
RIIO-ED2 Final Determinations Overview document

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In December 2021, the Distribution Network Operators (DNOs) submitted their Business Plans to Ofgem setting out proposed expenditure for the next electricity distribution price control (RIIO-ED2). We assessed these plans and published our Draft Determinations for DNO allowances for RIIO-ED2 for consultation in June 2022.

Following consideration of consultation responses, this document and others published alongside it set out our Final Determinations for DNO allowances under the RIIO-ED2 price control, which will commence on 1 April 2023 and cover the five-year period to 31 March 2028.

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Foreword

To overcome the energy crisis and meet our future needs, it is more important than ever that we rapidly develop a smarter, more integrated, low carbon energy system.

The economics of energy has fundamentally changed. Low carbon energy is now not only greener, but cheaper and more secure. That is why we are investing billions of pounds to transition away from our high dependence on imported fossil fuels towards homegrown, cleaner, cheaper, and more secure sources of energy. This will save people money, safeguard our security of supply, and ensure we are no longer at the mercy of international energy prices.

These Final Determinations for the next electricity distribution price control (RIIO-ED2) are a vital part of realising that ambition, and at no extra cost to consumers. They confirm a five-year investment package which will help deliver the local electricity distribution networks we need to connect up those new sources of energy to our homes and businesses and meet expected increases in electricity demand, such as from heat pumps and electric vehicles.

These investments will also improve the networks' resilience and response to extreme weather events and deliver improved customer service with additional protections for consumers living in vulnerable circumstances.

At the same time, to achieve the Government's net zero ambitions at the least cost for consumers, a more flexible grid will be required, requiring a raft of regulatory reforms to allow for greater planning, coordination and market creation at a regional and local level. These will put customers in control of their energy use as never before.

New innovations will give consumers more control to save money through access to better data and regularly updated prices, allowing them to access cheaper electricity at off-peak times, or when there is more wind or sun. This will mean lower bills, reduced strain on the grid, and help enable the transition to net zero.

These Final Determinations are a cornerstone of these ambitions – using flexible and adaptive regulation to drive the necessary investment to ensure the networks are ready, encourage new approaches to managing local systems which avoid unnecessary increases to network charges on bills and help keep the costs of the low carbon transition as low as possible for consumers. This will help deliver a cheaper, greener and more secure energy system that will protect the interests of consumers in the long term.

1. Introduction

Purpose of this document

- 1.1 This document sets out our Final Determinations for the next electricity distribution network price control (RIIO-ED2) for the key strategic areas that are common to all Distribution Network Operators (DNOs). The RIIO-ED2 price control covers the five-year period from 1 April 2023 to 31 March 2028. All figures presented in this document are in 2020/21 prices unless otherwise stated.
- 1.2 In our Final Determinations we set out the policies that determine allowed revenues that DNOs may collect during the RIIO-ED2 price control. Allowed revenue is adjusted throughout the price control period for DNO performance and other uncertain factors within the price control, in accordance with network licences.
- 1.3 In reaching these Final Determinations we have duly considered all stakeholder feedback received in response to our Draft Determinations published in June 2022. An update on our approach to embedding the consumer voice in the RIIO-ED2 process is set out in Chapter 2 of the Core Methodology Document.

Understanding the development of RIIO-ED2

- 1.4 We began the development process for RIIO-ED2 in August 2019 with an open letter setting out the context and aims for the price control. We subsequently set our RIIO-ED2 Framework with a Decision in December 2019.
- 1.5 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) 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.
- 1.6 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.
- 1.7 As part of the enhanced stakeholder engagement process for RIIO-ED2, the DNO Customer Engagement Groups (CEGs) published their assessments of their respective DNOs' Business Plans on 17 January 2022, while the RIIO-ED2 Challenge Group (RIIO-ED2 CG) published its final report on the DNOs' Business Plans on 8 February 2022.
- 1.8 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 for RIIO-

ED2. 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, and ensuring the evidence collected could be taken into consideration as part of our decision-making process.

