LPN	-	-	-	-
SPN	-	-	-	-
EPN	-	-	-	-
SPD	-	-	-	-
SPMW	-	-	-	-
SSEH	40	25	-15	-38%
SSES	54	42	-12	-23%
Total	146	110	-37	-25%

Consultation questions

Core-Q94. Do you agree with our proposed assessment approach for HVPs?

Core-Q95. Do you see any merit in setting a HVP threshold for RIIO-ED2, and if so should it be based on the RIIO-ED1 threshold?

Network Operating Costs

7.343 Network operating costs (NOCs) are the day-to-day costs incurred by DNOs as part of the work required to maintain and operate the distribution networks. NOCs include the following activity areas:

- Faults
- Occurrences Not Incentivised (ONIs)
- Severe Weather 1-in-20 events
- Tree Cutting
- Inspections and Repairs & Maintenance
- NOCs Other
- Smart Metering Rollout.

Faults and ONIs

Background

7.344 Faults costs are classified under Interruptions and reported as Unplanned Incidents which require action to restore an asset to Pre-Fault Availability. A fault starts at the same time as an Unplanned Incident and is completed when an asset is restored to Pre-Fault Availability. This may occur at a time that is later than when an Unplanned Incident (as reported under IIS) stops. Costs associated with faults relate to the activity required to restore the faulted asset to Pre-Fault Availability.

7.345 At RIIO-ED1, we carried out a unit cost-based assessment using RIIO-ED1 industry median costs per fault for each fault type, except for LV/HV OH Faults (regressed), submarine (submitted unit costs) and LV UG (qualitative adjustments applied to unit cost assessment). Efficient volumes were assessed taking the lower of DPCR5 actual volumes and RIIO-ED1 forecast volumes.

7.346 An ONI is any occurrence logged on the enquiry service operated by the licensee under Standard Licence Condition 8 (Safety and Security of Supplies Enquiry Service (SSSES)) which is not an incident, and which is not as a result of being identified during the installation of, or attempted installation of, a Smart Meter.

7.347 At RIIO-ED1, we assessed unit costs at a disaggregated level. For volumes, we mirrored the approach taken for faults and took the lower of DPCR5 actual volumes and RIIO-ED1 forecast volumes, with qualitative adjustments where required.

Consultation position

Cost area	Consultation position
Faults and ONIs	We propose to use regression analysis pooling Faults and ONIs costs using DPCR5, RIIO-ED1 and RIIO-ED2 data, and Faults volumes and ONIs volumes as independent variables.

Rationale for consultation position

7.348 In some fault categories, even when grouped together, we observed a wide variation in unit costs. Aggregating all categories and using submitted volumes also produced a wide variation in unit costs.

7.349 Similarly for ONIs, unit costs are variable across DNOs, suggesting that a unit cost model would exaggerate the degree of variation in DNOs' efficiency. Therefore, we do not consider this approach appropriate to explain RIIO-ED2 ONI costs.

7.350 We have tested a variety of regression models for these cost activities. We included RIIO-ED2 costs in any model tested. While there is not a structural break between RIIO-ED1 and RIIO-ED2, RIIO-ED2 costs are lower. Thus, using RIIO-ED1 data only would not allow us to fully explain RIIO-ED2 costs.

7.351 At the RIIO-ED2 CAWGs, one DNO presented a few options for regression models on faults and ONIs, including some where faults and ONIs were assessed together. We tested the proposed models and noted that statistical robustness improved when testing models pooling Faults and ONIs costs compared to testing separate models for Faults and ONIs. Moreover, a model pooling these costs alleviates a potential problem with reporting inconsistency, given DNOs have control in some instances on whether costs are reported under faults or ONIs. For RIIO-ED2, we propose using a model in which faults volumes and ONIs volumes are included as separate independent variables, thus drawing out any differences in faults and ONIs drivers. We also included two linear time trends to account for potential time effects not captured by the main drivers. The results of the regression analysis are shown in Appendix 10.

7.352 Looking at the results, we note that fault rates do not correlate to modelled costs, meaning that DNOs with the highest ratio of faults to volumes do not necessarily receive higher costs. The efficiency score rankings of the model do not correlate with faults volumes, ONIs volumes or fault rates. We consider that this shows that, while these drivers are somewhat endogenous, the model does not create perverse incentives, as it does not reward inefficiency in costs.

7.353 Table 56 and Table 57 show our view of modelled costs compared to DNOs' submitted costs. The fourteen DNOs forecast they would spend £1,867m on faults and £509m on ONIs in RIIO-ED2. We assessed the efficient level of expenditure to be £1,562m for faults and £427m for ONIs, resulting in a 16% reduction at the industry level for both areas.

Table 56 Faults modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	127	103	-24	-19%
NPgN	119	97	-22	-18%
NPgY	178	149	-29	-17%
WMID	123	101	-22	-18%
EMID	142	117	-25	-18%
SWALES	54	45	-9	-17%
SWEST	108	83	-26	-24%
LPN	134	123	-11	-9%
SPN	142	127	-14	-10%
EPN	227	196	-31	-13%
SPD	121	105	-16	-13%
SPMW	121	104	-17	-14%
SSEH	61	47	-13	-22%
SSES	209	164	-45	-21%
Total	1,867	1,562	-305	-16%

Table 57 ONIs modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	46	38	-9	-19%
NPgN	29	24	-5	-18%
NPgY	61	51	-10	-17%
WMID	45	37	-8	-18%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
EMID	34	28	-6	-18%
SWALES	17	14	-3	-17%
SWEST	27	21	-6	-24%
LPN	38	35	-3	-9%
SPN	40	36	-4	-10%
EPN	74	64	-10	-13%
SPD	26	22	-3	-13%
SPMW	25	21	-3	-14%
SSEH	6	5	-1	-22%
SSES	41	32	-9	-21%
Total	509	427	-82	-16%

Consultation questions

Core-Q96. Do you agree with our proposed assessment approach for faults and ONIs?

Tree Cutting

Background

7.354 Tree Cutting is the activity of physically felling or trimming vegetation from around network assets. The activity includes costs for:

- The felling or trimming of vegetation to meet Energy Networks Association Technical Standard (ENATS) 43-8 and ETR 132 requirements.
- The inspection of vegetation cut for the sole purpose of ensuring the work has been undertaken in an appropriate manner.
- Inspection of tree-affected spans were included as part of a tree cutting contract.[234]

[234] The Tree Cutting activity does not include: costs of felling or trimming of vegetation as part of a Capital Scheme (costs remain with the driver for works which necessitated the installation of the asset/tree cutting), general inspection costs relating to wires that are subject to vegetation and not performed solely as part of a tree cutting contract or to ensure vegetation has been cut appropriately (included in Inspections & Maintenance), costs of assessing and reviewing the tree cutting policy (included in Network Policy), data collection and manipulation relating to vegetation (included in Network Design & Engineering), and costs of managing or procuring the tree cutting contract, except as stated above.

7.355 At RIIO-ED1, we applied regression analysis to the ENATS 43-8 activity over the RIIO-ED1 period, using spans cut and spans inspected as drivers. For the ETR 132 activity we used an industry median unit cost based upon kilometres cleared.

Consultation position

Cost area	Consultation position
Tree Cutting	We propose using industry median unit costs based on RIIO-ED1 and RIIO-ED2 data. For ENATS 43-8 activity, we propose to use physical cuts and inspections as drivers, while we propose to use overhead network length for ETR 132 activity. We propose to use run rates for volumes.

Rationale for consultation position

7.356 Cost and volume data on tree cutting is collected under two activity levels: ENATS 43-8 and ETR 132. Unit costs are calculated at each voltage, by activity category.

7.357 We find forecast unit costs in RIIO-ED2 to be generally stable or decreasing across activity and voltage categories compared to RIIO-ED1. This favours the use of both historical and forecast data. Moreover, different to RIIO-ED1 where we used forecast data only, due to the cyclical nature of tree cutting work, we consider forecast data combined with historical data to provide a more reliable dataset. Unit costs also continue to vary substantially between voltages and activity categories due to the complexity involved with the activity. To account for this complexity, we propose to use the RIIO-ED1 and RIIO-ED2 data to set the efficient unit costs at the industry median unit cost for each voltage and activity category within ENATS 43-8. As for ETR 132 activity, we consider the RIIO-ED1 assessment method to be the appropriate approach to use for RIIO-ED2. Thus, we propose to use industry median unit costs based on overhead network length.

7.358 Run rate analysis of tree cutting volumes shows that there is a slight increase in volumes for the ENATS 43-8 activity and an overall decrease in volumes for ETR-132 for the RIIO-ED2 period. Therefore, in both cases we propose to use modelled volumes from the run rate analysis.

7.359 Finally, we note that in the preliminary phase of our assessment we considered using regression analysis, but we discarded the option as results were not statistically robust.

7.360 The impact of the Ash Dieback disease was also considered in our analysis.[235] Two DNOs proposed Uncertainty Mechanisms for this aspect of tree cutting. Please see the company specific annexes for ENWL and SSEN for further details.

Table 58 Tree Cutting modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	49	40	-9	-19%
NPgN	22	18	-4	-18%
NPgY	32	26	-5	-17%
WMID	61	50	-11	-18%
EMID	61	50	-11	-18%
SWALES	50	42	-8	-17%
SWEST	74	56	-18	-24%
LPN	-	-	-	-
SPN	33	30	-3	-10%
EPN	57	49	-8	-13%
SPD	24	21	-3	-13%
SPMW	58	50	-8	-14%
SSEH	49	38	-11	-22%
SSES	140	110	-30	-21%
Total	710	581	-130	-18%

Consultation questions

Core-Q97. Do you agree with our proposed assessment approach for Tree Cutting?

[235] "Ash dieback is a serious disease of ash trees caused by the fungus Hymenoscyphus fraxineus (it used to be called Chalara fraxinea). The disease causes leaf loss and crown dieback in affected trees and can lead to the death of the tree" (Ash Dieback | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk), retrieved on 14 June 2022).

Severe Weather 1-in-20

Background

7.361 An exceptional severe weather event is deemed to begin at the beginning of a 24-hour period when the number of incidents caused by the event at distribution higher voltage in that period is equal to or greater than the commencement threshold number (42 times the mean number of incidents per day), and is deemed to end at the time determined by the Authority having regard to the selected criteria.

7.362 At RIIO-ED1, we calculated an industry wide estimate of expenditure in this area using the actual DPCR5 costs, the probability of an event occurring, and the DNO's forecast expenditure. Allowances were allocated to each DNO based upon each DNO's share of the industry's OHL MEAV.

Consultation position

Cost area	Consultation position
SW 1-in-20 Event	For RIIO-ED2 we propose to exclude this activity from cost assessment. We propose the implementation of a UIOLI mechanism with a zero starting allowance.

Rationale for consultation position

7.363 Upon review, we considered the RIIO-ED1 assessment approach to be somewhat subjective. DNOs were allocated an ex-ante allowance for the period. If a Severe Weather 1-in-20 Event did not occur during the period, the DNO would be eligible to retain some of the allowance under the totex Incentive Mechanism.

7.364 A Severe Weather 1-in-20 event is difficult to forecast in terms of both costs and volumes. Up until the Autumn of 2021, the only actual cost data available dates to the DPCR5 period.

7.365 For more details on our proposed UIOLI mechanism, please refer to Chapter 6.

Consultation questions

Core-Q98. Do you agree with our proposed assessment approach for Severe Weather 1-in-20 Events?

Inspections and Repairs & Maintenance

Background

7.366 Inspections are carried out to identify safety issues and assess the condition of assets. Repairs & Maintenance are activities that aim to ensure that assets will reach anticipated life expectancy. This may involve the replacement of consumable items and repairs carried out where sub-components are replaced, or minor issues rectified.

7.367 At RIIO-ED1, we used a unit cost assessment using the industry median as a benchmark. Our assessment of volumes was based on MEAV - with a different MEAV used for LPN to reflect its lack of overhead lines.

Consultation position

Cost area	Consultation position
Inspections and Repairs & Maintenance	We propose using MEAV ratio benchmarking, with the industry median as a benchmark and based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.368 We consider the RIIO-ED1 assessment method for Inspections, Repairs & Maintenance to be the appropriate approach to use for RIIO-ED2. We propose using a total cost assessment with MEAV as a driver and setting the benchmark at the industry median over a 13-year period (RIIO-ED1 and RIIO-ED2).

7.369 Even though Inspections, and Repairs & Maintenance are reported as two separate categories, we assess them together and provide separate proposed modelled costs. We also considered a unit cost assessment, however we discarded this approach as it exhibited high variation in DNOs' unit costs and thus the results did not seem robust. We believe it was not sensible to conduct volume analysis on individual asset types due to low volumes, issues with defining the boundaries between Inspections and Repairs & Maintenance, and different company practices and intervention cycles across DNOs. Ahead of benchmarking, we accounted for a few Company Specific Factors (see Company Specific Factors section in this Chapter).

7.370 Our modelled costs were reallocated to Inspections and Repairs & Maintenance based on the ratio of submitted expenditure in these two areas.

Table 59 Inspections modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	17	14	-3	-19%
NPgN	14	12	-3	-18%
NPgY	19	16	-3	-17%
WMID	21	17	-4	-18%
EMID	22	18	-4	-18%
SWALES	15	13	-3	-17%
SWEST	20	16	-5	-24%
LPN	20	18	-2	-9%
SPN	16	14	-2	-10%
EPN	20	18	-3	-13%
SPD	9	8	-1	-13%
SPMW	12	10	-2	-14%
SSEH	24	18	-5	-22%
SSES	18	14	-4	-21%
Total	248	206	-42	-17%

Table 60 Repairs & Maintenance modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	54	44	-10	-19%
NPgN	39	32	-7	-18%
NPgY	49	41	-8	-17%
WMID	48	39	-9	-18%
EMID	49	41	-9	-18%
SWALES	27	23	-5	-17%
SWEST	34	26	-8	-24%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
LPN	51	46	-4	-9%
SPN	46	42	-5	-10%
EPN	56	48	-8	-13%
SPD	40	35	-5	-13%
SPMW	53	45	-7	-14%
SSEH	28	22	-6	-22%
SSES	85	66	-18	-21%
Total	660	550	-109	-17%

Consultation questions

Core-Q99. Do you agree with our proposed approach to assessing Inspections and Repair & Maintenance costs?

NOCs Other

Background

7.371 NOCs Other comprises three categories: Dismantlement, Remote Generation Opex and Substation Electricity costs. These are defined as follows:

- Dismantlement is the activity of de-energising, disconnecting, and removing (where appropriate) network assets where the cost of dismantlement is not chargeable to a third party and no new assets are to be installed.
- Remote Generation Opex denotes the costs associated with fixed diesel generation stations that provide permanent emergency backup in remote locations including islands. Remote locations will generally only have a single electrical feed. Mobile generation is not classified a Remote Generation.
- Substation Electricity denotes the costs associated with electricity consumption (both metered and unmetered) in DNOs' substations.

7.372 At RIIO-ED1, for Dismantlement and Remote Generation Opex we applied the lower of the industry median change in annual spend (from DPCR5 to RIIO-ED1) and the DNOs' submitted unit costs. For Substation Electricity, we used unit cost assessment and set the benchmark at the RIIO-ED1 industry median.

Consultation position

Cost area	Consultation Position
NOCs Other	For Dismantlement, we propose using MEAV ratio benchmarking based on RIIO-ED1 and RIIO-ED2 data. For Remote Generation Opex, we propose to allow submitted costs. For Substation Electricity activities, we propose using DNOs' median unit costs based on RIIO-ED1 and RIIO-ED2 data.

Rationale for consultation position

7.373 We propose to move away from the RIIO-ED1 assessment approach for RIIO-ED2. No volumes are submitted against these costs, so unit cost benchmarking was not an option. Following our analysis into the most suitable drivers of these costs, we propose to use MEAV to benchmark Dismantlement costs. We consider this a more appropriate approach than applying the industry median change in annual spend between price controls, which was the approach at RIIO-ED1. RIIO-ED1 costs are not wholly reflective of RIIO-ED2 costs. As a result, we consider an approach that benchmarks costs against RIIO-ED1 and RIIO-ED2 industry median MEAV to be more suitable than solely using historical costs.

7.374 RIIO-ED2 costs are considerably lower for Remote Generation Opex. We consider costs justified so propose to allow submitted costs.

7.375 Both price per unit and units consumed are variable for the substation electricity activity. Given this and the fact that deriving the average consumption per site may need to take the characteristics of substations and interaction with losses into account, we propose using DNOs' own RIIO-ED1 and RIIO-ED2 median unit cost. Using DNO's own median unit costs results in equivalent modelled costs when assessing with price per unit or units consumed.

7.376 Table 61, Table 62 and Table 63 show our view of modelled costs compared to DNOs' submitted costs. The fourteen DNOs forecast they would spend £9m on Dismantlement, £31m on Remote Generation Opex and £148m on Substation Electricity in RIIO-ED2. We assessed the efficient level of expenditure to be £8m for dismantlement, £24m for Remote Generation Opex and £123m for Substation Electricity.

Table 61 Dismantlement modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	2	2	0	-19%
NPgN	2	1	0	-18%
NPgY	2	1	0	-16%
WMID	0	0	0	-18%
EMID	0	0	0	-18%
SWALES	0	0	0	-17%
SWEST	0	0	0	-24%
LPN	0	0	0	-9%
SPN	0	0	0	-10%
EPN	0	0	0	-13%
SPD	1	1	0	-13%
SPMW	1	0	0	-14%
SSEH	0	0	0	-22%
SSES	2	2	0	-21%
Total	9	8	-2	-18%

Table 62 Remote Generation Opex modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	-	-	-	-
NPgN	-	-	-	-
NPgY	-	-	-	-
WMID	-	-	-	-
EMID	-	-	-	-
SWALES	0	0	0	-17%
SWEST	5	4	-1	-23%
LPN	-	-	-	-
SPN	-	-	-	-

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
EPN	-	-	-	-
SPD	-	-	-	-
SPMW	-	-	-	-
SSEH	26	20	-6	-22%
SSES	-	-	-	-
Total	31	24	-7	-22%

Table 63 Substation Electricity modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	10	8	-2	-19%
NPgN	6	5	-1	-18%
NPgY	10	8	-2	-17%
WMID	11	9	-2	-18%
EMID	19	16	-3	-18%
SWALES	7	6	-1	-17%
SWEST	10	8	-2	-24%
LPN	10	9	-1	-9%
SPN	8	7	-1	-10%
EPN	15	13	-2	-13%
SPD	12	11	-2	-13%
SPMW	9	8	-1	-14%
SSEH	7	5	-2	-22%
SSES	13	10	-3	-21%
Total	148	123	-25	-17%

Consultation questions

Core-Q100. Do you agree with our proposed assessment approach for NOCs other?

Smart Metering Rollout

Background

7.377 The Smart Meter Rollout relates to the activity of a DNO having to physically attend a site to allow the installation of a smart meter.

7.378 In RIIO-ED1, we set a proportion of costs to be allowed ex ante, with the remainder of costs subject to a volume driver. We benchmarked the DNOs' submitted unit costs against the industry upper quartile, based on a 2% call out rate for volumes.

Consultation position

Cost area	Consultation position
Smart Meter Rollout	We propose to remove the volume driver and provide an ex ante allowance, set using an industry median unit cost based on RIIO-ED2 data.

Rationale for consultation position

7.379 We propose setting ex ante allowances for RIIO-ED2. We propose to remove the volume driver that was used in RIIO-ED1, as the volumes required to meet the national program are no longer uncertain. The RIIO-ED1 period has provided an opportunity to better understand the activity and smooth out any communication issues between the distributor and the supplier. Specifically, the national smart metering program has a current definitive end date. DNOs also have access to the data that informs them of the exact number of smart meters installed in their licence areas and, therefore, of the remaining number to be installed.

7.380 As noted in our SSMD,[236] we decided to retain Smart Meter IT and communication costs as pass-through items in line with RIIO-ED1 arrangements. Moreover, these costs remain excluded from totex modelling activities.

7.381 For the ex ante allowances, we propose to use RIIO-ED2 data to calculate an industry median unit cost. Using only RIIO-ED2 data means using a dataset that does not include the high unit costs experienced at the start of RIIO-ED1. Over RIIO-ED1, the cost of intervention has become more efficient and translated into lower unit costs for RIIO-ED2. We selected the median unit cost over all other

[236] SSMD Annex 2, pg.69-70 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf

options to take into account this efficiency. Over time volumes have also become more stable, which allows us to use submitted volumes more confidently.

Table 64 Smart Metering Rollout modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	13	11	-2	-18%
NPgN	2	2	0	-18%
NPgY	4	3	-1	-16%
WMID	5	5	-1	-17%
EMID	5	4	-1	-16%
SWALES	3	3	0	-15%
SWEST	3	2	-1	-22%
LPN	2	2	0	-7%
SPN	3	3	0	-9%
EPN	5	4	-1	-12%
SPD	12	11	-1	-12%
SPMW	8	7	-1	-13%
SSEH	1	1	0	-21%
SSES	5	4	-1	-20%
Total	72	61	-11	-15%

Consultation questions

Core-Q101. Do you agree with our proposed assessment approach for Smart Metering Rollout?

Closely Associated Indirects and Business Support

Closely Associated Indirects

Background

7.382 Closely Associated Indirect (CAI) costs include the back office functions directly involved in the construction and operation of the network assets, such as project management and network design.

7.383 At RIIO-ED1, CAI activities were grouped into the following categories:

- Core CAIs: network design and engineering, project management, system mapping, engineering management and clerical support (excluding Wayleaves), stores, network policy, control centre and call centre.
- Wayleaves
- Vehicles and transport
- Operational training including workforce renewal.

7.384 In RIIO-ED1, for Core CAIs we run a regression analysis using eight years of RIIO-ED1 forecast data and using MEAV and asset additions as the explanatory variables. For Wayleaves, we calculated unit costs applying an industry median using 13 years of data from DCPR5 and RIIO-ED1 and using the number of supports - towers and poles - as the cost driver. For CAI Vehicles and transport costs, we assessed them together with Non-Operational Capex – Vehicles and Transport. We applied an industry median unit cost based on 13 years of data from DCPR5 and RIIO-ED1 and MEAV as the cost driver. Finally, for operational training, we assessed separately workforce renewal and non-workforce renewal costs using ratio benchmarking at a DNO group level over the RIIO-ED1 period.

Consultation position

Cost area	Consultation position
Closely Associated Indirect (CAI) Costs	CAIs (excluding Vehicles and Transport): We propose to use a regression analysis based on 13 years of data – RIIO-ED1 and RIIO-ED2 with MEAV as explanatory variable. CAI Vehicles and Transport: We propose assessing CAI Vehicles and Transport together with Non-Operational Capex and using MEAV as a driver with RIIO-ED1 and RIIO-ED2 data (see Vehicles and Transport).

Rationale for consultation position

7.385 Different to RIIO-ED1, for RIIO-ED2 we simplified the approach and assessed CAI costs all together (excluding Vehicles and Transport). In line with RIIO-T2, we consider that, compared to the RIIO-ED1 approach, a more aggregate level of analysis better accounts for potential reporting inconsistencies across DNOs. Differences in reporting, as well as in the composition of CAI activities and operating environment, are also the reason we did not consider other sectors (eg transmission and gas distribution) or DPCR5 data in our analysis.

7.386 Similar to RIIO-ED1, we propose to assess CAI costs through regression analysis. We propose to use MEAV as a driver, which reflects scale and complexity of the network asset base, and to use RIIO-ED1 and RIIO-ED2 data to exploit a larger dataset and avoid relying on forecast data only. To account for cost variation over time not captured by MEAV, we included two linear time trends, one for historical data and one for forecast data. For the results of our regression analysis, see Appendix 10.

7.387 For Vehicles and Transport CAI costs, we consider the RIIO-ED1 approach suitable for use in RIIO-ED2. For more details on the proposed approach, see Vehicles and Transport.

Table 65 CAI modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	404	327	-77	-19%
NPgN	289	235	-53	-18%
NPgY	332	277	-55	-17%
WMID	456	374	-83	-18%
EMID	476	392	-85	-18%
SWALES	232	193	-39	-17%
SWEST	342	261	-81	-24%
LPN	437	399	-37	-9%
SPN	405	364	-41	-10%
EPN	693	600	-93	-13%
SPD	366	317	-49	-13%
SPMW	360	310	-50	-14%
SSEH	346	270	-76	-22%
SSES	634	499	-136	-21%
Total	5,773	4,817	-956	-17%

Consultation questions

Core-Q102. Do you agree with our approach to assessing CAI costs?

Business Support

Background

7.388 Business Support Costs (BSCs) are the indirect operating costs that are required to support the DNOs overall business, such as corporate governance arrangements. For RIIO-ED2, BSCs fall into the following categories:

- Core Business Support, comprising of Human Resources and Non-Operational Training, Finance and Regulation, Insurance, Fines and Penalties, and Chief Executive Officer (CEO)
- IT & Telecoms
- Property Management

7.389 At RIIO-ED1, we grouped all categories but IT & Telecoms and used MEAV ratio benchmarking for the assessment at the company group level. For IT & Telecoms costs, we relied on a combination of ratio benchmarking and expert review.

Consultation position

Cost area	Consultation position
Business Support Costs	Core Business Support: We propose to use a regression analysis based on 13 years of data – RIIO-ED1 and RIIO-ED2 with MEAV as explanatory variable. IT & Telecoms: We propose assessing these costs together with operational and non-operational IT & Telecoms capex using MEAV ratio benchmarking on RIIO-ED1 and RIIO-ED2 data (see Operational, Non-Operational and Business Support Information Technologies and Telecommunications (IT&T) Costs). Property Management: We propose assessing these costs together with Non-Operational Property costs, using MEAV ratio benchmarking on RIIO-ED1 and RIIO-ED2 data (see Property).

Rationale for consultation position

7.390 For RIIO-ED2, we followed a similar approach to RIIO-ED1 and assessed most BSC categories (Core BS) together, with IT & Telecoms assessed separately. Compared to the other categories, IT & Telecoms costs entail a high level of fixed costs. Moreover, these costs are expected to increase substantially over RIIO-ED2 due to investments in data and digitalisation. As such, we consider these costs are better assessed together with Non-Operational and Operational IT & Telecoms capex (for details see Operational, Non-Operational and Business Support Information Technologies and Telecommunications (IT&T) Costs). As for Property

Management costs, although at RIIO-ED1 they were assessed together with the other BSC categories, for RIIO-ED2 we deemed more appropriate to assess these costs separately with the Non-operational Property activity (for details see Property).

7.391 Different to RIIO-ED1, we propose to assess Core Business Support costs through regression analysis using MEAV as a driver, which reflects scale and complexity of the network asset base. The use of regression analysis is in line with the approach taken for RIIO-T2. In a similar vein, we did not attempt any cross-sector analysis for BSCs, as comparability concerns were raised when developing the approach for the other RIIO-2 price control.

7.392 This approach is analogous to what we implemented for the RIIO-T2 price control. We propose to use RIIO-ED1 and RIIO-ED2 data to exploit a larger dataset and avoid relying on forecast data only. For the same reason, we propose to assess costs at the DNO level, not at the company group level. Moreover, to account for cost variation over time not captured by MEAV, we included two linear time trends, one for historical data and one for forecast data. For the results of our regression analysis, see Appendix 10.

Table 66 Business Support modelled costs (£m, 2020/21 prices)

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
	£m	£m	£m	%
ENWL	256	208	-49	-19%
NPgN	140	114	-26	-18%
NPgY	164	136	-27	-17%
WMID	224	183	-40	-18%
EMID	227	187	-40	-18%
SWALES	115	96	-19	-17%
SWEST	188	144	-44	-24%
LPN	171	156	-15	-9%
SPN	157	141	-16	-10%
EPN	258	223	-35	-13%
SPD	190	165	-25	-13%
SPMW	179	154	-25	-14%

DNO	RIIO-ED2 submitted	RIIO-ED2 modelled	Difference	Difference
SSEH	184	143	-41	-22%
SSES	311	244	-66	-21%
Total	2,762	2,294	-468	-17%

Consultation questions

Core-Q103. Do you agree with the proposed assessment approach for Business Support costs?

Streetworks

Background

7.393 Streetworks relate to activities that enable and support works in the public domain, such as permits and inspections relating to working in the highway and in footpaths. The costs associated with streetworks result from complying with traffic management legislation, which is designed to ease congestion and disruption to the road network and establish conditions and requirements during DNO activities. Some DNOs also incur lane rental costs, which are levied by highway authorities for occupation of the busiest streets at the busiest times.

7.394 Streetworks costs have historically impacted DNOs differently due to local authorities having introduced permit and lane rental schemes at different rates, leading to some DNOs operating in regions that are more heavily permitted than others. Furthermore, permit and lane rental charges can vary substantially between local authorities, limiting the suitability of streetworks for comparative benchmarking.

7.395 At RIIO-ED1, we assessed permit and lane rental activities by comparing historical and forecast volumes and unit costs. Allowances were determined based on the lower of historical and forecast annual average rates for each DNO.

Consultation position

Cost area	Consultation position
Streetworks	We propose to use each DNO's recent streetworks costs to model their future spend, with reference to the trend in the underlying activity volumes driving streetworks activity. Since this approach does not involve benchmarking across the sector, we propose to

	apply a ratchet mechanism that selects the lower of DNO-submitted and modelled costs for future years.

Rationale for consultation position

7.396 We considered applying the RIIO-ED1 approach for RIIO-ED2. However, we recognise that streetworks is an emerging area of spend for many DNOs and is therefore likely to look different in future years compared to the earlier years of RIIO-ED1. Furthermore, as permit and lane rental charges can vary substantially between local and highway authorities, we do not think streetworks is appropriate for comparative benchmarking between DNOs.

7.397 To deal with this lack of comparability over time and between DNOs, we modelled each DNO's future streetworks costs using a trend of the underlying activity volumes that drive streetworks costs with reference to an average base year of streetworks costs for each DNO.[237] In establishing a base year, we struck a careful balance between using the longest possible historical time-period while excluding earlier years that may not capture streetworks schemes that were introduced recently. In doing so, we also considered the impact of Covid-19 and determined that its impact on streetworks costs was negligible. We have set a base year for each DNO equal to the average annual costs between 2019 and 2021.

7.398 We excluded costs for fines and penalties from our calculation of base year costs, as we think these costs are within DNOs' control and are levied by highway authorities due to failure by a DNO or its contractors to comply with agreed permit conditions. These conditions are in place to ensure sites are managed safely and effectively and there must be a strong incentive on DNOs to comply with these requirements. We also consider that the cost to comply with such legislative requirements is already reflected in base funding, and to provide further funding would constitute a double-count.

7.399 We have not applied regional or company-specific factor pre-modelling adjustments, since our assessment approach does not involve comparative benchmarking between DNOs.

7.400 We applied a ratchet mechanism to RIIO-ED2 costs, which selects the lower of DNO-submitted and Ofgem-modelled streetworks costs. We think this is

[237] We have calculated a composite growth trend based on a weighted average of Connections, LRE and NOCs volumes, specific to each DNO. Each DNO's average base year streetworks costs have then been rolled forward into future years based on this growth trend.

appropriate given that we are not modelling streetworks costs based on a sector benchmark, so where a DNO's own cost forecast is below our view of modelled future costs, we have selected the former.

Consultation questions

Core-Q104. Do you agree with our approach to assessing streetworks costs?

Non-controllable Costs

7.401 We propose to accept in full all submitted non-controllable costs.

Post Modelling Adjustments

Demand Driven Adjustment

Background

7.402 Our totex and disaggregated benchmarking use the DNOs' Business Plan forecasts of load growth eg units distributed, peak demand, LCT uptake. The regression models employed for the totex benchmarking should control for differences in these variables across DNOs, through their inclusion as independent, explanatory variables. While the disaggregated models attempt to adjust DNOs' forecast workload activity to an efficient view of workload activity given their respective demand forecasts and LCT uptake projections.

7.403 Our Uncertainty Mechanism package for LRE and specifically the proposed LRE volume driver, discussed in Chapter 3, aims to manage the risks associated with under or overprovision of allowances, as it is designed to flex allowances up and down based on actual outturn demand growth as a result of LCT uptake. However there remains a risk to consumers that DNOs that have submitted the most ambitious load plans and scenarios are provided with inflated baseline allowances if the forecast level of growth does not materialise, especially in light of the concerns highlighted by our analysis of the plans as described in Chapter 3. It is in consumers' interests to maintain lower costs where possible, and as such it is in our view preferable to set a lower, more conservative, baseline allowance that flexes up, than having to flex allowances down for large sections of the sector.

Options Considered

7.404 We have considered options for how we might vary the level of demand growth that is funded through the baseline allowances we set, mitigating the risk of inflated baseline allowances, and ensuring consumers are protected. Our totex benchmarking models provide elasticities of the variation in spend to the change in scale and demand drivers, eg a 1% change in MVA released or a 1% change in LCT additions results in a corresponding percentage change in totex requirement. Thus, in principle modelled elasticities in the regressions could be used to fund DNOs on alternative baseline demand forecasts.

7.405 The three options that we have considered are:

- Option 1 – Reduce DNO demand driver forecasts by agreed percentage to give an alternative set of demand drivers.
- Option 2 – Identify an appropriate alternative growth scenario (eg FES System Transformation) from which to calculate an alternative set of demand driver forecasts.
- Option 3 – Identify an appropriate alternative baseline scenario and calculate a corresponding set of cost driver forecasts (all drivers, not just demand drivers).

Proposed Approach

7.406 Option 1 requires identifying a percentage reduction in demand drivers, which requires careful analysis and consideration. It is important to ensure that the chosen reduction is both internally consistent and justifiable taking into account the potential pathway for each DNO region. There is a risk that any reduction is considered arbitrary and without empirical justification.

7.407 Option 3 requires substantial analysis to determine the appropriate adjustment to scale and asset related variables such as MEAV, which corresponds to the reduction in demand drivers. While there is stronger empirical evidence for a consistent reduction in the drivers that are applied to calculate the funded totex allowance, it is our view that the impact of the other drivers on totex is secondary compared to the impact that the demand driver adjustment has on totex.

7.408 While Option 2 is likely to result in a more conservative adjustment compared to Option 3, it is our view that this approach represents the most simple and intuitive approach to adjusting totex using an adjusted forecast of demand drivers.

7.409 The approach we have taken to implement this option is set out as follows:

- Step 1: Estimate totex Model 3 using DNO forecasts of drivers, to obtain cost elasticities with respect to each driver (from the estimated regression coefficients) and a set of modelled (predicted) totex.
- Step 2: Use alternative FES System Transformation[238] forecasts of EV[239] and HP uptake.
- Step 3: Use the estimated elasticities from Step 1 in combination with the FES System Transformation view of the cumulative size of EV charger additions and cumulative number of HP additions.
- Step 4: Calculate the % difference between the RIIO-ED2 modelled totex from Step 1 and Step 3 to obtain the appropriate % reduction for the post-modelling adjustment.
- Step 5: Apply this post-modelling adjustment to totex Model 1, 2 and 3 and the LRE component of Disaggregated Model 4.

Testing the Size of Adjustment

7.410 We have carried out analysis to test and provide assurance on whether the size of the demand driven adjustment is necessary in the context of RIIO-ED2. This included but was not limited to:

- Comparing the size of the proposed adjustment by DNO, with what might have been expected as a result of our qualitative and engineering review.
- Comparing total DNO allowances including the demand driven adjustment in RIIO-ED2 to total outturn/forecast spend in RIIO-ED1.
- Comparing the run rate of totex by DNO in RIIO-ED1 and RIIO-ED2 including the demand rebasing adjustment.
- Comparing the demand driven adjustment by DNO to the "step change" in totex and expenditure areas that DNOs have said demand has impacted their BP forecasts, eg LRE and CAI.

7.411 Overall, the results from these tests and the total proposed demand driven adjustment to RIIO-ED2 allowances appear consistent with the step change on LRE that we have observed relative to RIIO-ED1 outturn/forecast spend.

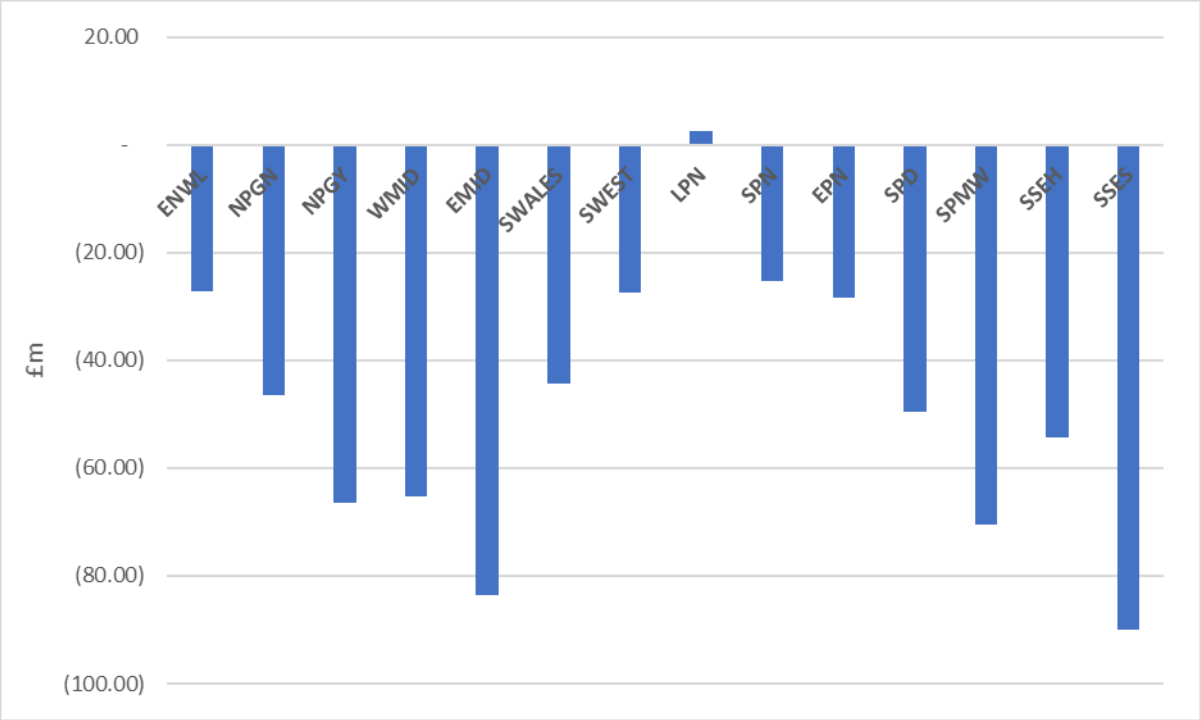
[238] Downloadable Future Energy Scenarios resources | National Grid ESO
[239] Note: DNO-specific EV to charger ratios and assumed charger size are used to infer the cumulative size of EV chargers corresponding to the regionalised FES System Transformation forecasts of EVs.

Summary of Demand Driven Adjustment

7.412 The process results in a reduction in RIIO-ED2 totex of approximately 3% on average. This post-modelling adjustment impacts some DNOs, in particular WPD, SSEN and NPg networks, more than others.

7.413 Figure 19 below provides a summary of demand driven adjustments by DNO.

Figure 19: Summary of demand driven adjustments by DNO (£m, 2020/21 prices)



Consultation questions

Core-Q105. Do you agree with our proposal to carry out a demand driven post-modelling adjustment?

Quality of Service Adjustment

Background

7.414 We expect DNOs to deliver high quality services that meet customers' needs and we set baseline allowances to reflect this. As was the case in RIIO-ED1, we do not set specific ex ante allowances for Quality of Service (QoS). Instead DNOs receive financial incentives if they perform well against their Customer Interruption (CI) and Customer Minutes Lost (CML) targets set under the IIS. As detailed in Chapter

6 of the Core Methodology, our proposed approach on IIS in RIIO-ED2 means that CI and CML targets will be based on a DNO's individual average performance, taking into account company specific circumstances.

7.415 While we do not set specific ex ante allowances for QoS, we do undertake a robust Business Plan assessment and cost benchmarking exercise to set baseline allowances for areas that directly and indirectly impact performance against reliability outputs, such as Asset Replacement, Faults and Occurrences Not Incentivised (ONIs). This level of baseline funding is expected to enable DNOs to maintain their performance levels against their outputs, while the IIS incentivises improvements in performance.

7.416 There are different aspects to quality of service and there are several service metrics that could fall under a broader quality of service measure. These include but are not limited to Customer Satisfaction (CS), Customer Complaints (CC) and CIs and CMLs as discussed above.

7.417 Through the CAWGs one DNO has argued that companies are required to deliver ever increasing standards of service, which are reflected in output targets, licence conditions and legislation, and that the requirement to deliver higher service requires higher expenditure.

7.418 It was reasoned that quality of service is a cost driver ie higher quality comes at higher costs, and that as such it can help to explain variation in cost areas across DNOs and reduce the risk that the cost assessment may falsely attribute forecast cost variation between DNOs as scope for catch-up efficiencies. It was proposed that accommodating quality of service within the scope of the cost assessment will ensure companies are appropriately funded and incentivised to deliver the quality of service they forecast.

7.419 It was also noted the cost-quality interaction was an issue that has received considerable attention in the water sector, including PR19 (and subsequent appeals to the CMA) and more recently in Ofwat's early consultations on its cost assessment approach for PR24.[240,241]

[240] Ofwat (2021): 'Assessing base costs at PR24'

[241] At the PR19 appeals, the CMA considered but rejected the use of performance variables in econometric models, on the basis that they are under management control, while accepting the need for off-model adjustments for leakage. Ofwat's recent PR24 consultation considers how it may approach questions of what level of performance its PR24 base cost modelling is considered to provide ('what does base buy') and what level of cost adjustments may be necessary if the performance commitment level of a particular company differs from what is assumed to be funded in the base cost assessment.

Options Considered

7.420 Through our CAWGs, the following options were discussed and considered:

- Option 1 – Do nothing
- Option 2 – Control for quality of service within econometric models
- Option 3 – Pre-modelling adjustment
- Option 4 – Post-modelling adjustment
- Option 5 – Calibration of output targets

7.421 It was argued by one DNO in the CAWG that Option 1 would risk distorting cost allowances and incentives for high performance, and for some DNOs may result in an unachievable challenge from the price control should there be a funding gap between the cost allowances and the output targets proposed for RIIO-ED2.

7.422 With Options 2 and 3 there is a risk that model accuracy will deteriorate and as the CMA identified in the appeals on PR19, there is an endogeneity issue as the quality of service drivers are within company control. Option 4 is difficult to quantify and risks overlapping with ODIs.

7.423 Option 5, where output targets can be DNO specific and set at a level to avoid any funding gap, is likely easier to implement than Options 2 to 4, but this approach may risk the price control only supporting existing performance rather than incentivising improvements over time.

7.424 While the majority of DNOs at the CAWG agreed that the demand for higher standards was increasing and that there were cost implications associated with this, there were mixed views on how this should be approached in RIIO-ED2. One DNO noted that this challenge had been considered in previous price controls, but there was significant complexity in assessing the cost allowances required for meeting or maintaining specific quality of service standards.

Proposed Approach

7.425 While understanding of the challenge and link between quality of service and cost allowances, it is our view that the issue is addressed by our overall approach to cost assessment and the calibration of performance targets. As discussed, we undertake a robust Business Plan assessment and cost benchmarking process to set ex ante allowances for areas that directly and indirectly impact DNOs' ability to deliver their outputs. In addition, for the IIS, we set company specific targets based on individual average performance, which means that no DNO will start

RIIO-ED2 in a position where they are in penalty territory, ie under-delivering against their outputs.

7.426 As noted, there is significant complexity in determining the cost allowances required to meet or maintain a specific quality of service standard, made more challenging by the fact that companies can improve outcomes without incurring additional costs, if they are able to make efficiency gains over time. While there are links here to Ongoing Efficiency, discussed in more detail later in this Chapter, the key point is that the cost-quality relationship is highly complex to quantify. Low quality may be associated with low cost, ie it is cheaper to deliver low quality, but low quality may also be associated with high cost ie it is inefficient to maintain low quality (if it triggers costly repairs, customer engagement etc). There are also dynamic or lagging effects to consider, in that low cost today may lead to low quality in future price controls rather than the current one.

7.427 The lack of exogenous cost drivers that reflect quality of service also poses a significant challenge, not least the risk of distorting our overall benchmarking.

7.428 As such, at this stage, we are not proposing to implement any pre, within, or post modelling adjustments to account for any perceived funding gap associated with the cost and quality of service link. We consider, on balance, that this is the appropriate approach on the basis that:

- while the cost-quality relationship has been articulated conceptually, we have yet to be provided with quantitative data and justification that individual DNOs' historical and forecast costs are necessarily consistent or inconsistent with performance targets expected from the sector in RIIO-ED2.
- as highlighted during the CAWG, there are considerable practical challenges and complexities with integrating quality of service with the cost assessment using post modelling adjustments. This means there are risks the size of any post modelling adjustment would lack objective justification.[242]
- we have used forecast Business Plan data in setting proposed performance targets and cost baselines for the RIIO-ED2 period. We consider this reduces the risk the price control may be distorted or overly challenging in its assumptions of the cost and service quality relationship, given the relative level of ambition companies have accommodated within their plans.

[242] For example, the expected marginal cost for a change in service quality.

7.429 We propose to continue working with stakeholders through the CAWGs on this issue ahead of Final Determinations. Specifically, we would welcome evidence on any perceived funding gap between the allowances that companies are set and the outputs they are expected to deliver.

7.430 There is potential for an asymmetric risk to consumers here in that DNOs may seek an upwards adjustment where they identify and evidence a funding gap.

7.431 We consider that the onus is on DNOs to justify their case for any proposed adjustments, and we propose to set a high evidential bar for accepting any cost adjustment claims. The high evidence bar is appropriate in that there exists an asymmetric risk to consumers here in favour of companies, similar to that of the Regional and Company Specific Factors process. As such, in the qualification and quantification of this issue, it is our view that there should be some consideration in line with the following principles:

- We do not expect to consider claims that are not materially significant enough to warrant an adjustment.
- The effect is not already captured in our benchmarking.
- There is sufficient variation between DNOs in terms of targets/ambition.

Consultation questions

Core-Q106. Do you agree with our proposal to not carry out any Quality of Service based adjustments?

Combining Models and Efficiency Challenge

Background

7.432 The allowances we set are for an efficiently operating network, consistent with our duties to protect consumers. At RIIO-ED2, we have assessed the efficiency of DNO costs on a gross basis (ie including customer contributions) given the different levels of costs recovered from third parties by different DNOs. Since totex allowances are set on a net basis (ie excluding customer contributions), we convert the modelled costs from each of our cost models from gross to net before combining the results and applying efficiency adjustments. We convert a DNO's modelled costs from gross to net based on the ratio of the two for each activity as reported in their Business Plan.

7.433 We benchmark the efficient level of totex for each DNO based on a notional level of efficiency across the sector, which we set above the sector average to challenge relatively less efficient DNOs to catch up to the most efficient DNOs in the sector.

7.434 In RIIO-ED1, we set our efficiency benchmark (catch-up efficiency) at the upper quartile, or 75th percentile, level.[243] In RIIO-GD2, we included a glide path that increased the efficiency benchmark from the 75th percentile to the 85th percentile over the first three years. Our decision to introduce an efficiency glide path from the 75th to the 85th percentile in RIIO-GD2 was unsuccessfully appealed to the CMA, which noted that the choice of the efficiency benchmark is context specific and subject to regulatory discretion.[244]

7.435 At RIIO-ED1, we applied the efficiency benchmark after combining our individual benchmarking models but before we applied ongoing efficiency. At both fast-track and slow-track, we combined our totex and disaggregated (activity-level) benchmarking models based on an equal weighting across both streams. This resulted in our two totex models being weighted at 25% each and our disaggregated model being weighted at 50%.

Options Considered

7.436 For RIIO-ED2, we have considered several options for weighting and combining the various models, including the RIIO-ED1 approach. As discussed in the previous sections, the integrated nature of totex benchmarking can help account for cost complementarities and trade-offs between activities, and potential reporting inconsistencies between DNOs. Disaggregated, or activity-level, benchmarking can complement totex benchmarking by enabling a more targeted assessment of individual activities in isolation.

7.437 We have also considered several options in regard to the efficiency benchmark, including maintaining the RIIO-ED1 approach of setting the efficiency benchmark at the 75th percentile, and adopting the RIIO-GD2 approach of setting the efficiency benchmark using a glide path from the 75th to the 85th percentile over a three-year period.

[243] In RIIO-ED1 we calculated the efficiency scores on submitted and modelled costs using the RIIO-ED1 forecast period only. Historical performance/costs were not included in the efficiency score calculations, although historical costs were included in the regression model specification.

[244] https://assets.publishing.servicegov.uk/media/617fd092d3bf7f5604d83de4/ELMA_Final_Determination_Vol.3.pdf, p.125.

7.438 When combining our models and applying the efficiency benchmark, it is important that we do so on a consistent basis. At RIIO-ED2, our disaggregated modelling utilises substantial direct technical input from our separate engineering assessments. Furthermore, as discussed in the Disaggregated Benchmarking chapter, the granular nature of disaggregated benchmarking presents a risk that genuine differences in business strategies and/or cost allocation are interpreted as differences in efficiency.

7.439 As a result, the costs that are outputted from our disaggregated modelling are likely to already capture a degree of cost efficiency, rather than representing a pure sector-average view as is the case for the outputs from our totex models. We have therefore considered the appropriateness of applying an efficiency benchmark to disaggregated modelled costs, or stated differently, whether the modelled costs produced by our disaggregated model should be combined with our totex models before or after applying the efficiency benchmark.

Proposed Approach

7.440 As per our approach at RIIO-ED1, we think that totex and disaggregated benchmarking approaches are different in nature but mutually complementary, since they seek to capture different characteristics of the DNOs' Business Plans. We have therefore weighted both streams equally to calculate our combined view of modelled costs for RIIO-ED2 - ie applying a combined 50% weighting on our three totex models and a 50% weighting on our disaggregated model, as detailed below:

- Totex model 1: 16.67%
- Totex model 2: 16.67%
- Totex model 3: 16.67%
- Disaggregated model: 50.00%

7.441 As per our approach at RIIO-GD2, we propose to adopt an efficiency benchmark at RIIO-ED2 that includes a linear glide path from the 75th to the 85th percentile over the first three years. The following factors have supported our choice of efficiency benchmark:

- Our proposed approach for RIIO-ED2 is consistent with our approach in the gas distribution sector.
- The DNOs have now been operating under a totex-based price control for two price review cycles (ie over 10 years). This increases our confidence that

DNOs have had the opportunity to adapt their businesses to this alternative framework and that differences in cost performance revealed through our benchmarking can increasingly be attributed to genuine differences in efficiency.

- When the benchmark is calculated on the basis of the weighted average of efficiency scores across our three totex models, the difference between the 75th and 85th percentile benchmark is relatively small, particularly when applied as a glide path to the 85th percentile.
- We have benchmarked the DNOs' plans using a range of models, including models that include capacity released as a cost driver. This means that our models take account of the reinforcement requirements individual DNOs have indicated are needed in their Business Plans and which may reflect factors that can be challenging to control, eg degree of network utilisation or characteristics of individual distribution areas, in a relatively small data set.

7.442 To ensure that our efficiency benchmark is applied consistently, we have applied it to our three totex modelled costs but not to our disaggregated modelled costs, which we consider already capture a sufficient degree of DNO cost efficiency given the substantial technical input into our disaggregated modelling stream. Moreover, by not computing a catch-up efficiency challenge based on disaggregated modelling results, we also reduce the risk of interpreting differences in business strategies and/or cost allocation approaches as differences in efficiency.

7.443 We calculated an average efficiency benchmark, including a glide path, based on an unweighted average of our three totex models.[245] This average efficiency benchmark is then applied consistently to the modelled costs produced by all three totex models. Note that we will further consider the appropriateness of applying the efficiency benchmark to our disaggregated modelled costs ahead of Final Determinations, and welcome stakeholders' views on the appropriateness of doing so.

7.444 In terms of combining our models, our approach to applying the efficiency benchmark at Draft Determinations means that we are essentially combining our three totex models ahead of applying the efficiency benchmark, following which we incorporate our disaggregated modelling results.

[245] The combined efficiency benchmark represents the average efficiency benchmark across all three of our totex models, including a glide path from the 75th to the 85th percentile, with each receiving a weighting of 1/3.

Consultation questions

Core-Q107. Do you agree with our approach to combining our totex and disaggregated benchmarking models?

Core-Q108. Do you agree with our approach to setting and applying the efficiency challenge using a glide path between the 75th and 85th percentile over a 3-year period?

Real Price Effects and Ongoing Efficiency

Real Price Effects (RPE) and ongoing efficiency	
Purpose	We set price control allowances that are indexed to a general inflation measure (Consumer Prices Index including owner occupiers' housing costs (CPIH)), which is a consumer-focused index. To the extent that CPIH does not adequately capture changes to prices that network companies face, we may make further adjustments to allowances. We refer to these adjustments as RPEs. Ongoing efficiency reflects the productivity improvements that we consider even the most efficient company can achieve.
Benefits	Setting a suitably stretching ongoing efficiency challenge ensures value for money for consumers, while RPEs allow company revenues to reflect material external cost fluctuations.

Background

7.445 In our SSMD[246] we set out our decision on RPEs to:

- Index RPEs in RIIO-ED2, as opposed to setting an ex ante allowance.
- Set a high materiality threshold and a high evidence bar for RPEs.
- Compare a wide range of indices to ensure that we accurately measure DNOs' variation in input prices.
- Further develop our proposal to use a notional cost structure and its appropriate cost input and expenditure categories through the CAWG.

7.446 On ongoing efficiency we:

- Stated our intention to use a wide range of evidence for setting our ongoing efficiency assumption in RIIO-ED2, including a growth accounting approach using the EU KLEMS[247] database.