- 1.9 In June 2022 we published our Draft Determinations for consultation. The consultation closed on 25 August 2022. During and since the consultation, there has been extensive engagement with the DNOs and wider stakeholders, including a Draft Determinations stakeholder consultation webinar event, various technical working groups and bilateral engagement. We have carefully considered all feedback received in reaching these Final Determinations.

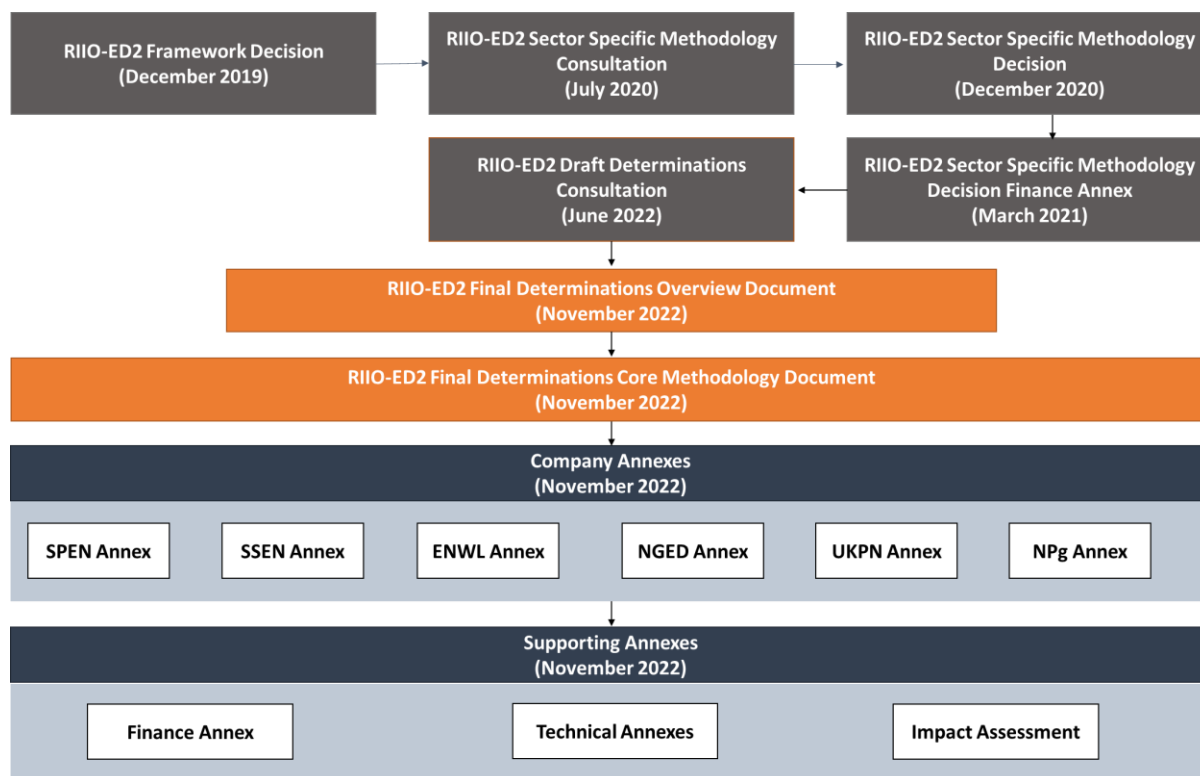
Navigating the RIIO-ED2 Final Determinations documents