[246] SSMD Annex 2, pg.31-2 riio_ed2_ssmd_annex_2_keeping_bills_low.pdf
[247] EU KLEMS: capital (K), labour (L), energy (E), materials (M) and service (S) inputs.

- Would consider the feedback received on the key aspects of our ongoing efficiency methodology in response to our SSMC when setting our ongoing efficiency assumption.
- Emphasised our expectation that companies should submit ambitious ongoing efficiency assumptions in their Business Plans.

Approach to assessment

7.447 We commissioned consultants (CEPA) to undertake a full assessment of evidence, including company Business Plan submissions, and provide a report with recommendations for RPE indices and ongoing efficiency assumptions. Details of CEPA's analysis and approach to assessing ongoing efficiency and RPEs can be found in CEPA's 'RIIO-ED2: Cost Assessment - Frontier Shift methodology' paper.

7.448 We think that the methodological approaches set out in CEPA's paper are appropriate to determine RPEs and ongoing efficiency. Therefore, these are our preferred approaches for RIIO-ED2 and have been applied to establish our proposed RPEs and ongoing efficiency assumptions for all network companies.

Consultation position

Output parameter	Consultation position
RPEs	Include adjustments for RPEs for all network companies based on forecasts of input price indices in upfront allowances. "True up" RPE adjustments annually based on out-turn differences between CPIH and input price indices.
Ongoing efficiency	Apply an ongoing efficiency challenge of 1.2% per year for totex for all network companies.

Rationale for consultation position

RPEs

7.449 We have carefully considered CEPA's report and think that both the approach taken to assess the case for RPE adjustments, and methodology for calculating the size and coverage of those adjustments, is appropriate.

7.450 The analysis that CEPA has undertaken identified several RPE adjustments that meet our selection criteria for DNOs. CEPA's analysis considered both the case for RPE adjustments and aspects of implementation of those adjustments through a four-stage process, covering:

- Stage 1: The determination of input cost structures.
- Stage 2: A materiality assessment.
- Stage 3: Selection of appropriate indices for each cost category.
- Stage 4: Developing forecasts for the indices.

7.451 We propose to apply the resulting RPEs to the notional cost structure proposed in CEPA's report. For the purposes of Draft Determinations, we have used CEPA's calculated cost shares based on the cost structures submitted by DNOs in the final version of the Business Plan Data Templates in March 2022.

7.452 In setting an RPE indexation mechanism that balances accuracy in reflecting DNO cost pressures with simplicity of application, we agree with the approach of applying indexation to cost areas where there is evidence that DNOs' input prices will track materially above or below CPIH over RIIO-ED2, and on input costs that satisfy a high materiality threshold. We think that a two-stage materiality test that involves consideration of the materiality of the cost category (as a share of totex) as well as the sensitivity of costs to different assumptions about trends in input prices (relative to CPIH) provides a basis for assessing the need for RPE adjustments.

7.453 Having reviewed CEPA's analysis, we propose to apply RPE adjustments to the cost categories of labour (general and specialist) and materials for all companies. We propose the input price indices recommended by CEPA to determine RPE adjustments as set out in Table 67.

7.454 CEPA has produced forecasts of these indices and has used these forecasts to determine forecasts of RPE adjustments (in percentage terms) in each cost category. The forecast for each RPE input price index is:

- AWE Private Sector Index: the difference between Ofgem's CPI forecast used in the RIIO-ED2 PCFM and the OBR's March 2022 average earnings growth forecast for the years in which those are available, and 1.0% thereafter based on the long-term average historical RPE.
- All other price indices: the long-term historical average RPE over the period 2000 - 2020.[248]

[248] Excluding RPEs from 2009/10, 2010/11 and 2020/21 as these years are affected by the Global Financial Crisis and Covid-19.

7.455 CEPA then applied an unweighted average to the RPEs for the indices in each category to produce forecast composite RPEs for each category. These category-level RPEs are then weighted by the notional cost structure to produce the totex-level RPE.

Table 67 Proposed RPE input price indices and weightings

Index	Weightings
Labour costs (general and specialist)	100%
AWE: Private Sector Index: Seasonally Adjusted Total Pay Excluding Arrears (K54V)	33%
4/CE/01 Civil Engineering Labour	33%
BEAMA Electrical engineering labour	33%
Materials costs	100%
3/58 Pipes and Accessories: Copper	25%
3/59 BCIS PAFI Pipes and Accessories: Aluminium	25%
3/S3 Structural Steelwork - Materials: Civil Engineering Work	25%
FOCOS Resource Cost Index of Infrastructure: Materials	25%

7.456 Table 68 below sets out current RIIO-ED2 RPE forecasts following an application of the indices and weightings set out in Table 67, to our proposed notional cost structure.

Table 68 RIIO-ED2 RPE forecasts

Category	Weighting	2023/24	2024/25	2025/2026	2026/27	2027/28
Labour	63%	0.4%	1.0%	1.0%	1.0%	1.0%
Materials	25%	1.6%	1.6%	1.6%	1.6%	1.6%
Totex[249]	-	0.7%	1.0%	1.0%	1.0%	1.0%

7.457 We will update these forecasts ahead of our Final Determinations to take account of new information that may become available in the interim.

7.458 Under our proposed approach, we will include our forecast RPEs in upfront allowances with an ex-post true-up based on out-turn CPIH and input price indices, once they become available. This will be undertaken as part of our Annual Iteration Process (AIP).

[249] The other 12% of the weighting represents costs which are not subject to RPE indexation.

Ongoing Efficiency

7.459 We are proposing to set DNOs an ongoing efficiency challenge of 1.2% for totex. This represents the productivity increases we expect even the most efficient DNO to deliver, year on year during the RIIO-ED2 price control.

7.460 We expected companies to include an assumption for ongoing efficiency within their Business Plans and to evidence how this assumption has been derived. Companies submitted ongoing efficiencies separately from their forecast costs. The DNOs submitted a range of ongoing efficiency assumptions in their Business Plans. WPD, SPEN and NPg were the least ambitious with 0.5%, SSEN proposed 0.7%,[250] while UKPN[251] and ENWL indicated 1% for totex.

7.461 We commissioned CEPA to carry out analysis, consider the available evidence and present a range for the ongoing efficiency challenge that reflects the cost savings from efficiency and productivity gains which we consider even the frontier company should be able to achieve during the RIIO-ED2 period. We have used CEPA's analysis in arriving at our own judgement on the ongoing efficiency challenge proposals.

7.462 In its analysis, CEPA considered evidence from a range of sources, including:

- growth accounting analysis based on a review of the EU KLEMS database
- forward-looking productivity forecasts for the UK economy
- the DNOs' Business Plan submissions to understand their proposed rationale and estimates of their scope to achieve ongoing efficiencies, including with respect to innovation funding received during RIIO-ED1
- other recent regulatory determinations and decisions in Great Britain and Northern Ireland.

7.463 CEPA calculated historical Total Factor Productivity (TFP) figures from data sourced from the 2019 EU KLEMS database, covering both 1995-2016 and alternative periods based on various business cycle definitions. CEPA calculated both Value Added (VA) and Gross Output (GO) measures of TFP, with VA

[250] SSEN states that it has adopted an ongoing efficiency assumption of 0.7% per annum (SSEN (Dec 2021) RIIO-ED2 Business Plan Annex 15.1, p17). But calculated on a like-for-like Compound Annual Growth Rate (CAGR) basis (ie the mean annual growth rate over five years) with other network companies, the Business Plan Data Templates provide an average ongoing efficiency assumption of 0.97% per annum (CEPA analysis of SSEH and SSES Business Plan Data Templates).

[251] UKPN states that it has adopted an ongoing efficiency assumption of 1.0% per annum (UKPN (Dec 2021) RIIO-ED2 Business Plan 2023–2028, p184). But calculated on a like-for-like CAGR basis with other network companies, the Business Plan Data Templates provide an average ongoing efficiency assumption of 1.4% per annum across the RIIO-ED2 period (CEPA analysis of EPN, LPN and SPN Business Plan Data Templates).

measures recording higher growth rates than GO. CEPA considers that the growth accounting analysis of EU KLEMS data to inform a totex challenge should use both GO and VA productivity metrics for TFP. This approach is consistent with the evidence base which CEPA used in its advice to Ofgem ahead of RIIO-GD2/T2, by the CMA in the RIIO-GD2/T2 appeals, and Ofwat and the CMA for PR19. CEPA's report presents the unweighted average TFP figures for two different comparator sets alongside the weighted average of a wider group of industries.

7.464 We remain of the view, as set out in our SSMD,[252] that a growth accounting approach to ongoing efficiency using the EU KLEMS database is a useful source of information on productivity trends in the UK. While this approach is well-established and benefits from a strong regulatory precedent, we recognise that there are limitations in any approach that relies exclusively on analysis of historical productivity growth rates to set the potential for productivity growth over future periods. On that basis, we have considered a range of factors in coming to the proposed ongoing efficiency challenge for RIIO-ED2, including:

- The clear ambition to deliver transformational change in the electricity distribution sector over the RIIO-ED2 period, which may provide additional opportunities for productivity growth in RIIO-ED2 above and beyond what has been set in the past or what has been set in other regulated sectors.
- The potential for both embodied and disembodied technical change; taking into consideration that (GO-based) TFP growth rates calculated from the EU KLEMS database may underestimate the total potential for cost savings that can be achieved by network companies when quality improvements in the factor inputs are considered.
- The time period taken into account in the EU KLEMS analysis, which includes the period of slower UK productivity growth since 2009. However, we do not consider that there is strong evidence to suggest that the slowdown in wider productivity growth since the Global Financial Crisis should fully impact on the potential for ongoing productivity gains in RIIO-ED2.
- The reliance on and relevance of forward-looking, economy-wide productivity forecasts which are influenced by short-term macroeconomic factors with limited relevance to the potential for ongoing efficiency improvements in RIIO-ED2.
- Noting the DNO Business Plan submissions on ongoing efficiency, which range from 0.5% per annum for the least ambitious companies, up to 1% per

[252] SSMD paragraph 4.35

annum for the most ambitious network companies. We consider that there should be similar scope for frontier efficiency gains in RIIO-ED2 across all the network companies, and there is a basis that the DNOs should at least be able to match the higher level of ambition (1%).

- Considering UK regulatory precedent where growth accounting analysis using EU KLEMS data has been widely used to inform recent regulatory decisions on the ongoing efficiency challenge in different network price controls, with the final challenge applied in such decisions generally clustering around 1% per annum.
- The evidence provided in the DNOs' Business Plan submissions in relation to what extent past innovation funding awarded in previous price controls could lead to further efficiencies beyond those in competitive sectors in RIIO-ED2; and to what extent the efficiencies arising from innovation could already be captured in the comparative benchmarking.

7.465 Based on its analysis of the evidence available, CEPA recommended that we consider three potential reference points for an ongoing efficiency challenge at a totex level (ie consistent across capex and opex):

- 0.5%, consistent with the ongoing efficiency challenge proposed by the least ambitious DNOs, representing a pessimistic outlook for the frontier efficiency improvements possible in RIIO-ED2.
- 1.0%, consistent with the ongoing efficiency challenge proposed by the most ambitious DNOs, representing a relatively stable outlook for the frontier efficiency achievements possible in RIIO-ED2.
- 1.2%, representing a more stretching outlook for the frontier efficiency achievements possible in RIIO-ED2. This would suggest that the average historical TFP growth rates calculated from EU KLEMS significantly underestimate the frontier efficiency improvements that can be achieved in RIIO-ED2 and would be consistent with a belief that in RIIO-ED2 the network companies will be able to achieve efficiencies closer to more dynamic competitive sectors, and that, in the main, such efficiencies will not be captured in the comparative benchmarking process that sets the 'catch-up' efficiency challenge.

7.466 In proposing 1.2%, we have taken account of CEPA's analysis and have further considered the feedback received on the key aspects of our methodology in response to our SSMC. We consider the results and context of the growth accounting analysis, the clear ambition to deliver transformational change in the

electricity distribution sector over the RIIO-ED2 period and the available evidence supports the stretching frontier productivity outlook of 1.2% per annum for RIIO-ED2.

Growth accounting analysis

7.467 CEPA's analysis of UK KLEMS data presents a range of values of historical TFP growth rates, from:

- 0.2% using a GO measure for a narrow comparator set (developed for GD2/T2) and based on various business cycle definitions, to
- 1.2% using a VA measure for an expanded comparator set (developed for RIIO-ED2) and the full time series.

7.468 Though we are not relying on any given figure from the growth accounting analysis, we are placing more weight on the expanded comparator set developed specifically for this price control.

7.469 CEPA's EU KLEMS GO-based TFP analysis is likely to underestimate historical productivity as it only captures disembodied technical change. We consider that embodied technical change (ie related to quality improvements in inputs) is important when setting the efficiency challenge, particularly given the context of technological change anticipated during RIIO-ED2.

7.470 The analysis of the full time period (1995-2016) produced TFP ranges of 0.8% - 1.2% on VA basis or 0.4% - 0.6% on a GO basis, depending on the comparator group used. This period includes the slower UK productivity growth since 2009. We agree with CEPA that this slowdown should not fully impact on the potential for ongoing productivity gains in the energy sector. Any such analysis may therefore underestimate the scope for productivity improvements among the DNOs during the RIIO-ED2 period.

7.471 We note that forward-looking, economy-wide productivity forecasts (such as those produced by the OBR and the Bank of England) are potentially less useful than the EU KLEMS data. This is because they do not cover the whole of the RIIO-ED2 period and are influenced by short-term macroeconomic factors. We consider that the five-year price control framework provides more stability than more competitive sectors of the economy for which such forecasts may be more useful. While we acknowledge the potential impact of Covid-19, Brexit and the Russian invasion of Ukraine, as well as the uncertain outlook for the economy overall, we consider the price control insulates DNOs from these impacts to a certain degree,

given the inflation-linking of allowances plus the indexation of RPEs. In addition, stability is provided by planning horizons that are longer term than many other more competitive sectors of the economy.

Specific context of RIIO-ED2

7.472 The RIIO-ED2 period is set to deliver transformational change in the ED sector. In this context, we are satisfied that there should be more potential to deliver productivity growth beyond that recorded historically.

7.473 For example, the step-up in submitted network company expenditure data and digitalisation presents a significant opportunity for productivity improvements, more akin to the more dynamic sectors of the economy. We are proposing a 14% increase in base allowances from RIIO-ED1, alongside agile and flexible uncertainty mechanisms that can dial up investment further. We expect the high productivity potential in this area to contribute to the scope for improvements in ongoing efficiency during RIIO-ED2.

7.474 In the run-up to this transformational period, DNOs have made use of customer-funded innovation projects since 2010. Our analysis of the BPs suggests that the basis on which the DNOs claim to have embedded cost efficiencies from previous innovation funding is inconsistent. Based on the DNOs' submissions, we have been unable to quantify the extent to which any such efficiencies are already captured to some degree in the comparative benchmarking.

7.475 We also note that such innovation funding has been a longer standing arrangement in the ED sector, compared with, for example, the water sector, which has an OE target of 1%-1.1%[253] with less historical innovation funding.

7.476 The most ambitious DNOs have submitted targets of 1% ongoing efficiency improvements for RIIO-ED2. Given the information asymmetry, we also note that there is an intrinsic incentive for DNOs to submit relatively modest OE targets compared with what they think they can realistically achieve.

7.477 We are satisfied that the available evidence, including the RIIO-ED2 specific factors outlined above, provide a strong basis to support more stretching OE

[253] Ofwat set an Ongoing Efficiency challenge of 1.1% where the PR19 price control package was accepted by most water companies. PR19 was appealed by four companies (Anglia, Bristol, Northumbria and Yorkshire) and for these companies the CMA reduced the Ongoing Efficiency Challenge to 1%.

target than suggested by the historical analysis alone. Our detailed assessment has led to the following conclusions on the potential reference points:

- 0.5% is insufficiently ambitious and would represent a poor outcome for consumers.
- 1.0% appears insufficiently stretching, particularly in light of the transformational change anticipated during RIIO-ED2.
- 1.2% will help deliver value for money for consumers, while incentivising the DNOs to maximise the opportunities to improve productivity during RIIO-ED2.

7.478 We will continue to review the available evidence and would welcome further relevant evidence in response to this consultation. For example, external analysis (cited by CEPA[254]) finds that historical TFP growth in the ED sector varies from -0.5% to 3.8% per annum. Given the wide range in the figures, we plan to further consider the evidence before assessing whether such analysis provides a useful "sense check" to help calibrate the target we are setting.

7.479 Further details on individual company submissions and how our proposed ongoing efficiency challenge are applied to set totex allowances for RIIO-ED2, are set out in the company specific annexes.

Consultations questions

Core-Q109. Do you agree with our proposed RPEs allowances? Please specifically consider our proposed notional cost structure, assessment of materiality, and choice of indices in your answer.

Core-Q110. Do you agree with our proposed approach to setting the ongoing efficiency challenge and the level of challenge applied?

Disaggregation of Allowances

7.480 In order to compare allowed costs against submitted costs, we require a breakdown of costs at an activity level. While this does not impact the overall totex baseline, it is required for the setting of volume drivers and some PCDs and UIOLI allowances. This means it does impact the proportion of totex that is funded ex ante versus in variant (at-risk) totex.

[254] Ajayi, V., Anaya, K., and Pollitt, M. (November 2021) Incentive regulation, productivity growth and environmental effects: the case of electricity networks in Great Britain. University of Cambridge Energy Policy Research Group Working Paper No. 2126, available online.

7.481 We determine the value and level of disaggregation of allowances will vary by activity. For activities which are technically assessed, we determine an efficient cost and add the cost to the appropriate activity category. For activities which are modelled through our totex and disaggregated regression or non-regression approaches (ie excluding technical assessment), we apply a methodology to disaggregate each DNO's overall modelled allowance.

7.482 We have considered the following options for disaggregating allowances to an activity level:

- Use the proportional split of costs by activity from each DNO's normalised submitted costs. This would mean the proportion of costs funded in ex ante and variant totex would vary between DNOs based on the spending approach each has submitted.
- Use the proportional split of costs by activity from our disaggregated modelling. This would mean we calculate each DNO's modelled cost proportions from the disaggregated modelling outputs, and the proportion of costs funded in ex ante and variant totex would vary between DNOs.
- Use an industry average proportional split of costs by activity. This would mean we calculate each DNO's proportional split of costs by activity (either using submitted costs or our disaggregated modelling outputs) and calculate an industry average apportionment. All DNOs would have the same proportion of costs funded in ex ante and variant totex under this approach.

7.483 Using an industry average activity apportionment would provide the most consistent proportional split of ex ante and variant allowances between DNOs. However, it would also assume all DNOs will spend in the same way. This would not take into consideration the differences between business plans or levels of activity in different areas which may reflect planned efficiencies or different activity investment cycles. We consider this option to be the least appropriate and the least reflective of how we expect DNOs to spend allowances by activity in RIIO-ED2.

7.484 The main difference in using a proportional split of costs based on DNOs' submitted costs or efficient costs from the disaggregated modelling is in where cost efficiencies are applied.

7.485 We view a proportional split of costs based on DNOs normalised submitted costs as most reflective of plans for RIIO-ED2 and how they expect to spend their allowances. However, we recognise that this may mean the total cost efficiencies

applied to submitted costs are not allocated by activity according to the efficiency of each activity for each DNO. For example, if a DNO had a high proportion of LRE costs and their high LRE forecasts were a significant contributor to the reduction in allowed costs we've modelled, they would still have a high proportion of allowances allocated to LRE based on their submitted costs proportions.

7.486 In contrast, using a proportional split of costs based on our disaggregated modelled costs would reflect our view of the efficient proportion of spend on each activity, relative to our total efficient costs view from the disaggregated modelling. One limitation of this approach is that it only reflects our disaggregated modelling view, but allowances are a combination of totex and disaggregated modelling. Some of the cost efficiencies in the totex modelling may derive from the efficiency of different activities to the disaggregated modelling. This approach also does not take account of each DNOs planned operational approach and spend areas based on anticipated demand.

7.487 We have decided to use the proportional split of costs by activity from each DNOs normalised submitted costs for Draft Determinations. This is so that activity costs most reflect DNOs Business Plans and their planned operational approach, particularly given we have allowed DNOs to submit their own demand scenarios rather than a common scenario.

Consultation questions

Core-Q111. Do you agree with our proposed disaggregation methodology?

Appendices

Index

Appendix 1 EAP Proposals

A1.1 In this appendix, we provide more detail on the DNOs' EAP proposals in line with our baseline expectations and the rationale for our consultation position on the specific commitments in each area.

Business Carbon Footprint

Table 69 DNO proposals for science-based targets (SBT) to reduce BCF

DNO	EAP proposal
ENWL	• Adopt science-based targets to help limit global warming to 1.5ºC above pre-industrial levels. • Committed to a 63% absolute reduction in scope 1 and 2 emissions by 2035 according to a baseline year of 2020.
NPg	• Adopt a verified SBT to reduce scope 1 and 2 emissions in line with net zero (1.5ºC pathway). • Committed to reducing controllable internal BCF by 21% between 2023-2028 to remain in line with Government's 2035 target and on path to being a carbon neutral operation by 2040.
SSEN	• Aligned with a 1.5ºC SBT pathway for Scope 1 and 2 emissions while investigating a Scope 3 SBT for implementation by 2026. • Committed to a 55% reduction in scope 1 and 2 emissions by 2033 with at least a 35% reduction by 2028.
SPEN	• Set the SBT for scope 1, 2 and 3 emissions aligned with a 1.5ºC pathway as per the SBTi methodologies. • Committed to deliver efficient and economic actions to reduce scope 1, 2, 3 BCF by 67.2% by 2035 from a 2018/19 baseline.
UKPN	• For full carbon footprint (including losses and scope 3), UKPN will exceed their reduction SBT of well below 2ºC and commit to the Business Ambition for 1.5ºC SBT. • Committed to reducing their full footprint by 28.7% by 2028 and to a path of net zero by 2040 from a 2018/19 baseline.
WPD	• Achieve net zero in their internal BCF by 2028 (excluding network losses) and follow a 1.5ºC SBT pathway • Committed to reducing absolute scope 1 and 2 emissions by 63% by 2034/35 from a 2019/20 baseline.

A1.2 We propose to accept the science-based targets presented by NPg, SSEN, SPEN, and WPD to reduce their scope 1 and 2 BCF as they are, in our view, robust and validated by the Science-based Target Initiative (SBTi).

A1.3 At the time of the RIIO-ED2 Business Plan submission, ENWL was still in the process of having their SBT validated by the SBTi, but we note that they have committed to the 1.5ºC pathway and have proposed a long-term target to 2035. Additionally, prior to the submission of the RIIO-ED2 Business Plan, UKPN had their SBT of well-below 2ºC validated by SBTi. They have committed to having a

1.5ºC pathway re-validated for their directly controllable emissions (scope 1 and 2). As part of their consultation response, both companies should provide us with an update on their respective SBTs.

A1.4 WPD has proposed a CVP to achieve their 1.5ºC SBT pathway as well as to become a net zero business by 2028. Our consultation position for this proposal can be found in their company-specific annex.

Sulphur hexafluoride (SF_6)

Table 70 DNO proposals for managing SF_6

DNO	EAP proposal
ENWL	Maintain a leakage rate of no more than 0.3% of the total inventory on the network.
NPg	Maintain SF_6 losses at 42.7kg by 2028 through the targeted replacement of SF_6 equipment where leaks exceed 5kg over a four-year period which provides a 15% reduction in leakage.
SSEN	Develop an SF_6 Strategy that aims to reduce their BCF from SF_6 leaks by a minimum of 35% by 2028 from 2019/20 levels.
SPEN	Reduce SF_6 leakage by 10% over the RIIO-ED2 prior compared to ED1 performance.
UKPN	Reduce SF_6 leakage to 0.1% of the installed bank by the end of RIIO-ED2 which is a 9% improvement against RIIO-ED1 performance.
WPD	Deliver a 20% reduction in SF_6 losses and drive industry partners to develop technological alternatives to reduce overall volumes.

A1.5 SF_6 has a global warming potential (GWP) approximately 23,500 times more than CO_2[255] and makes up a portion of companies' BCF emissions. All companies have committed to the following actions in alignment with Ofgem's baseline expectations for SF_6 management as set forth in Appendix 3 of the BPG

- reducing emissions
- leak identification and repair
- asset management, procurement, and innovation.

A1.6 The DNOs have committed to exploring SF_6 alternatives and procuring non-SF_6 emitting alternatives with a lower GWP, where commercially available. All DNOs' have committed to working with suppliers and manufacturers to develop and deploy alternatives to SF_6 where possible. We note that commercial SF_6 alternatives are becoming more available at higher voltages but that there are differing levels of technology readiness at lower voltages.

[255] 2020 UK Greenhouse Gas Emissions, Final Figures (publishing.servicegov.uk)

A1.7 We are consulting on accepting the SF_6 proposals from ENWL, NPg, SPEN, UKPN, and WPD as outlined above without any amendment. We are satisfied that by setting their respective targets and implementing strategies to achieve said targets, the DNOs can reduce SF_6 leakage rates in RIIO-ED2 while also avoiding a proportion of new SF_6 equipment on the network. In our view, this will lead to fewer CO_2 emissions which is in the interests of current and future consumers.

A1.8 SSEN has proposed a bespoke PCD for SF_6 asset replacement. Our consultation position for this proposal can be found in their company-specific annex.

Electricity distribution losses

Table 71 DNO proposals to manage losses

DNO	EAP proposal
ENWL	Implement and monitor their Losses Strategy to manage technical and non-technical losses on their distribution network.
NPg	
SSEN	
SPEN	
UKPN	
WPD	

A1.9 Losses in the electricity distribution network contribute to carbon emissions and higher system costs for consumers. In our SSMD, we decided to incorporate distribution losses into the common environmental framework, and thus in scope for the EAPs, rather than have it remain as a standalone area.[256] DNOs are required to develop and commit to implementing a strategy to efficiently manage both technical and non-technical losses as well as commit to reporting on its progress.

A1.10 In our SSMD, we decided to remove the Losses Discretionary Reward for RIIO-ED2.[257] We considered effective losses management would be more appropriately driven by embedding the consideration of how to manage losses within the proposed overarching environmental framework.

A1.11 All DNOs have provided a Distribution Losses Strategy as part of their Business Plans. These include common commitments to consider the cost of losses within

[256] Paragraph 9.89 of Annex 1 of SSMD
riio_ed2_ssmd_annex_1_delivering_value_for_money_services_for_customers (1).pdf
[257] Paragraph 9.88 of Annex 1 of SSMD
riio_ed2_ssmd_annex_1_delivering_value_for_money_services_for_customers (1).pdf

the lifecycle of new assets as part of their procurement processes. The losses strategies also include their proposed approaches to:

- Managing and/or minimising losses as reasonably practicable;
- Estimating and calculating losses;
- Asset replacement;
- Asset specification (low-loss assets);
- Innovation and new technologies;
- Learning, information-sharing, and collaboration;
- Stakeholder engagement, monitoring and reporting.

A1.12 All of the DNOs have indicated in their Losses Strategies that despite efforts to reduce losses, total losses on their networks are expected to increase during RIIO-ED2, primarily due to the growth of distributed generation. At the same time, the carbon intensity of these losses is expected to fall.

A1.13 We welcome the commitments the DNOs have made in their distribution losses strategies and propose to accept these without any amendment. We are satisfied that if the DNOs implement their proposed losses strategies, the DNOs will make a positive contribution to an efficient level of distribution losses, which we consider is in the best interest of current and future consumers.

A1.14 However, we would encourage the DNOs to improve upon their distribution losses strategies to increase transparency to stakeholders on their direct actions to manage distribution losses.

Reducing emissions from operational and business transport

Table 72 DNO proposals for reducing emissions from operational and business transport

DNO	EAP proposal
ENWL	Convert 36% of overall fleet to electric vehicle by the end of RIIO-ED2.
	Convert all company lease cars to electric vehicles prior to the start of RIIO-ED2.
NPg	Increase ultra-low emission vehicles on fleet to 40% by 2028.
	Reduce business mileage by 15% assisted by more flexible working.
SSEN	Transition fleet to 80% electric by the end of RIIO-ED2.
	Reduce average road mileage by 15% and manage return flights to an average of 0.4 per employee per year.

DNO	EAP proposal
SPEN	Decarbonise operational fleet by 2030 by replacing 100% of cars and vans with electric vehicle alternatives.
	Implement SP Group's new business travel policy to limit business travel for only essential purposes.
UKPN	Replace all vehicles in fleet with electric vehicle alternatives.
	Decarbonise business transport to reduce overall NOx emissions by 25% overall.
WPD	Replace 89% of existing operational fleet with electric vehicle alternatives by 2028 and install EV charging infrastructure at all operational sides and key substations.
	Reduce business travel by encouraging more remote working.

A1.15 We consider that the DNOs have a role to play in facilitating the decarbonisation of transport, as well as leading by example to convert their own fleet to electric or alternative fuel vehicles.

A1.16 We propose to accept the EAP commitments for fleet replacement activities in RIIO-ED2 made by ENWL, NPg, SSEN, SPEN and UKPN. We are supportive of the companies transitioning their fleet where there is clear value for money for consumers and environmental benefits.

A1.17 We propose to set baseline funding allowances as the amounts are not sufficiently material to set a PCD and the DNOs will be required to report on efforts to decarbonise their fleet in the AER.

A1.18 WPD has proposed a bespoke PCD for fleet electrification. We have set out or consultation position in their respective company annex.

Reducing emissions from building energy use

Table 73 DNO proposals for reducing emissions from building energy use

DNO	EAP proposal
ENWL	Convert one site to net zero carbon for each year of ED2.
NPg	Install renewable energy at 50 sites and implement BREEAM initiatives and standards at 10 sites.
SSEN	Invest in low carbon technologies in SSEPD buildings, including upgraded glazing, insultation, heating and lighting.
	Undertake refurbishment work to at least 44 existing substations to improve asset health and reduce onsite electricity demand.
SPEN	Reduce energy consumption by 3.4GWh at 650 primary substations by applying updated civil specifications while also refurbishing 8 strategic offices and depot

DNO	EAP proposal
	sites (BREEAM ratings of very good or excellent) and piloting and monitoring renewable generation at substations and depots to offset demand.
UKPN	Install solar PV to applicable sites along with plant and building fabric updates.
	Increase the energy efficiency of substations through metering (of unmetered supply).
WPD	Install low carbon technology at all suitable depots and offices to match demand.
	Purchase all building energy from REGO tariffs.
	Ensure that all new WPD office and depot buildings achieve an excellent BREEAM rating.

A1.19 Energy used to control the building environment in substations contributes to overall losses on the distribution system, and energy consumed at DNO offices and depots contributes to their overall BCF as a Scope 2 emission.

A1.20 As such, we propose to approve the DNOs' baseline funding requests for substation and building refurbishment to reduce energy consumption.

A1.21 We propose to approve the baseline funding requests for renewable generation at DNO sites provided the companies submit evidence that they satisfy the requirements set forth in SLC 43B (Prohibition of Generation) and the supporting Guidance document.[258] While we agree that energy efficiency and energy reduction are positive activities, companies must demonstrate a satisfactory methodology that matches solar array output to consumption in their respective consultation responses.

Reducing emissions from temporary generation

Table 74 DNO proposals for temporary generation

DNO	EAP proposal
ENWL	Investigate the use of lower emission biodiesel fuels and battery-powered sources for mobile generators.
NPg	Rollout the use of low carbon fuel alternatives for mobile generation fleet.
SSEN	Reduce emissions by replacing mobile generators wherever possible with lower carbon alternatives or by using lower carbon fuel types by 2028.
SPEN	Analyse generator use and set targets for reduction in carbon emissions to be achieved by end of RIIO-ED2.
UKPN	Modernise the generator fleet using biofuels for generation requirements and adoption hybrid generators where possible.
WPD	Replace 35 generators from their mobile generator portfolio.

[258] Prohibition on Generating Guidance (POGG): decision | Ofgem

A1.22 We propose to accept, without amendment, the DNOs' commitments to reduce the environmental impact and carbon emissions associated with their mobile generator fleet as it will reduce noise, greenhouse gas emissions, and particulate matter in the air.

Embodied carbon

Table 75 DNO proposals for managing embodied carbon

DNO	EAP proposal
ENWL	Baseline the embodied carbon in new projects by 2024
	Report on activities to manage or reduce embodied carbon within the AER.
	Introduce carbon reduction plans for all major network projects by the end of RIIO-ED2.
NPg	Introduce an embodied carbon model in 2023/24 for new projects and monitor and report on their embodied carbon throughout RIIO-ED2.
	Establish a baseline for 2023/24 with a target for the period to reduce embodied carbon.
	Collaborate with supply chain actors to deliver downward benefits that will also enhance accountability and will inform their investment decisions for raw materials.
SSEN	Create and implement an Environmental Reporting tool to calculate and report embodied carbon from manufacturing to implementation for projects which commence in RIIO-ED2 and beyond.
SPEN	Introduce a measurement tool for embodied carbon and other capital carbon emissions to establish a baseline and set a target to reduce carbon on new projects during RIIO-ED2.
	Monitor and report on embodied carbon in new projects.
UKPN	Build a tool to measure embodied carbon for significant projects and use this to inform decision-making processes and design standards.
WPD	Work collaboratively to measure embodied carbon associated with major projects as well as a number of key operational activities, including those that generate scope 3 emissions.

A1.23 Physical infrastructure assets are a significant source of the UK's carbon emissions. If the UK is to achieve its net zero ambition, it is critical that the carbon lifecycle of infrastructure assets, including construction, maintenance, decommissioning and disposal, is significantly decarbonised.

A1.24 We propose to accept, without amendment, the DNOs' commitments to baseline, measure and report on embodied carbon of new projects as an essential first step to managing their emissions.

A1.25 ENWL and NPg have proposed to establish baselines for embodied carbon in the first year of RIIO-ED2. We welcome their ambition and would encourage all DNOs

to collaborate and share best practice across the sector when measuring and taking action on embodied carbon.

Supply chain management

Table 76 DNO proposals for supply chain management

DNO	EAP proposal
ENWL	Enhance the environmental management standard requirements of their suppliers through their supplier code.
	Require their top 10 suppliers (by value) to set targets in line with SBTi criteria by 2026.
	Introduce a Responsible Procurement Charter achieving >90% compliance, and report on the number of suppliers that are compliant as part of the AER.
NPg	Deliver a funded programme of support for suppliers to enhance environmental competence, including ISO 140001 certification.
	Introduce a Responsible Procurement Charter achieving 90% compliance.
SSEN	Implement a Sustainable Supplier Code and have 80% of supply chain (by value) signed up by the end of RIIO-ED2 with the aspiration to achieve 90%.
SPEN	Introduce environmental sustainability considerations in procurement processes in line with ISO 20400 Sustainable Procurement Standard.
	Collaborate with supply chain to target more than 80% of RIIO-ED2 suppliers (by value) to meet increased standards.
UKPN	Ensure that at least 80% of suppliers (by value) sign up to the Code of Practice by 2026 and report annually on the percentage of suppliers (by value) meet the code.
	Ensure that all high carbon suppliers have an SBTi-approved plan.
WPD	Adopt and cascade an environmental supplier code via certification to ISO 14001: 2015 and target 80% of suppliers to meet the supplier code.

A1.26 DNOs are resource intensive. There are good economic reasons for the DNOs to improve their resource efficiency and move to a more environmentally sustainable business model. Integrating environmental considerations into the supply chain can not only reduce their total carbon footprint but also aid in optimizing their end-to-end operations to achieve greater cost savings.

A1.27 We are proposing to accept the EAP commitments made by the DNOs without any amendment. We note that the DNOs have taken different approaches to collaborating with their suppliers to reduce supply chain emissions or environmental impact. While we do not consider it appropriate to prescribe a uniform course of action for the DNOs to adopt at this time, the DNOs should ensure that they are transparently reporting on actions taken and how it benefits consumers.

Sustainable resource use and waste reduction

Table 77 DNO proposals to sustainable resource use and waste reduction

DNO	EAP proposal
ENWL	Create a resources strategy to embed circular economy principles within their activities.
	Achieve a landfill diversion rate of 95% of waste.
	Reuse or recycle 70% of waste.
	Reuse and recycle at least 85% of waste excavated for installation and repair.
NPg	Achieve a landfill diversion rate of 90% of waste with a target to be zero waste to landfill by 2035.
	Recycle and reuse 85% of total waste generated.
	Report on annual progress of the waste to landfill and recycling/reusing rates.
SSEN	Commit to zero waste to landfill (excluding compliance waste) by 2028.
	Achieve a recycling, recovery, and reuse rate of >90% across waste streams by 2028.
	Report on actual waste to landfill, recycling, and reuse as a percentage of total.
	Update sustainable procurement processes to embed circular economy principles to enable a Zero Waste philosophy.
	Creation of resource use and waste standards and reporting in network including offices and depots by 2023.
SPEN	Divert 95% of waste from landfill by 2023 and 100% by 2030, excluding compliance waste.
UKPN	Develop and implement a circular economy tool to address high impact materials at the start of RIIO-ED2.
	Recycle 80% of office, depot, and network waste and 99.5% of streetworks material by the end of RIIO-ED2 with no recoverable waste to landfill by 2025.
WPD	Achieve zero waste to landfill by 2028 (excluding hazardous waste) and deliver an overall 30% reduction in tonnage of waste produced.

A1.28 We propose to accept all the EAP commitments made by the DNOs without amendment. We believe that these activities should reduce the environmental impact of network company activities at minimal additional cost to consumers.

Biodiversity and natural capital

Table 78 DNO proposals for enhancing biodiversity and natural capital

DNO	EAP proposal
ENWL	Enhance 100 sites using biodiversity initiatives and plant 10,000 trees per year on ENWL land or within its operational area to offset trees lost to vegetation management.
	Adopt an appropriate tool to assess changes in natural capital from different options for network projects, and to monitor the provision of ecosystem services.
NPg	Delivery biodiversity improvements at 200 sites.
	Implement their natural capital assessment and monitoring tool on new projects.

DNO	EAP proposal
SSEN	Develop a tool to baseline and monitor biodiversity and enable cultural change required to enhance biodiversity.
SPEN	Implement biodiversity enhancement projects and programmes to provide 500 biodiversity units over RIIO-ED2.
	Pilot biodiversity initiatives across 25 hectares of non-operational land and along existing linear infrastructure.
UKPN	Increase the biodiversity of new major substation developments by a net gain of 10-20% and 30% overall at 100 existing sites.
	Create a biodiversity bank for use against future projects.
WPD	Achieve a 10% net gain in biodiversity (in line with nationally recognised assessment tools) for new major projects and for selected primary and grid substation sites.

A1.29 Many parts of the UK's natural environment are in decline. As outlined in the *Economics of Biodiversity: The Dasgupta Review report*, biodiversity is declining faster than at any time in human history and this poses a danger to the prosperity of current and future generations.[259]

A1.30 We propose to accept all the EAP commitments made by the DNOs without amendment. This is because there is strong evidence that stakeholders and consumers strongly support the DNOs to take appropriate steps to address network impacts on the natural environment.

A1.31 We have set out our consultation position on SSEN's bespoke PCD for woodland and peatland restoration in their respective company annex.

A1.32 We have set out our consultation position on SPEN's bespoke Licence Obligation and clawback for biodiversity enhancement in their respective company annex.

Fluid-filled cables

Table 79 DNO proposals for reducing leakage from fluid-filled cables

DNO	EAP proposal
ENWL	Maintain a leakage rate of no more than 25,000 litres per year.
NPg	Maintain a leakage rate of no more than 23,200 litres (15% improvement) in RIIO-ED2 by replacing 40km of fluid-filled cables and dosing 250km with PFT to reduce fluid leaks.
SSEN	Remove 72km of oil-filled cables and reduce leakages by 20%.
	Tag worst performing circuits on an annual basis for future improvement opportunities.

[259] Final Report - The Economics of Biodiversity: The Dasgupta Review - GOV.UK (www.gov.uk)

DNO	EAP proposal
SPEN	Reduce oil leaks by 50% through replacement of poorly performing 132kV cables in the SPM licence area so to avoid 3,490 litres of oil spillage in RIIO-ED2.
UKPN	Reduce fluid leaks from cables by 15% over RIIO-ED2 to reduce negative impacts to the environment.
WPD	Reduce the volume of oil leaked from fluid-filled cables by 50% by 2028 and replace 90km of worst leaking circuits with non-oil alternatives.

A1.33 We are supportive of companies reducing leakage from fluid-filled cables where there is clear value for money and environmental benefits. However, given the variances in the Business Plan proposals, we are still working on the best way to proceed for RIIO-ED2. We encourage DNOs to provide the additional information set out below as part of their response to Draft Determinations as these costs are material to the consumer.

A1.34 At this stage, we do not have sufficient information on the investment drivers of the indicated activities and the optioneering presented to allow us to form our position. Therefore, all DNOs should provide the following as part of their consultation responses:

- A leakage reduction target (in percentage and litres). This should also include the number of kilometres of cables expected to be replaced during RIIO-ED2.
- Further evidence and justification for the primary and secondary investment drivers, the associated costs, risks to delivery, optioneering and environmental benefits.

A1.35 We propose to accept baseline funding if the DNOs provide satisfactory information and evidence. If DNOs fail to do so, we will consider the use of a PCD, where appropriate, to ensure that the DNOs are delivering on the targets proposed in their Business Plans and are reducing leakage from fluid-filled cables over RIIO-ED2.

PCBs

Table 80 DNO proposals for PCBs on their network

DNO	EAP proposal
ENWL	Remove PCB contamination from the network by 31 December 2025.
NPg	Remove PCB contaminated equipment from the network by 31 December 2025.
SSEN	Remove all PCB-contaminated assets from the network by 31 December 2025.
	Commit to reporting on the volume of PCB-contaminated equipment on the network.

DNO	EAP proposal
SPEN	Remove PCB-contaminated equipment from the network by 31 December 2025.
	Test network assets for PCB contamination.
UKPN	Remove PCB-contaminated equipment before the statutory deadline, to reduce contamination of the environment.
WPD	Ensure that all PCB-contaminated equipment will be removed from the network by 31 December 2025.

A1.36 DNOs are required to comply with the Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) Regulations 2000 ("PCB Regulations").[260][261] As such, DNOs are required to remove any transformer from service on or before 31 December 2025 if it is confirmed to be or can be reasonably assumed that the volume of PCBs surpasses the permitted thresholds.[262]

A1.37 The DNOs have indicated in their Business Plans that there is uncertainty about the volumes of PCB-contaminated equipment on their respective networks. This is due to cross-contamination during the manufacturing process of transformers prior to 1987. Due to this uncertainty, we are proposing that funding associated with the removal of PCB-contaminated equipment should be through an uncertainty mechanism.

A1.38 We consider that an uncertainty mechanism is the most appropriate path forward as it balances the needs of DNOs to invest in their networks while also protecting consumers. Therefore, we are proposing to address activities related to the statutory requirement to remove PCB-contaminated pole-mounted equipment from the network by 2025 to go through a volume driver. Oil testing and replacement of ground-mounted equipment will be funded through baseline allowances as DNOs indicate these volumes are more certain.

A1.39 Our consultation position on the PCB volume driver can be found in Chapter 3 of this document.

[260] The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) Regulations 2000 (legislation.gov.uk)
[261] The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (Scotland) Regulations 2000 (legislation.gov.uk)
[262] RPS 246 - Transformers containing PCBs: New rules

Noise pollution

Table 81 DNO proposals for managing noise pollution and complaints arising from their network activities

DNO	EAP proposal
ENWL	Report on actions taken to reduce noise pollution in the AER.
NPg	Undertake site enhancements to mitigate noise from their assets with a target of 33 noise complaints for RIIO-ED2.
SSEN	Take efficient actions to reduce noise pollution and report on these actions.
	Implement a Noise Pollution Strategy and trend analysis of complaints by 2024 and monitor throughout RIIO-ED2.
SPEN	Reduce potential disruption to the public from noise resulting from network infrastructure.
UKPN	Proactively manage noise pollution and respond quickly to noise complaints when they occur.
WPD	Report via the AER any actions undertaken to reduce local noise pollution relating to operational network and associated activities.

A1.40 We propose to accept all the EAP commitments made by the DNOs' without amendment. We believe that these activities should reduce the impact of noise pollution while meeting consumer expectations at minimal additional cost.

Carbon offsetting or removal

Table 82 DNO proposals for carbon offsetting or removal

DNO	EAP proposal
ENWL	None proposed
NPg	None proposed.
SSEN	Nature-based solutions for carbon removal to offset 300,000 tCO_2e and delivery 3,000 biodiversity units over 45 years through woodland and peatland restoration.
SPEN	Deliver their RIIO-ED2 Carbon Offsetting strategy to offset 101,315 tCO_2e.
UKPN	Explore how remaining emissions can be offset through a combination of own activities and working with partners on projects so to achieve the ambition of being a net zero company by end of RIIO-ED2.
WPD	Use UK-based carbon offsets within our regions to offset residual BCF emissions to achieve net zero by 2028.

A1.41 SSEN, SPEN, UKPN, and WPD have proposed to offset residual carbon emissions when it is uneconomic or not technically feasible to reduce emissions through other means. We are still considering the path forward for how carbon offsetting will be implemented during RIIO-ED2 due to the variance in proposals and approaches.

A1.42 The Challenge Group and the CEGs have expressed concerns over consumers funding offsetting activities but have commended those taking a nature-based approach.

A1.43 At this stage, we would like to invite DNOs to submit as part of their responses to this consultation, where it has not already been provided, the following information:

- A marginal abatement cost curve for carbon.
- A joint consumer willingness-to-pay study for carbon offsetting and/or carbon removal projects.
- Stakeholder and/or consumer support for offsetting activities.
- A summary of the benefits to network consumers.
- Detail on any carbon offsetting projects or schemes undertaken and/or supported, including expected emissions to be offset per annum in RIIO-ED2.

A1.44 We propose to accept the DNO proposals and fund through a price control mechanism if the DNOs provide satisfactory information and evidence. If DNOs fail to do so, we propose to reject all funding associated with carbon offsetting.

A1.45 SSEN has proposed a bespoke PCD for nature-based carbon removal. We have set out our consultation position in their respective company annex.

Appendix 2 Draft DSO Regularly Reported Evidence

Table 83 Draft DSO Regularly Reported Evidence

No.	RRE	Description	Related panel criteria
1	Capacity released through flexibility	Measures MVA capacity released at the primary and secondary level from the use of flexibility solutions, as a ratio of MVA capacity released from flexibility and network reinforcement combined, in the previous regulatory year.	Delivery of DSO benefits
2	Distribution flexibility trading	Measures the volume (MW or MWh) of distribution connected assets that are procured by the ESO as balancing services in the previous regulatory year.	Delivery of DSO benefits
3	Forecasting accuracy	Measures the difference between the forecast maximum demand (in MW) as reported in the LTDS and outturn values for all primary substations. Reported as an average absolute % error between forecast and outturn.	Data provision
4	Transformer utilisation	This metric is being proposed as part of the Secondary Reinforcement Volume Driver Controls in Chapter 3. We also propose reporting on it within the DSO RRE. It would report on the number of secondary network transformers in pre-defined utilisation % bands.	Data provision
5	Data publication	Measures the proportion of pre-agreed datasets that are published on time and in the specified format. The list of datasets and publication schedule is still to be defined. We propose it includes data covering all three DSO roles, including planning, operational and market data. Reported as a percentage.	Data provision
6	Operational data sharing	Measures the proportion of operational data that is shared with the ESO on time and in the agreed format. The datasets, method of sharing and schedule will need to be defined in discussion with DNOs and the ESO. Reported as a percentage.	Data provision
7	Flexibility procurement	The proportion of flexibility contracted (MW) relative to the flexibility put out for tender (MW) in the previous regulatory year. This should include Sustain, Secure, Dynamic and Restore products and the data should be taken from the backward-looking Flexibility Procurement Report. Reported as a percentage.	Flexibility market development
8	Flexibility tendering bid acceptance rate	The proportion of bids accepted relative to the total number of bids submitted for all distribution flexibility services tenders in the previous regulatory year. This should include Sustain, Secure, Dynamic and Restore products and the data should be taken from the backward-looking Flexibility Procurement Report. Reported as a percentage.	Flexibility market development
9	Flexibility dispatch	The proportion of flexibility dispatched (MWh) relative to the flexibility contracted (MWh) in the previous regulatory year. This should include	Flexibility market development

No.	RRE	Description	Related panel criteria
		Sustain, Secure and Dynamic products and the data should be taken from the backward-looking Flexibility Procurement Report. Reported as a percentage.	
10	Registration time	The average time (in days) taken to register new flexibility service providers, starting from the first submission received by the DNO through to the provider being fully registered.	Flexibility market development
11	Flexibility market participation	The number of unique parties contracted to provide distribution flexibility services in the previous regulatory year. This should include existing and new providers, not just those that are new market entrants. This should include parties contracted to provide Sustain, Secure, Dynamic and Restore products and the data should be taken from the backward-looking Flexibility Procurement Report.	Flexibility market development
12	Diversity of technologies in distribution flexibility services	A breakdown of the solutions that have provided distribution flexibility services in the previous regulatory year. This should include the number and type of different solutions, and the proportion of total distribution flexibility services (measured in MWh) provided by each different solution. This should include Sustain, Secure, Dynamic and Restore products and the data should be taken from the backward-looking Flexibility Procurement Report.	Flexibility market development
13	DNOA decision outcomes	The number of Distribution Network Options Assessment (DNOA) decisions by type, including the proportion of flexibility, reinforce, reinforce with flexibility, signposting and remove decisions relative to the number of total schemes assessed. This should be taken from the DNOA.	Options assessment and conflict of interest mitigation
14	Investment decisions review	Measures the proportion of investment decisions that were externally reviewed, assured or audited in the previous regulatory year. This could include being formally audited or assured by external auditors or decisions that are reviewed by an independent board, panel or stakeholder group set up by the DNO. Measured as a percentage of all investment decisions.	Options assessment and conflict of interest mitigation
15	Error corrections issued for dispatch	Measures the count of dispatch instructions where corrections are made after issue (and/or information which results in incorrect delivery) to market participants, in relation to the total count of dispatch instructions issued. This should include Sustain, Secure and Dynamic services.	DER dispatch
16	Late issuance of dispatch data	Measures the count of instances of late issuance of dispatch data, where instructions are issued outside of the agreed or contracted timelines, in relation to the total count of dispatch instructions issued. This should include Sustain, Secure and Dynamic services.	DER dispatch

Appendix 3 DSO stakeholder survey questions

Table 84 DSO Stakeholder Survey Questions

Stakeholder survey questions
In developing our activities across our three DSO roles (planning and network development, network operations and market development) it is important that operations and initiatives are in coordination with those of other network licence holders, the ESO, third parties and local authorities. This is to avoid market fragmentation and conflicting actions, as well as to ensure that all resources are effectively utilised in our operations. To do this we have recently: [Each DNO to input a short list of titles of relevant initiatives relating to question *not exceeding 200 characters*]. Overall, how satisfied are you with our coordination of DSO activities with other parties over the past year?
One of our focus areas for DSO is to provide frequent and accurate operational data and network planning information in an accessible format to enable network users to plan and operate effectively. Our recent activities in this area include: [Each DNO to input a short list of titles of relevant initiatives relating to question *not exceeding 200 characters*]. Overall, from your experience over the last year, to what extent has our delivery in this area met your data and information needs over the past year?
With respect to DSO, we are designing and developing distribution flexibility services, contracts and processes with an objective to facilitate wide and diverse participation in flexibility markets. This includes our recent initiatives to: [Each DNO to input a short list of titles of relevant initiatives relating to question *not exceeding 200 characters*]. Overall, how satisfied are you with your experience over the last year with our flexibility services and processes over the past year?
With respect to DSO, it is important that our decision-making framework is robust and transparent to ensure we are responsive and adaptive to system needs. This includes identifying and addressing perceived or actual conflicts of interest to enable us to use the network effectively, with neutral consideration to alternative solutions, and ensure we are accountable for our decisions. To do this we have recently: [Each DNO to input a short list of titles of relevant initiatives relating to question *not exceeding 200 characters*]. Overall, from your experience over the last year how satisfied are you with our decision-making framework over the past year?
In our activities across the areas mentioned in the previous questions, such as data and information publication, our flexibility services and process, and our decision-making framework, it is important that we communicate, engage and take stakeholder views into consideration. To do this we have recently: [Each DNO to input a short list of titles of relevant initiatives relating to question *not exceeding 200 characters*]. Overall, how satisfied are you with our communication and engagement across these areas over the past year?

Appendix 4 Results Middle-Up Regressions

A4.1 We have explored 'middle-up' models that potentially take greater account of activity drivers in modelling DNOs allowances (eg LCT uptake). This approach has the advantage that more disaggregated regressions can in principle allow a richer set of cost drivers to be used in the regressions.