- 1.10 This Overview document sets out a high-level summary of our Final Determinations. It provides an update on the strategic context for the RIIO-ED2 price control and key interdependencies with wider regulatory programmes aimed at supporting the transition to a net zero energy system. It also confirms:
- our approach to setting the key quality of service outputs and incentives for RIIO-ED2
 - our approach to ensuring efficient cost of service to consumers, confirming our cost assessment framework and steps taken to ensure efficient financing
 - our approach to optimising the use of existing network capabilities and new investments, including in data and digital technologies, to support the transition to a net zero energy system.
- 1.11 This Overview Document should be read alongside the following Final Determinations documents:
- **Core Methodology Document:** this sets out our detailed Final Determinations on the net zero, innovation, environmental, Smart Optimisation, quality of service and cost of service positions common to all DNOs
 - **Finance Annex:** this sets out our Final Determinations on the regulatory finance building blocks of RIIO-ED2. In general, these apply across all DNOs with any company-specific considerations identified
 - **Company Annexes:** these set out our Final Determinations on areas specific to each individual DNO
 - **Impact Assessment:** this sets out our final assessment of the likely impact of Final Determinations on consumers and the DNOs

Decision – RIIO-ED2 Final Determinations Overview document

- Technical Annexes: these set out any relevant detail underpinning our Final Determinations including, where appropriate, consultancy reports relevant to specific topic areas. Each Technical Annex will be cross-referenced where applicable.

Figure 1 Navigating the RIIO-ED2 Final Determinations documents



RIIO-ED2 next steps

- 1.12 These Final Determinations are not the end of the process for setting the RIIO-ED2 price control. We expect the DNOs to continue to work constructively with Ofgem to finalise all aspects of RIIO-ED2. This will include finalising Associated Documents for a range of outputs and mechanisms to enable companies to deliver the price control effectively.
- 1.13 Following the publication of these Final Determinations, we will publish our statutory consultation on licence modifications, including the Price Control Financial Instruments, during December 2022.
- 1.14 In February 2023 we will publish the RIIO-ED2 licences and Price Control Financial Instruments.
- 1.15 On 1 April 2023 the RIIO-ED2 price control will commence.

2. Strategic context and overall package

Strategic context

- 2.1 Energy systems across the world continue to face an unprecedented shock due to the extraordinary increase and volatility in the price of gas.
- 2.2 Ofgem’s principal objective is to protect the interests of Great Britain's (GB) energy consumers, both now and in the future. Our immediate response has been to stabilise the market and protect consumers, ensuring continued energy supply for customers of failed suppliers, and strengthening the resilience of the sector to better cope with volatility.
- 2.3 The major shock from the unprecedented rise in gas prices in the past eighteen months also demonstrates a clear need to accelerate the transition to net zero to reduce our dependence on fossil fuels, bridging to a future market that is less subject to volatile market prices and which makes efficient use of cleaner, greener, secure home-grown energy. The transition is well underway and is being driven by the United Kingdom (UK), Scottish and Welsh governments' legislative commitments to net zero.
- 2.4 These legislative commitments and associated decarbonisation targets and ambitions - including those of regional and local authorities across the country - will mean increased demand for electricity and significant expansion in low carbon generation. Achieving net zero across the energy system will require a significant increase in investment in new low carbon infrastructure to meet the increased demand for electricity, both on low carbon generation and on upgrading our electricity networks.
- 2.5 Delivering these ambitions at least cost to consumers and minimising the impact on energy bills also requires any new investment in new low carbon infrastructure to be delivered efficiently. This means making best use of existing network capacity and the various new smart and flexible technologies that are emerging, including through increased data and digitalisation of the sector, while ensuring any new investment is made in the right place, at the right time, and at the right price.
- 2.6 RIIO-ED2 is a critical part of this package. It will enable the changes that are needed in the five-year period to 2028 and also put in place the building blocks for a smart, digitally enabled energy system of the future. Critically, these Final Determinations:
 - recognise the speed of the transition already occurring across the energy system, and the need for the local distribution networks to maintain high levels of reliability while responding quickly and efficiently to changing requirements. This includes the new demands from electric vehicle (EV) uptake, changes arising from the move to low carbon heating, and new low carbon generation. Where network upgrades are required, our approach will also enable the least cost investment path. For example, ensuring reasonable steps to invest

ahead of demand and future-proof the network where this benefits consumers and making full use of flexibility and other smart resources where those reduce costs for consumers