A4.2 We explored two different 'middle-up' approaches. Our first approach draws together three separate regressions for Total LRE, Faults + ONIs and the remaining totex. Our second approach draws together two separate regressions for indirect totex and direct totex. The following figure sets out the building blocks in more detail:

Figure 20 Building Blocks 'Middle-Up' Regressions

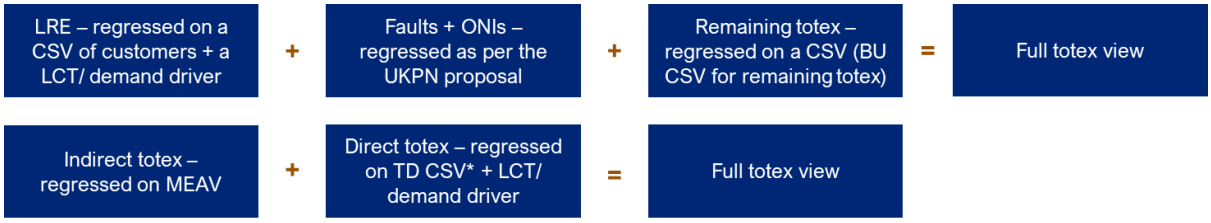


Table 85 Middle-up regression results - LRE, faults and ONIs and the remaining totex

	LRE	LRE	"Middle-up"	Faults and ONIs
Time period (years)	2016-28	2022-28	2016-28	2016-28
LRE CSV 1 (customers, average capacity released)	0.59***			
LRE CSV 2 (customers, EV chargers, HPs)		0.56***		
Bottom-up CSV (adapted to reflect included cost areas)			0.75***	
Total faults				0.70***
Total ONIs				0.32*
Time trend (whole period)	0.04*		0.00	0.01**
Time trend (forecast)	0.08*		0.03***	-0.03***
Constant	-2.69**	-2.71***	1.02***	-6.37***
Robustness test (p-values)				
RESET	0.004	0.259	0.492	0.000

	LRE	LRE	"Middle-up"	Faults and ONIs
Heteroscedasticity	0.033	0.874	0.099	0.414
Normality	0.071	0.889	0.556	0.015
Pooling	0.992	0.924	0.808	1.000
Adjusted R-squared	0.65	0.52	0.76	0.81

Table 86 Middle-up regression results - directs and indirects

	Directs	Directs	Indirects
Time period (years)	2022-28	2016-28	2016-28
Top-down CSV (adapted to reflect included cost areas)	0.57***	0.65***	
LCT driver (1/2 EV chargers, 1/2 HPs)	0.10**		
Average capacity released during price control		0.06**	
MEAV			0.71***
Time trend (whole period)		0.00	0.00
Time trend (forecast)		0.03***	0.02**
Constant	-3.06**	-3.69***	-6.71***
Robustness test (p-values)			
RESET	0.245	0.007	0.000
Heteroscedasticity	0.036	0.289	0.983
Normality	0.221	0.212	0.017
Pooling	0.150	0.997	0.997
Adjusted R-squared	0.80	0.83	0.76

A4.3 In general, we found that the middle-up models appear to perform less well than the totex models. The middle-up models we have tested perform less well against model diagnostic tests. In particular, the R-squared is materially lower than in the totex regressions. Additionally, the specifications we have used for the LRE models rely on arbitrary weights between the scale (customer numbers) and demand driver variables (50:50). Therefore, at this stage we do not consider it appropriate to set allowances based on the middle-up approach.

Appendix 5 Methodology for Calculating Regional Labour Indices

A5.1 Following engagement with the DNOs and undertaking our own analysis, we consider that the wage differentials between London, the South-East, and the rest of Great Britain are still wide enough to warrant an adjustment in our benchmarking to ensure better comparability between DNOs. In line with our RIIO-ED1 approach, we have decided to make these adjustments as part of the normalisation process (ie as pre-modelling cost adjustments) using regional labour indices.

A5.2 We have estimated labour indices using BPDT information on the DNOs' Full-Time Equivalents (FTEs) by employment category, ASHE data on regional wages, and ONS population data. We largely followed the same process used in RIIO-ED1. From the DNOs' Business Plans, CAWGs and our own analysis, we have further developed our approach to calculating labour indices. Table 87 summarises the changes in our approach between RIIO-ED1 Final Determinations and RIIO-ED2 Draft Determinations.

Table 87 Calculating regional labour indices, RIIO-ED1 and RIIO-ED2

Step	RIIO-ED1	RIIO-ED2 Draft Determinations
1. Calculate occupational weights	We calculated industry average occupational weights at the 2-digit SOC code level. For each SOC code, we calculated the DNO's FTEs relative to its total FTEs to obtain the industry average occupational weight. We excluded the FTEs related to Business Support (BS) costs for this calculation, as we did not apply a regional labour adjustment for BS (Step 5). Lastly, we removed the weighting on some SOC codes which we did not consider relevant to the activity areas we were adjusting.	Same approach as RIIO-ED1, with some minor differences: To calculate the number of BS FTEs, we apply the ratio of BS FTEs to total FTEs from the RIIO-ED1 data submission to the RIIO-ED2 total submitted FTEs for each SOC code.[263] We do not remove the weighting on some SOC codes (aside from BS); we rely on the DNOs' submitted FTEs without any adjustments.

[263] BS FTEs were not included in the initial Draft Determinations Business Plan data submissions. For the RIIO-ED2 Final Determinations we expect to update this assumption with DNOs' actual submitted BS FTEs.

Step	RIIO-ED1	RIIO-ED2 Draft Determinations
2. Calculate regional wage indices	For each administrative region of the UK and occupational category, we calculated the region's mean annual wages relative to the UK mean wage. Then, we averaged these relative wages across occupational categories, using the weights calculated in Step 1, to obtain regional wage indices. This was based on 2-digit SOC wage data from the Annual Survey of Hourly Earnings (ASHE) gross hourly mean wages (including overtime) published by ONS.	First, for each region, we average regional wages across occupational categories using the weights calculated in Step 1. We also do this for UK wages. Then, we divide the regional average wage by the UK average wage to obtain regional wage indices. This better reflects wage differentials across occupational categories. In line with RIIO-ED1, we calculate average wages and wage indices at the 2-digit SOC level to reduce uncertainty and missing data in the ASHE wage estimates. We also continue to use gross hourly mean wages (including overtime) rather than annual wages, as these are more robust to regional differences in the number of hours worked.
3. Calculate the wage index for 'Elsewhere'	We calculated the wage index for 'Elsewhere' as the straight average of the regional wage indices calculated at Step 2 (excluding the London and South-East regions). Northern Ireland was excluded from the Elsewhere index as it is not served by any DNO.	We calculate the wage index for 'Elsewhere' as the average of the regional wage indices calculated at Step 2 (excluding the London and South-East regions), weighted according to the regions' population. We also rescale the indices so that the Elsewhere index equals 1, meaning that only DNOs operating in London and the South-East will have an adjustment applied, making it easier to interpret adjustments.
4. Estimate of DNOs' work across the London, South-East and Elsewhere regions	We assumed that DNOs' work was distributed across London, South-East and Elsewhere in the same proportion as the area's share of the DNO's total population. Three DNOs, LPN, SPN and SSES have the majority of their operations in London and the South-East, and WMID, EMID and EPN have a small	Same approach as RIIO-ED1.

Step	RIIO-ED1	RIIO-ED2 Draft Determinations
	share of their population in these regions. All other DNOs operate exclusively in the Elsewhere region.	
5. Estimate of work that should be done locally	To reflect the fact that some work does not need to be carried out locally, we applied a specific local work percentage to each cost activity when making the labour adjustments. We assumed that Business Support can occur anywhere in the UK (ie 0% locally), 40% of CAI and Non-operational occur locally and the remaining activities were 88% local.	Same approach as RIIO-ED1.
6. Calculate the DNOs' labour indices	For each DNO, the labour index was the average of the regional wage indices for London (Step 2), South-East (Step 2), and Elsewhere (Step 3), weighted by the share of the DNO's population within each region (Step 4).	Same approach as RIIO-ED1.
7. Standardise the labour indices	Lastly, we divided each DNO's labour index by the indices' average and used these standardised indices to make labour cost adjustments for each cost activity.	We do not standardise labour indices to avoid losing the benefit of scaling in Step 3 so that the Elsewhere index equals 1.

A5.3 In addition to the changes reported in Table 87, our RIIO-ED1 approach differs in the way that historical indices are applied to historical costs. In RIIO-ED1, we calculated the labour indices for 2008/9 – 2012/13, then applied the 5-year historical average index to all years in the dataset (ie historical and forecast). For the RIIO-ED2 Draft Determinations, we have calculated the indices for 2010/11 – 2020/21 and applied a yearly index to each historical year. This is in line with the RIIO-GD2 approach. We still apply the 5-year historical average (ie 2016/17 – 2020/21) index for all forecast years. This approach makes use of the latest information available, while continuing to ensure robustness to year-to-year variations in the historical indices.

Proportion of expenditure related to labour

A5.4 Calculating the proportion of expenditure that is related to labour and therefore subject to labour adjustments is not necessary to calculate the labour indices but is required to determine the size of each DNO's labour adjustments.

A5.5 In RIIO-ED1, we calculated industry average labour ratios based on DNOs' actual expenditure for each cost activity, then adjusted this share based on labour indices.

A5.6 For RIIO-ED2, we apply industry average labour ratios to all DNOs for each cost activity, but calculate these after adjusting the DNOs' expenditure for labour. This avoids distortions to labour ratios due to the impact of regional labour costs on DNOs' labour spend. Using notional weights also ensures that we do not reward a potentially inefficient company. This approach is consistent with RIIO-GD2.

Calculating occupational weights and regional wage indices

A5.7 The SOC is a common classification of occupational information for the UK. It is a hierarchical structure that categorises jobs in four increasing levels of detail: 1-digit SOC codes indicate nine broad occupational categories which are further broken down into 25 2-digit groups, 90 3-digit groups, and 369 4-digit units.[264]

A5.8 As lower-digit (shorter) groups are aggregates of higher-digit (longer) groups, the decision of which level to adopt presents a trade-off between robustness and granularity. Lower-digit wage estimates refer to more broadly defined occupational categories which may encompass more jobs than those strictly relevant to the DNOs but are based on larger samples and are more reliable than higher-digit estimates.

A5.9 DNOs reported FTEs by SOC code at a 3-digit level in their Business Plans. We have decided to use 2-digit SOC codes in our calculation of regional labour indices. This is in line with our approach in RIIO-ED1 and RIIO-GD2 and appears to have a stronger statistical basis than using 3-digit SOC codes. Using 2-digit codes also reduces the occurrence of missing data from the ASHE wage estimates.

A5.10 We have used mean hourly wages to calculate the regional wage indices. We consider that hourly wages better represent the price of labour compared to annual wages because they are not affected by people in some regions working more hours than in other regions. This approach is in line with our RIIO-ED1 and RIIO-GD2 decisions.

A5.11 We have decided to use industry average occupational weights based on FTEs as a starting point for the calculation of regional wage indices. However, different to

[264] Data from the Annual Survey of Hours and Earnings (ASHE) 2011-2021, Table 15.5a. URL: here

RIIO-ED1, we average regional wages across occupational categories before calculating the ratio between regional and UK mean wages. This approach ensures that we also take into account the amount paid for different job types.

Regions requiring a labour adjustment

A5.12 In RIIO-ED1 we made a labour adjustment for three regions: London, South East, and Elsewhere (ie the rest of Great Britain).

A5.13 SSEN argued in its Business Plan that a three-region approach should be used, but with Scotland grouped with the South-East. SPEN also argued that higher wages in Scotland need to be accounted for but argue that the eleven-region approach is a more robust because it removes the need to make subjective choices concerning which regions to consider for the adjustment.

A5.14 We consider that a three-region approach is still the most appropriate, and this is consistent with the approach we used on RIIO-ED1 and RIIO-GD2. We do not consider that there is sufficient and compelling new evidence to support applying regional wage differentials for other regions.

Table 88 Regional labour indices (2017-2021)

DNO	Indices
ENWL	1.00
NPgN	1.00
NPgY	1.00
WMID	1.00
EMID	1.00
SWALES	1.00
SWEST	1.00
LPN	1.24
SPN	1.10
EPN	1.06
SPD	1.00
SPMW	1.00
SSEH	1.00
SSES	1.07

Appendix 6 Choice of Cost Drivers

A6.1 We have taken on board the DNOs' proposals for suitable cost drivers put forward in the Business Plan submissions and the CAWG meetings. The first step in updating the top-down and bottom-up totex models was to consider which high level cost drivers could be used to explain DNO costs. The following table lists the cost drivers we have tested and the rationale for including in a totex regression:

Table 89 Summary of Potential Cost Drivers

Driver	Rationale	Under DNO control?
Potential scale drivers		
Customer number	A DNO's totex should be driven by the number of customers they serve. A network is operated, maintained and reinforced to meet its customer requirements. Customer numbers is an alternative driver to MEAV but may not capture the complexity of the network.	
Network length	DNOs' costs should be related to the length of network that they serve. Network length is an alternative driver to MEAV but may not capture the complexity of the network.	
Units distributed	Reflects the amount of electricity that is being distributed through a DNO's network on an annual basis. Units distributed is an alternative driver to MEAV but may not capture the complexity of the network.	
Density	Reflects the distribution of consumers within a DNO's area which should affect costs incurred. A dense area may drive costs up as it requires a more complex network (eg London), while a sparse area may also drive costs up (eg larger network length per customer, engineers may need to travel further for repair/maintenance).	
Gini index	The Gini index captures the variability of customer density within an area and how this impacts on a number of cost areas.	
Peak demand	DNOs' networks are designed to meet the level of peak demand as well as the annual volume of units distributed.	
MEAV	MEAV reflects the scale and composition of a network based on its replacement costs. As it captures the scale and it is therefore a key driver of costs.	
Updated RIIO-ED1 bottom-up CSV	A composite scale variable, which aggregates cost drivers used in the activity-level analysis into a single composite driver (ie MEAV, Customer numbers, Total faults, Peak demand, Capacity released, Length OHL, Total network length, Spans cut and ONIs faults)	

Updated RIIO-ED1 top-down CSV	A composite scale variable consisting of customer numbers and MEAV, used in the RIIO-ED1 top-down totex model specification. We have used the same approach, which bases the weightings in the CSV on the results of regression analysis. However, when including RIIO-ED2 data into this regression, the weight on customer numbers became negative. We therefore considered this approach to nolonger be viable.	
RIIO-ED2 top-down CSV	A composite scale variable, based on 73% weight on MEAV, 11% weight on customer numbers, 9% weight on total faults and 7% weight on peak demand. We assigned a cost driver to each high-level cost area. Weights for each cost area were calculated based on the industry average proportion of totex used in the totex regressions.	
Potential activity drivers		
Capacity released	A measure for the net impact of a reinforcement intervention on the peak demand in the year in which it is enacted. It captures the different need for network reinforcement across DNOs in response to LCT uptake and other network reinforcement requirements.	
LCTs	We explored including different LCT drivers, including number of additional EVs, cumulative number of HPs, cumulative number of EVs, composite LCT uptake variable. LCT uptake is identified a key driver of load related expenditure and network reinforcement in the DNOs plans.	
Composite LCT uptake variable	The LCT uptake composite variable includes the cumulative number of HPs and cumulative size of EV chargers for each DNO region, equally weighted. HPs and EVs are expected to contribute to future demands and, therefore, reinforcement requirements, on DNOs networks.	

Appendix 7 Results Statistical Robustness Tests

A7.1 We have used a number of statistical tests for the totex models. These tests provide an indication of the robustness of the modelling results and also indicate where a parameter estimate might be biased and require an adjustment to the model specification. We included the following statistical robustness tests:

- Ramsey RESET test for model misspecification: a general test for model misspecification. For instance, the test may identify an incorrect assumed linear functional form for a variable. The driver may need to be transformed to logs, powers or something else
- white test for heteroskedasticity: heteroskedasticity can cause the standard errors to be biased. It typically occurs when the variation in the residuals is very different over time. The White test examines whether the variance in the model's residuals is constant (homoscedasticity). However, we use clustered robust standard errors to control for possible heteroskedasticity
- skewness and Kurtosis (SK) test for normality: The SK test is used to test whether the residuals are normally distributed. Normality of residuals is not a necessity to derive unbiased results
- pooling test for structural break: the pooling test focuses on whether the coefficients in the model are stable over time. If there is a statistically significant structural break in the data, there may not be a justification for pooling the data.

A7.2 There is no single method or robustness test to assess the model mechanistically. In order to assess the suitability of the models, we reviewed the results against the statistical tests and carefully considered the statistical robustness of the models and the economic rationale. Table below shows the regression results of the three totex models.

Table 90 Regression Results Totex Models

	Totex 1	Totex 2	Totex 3
Time period	2016-2028	2016-2028	2022-2028
Bottom-up CSV	0.80***		
Time trend	0	0	
Forecast time trend	0.02**	0.03***	
Top-down CSV		0.68***	0.61***

	Totex 1	Totex 2	Totex 3
Capacity released		0.06**	
Composite LCT uptake variable (HPs and EVs)			0.09***
Constant	1.08***	-4.83***	-4.13***
Robustness test (p-values)			
Ramsey RESET	0.791	0.022	0.471
Heteroskedasticity	0.526	0.284	0.037
Normality	0.575	0.444	0.241
Pooling	0.312	0.992	0.126
Adjusted R-squared	0.86	0.84	0.80

Note: *** p < 0.01, ** p < 0.05, * p < 0.1

A7.3 Totex 1: the first totex model (consisting of a bottom-up CSV, a whole period time-trend and a forecast time trend) passes all statistical diagnostic tests and has an adjusted R-squared of 0.86. The coefficients on the bottom-up CSV, forecast time trend and constant are statistically significant on a 5% basis and have an intuitive sign. The coefficient on the whole period time trend is not statistically significant, suggesting there are no unobserved time effects in the historical data that are not captured by the model.

A7.4 Totex 2: the second totex model (consisting of a top-down CSV, capacity released, a whole period time-trend and a forecast time trend) passes the heteroskedasticity, normality and pooling tests and has an adjusted R-squared of 0.84. The exception was the failure of the RESET test. The coefficients on the top-down CSV, capacity released, forecast time trend and constant are statistically significant on a 5% basis and have an intuitive sign. The coefficient on the whole period time trend is not statistically significant, suggesting there are no unobserved time effects in the historical data that are not captured by the model.

- we understand that the RESET test is not a critical measure for complex regression models and, in the context of other statistical measures of model performance is not a reason in its own right to question the robustness of the modelling outcomes from an academic perspective
- furthermore, while RESET test failure may suggest the adoption of non-linear terms (eg squared terms), the appropriateness of introducing these terms was significantly questioned by the CMA in its 2015 Bristol Water price

determination as it can significantly reduce the transparency and ease of interpretation of model results from an engineering and economic perspective.

- we tested the inclusion of an RIIO-ED2 time dummy – as an alternative to the forecast time trend – and, while this resulted in the model passing the RESET test we considered that the two time trend specification was more consistent with our prior expectations for why we wanted to control for time effects within our totex models.[265]

A7.5 Totex 3: the third totex model, (consisting of a top-down CSV and a composite LCT uptake variable of HPs and size of EV chargers) passes the RESET, normality and pooling tests and has an adjusted R-squared of 0.80. The exception was the failure of the heteroskedasticity test. The coefficients on the top-down CSV, LCT uptake variable and constant are statistically significant on a 1% basis and have an intuitive sign.

- We control for heteroskedasticity by using clustered standard errors. Therefore, the failing of this test does not affect the robustness of the model.

[265] Using a forecast time trend was also consistent with the specification for Model 1.

Appendix 8 Bottom-Up CSV Calculation

A8.1 The totex model using the bottom-up CSV is similar to the bottom-up totex model used at RIIO-ED1, which aggregated cost drivers used in the RIIO-ED1 activity-level analysis into a single composite driver, based on the median unit cost of each single category. There are a number of steps involved in this approach:

- a cost driver was assigned to each cost area of the activity-level analysis. Where no obvious activity level driver existed, we used the scale variable weighted MEAV as a proxy driver to assess the residual costs
- the next step was to calculate the unit cost of each cost category for each DNO, by dividing the total cost of the category by the relevant driver (eg £m connection costs/number of customers)
- the weight was then calculated using the industry median unit cost for each category. This weight was then multiplied by the relevant cost driver
- the CSV was then calculated as $\text{CSV} = \text{median}\ (\text{u/c})_1 * \text{Driver}_1 + \text{median}\ (\text{u/c})_2 * \text{Driver}_2) + \cdots + \text{median}\ (\text{u/c})_{28} * \text{Driver}_{28}$.

Table 91 Drivers used in the bottom-up CSV[266]

Cost area	Driver
Connections	Customer numbers
Total Reinforcement	Capacity released
Civil Works Condition Driven	MEAV
Blackstart	MEAV
Legal Safety	MEAV
Flood Mitigation	MEAV
Overhead Line Clearances	Length LV HV OHL
Losses	MEAV
Environmental Reporting	MEAV
Operational IT and telecoms	MEAV
Visual Amenity	MEAV
Total Diversions	Length total

[266] for connections and total reinforcement, we use a different driver compared to the RIIO-ED1 bottom-up CSV. For connections and reinforcement, the RIIO-ED1 driver used units distributed.

Cost area	Driver
Total Asset Replacement	MEAV
Total Refurbishment	MEAV
Total Non-op Capex	MEAV
Total HVP	Units distributed
Tree Cutting	Spans cut
Faults op	Faults total
Severe Weather 1 in 20	Length LV HV OHL
ONIs	ONIs faults
Inspections	MEAV
Repair and Maintenance	MEAV
Dismantlement	MEAV
Remote Generation Opex	MEAV
Substation Electricity	MEAV
Smart Metering Rollout	Customer numbers
Total CAI	MEAV
Total Business Support	MEAV

Appendix 9 Modelling LRE in RIIO-ED2

Introduction

RIIO-ED2 Demand Pathways

A9.1 The key objective in the assessment of Load Related Expenditure (LRE) is to ensure that sufficient investment is made to meet future demand while protecting consumers' interests from unnecessary investment. This challenge is amplified in RIIO-ED2 due to:

- the step change in forecast expenditure compared with RIIO-ED1
- the projections of significant growth in energy demand and LCT uptake along with the inherent uncertainty of such projections
- the considerable variation among DNOs in their choice of demand scenario and corresponding reinforcement requirements.

A9.2 We undertook substantial quantitative analysis using primarily the BPDT data, as well as some external data sources. The primary focus of the analysis was to identify suitable cost drivers that captured the effects of the significant increase in demand forecast for RIIO-ED2 and accounted for the differences between DNOs with respect to their chosen demand pathway. This work included:

- Detailed analysis of how the DNOs Business Plan scenarios and demand pathways are reflected in key cost drivers. These drivers include the forecasts of LCTs, peak demand, units distributed, and network utilisation.
- Comparative analysis of EV and HP volumes with forecasts from FES 2021. Another area of focus was the differing assumptions made concerning EV to charger ratios, the size of chargers and HPs, and their assumed contribution to peak demand.
- Assessment of the relationship between forecast LCT uptake/demand growth and the DNO's proposed workload in RIIO-ED2 (ie their reinforcement requirements). This was an important area of analysis during model development and testing.

A9.3 DNOs' projections of future demand are aligned with a common range of national net-zero pathways defined by the ESO's FES, and the CCC's 6th Carbon Budget. These scenarios make various projections for the UK out to 2050, including the expected uptake of LCTs, growth in total electricity demand (GWh), growth in

network peak demand (MW), distributed generation connections and energy efficiency trends.

A9.4 The DNO's augment these pathways for their regions to form their own Distribution Future Electricity Scenarios (DFES) – a standardised set of four scenarios (Steady Progression, System Transformation, Consumer Transformation, Leading the Way) that are common among all DNOs and share the same names, assumptions, and framework as the ESO FES.

A9.5 The Business Plans are based on a baseline scenario (see Figure 21 and Figure 22), but also include a low and high case scenario. These may directly follow one of the DFES pathways or represent an average of several scenarios. DNOs report high level forecasts out to 2050 for energy demand, customer numbers, and LRE under their baseline, high case and low case scenarios.

Figure 21 Energy demand pathways to 2050, under DNOs respective baseline scenarios. Shown as a % of 2016 demand.

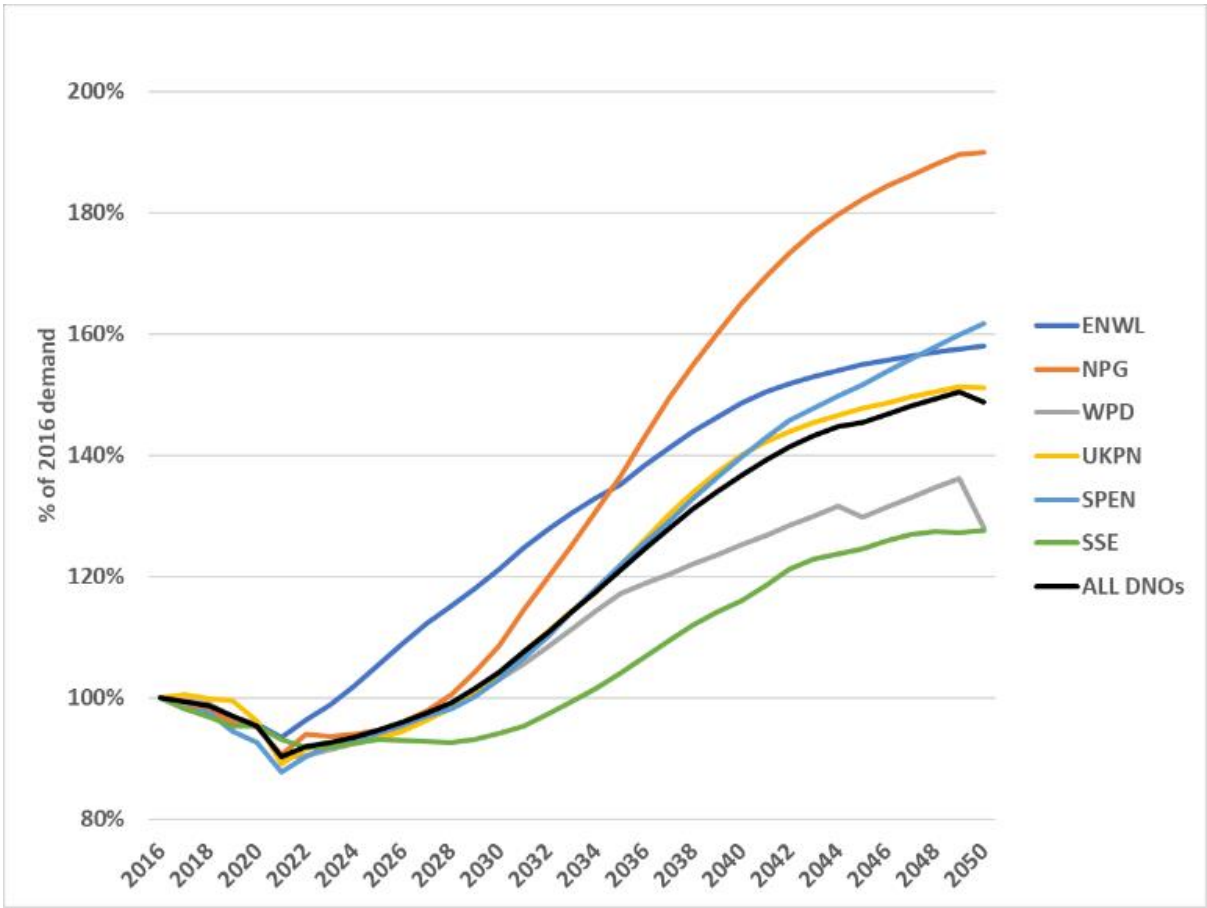
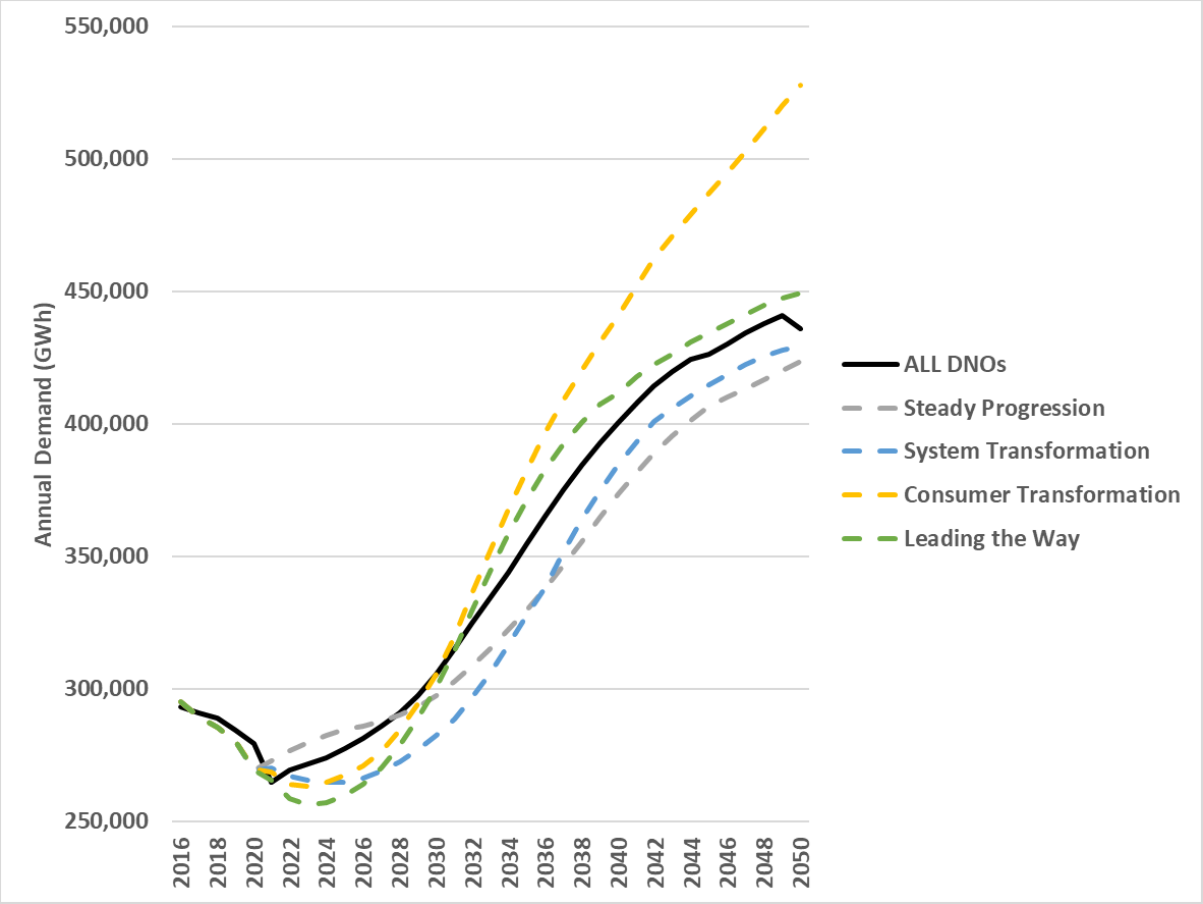


Figure 22 Combined DNO baseline scenarios showing GB energy demand compared against the four National Grid ESO 2021 FES. (The FES pathways show total customer demand minus the demand from direct transmission customers).



RIIO-ED2 LRE Submitted Costs

A9.6 DNOs submitted total gross costs for LRE in RIIO-ED2 amount to £3.43bn. This increased to £3.76bn following the reclassification of some LRE uncertainty mechanism costs from BPDT table M13 for ENWL, NPgN, NPgY, SSEH, and SSES. These costs were deemed to be part of the DNO's LRE baseline Business Plan scenario and were therefore reclassified to ensure consistency across industry with respect to the ex ante cost assessment. More detail on this can be found in Chapter 7.

A9.7 Secondary reinforcement is the largest component of LRE in RIIO-ED2, totalling over £1.3bn. Connections costs are the next largest contributor amounting to £1.25bn, while primary reinforcement totals £0.78bn (see Figure 23 and Figure 24).

Figure 23 RIIO-ED2 total LRE, submitted gross costs per activity

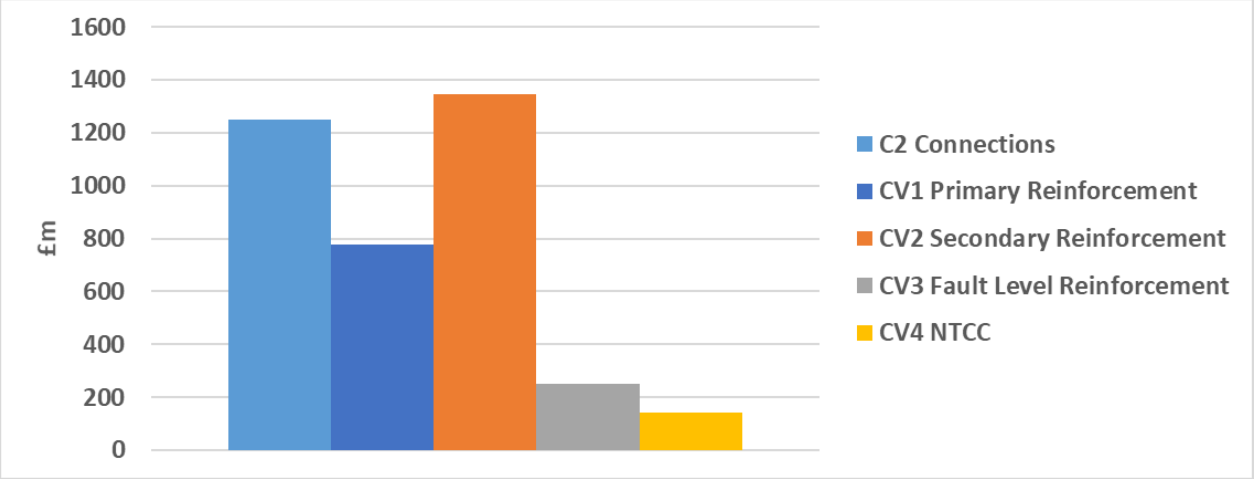
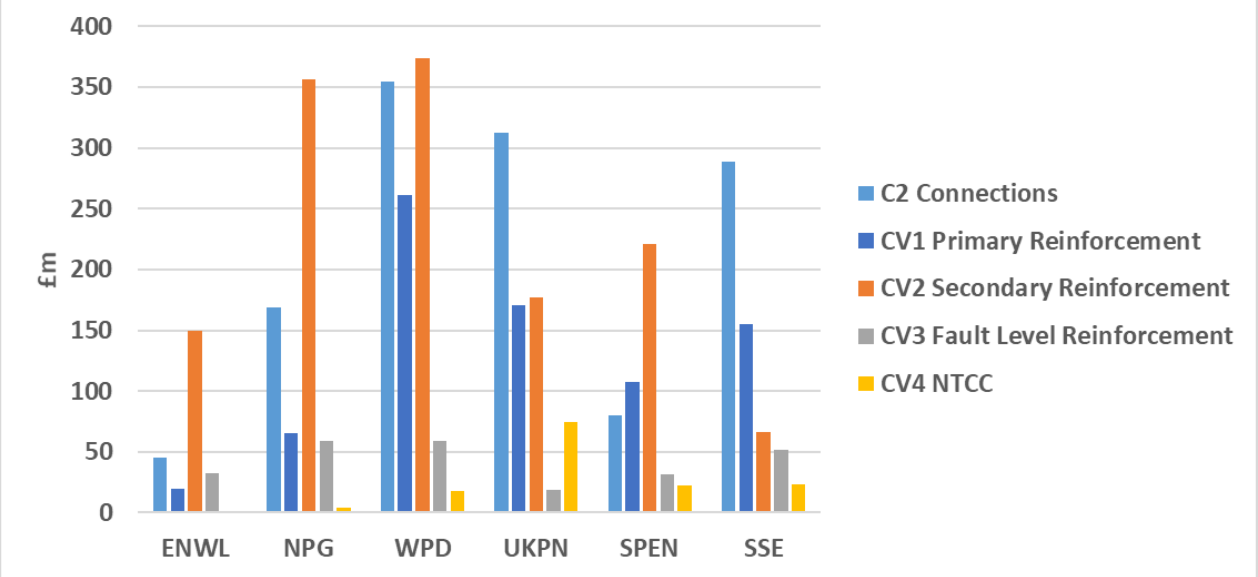


Figure 24 RIIO-ED2 total LRE, submitted gross costs per activity split by DNO



A9.8 Overall, average annual LRE in RIIO-ED2 is forecast to be more than double the current annual spend in RIIO-ED1 (see Figure 25). When considered on a per customer basis, LRE per customer dropped considerably in RIIO-ED1 compared with DPCR5, partly due to expected demand growth not materialising. RIIO-ED2 submitted costs display a significant increase in LRE per customer compared to RIIO-ED1 (see Figure 26). This increase is highly variable between DNOs, ranging from 40% to 300%.

A9.9 The cost activity with the largest overall increase is secondary reinforcement, with a 300% increase in average annual expenditure in RIIO-ED2 compared with RIIO-ED1 (see Figure 27).

Figure 25 Average p.a. LRE, RIIO-ED1 vs. RIIO-ED2

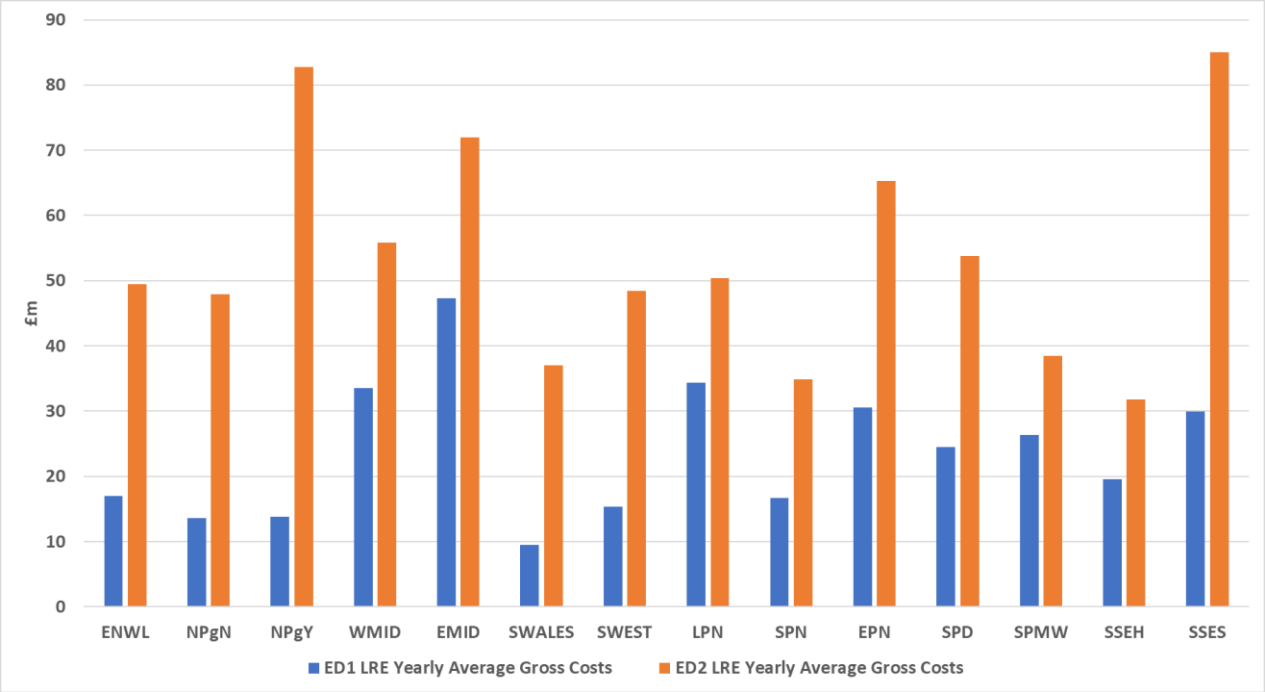


Figure 26 Average p.a. LRE per customer - DPCR5, RIIO-ED1, and RIIO-ED2

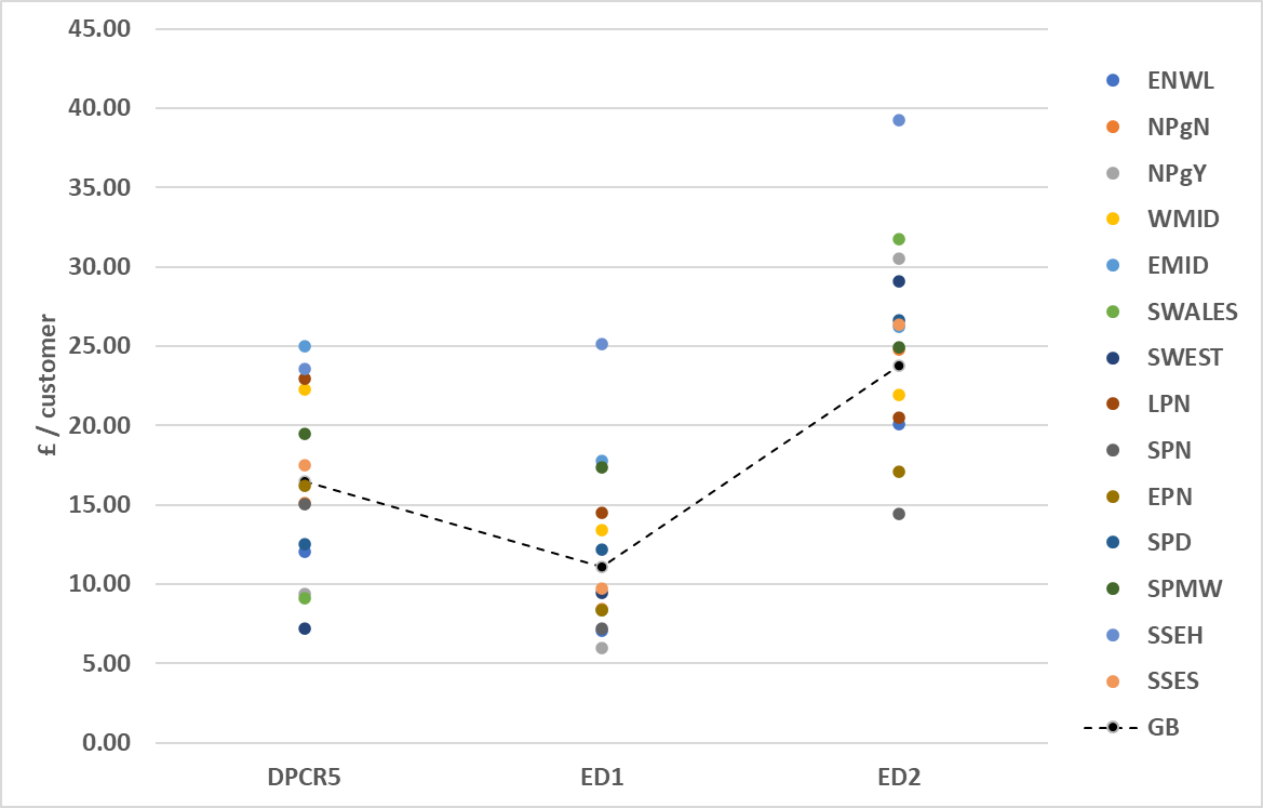
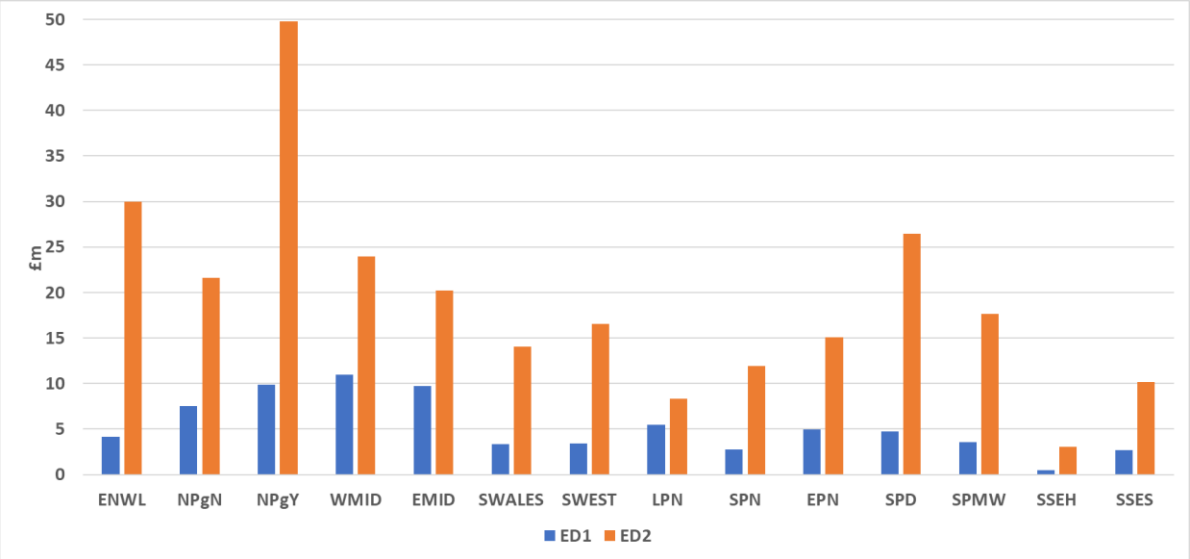


Figure 27 Average p.a. secondary reinforcement costs, RIIO-ED1 vs. RIIO-ED2



Cost Driver Analysis

LCTs

A9.10 LCT uptake is expected to contribute significantly to future demand growth and is therefore a key driver of network reinforcement costs in RIIO-ED2. DNOs reported the number and size (MW) of yearly additions of EV chargers, HPs, solar PV, and distributed generation in their Business Plan submission.

A9.11 The two figures below (Figure 28 and Figure 29) compare volumes of EV chargers and HPs reported in the BPDT table M20, alongside the high-level forecast numbers cited in Business Plan documents. Comparing the count of charge point installations with the total number of EVs DNOs expect in their regions by the end of RIIO-ED2, we see clear differences between DNOs in the assumption of an EV to charger ratio. While ENWL, NPg, and SPEN assume a ratio of roughly 1:1, the other three DNOs assumed a ratio of at least 2:1. Furthermore, the EV charger and HP numbers reported in BPDT table M20 reflect installations that do not lead to a new or modified connection. This is likely another source of the differences between DNOs, with there being contrasting assumptions of how many LCTs will require new connections.

Figure 28 Forecasts of EVs and EV chargers in region by end of RIIO-ED2

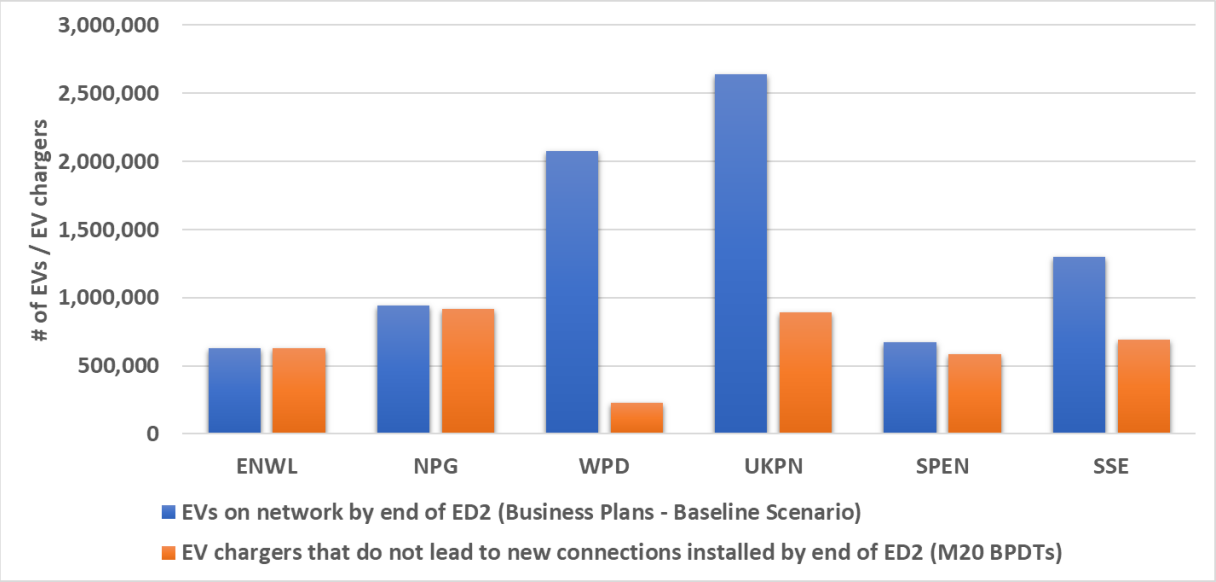
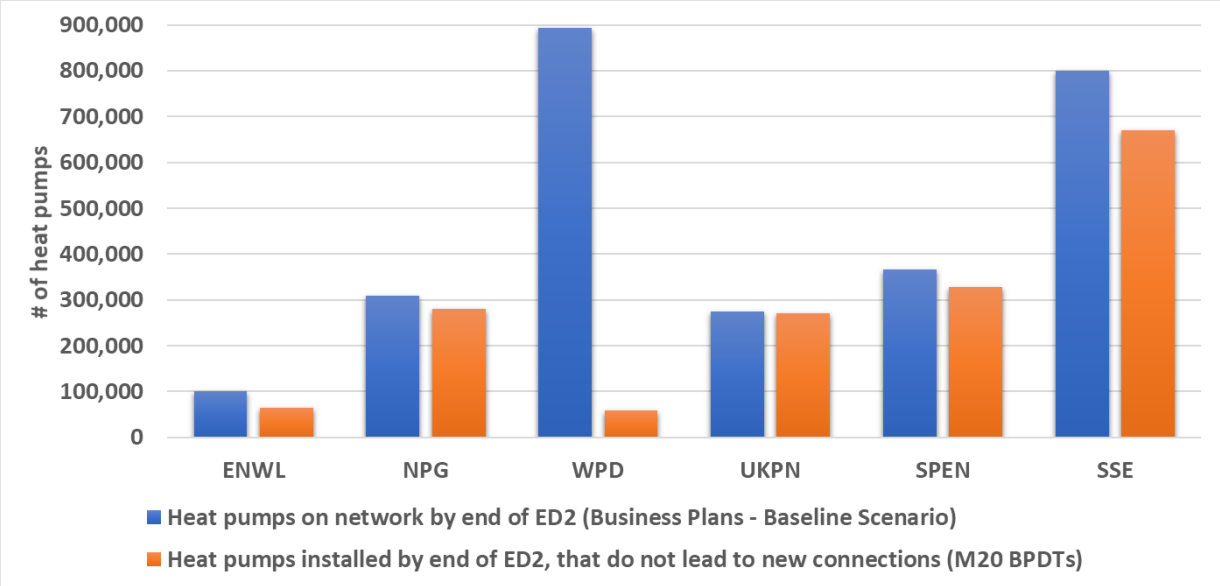


Figure 29 Forecasts of HPs per DNO region by end of RIIO-ED2



A9.12 To obtain greater clarity around the LCT forecasts, we requested additional data through an SQ sent on 9 February 2022. This asked DNOs to provide the direct EV, EV charger and HP forecasts from their DFES baseline scenario. The EV volumes reported, once combined with historical numbers where necessary, tied very closely with the 2028 totals cited in the Business Plans, and allowed us to compare DNOs on a more consistent basis (Figure 30 and Figure 31). It also enabled direct comparison to EV forecasts from the four scenarios in the FES 2021. Examples of this comparison are shown for two DNOs in Figure 32 and Figure 33.

Figure 30 Projections of EV uptake by DNO

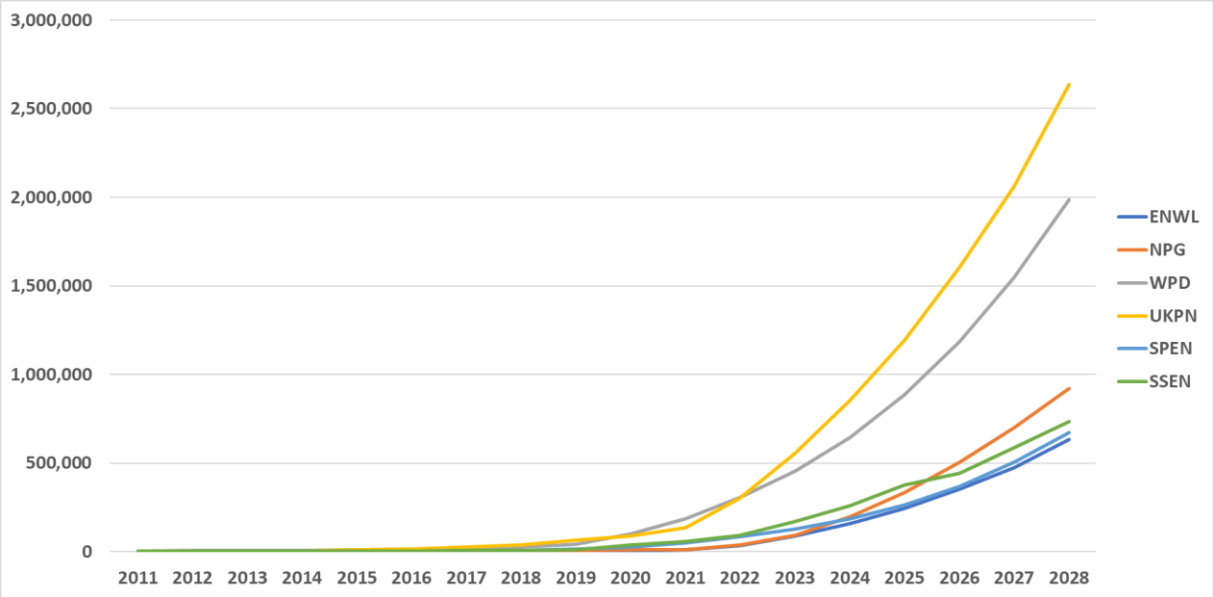


Figure 31 Projections of HP uptake by DNO

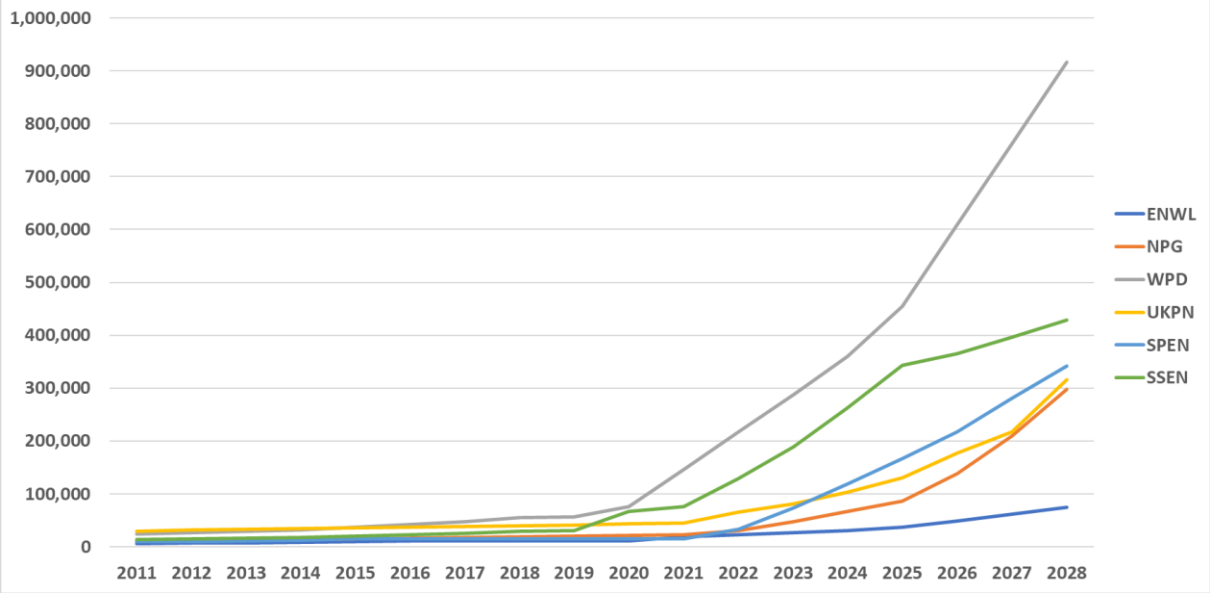


Figure 32 An example of projected EV uptake for RIIO-ED2 compared with regionalised FES 2021 forecasts (shown here for NPg)

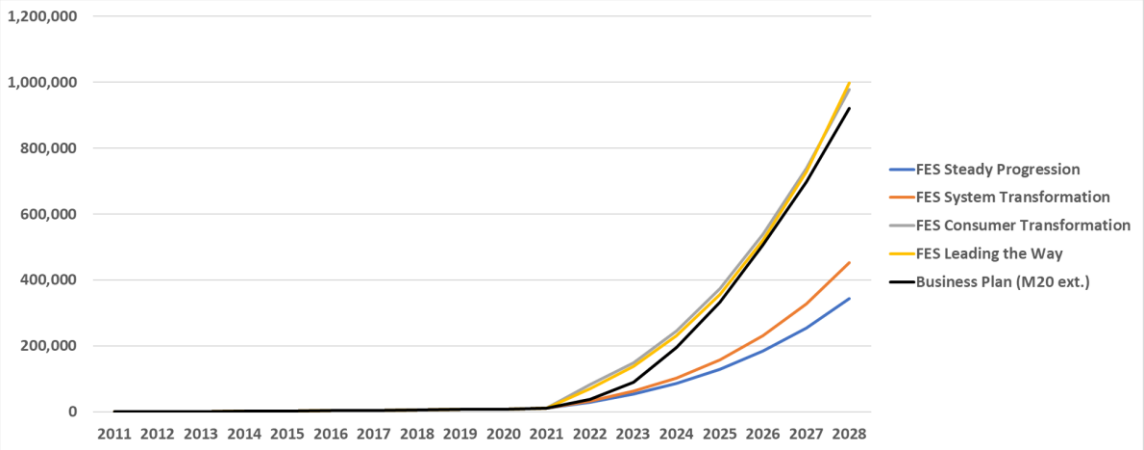
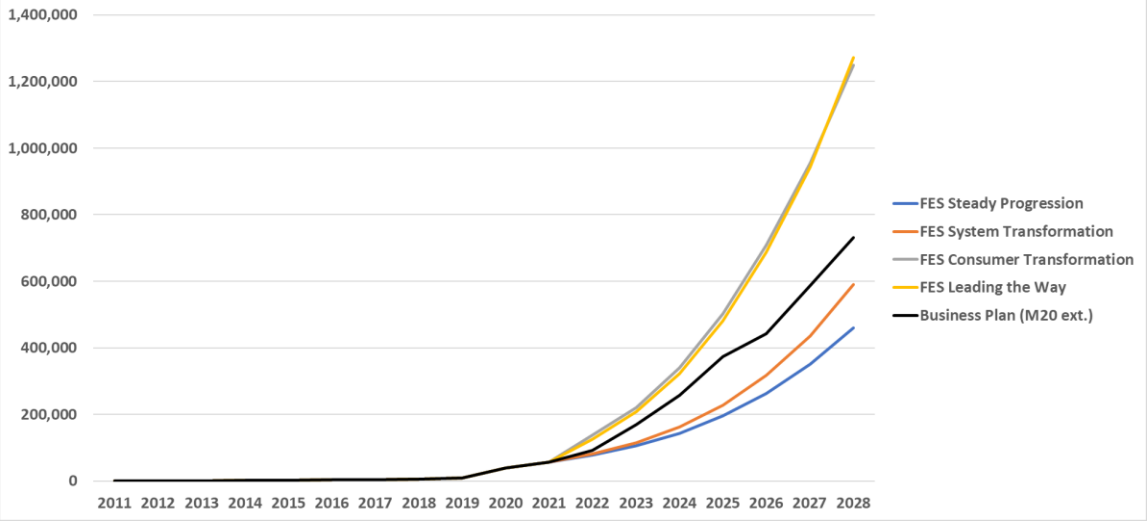
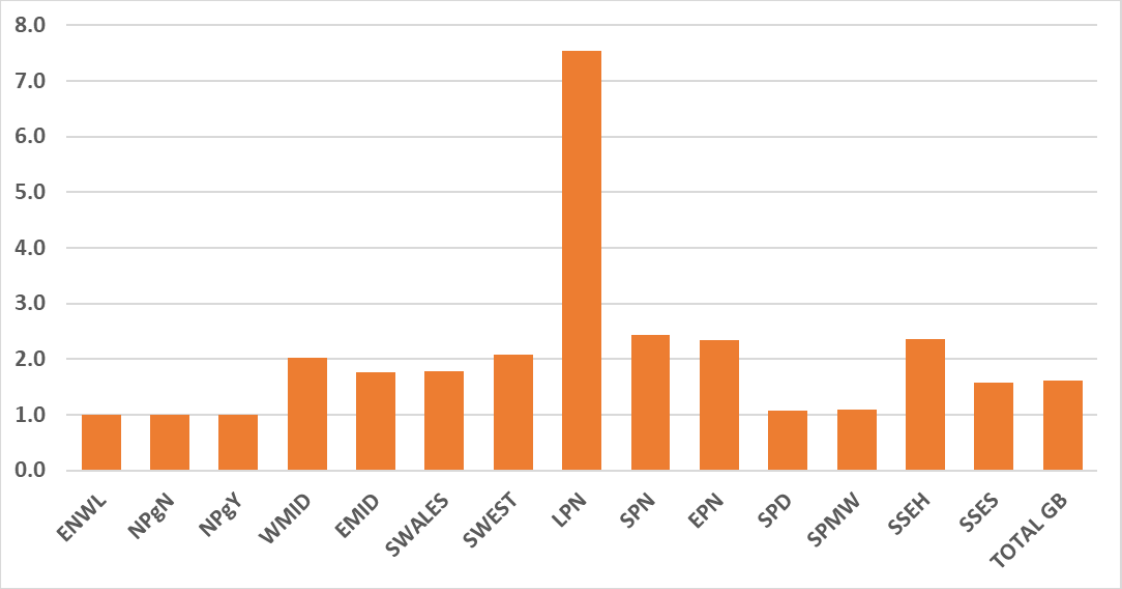


Figure 33 An example of projected EV uptake for RIIO-ED2 compared with regionalised FES 2021 forecasts. Shown here for SSEN.



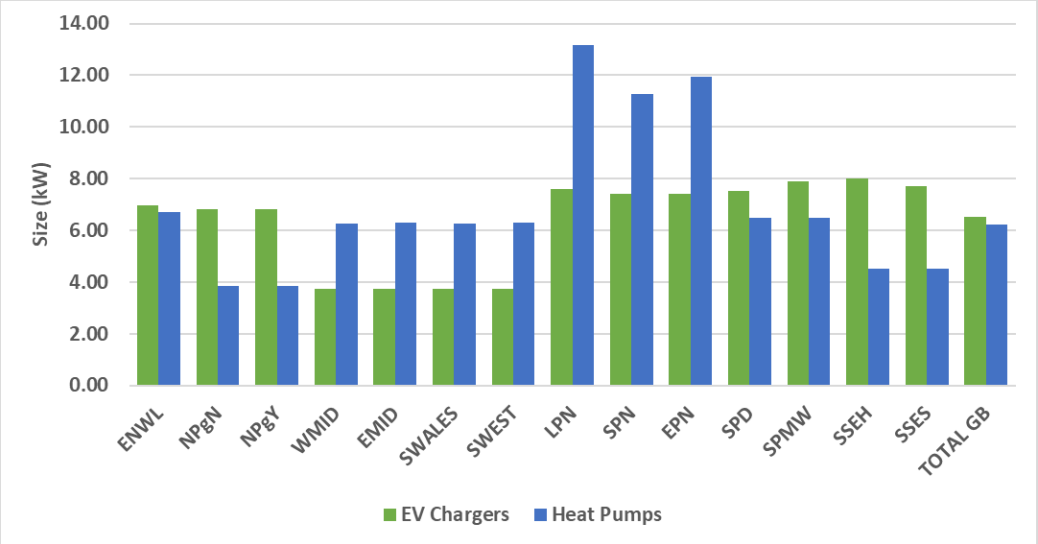
A9.13 With the revised submission of EV and HP data, differences in the assumptions of EV to charger ratios were still apparent (see Figure 34). Although the rationale behind some of these differences is reasonable – one would expect a higher ratio for LPN – a question remains as to why some networks, with a seemingly comparable mix of urban and rural geographies, have assumed a 1:1 ratio while others a roughly 2:1 ratio.

Figure 34 Assumed EV to EV charger ratio by DNO, based on forecasts in RIIO-ED2 and data sourced from DNO SQ responses



A9.14 Another difference highlighted in our analysis was the assumed size (MW) of EV charger and HP installations. Given its implications for the assumed contribution to peak demand of a single EV or HP, it is clearly an important measure in determining the likely load growth and corresponding network reinforcement requirements in RIIO-ED2. From the figure below, it is evident there is a broadly consistent assumption of around 7kW per charger among 5 DNOs (ie the typical size of a fast charger), while WPD assumes an average size of roughly 3.7kW (ie the typical size of a slow charger). The assumed size of HP installations is more variable as shown in Figure 35.

Figure 35 Assumed size of EV chargers and HPs per DNO, based on RIIO-ED2 forecast data from DNO SQ responses



A9.15 The number and size of LCT additions is certainly a key measure of expected demand growth in RIIO-ED2, and therefore a very important cost driver to consider. The apparent differences between DNOs regarding the underlying LCT uptake scenarios and associated assumptions, as discussed in this section, illustrate the challenge of using this data as a variable in the cost assessment models. The analysis presented here helps demonstrate the many elements we have considered before arriving at our ultimate choice of LCT cost drivers, whether for application in the totex regression models or the disaggregated benchmarking.

Network-wide Peak Demand

A9.16 Much consideration was given to the suitability of network-wide peak demand as a cost driver for LRE. It warranted further analysis given it generally displayed stronger correlation (both historical and forecast data) with LRE than other key network drivers such as units distributed, customer numbers and MEAV.

A9.17 Throughout DPCR5 and RIIO-ED1, network-wide peak demand has generally fallen in absolute terms and currently sits below 2011 levels for all DNOs. DNOs have seen a reduction of between 5–20% in network-wide peak demand since 2011. Furthermore, the peak demand recorded in RIIO-ED1 is significantly below what was forecast at the beginning of the price control (Figure 36).

A9.18 This coincides with a much-reduced average p.a. LRE in RIIO-ED1 compared with allowances at the start of the period. For most DNOs the reduction in RIIO-ED1 LRE vs. allowance is ~ four times greater than the reduction in actual peak demand vs. forecast (Figure 37).

A9.19 The expected growth in peak demand forecast by DNOs by the end of RIIO-ED2 averages 15%. This overall figure for GB suggests broad agreement with national forecasts from the ESO FES 2021, whose scenarios suggest a range of 7 – 12%. However, there is considerable variation in peak demand forecasts between the 6 DNOs and 14 licence areas (see Figure 36).

A9.20 Network-wide peak demand might be a simplistic guide when considering the requirement for network reinforcement, but it would appear to hold some relationship with LRE, evident in the fact that:

- the reduction in peak demand relative to forecast is highlighted by the DNOs as a key reason for the difference between actual LRE and baseline allowances in RIIO-ED1

- forecasts of significant growth in peak demand are highlighted in explaining an associated increase in LRE in RIIO-ED2.

A9.21 Analysis of network-wide peak demand was shared with the DNOs through the CAWG. Some DNOs expressed concern around the use of peak demand as a cost driver for LRE, noting that it had been looked at in the past and not pursued due to a seemingly negative relationship with historical costs. However, one DNO suggested that there is a need for a high-level cost driver like peak demand or a load index, that can be used to explain the trends in LRE and applied as a mechanism in the cost assessment benchmarking.

A9.22 Another DNO commented on the fact that network-wide peak demand is unlikely to be a reliable indicator for secondary network reinforcement requirements. It is measured at the Grid Supply Point level and so is more likely to provide an indication of overall demand at the high voltage levels of the network, where the overall capacity needs are reduced by demand diversity.

A9.23 Given the material nature of secondary reinforcement at RIIO-ED2, it is vital to be using the correct cost drivers for benchmarking. At the LV levels, DNOs plan for the maximum capacity of the LCTs connecting. It is likely that this disparity between network-wide peak demand and the capacity needs of the LV networks will continue to diverge as more LCTs and distributed generation connect to the extreme points of the network. Thus, it is considered that LCT cost drivers, like those discussed in the previous section, are a more suitable variable for modelling secondary reinforcement costs.

Figure 36 Historical and projected network-wide peak demand, shown as a percentage of 2011 peak demand

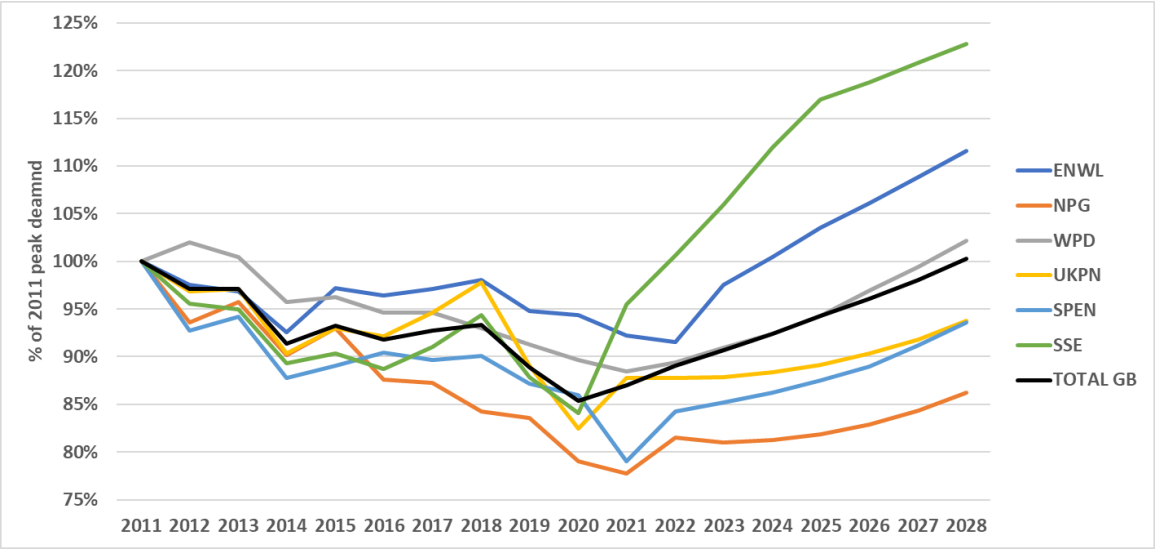
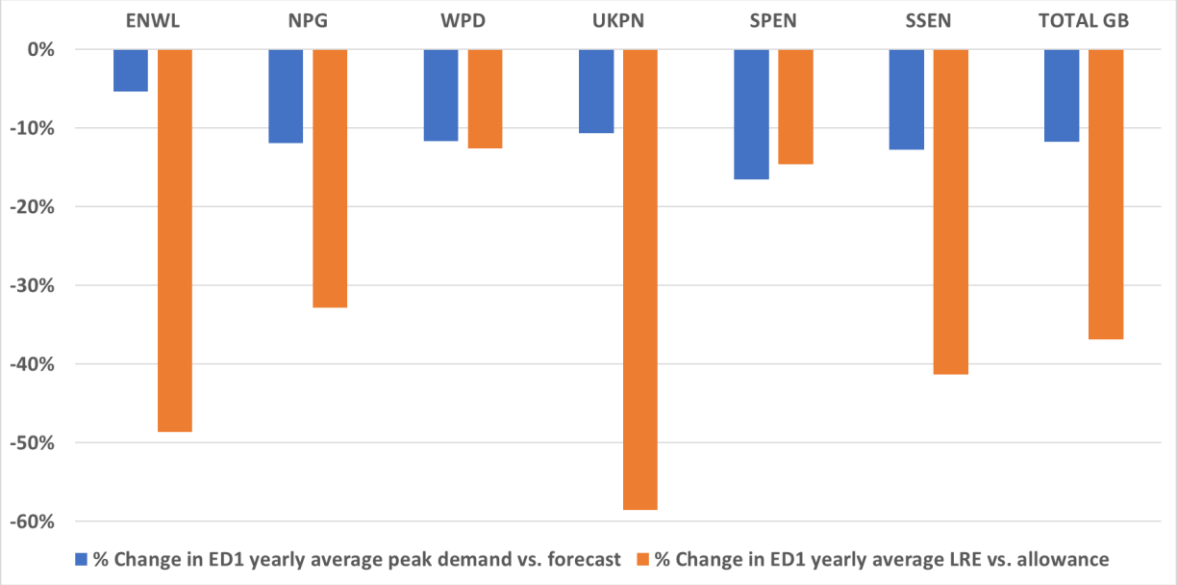


Figure 37 Percentage change in outturn peak demand in RIIO-ED1 compared to forecast, and corresponding percentage change in LRE compared to allowance



Other cost drivers considered

A9.24 Other cost drivers for LRE considered and tested include:

- units distributed: a key network driver that presents a similar trend to peak demand throughout DPCR5 and RIIO-ED1. It performed similarly to peak demand when tested
- customer numbers: a measure of the scale of demand on a DNO's network, but customer numbers or customer growth are unlikely to capture the significant demand growth forecast in RIIO-ED2. It was typically applied in testing alongside a demand driver like LCTs
- MEAV: used in RIIO-ED1 as the main cost driver for some LRE models. However as with customer numbers it is a measure of scale and an imperfect measure of load growth
- capacity released and km of circuit added: reflects the DNO's proposed reinforcement requirements. Performed strongly as a cost driver for secondary reinforcement
- network utilisation: A couple of high-level variables were derived using various combinations of the data from the load index tables for the primary network, and the utilisation memo tables for the secondary network. Drivers tested include the number of substations > 100% utilisation assuming no intervention, and the number of transformers > 100% utilisation assuming no intervention.

Model Development and Testing

Regression model testing

A9.25 Initially, regression testing was focused on developing a totex-style middle-up regression model for LRE. This involved testing several variants of LRE, which meant typically excluding one of C2 Connections, CV3 Fault level reinforcement or CV4 NTCC from the cost pool. A combination of all reinforcement costs plus connections, but with CV4 excluded, appeared to perform the strongest when analysing correlation coefficients with a variety of key cost drivers.

A9.26 Testing demonstrated that the best performing regression model for LRE was a log-log multiple regression model that included a combination of peak demand, the cumulative number of EVs and HPs, plus capacity released as variables. This model had an R-squared of 0.7 and performed better than models that used customer numbers, units distributed or MEAV in place of peak demand. Using any more than one of these scale variables in the same model had the effect of destroying the statistical significance of other variables. The data period used for the model was 2016–2028. Analysis had shown that omitting DPCR5 data from the regression improved the R-squared (see Figure 38 and Figure 39).

Figure 38 RIIO-ED2 LRE vs. cumulative number of HPs (log-log), the model is improved by omitting DPCR5 data shown in blue

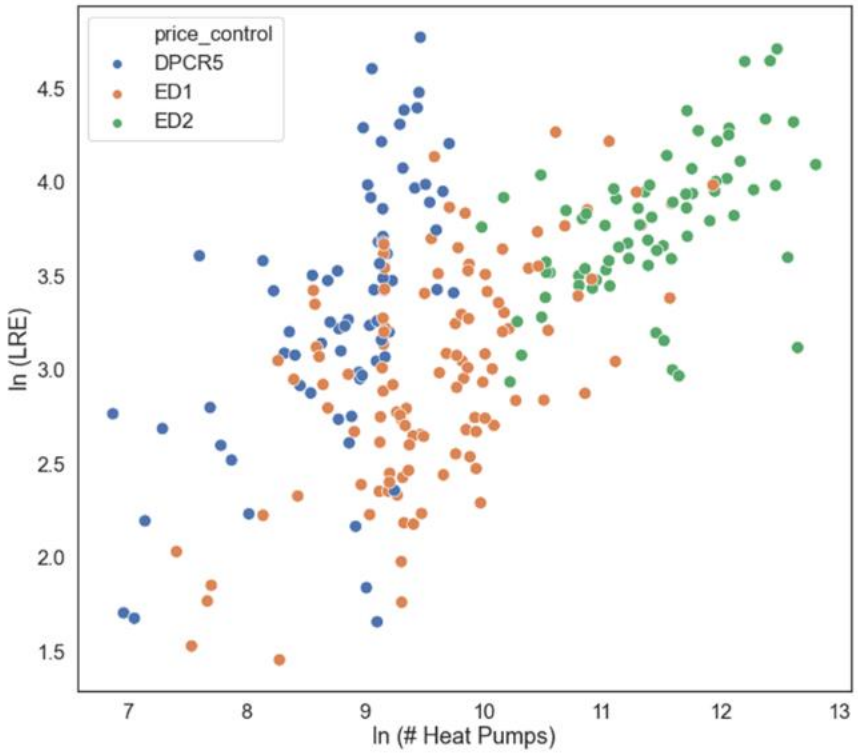
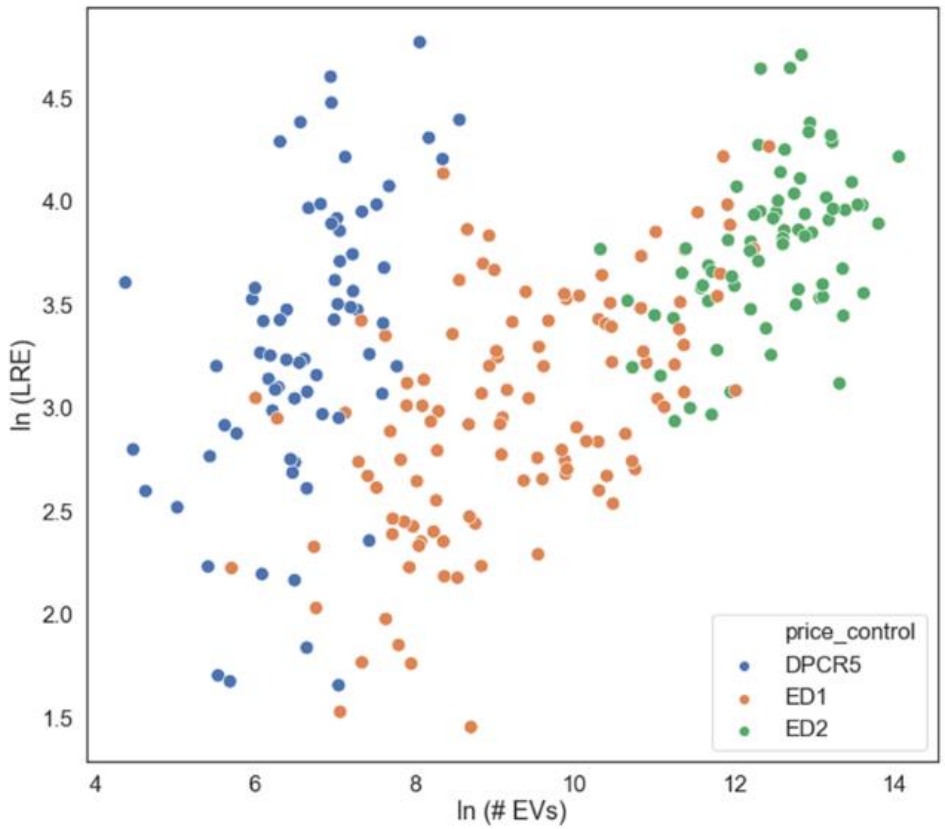


Figure 39 RIIO-ED2 LRE vs. cumulative number of EVs (log-log), the model is improved by omitting DPCR5 data (shown in blue)



A9.27 Regression testing was also performed for individual cost activities – namely the 3 major categories of connections, primary reinforcement and secondary reinforcement. Ultimately a suitable regression model for primary reinforcement or connections was not found.

A9.28 On the other hand, secondary reinforcement displayed much better model scores overall, and demonstrated a far better relationship with the LCT variables than other load categories. As explained in A9.23, network-wide peak demand is not a suitable cost driver for the secondary network. A simple regression model for CV2 that combined customer numbers, as well as cumulative EV and HP numbers achieved a low R-squared of 0.5. The model fit could be greatly improved by including workload drivers like capacity released (MVA) and circuit reinforcement (km). This model specification achieved an R-squared >0.85. However, the drawback of a model like this with a high R-squared and the inclusion of endogenous cost drivers, is that it is effectively performing an assessment of unit cost efficiency only, and not an assessment of workload efficiency.

A9.29 Furthermore, with the inclusion of capacity released across the primary and secondary networks included as a variable in the specification of totex model 2, and LCTs used as a cost driver in totex model 3, it was decided that it would be worthwhile pursuing an alternative disaggregated approach for modelling secondary reinforcement. A regression model at a disaggregated level, that did not differentiate from the totex models in respect of cost drivers, would offer little benefit in the overall cost assessment process.

Secondary reinforcement disaggregated model

A9.30 The next stage in the model development process explored a benchmarking approach that still made use of LCT data as an approximation of demand growth, but, instead of regression, used a unit cost assessment and ratio analysis to establish efficient costs and volumes.

A9.31 To derive consistent and efficient baseline allowances for secondary reinforcement, prior to the use of the volume drivers, we believe that an assessment of workload efficiency is required in addition to a unit cost assessment. A suitable approach for benchmarking volumes may be one that is analogous to the volume adjustment applied in the primary reinforcement model.

A9.32 We propose to assess the efficiency of workload volumes proposed by DNOs relative to their forecast demand growth from LCT uptake. This ensures each area of secondary reinforcement is directly linked with DNO's own forecasts of demand growth and is consistent with the capacity and services volume driver monitoring going forward.

A9.33 Taking the example of reinforcement for PMT and GMT, submitted baseline volumes already represent a significant increase over RIIO-ED1 (see Figure 40). If we were to fund DNOs on submitted workload, there is a risk that some may never need the volume driver.

A9.34 Utilisation data for the secondary network, both the transformer utilisation at the start of RIIO-ED2 and the forecast increase in utilisation, give an indication of the minimum likely level of constraints the DNOs will see on their networks in RIIO-ED2. The growth in highly utilised assets should be directly impacted by the size of LCTs connecting to the network. Assuming the network impact per unit of LCT connecting is relatively consistent across DNO licence areas, then the forecast total size of LCTs connecting to the network is a simple but reasonable measure of the reinforcement requirements for a DNO. According to the modelled utilisation

data for the start of RIIO-ED2, high levels of asset utilisation do not necessarily correlate with large volumes of reinforcement (see Figure 41). UKPN has one of the highest counts of transformers above 100% utilisation at the start of RIIO-ED2, but relatively low levels of transformer reinforcement forecast. WPD on the other hand, have lower numbers of transformers above 100% utilisation at the start of RIIO-ED2, but relatively high baseline reinforcement.

Figure 40 PMT and GMT reinforcement volumes (MVA) in RIIO-ED1 and RIIO-ED2

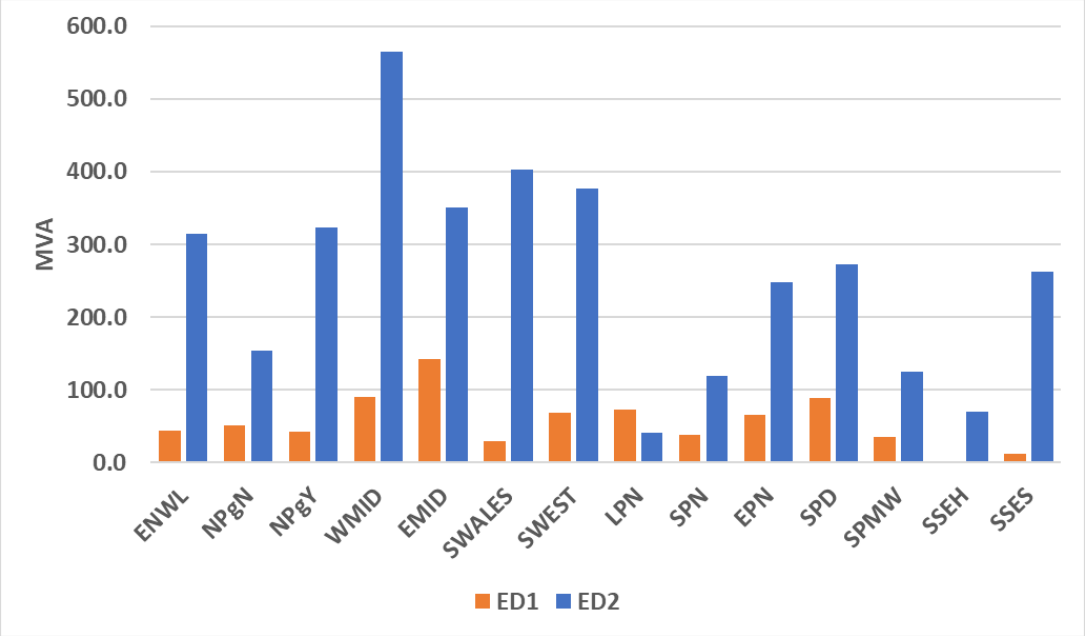
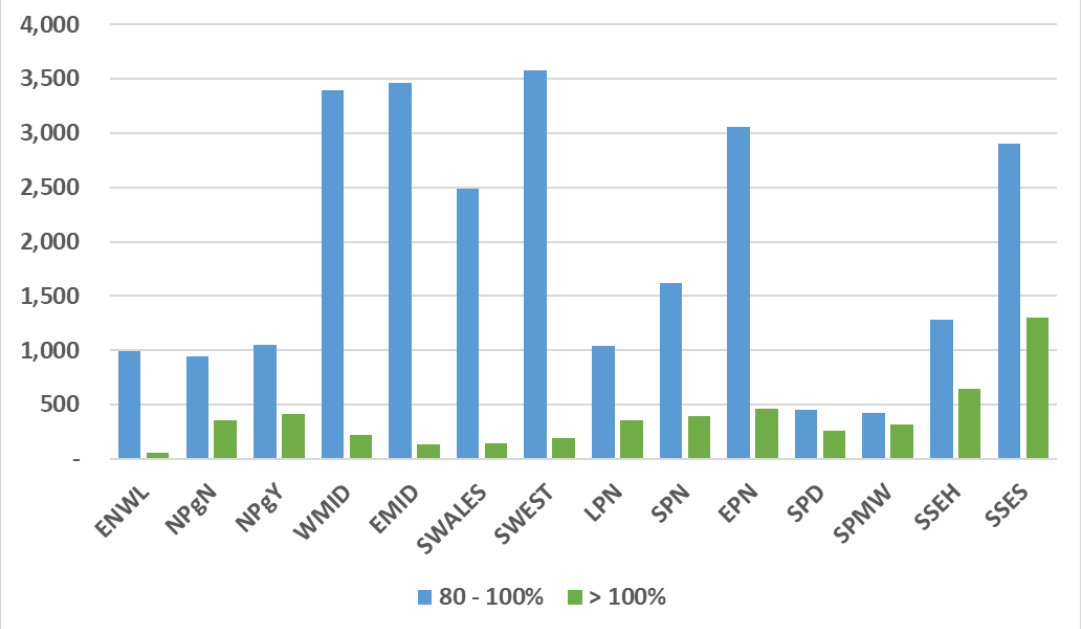
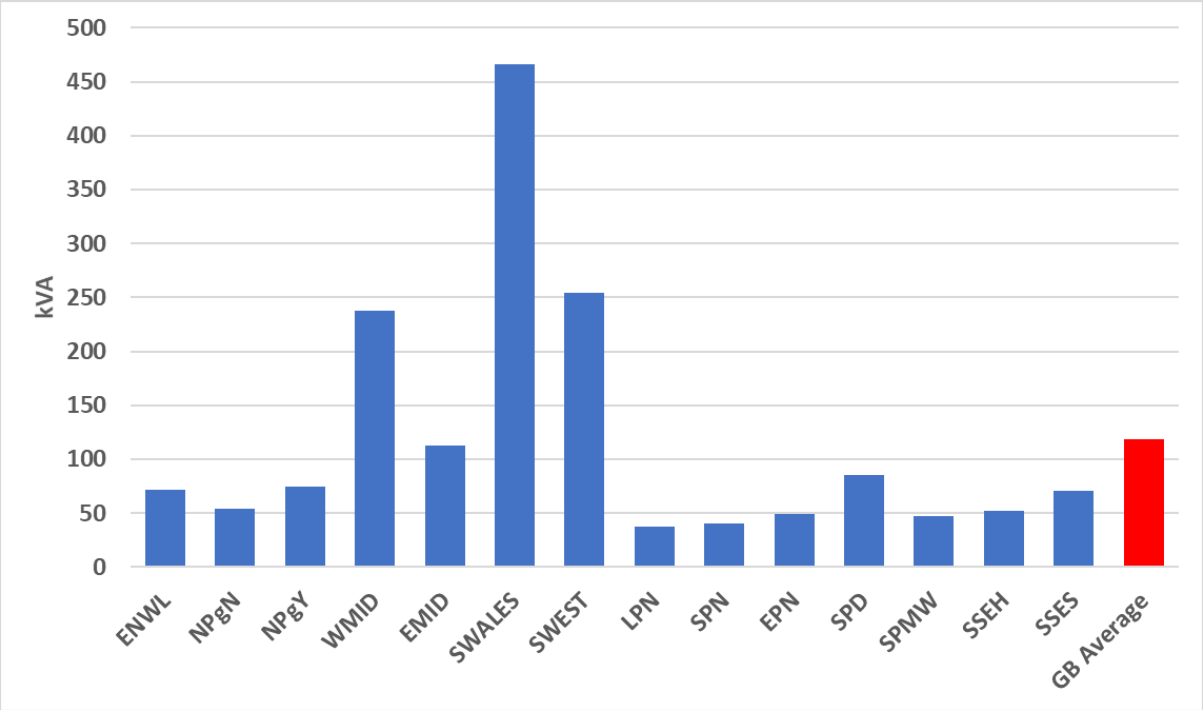


Figure 41 Number of secondary network transformers forecast to be above 80% utilisation at the start of RIIO-ED2



A9.35 We compare RIIO-ED2 transformer reinforcement volumes against the forecast total size of LCT connections on the secondary network (Figure 42). DNOs are benchmarked down where their ratio is above the industry average ratio of forecast capacity released relative to forecast MW of LCTs connected. The industry average ratio is 118 kVA capacity released for every 1 MW of LCT connected.

Figure 42 RIIO-ED2 PMT and GMT reinforcement volumes, shown in kVA for every 1 MW of LCT connected



A9.36 The total size of LCT connections used in this assessment is computed from DNOs' forecasts of the total size of EV chargers, HPs, solar PV and other distributed generation expected to connect to the secondary network in RIIO-ED2. The data for DG connections is sourced from the BPDT memo table M20, while the data for EV chargers and HPs is sourced from the SQ responses, described in A9.12. While there certainly is a question as to the appropriate size to assume for EV chargers and HPs in this analysis, we propose to use DNOs' LCT volumes as submitted at this stage, as we believe this to be consistent with the overall cost assessment approach. Any adjustment to DNOs' underlying LCT forecasts and associated assumptions is left to the post-modelling demand driven adjustment discussed in 7.409.

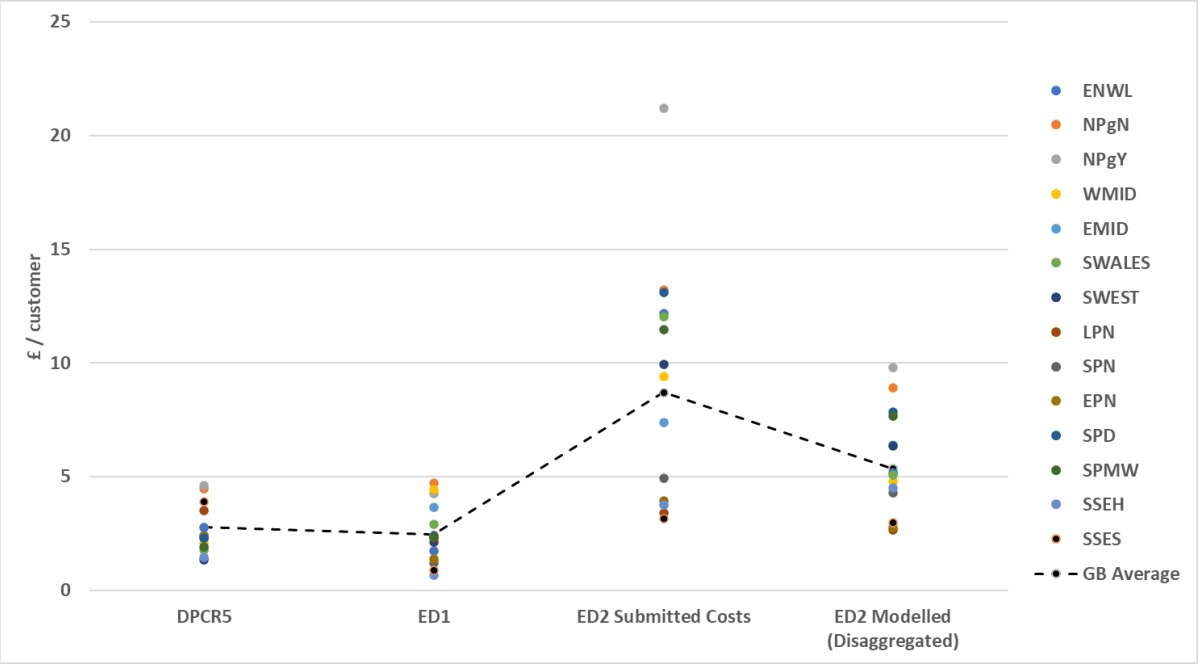
A9.37 This adjustment to transformer reinforcement looks to remove inefficient workload forecasts and set a consistent baseline prior to the use of the capacity volume driver. We recognise that this adjustment potentially penalises strategic

investment where the reinforcement work is anticipatory ahead of load growth expected in RIIO-ED3 or later. However, the industry average ratio used appears to be a fair benchmark - 11 of the 14 DNO licence areas sit below this benchmark and receive no adjustment.

A9.38 Including the similar adjustments applied to circuit and proactive service reinforcement, we believe the modelled baseline allowances from the disaggregated assessment represent a more consistent range of expenditure across industry, and a reasonable starting point prior to the use of the volume driver. This is best demonstrated by the chart below which shows a more consistent spread across industry of CV2 spend per customer following the disaggregated benchmarking (see Figure 43). There is still an overall increase in the spend per customer in RIIO-ED2 after disaggregated benchmarking. We believe this reflects the likely requirement for increased network investment.

A9.39 It is also worth noting here that the disaggregated modelling only comprises 50% of the cost assessment. The combination with the totex modelling outputs, which takes a suitably different assessment approach, will soften the reduction made to baseline allowances, therefore effectively allowing some expenditure for strategic investment in RIIO-ED2.

Figure 43 Secondary Reinforcement spend per customer (the RIIO-ED2 modelled costs here refer to the results of the disaggregated assessment only)



Appendix 10 Disaggregated Regression Models Results

A10.1 Table 92 shows the results of the regression analysis at the disaggregated level. For the three models, the model specification assumes a Cobb-Douglas functional form and two linear time trends.

Table 92 Regression Results Disaggregated Models

	Faults and ONIs	CAI	Core BS
Time period	2011-2028	2016-2028	2022-2028
MEAV		0.76***	0.75***
Number of Faults	0.70***		
Numbers of ONIs	0.32***		
Time trend (whole period)	0.01**	-0.01	0.01
Forecast time trend	-0.03***	0.02**	0.00
Constant	-6.37***	-8.12***	-9.49***
Robustness test (p-values)			
Ramsey RESET	0	0	0
Heteroscedasticity	0.414	0.618	0.157
Normality	0.015	0.122	0.033
Pooling	1	1	1
Adjusted R-squared	0.81	0.75	0.65

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix 11 Consultation questions

1. RIIO-ED2 Overview

2. Embedding the consumer voice in RIIO-ED2

Core-Q1. Do you agree with our proposals for the enduring role of the CEG?

Core-Q2. Do you see value in the CEGs working together to deliver more coordinated and comparative reporting on some of the DNOs' Business Plan commitments?

3. Networks for Net Zero

Core-Q3. Do you agree with our proposal to adjust allowances to £2.68bn to account for the concerns highlighted by our assessment?

Core-Q4. Do you agree with our proposed secondary reinforcement volume driver and LV services volume driver and the associated controls?

Core-Q5. Do you agree with our proposed LRE re-opener?

Core-Q6. Do you agree with our proposed approach to the Net Zero re-opener?

Core-Q7. Do you agree with our proposed approach to the value of the SIF?

Core-Q8. Do you agree with our proposed approach to weighting SSMD criteria and benchmarking RIIO-ED2 NIA requests against RIIO-ED1?

Core-Q9. Do you agree with our proposed approach to setting NIA allowances?

Core-Q10. Do you agree with our proposal to allow DNOs to carry over any unspent NIA funds from the final year of RIIO-ED1 into the first year of RIIO-ED2?

Core-Q11. Do you agree with our proposed approach for the Annual Environmental Report ODI-R?

Core-Q12. What are your views on the proposed mid-period review on DNO environmental performance and their progress to targets?

Core-Q13. Do you agree with our consultation position for the DNOs' EAP proposals in RIIO-ED2 as set out in this document? (Further detail included in Appendix 1 of this document)

Core-Q14. Do you agree with our proposal to withdraw the Environmental Scorecard ODI-F for RIIO-ED2?

Core-Q15. Do you agree with our proposed approach to design of the Environmental Re-opener?

Core-Q16. Do you agree with our proposal for addressing PCB contamination in PMTs through a volume driver in RIIO-ED2?

4. Supporting a smarter, more flexible, digitally enabled energy system

Core-Q17. Do you agree with our proposal for implementing a Digitalisation Licence Obligation?

Core-Q18. Do you agree with our proposal to have staggered publications of Digitalisation Strategies between RIIO-ED2 and RIIO-2 licensees?

Core-Q19. Do you agree with our proposed Digitalisation re-opener?

Core-Q20. Do you agree with the proposed enhanced reporting framework associated with IT/OT Data and Digitalisation spend and DSAP investment proposals?

Core-Q21. Do you agree with our proposal to adopt TBM as part of the RIGs/RRP?

Core-Q22. Do you agree with our intention to modernise the regulatory reporting process?

Core-Q23. Do you agree with the proposed timeline for implementation of this modernisation?

Core-Q24. Do you agree with our proposed design of the DSO incentive?

Core-Q25. What are you views on the outturn performance metrics and RRE we are proposing to include in the DSO incentive? If you do not support their inclusion, please outline which alternative outturn performance metric(s) or RRE you think should be included in the framework instead.

Core-Q26. Do you agree with our proposal for the DSO re-opener?

Core-Q27. Do you agree with our proposal to introduce a new whole system strategic planning Licence Obligation?

Core-Q28. What are your views on the digital tools that could be used to support this?

5. Meet the needs of consumers and network users

Core-Q29. Do you agree with our proposed target and thresholds for the deadband, maximum reward and penalty?

Core-Q30. Do you agree with our proposed approach to working with DNOs to implement Strom Arwen actions related to customer satisfaction?

Core-Q31. Do you agree with our proposed target and maximum penalty score?

Core-Q32. Do you agree with our proposal to remove the activities proposed from DNOs' baseline allowances?

Core-Q33. Do you agree with our proposals for the Consumer Vulnerability ODI-F?

Core-Q34. Do you agree with the performance metrics we are proposing to include in the incentive and the approach to setting targets and associated deadbands, performance caps and penalty collars? If not, please explain why and give details of your preferred alternative.

Core-Q35. Do you agree with our proposal for the Annual Vulnerability Report ODI-R?

Core-Q36. Do you agree with the proposed content of the annual report? If not, please explain why and give details of your preferred alternative.

Core-Q37. Do you agree with setting the maximum reward and penalty limit at +/-50% of the target?

Core-Q38. Do you agree with setting a deadband of +/-20% of the target?

Core-Q39. Do you agree with our proposed design of the Major Connections incentive?

Core-Q40. Do you agree with our proposed approach to target setting and applying the penalty?

Core-Q41. Do you agree with our proposal to require reputational reporting of timeliness metrics for all RMS?

Core-Q42. Do you agree with our proposal to launch a wider review of the Connections GSoP (that is, beyond updating the payment amounts for inflation and incorporating standards for DG customers)?

Core-Q43. Do you have any views on what else could be done to help speed up connections to the distribution network and or develop a standard for the overall (ie, end to end) time to connect?

6. Maintain a safe, resilient and reliable network

Core-Q44. Do you have evidence that customers would be willing to face an increase in their bills to also receive an increase in their reliability, including that

they understand the actual cost and how this translates into average power cuts?

Core-Q45. Do you have evidence of the cost of reliability improvements and the impact that lowering the revenue cap will have on them being achieved?

Core-Q46. What are your views on moving to an asymmetric cap and collar?

Core-Q47. Are there alternatives to reducing the revenue cap that you think would better balance increases in reliability and the cost to consumers than reducing the revenue cap?

Core-Q48. Do you agree with how we have characterised the operation of the current CML methodology and our reasons for changing to setting targets in line with our CI methodology?

Core-Q49. Do you agree with our rationale for retaining our RIIO-ED1 position on QoS funding? Can you provide any evidence that an alternative approach would not result in double rewarding alongside the IIS?

Core-Q50. Do you have any examples of situations where fault-related interruptions could be genuinely "exceptional" and how these could be separately identified from those that occur during planned works?

Core-Q51. Do you agree with our assessment of the OEE thresholds and the financial impact on each DNO?

Core-Q52. Do you agree with our proposal not to have an end-of-period adjustment mechanism? If not, what criteria should we use to determine whether a DNO has used its allowance for WSC, without it creating uncertainty?

Core-Q53. Are there any other areas or metrics that we should include in our governance framework?

Core-Q54. Do you agree with our proposed approach on NARM?

Core-Q55. Do you agree with our proposal to pass through SW 1-in-20 costs as a variant totex allowance rather than a fixed allowance in RIIO-ED2?

Core-Q56. Do you agree with our proposal to not set a cap for the amount that DNOs can adjust their allowance by, in the event they experience a SW 1-in-20 storm?

Core-Q57. Do you agree with our proposed approach to the physical site security re-opener?

Core-Q58. Do you agree with our proposed approach to the ESR re-opener?

Core-Q59. Do you agree with our approach to fund DNO telecoms resilience activities through baseline allowances?

Core-Q60. Do you agree with our proposal to assess the cyber resilience IT and OT plans against our BPG and RIIO-2 re-opener guidance?

Core-Q61. Do you agree with our proposed re-opener windows for cyber resilience OT and IT?

Core-Q62. Do you agree with our proposal to apply a UIOLI allowance to cyber resilience OT to manage the uncertainty around costs?

7. Delivering at lowest cost to energy consumers

Core-Q63. Do you agree with our proposed approach to pre-modelling normalisations and adjustments?

Core-Q64. Do you agree with our approach to totex benchmarking?

Core-Q65. Do you agree with our proposed assessment approach for primary reinforcement?

Core-Q66. Do you agree with the application of a volume adjustment based on the industry average ratio of forecast capacity added relative to the forecast

demand growth above firm capacity? If not, what do you consider to be a better approach to assessing the efficiency of a DNO's proposed workload for primary network reinforcement?

Core-Q67. Do you agree with our proposed assessment approach for secondary reinforcement?

Core-Q68. Do you agree with the level of disaggregation and period of data used to calculate the unit costs listed in the table above for transformer reinforcement, circuit reinforcement and proactive service reinforcement?

Core-Q69. Do you agree with our proposed assessment approach for fault level reinforcement?

Core-Q70. Do you agree with our proposed adjustments to account for outlier volumes data for ENWL and SSES?

Core-Q71. Do you agree with our proposed assessment approach for connections?

Core-Q72. Do you agree with our proposed assessment approach for NTTC expenditure?

Core-Q73. Do you agree with our proposed assessment approach on asset replacement?

Core-Q74. Do you agree with our assessment approach to refurbishment?

Core-Q75. Do you agree with our proposed assessment approach for asset replacement driven civil works?

Core-Q76. Do you agree with our proposed assessment approach for Condition Based Civil Works?

Core-Q77. Do you agree with our proposed assessment approach for diversions?

Core-Q78. Do you agree with our proposed approach for Rail Diversions?

Core-Q79. Do you agree with our proposed approach to assessing Non-Operational, Operational and Business Support IT&T costs?

Core-Q80. Do you agree with our proposed assessment approach for Legal and Safety?

Core-Q81. Do you agree with our approach to assessing Overhead Line Clearance costs?

Core-Q82. Do you agree with our proposed approach to assessing ESR costs?

Core-Q83. Do you agree with our proposed approach to assessing QoS and NoSR costs?

Core-Q84. Do you agree with our proposed assessment approach for Physical Security?

Core-Q85. Do you agree with our proposed assessment approach for Flood Mitigation?

Core-Q86. Do you agree with the proposed approach to assessing Rising and Lateral Mains costs?

Core-Q87. Do you agree with our approach to assessing WSCs?

Core-Q88. Do you agree with our proposed assessment approach for Losses?

Core-Q89. Do you agree with our proposed assessment approach for environmental reporting?

Core-Q90. Do you agree with our proposed assessment approach for PCBs?

Core-Q91. Do you agree with our proposed assessment approach for Property?

Core-Q92. Do you agree with our proposed assessment approach for STEPM?

Core-Q93. Do you agree with our proposed assessment approach for Vehicles and Transport?

Core-Q94. Do you agree with our proposed assessment approach for HVPs?

Core-Q95. Do you see any merit in setting a HVP threshold for RIIO-ED2, and if so should it be based on the RIIO-ED1 threshold?

Core-Q96. Do you agree with our proposed assessment approach for faults and ONIs?

Core-Q97. Do you agree with our proposed assessment approach for Tree Cutting?

Core-Q98. Do you agree with our proposed assessment approach for Severe Weather 1-in-20 Events?

Core-Q99. Do you agree with our proposed approach to assessing Inspections and Repair & Maintenance costs?

Core-Q100. Do you agree with our proposed assessment approach for NOCs other?

Core-Q101. Do you agree with our proposed assessment approach for Smart Metering Rollout?

Core-Q102. Do you agree with our approach to assessing CAI costs?

Core-Q103. Do you agree with the proposed assessment approach for Business Support costs?

Core-Q104. Do you agree with our approach to assessing streetworks costs?

Core-Q105. Do you agree with our proposal to carry out a demand driven post-modelling adjustment?

Core-Q106. Do you agree with our proposal to not carry out any Quality of Service based adjustments?

Core-Q107. Do you agree with our approach to combining our totex and disaggregated benchmarking models?

Core-Q108. Do you agree with our approach to setting and applying the efficiency challenge using a glide path between the 75th and 85th percentile over a 3-year period?

Core-Q109. Do you agree with our proposed RPEs allowances? Please specifically consider our proposed notional cost structure, assessment of materiality, and choice of indices in your answer.

Core-Q110. Do you agree with our proposed approach to setting the ongoing efficiency challenge and the level of challenge applied?

Core-Q111. Do you agree with our proposed disaggregation methodology?

Appendix 12 Privacy notice on consultations

Personal data

The following explains your rights and gives you the information you are entitled to under the General Data Protection Regulation (GDPR).

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally) not the content of your response to the consultation.

1. The identity of the controller and contact details of our Data Protection Officer

The Gas and Electricity Markets Authority is the controller, (for ease of reference, "Ofgem"). The Data Protection Officer can be contacted at dpo@ofgem.gov.uk

2. Why we are collecting your personal data

Your personal data is being collected as an essential part of the consultation process, so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data

As a public authority, the GDPR makes provision for Ofgem to process personal data as necessary for the effective performance of a task carried out in the public interest ie a consultation.

4. With whom we will be sharing your personal data

No personal data will be shared with any organisations outside Ofgem.

5. For how long we will keep your personal data, or criteria used to determine the retention period.

Your personal data will be held for twelve months after the project is closed.

6. Your rights

The data we are collecting is your personal data, and you have considerable say over what happens to it. You have the right to:

- know how we use your personal data

- access your personal data
- have personal data corrected if it is inaccurate or incomplete
- ask us to delete personal data when we no longer need it
- ask us to restrict how we process your data
- get your data from us and re-use it across other services
- object to certain ways we use your data
- be safeguarded against risks where decisions based on your data are taken entirely automatically
- tell us if we can share your information with 3rd parties
- tell us your preferred frequency, content and format of our communications with you
- to lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your data fairly or in accordance with the law. You can contact the ICO at https://ico.org.uk/, or telephone 0303 123 1113.

7. Your personal data will not be sent overseas

8. Your personal data will not be used for any automated decision making.

9. Your personal data will be stored in a secure Government IT system.

10. More information

For more information on how Ofgem processes your data, click on the link to our "Ofgem privacy promise".