- recognise the continued uncertainty surrounding the wider economic environment and the various pathways that may exist to net zero. This necessitates a flexible and responsive approach to the regulation of the networks, with mechanisms that allow RIIO-ED2 to adapt quickly and effectively to changing demands, optimising efficiencies across the whole energy system and ensuring strong protections for consumers
 - ensure the local distribution grids are preparing for the energy system of the future by ensuring the right arrangements and capabilities to enable greater local and regional planning and coordination of local energy networks. This includes putting in place the technologies and processes to support a smarter, more flexible and digitally enabled energy system as well as enabling a whole-system view of network planning which can inform and be informed by stakeholders on an ongoing basis.
- 2.7 Ultimately, any investments made in the electricity grid will be paid for by consumers through their energy bills. Given the extraordinary pressure faced by households in the current economic climate, this makes Ofgem's job of protecting consumers more important than ever and it is vital that the network companies can demonstrate value for money in the services they are providing.
- 2.8 In these Final Determinations, after carefully considering all stakeholder feedback on our Draft Determinations, we have arrived at what we consider to be a fair and balanced settlement, and one which provides a strong challenge to the network companies to ensure their costs are justified and efficient while driving the right investment decisions for all GB consumers in the transition to net zero.

RIIO-ED2 Final Determinations at a glance

- 2.9 The RIIO-ED2 price control will prepare the DNOs to deliver net zero at lowest cost to consumers, supporting a smarter, more flexible energy system, while maintaining world-class levels of system reliability and customer service, and ensuring no consumer is left behind.
- 2.10 Our Final Determinations for RIIO-ED2 set out a £22.2bn package of investment in the local distribution networks to help deliver net zero at the least cost to consumers.
- 2.11 Our key Final Determination decisions are summarised below.

Preparing the networks to deliver net zero

- An initial funding package of £22.2bn to operate, maintain and enhance the local distribution electricity distribution networks and ensure they are prepared to support the transition to net zero

- An additional £0.4bn to recognise the impact on network reinforcement requirements of GEMA's decision on the Access and Forward-Looking Charges Significant Code Review (Access SCR) in May 2022, which was not included in DNO's final business plan costs
- Investment, including Access SCR funding, of £3.2bn in network upgrades to support the rollout of EVs, heat pumps and the connection of more local, low carbon generation including solar and wind
- An agile package of uncertainty mechanisms (UM) that will allow investment to adapt quickly to support higher volumes of low carbon technologies if networks are faced with sharper uptakes in demand for new connections
- 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 £68.4m of additional allowances (Network Innovation Allowances (NIA)) to support smaller scale innovation projects
- Obligations and funding to ensure all DNOs undertake activities to decarbonise the electricity distribution networks and to reduce the wider impact of network activity on the environment. This includes the need to reduce their business carbon footprint, mitigate environmental damage from fluid-filled cables and chemical compounds such as polychlorinated biphenyls, and gain a further understanding of embodied carbon and supply chain emissions
- An expectation that DNOs should work together to establish an improved framework for assessing and reporting losses, as well as increasing understanding of the impact of sulphur hexafluoride and its prevalence on their networks.

Supporting a smarter, more flexible energy system

- A new framework of outputs and incentives for Distribution System Operation (DSO) with clearer executive level accountability for neutral decision-making between DSO and DNO business activities
- This includes a new DSO financial output delivery incentive (ODI-F) to drive DNOs to more efficiently develop and use their network, including considering flexible and smart alternatives to defer the need for reinforcement and ultimately reduce customer bills
- Funding to improve the DNOs' monitoring of their networks, including through the installation of network monitoring equipment and through improved use of data analytics
- New licence requirements for all DNOs to ensure that they communicate flexibility requirements for the future and the detailed information about the outcome of their procurement of flexibility

services annually to Ofgem, to benefit those businesses able to respond

- A new licence obligation (LO) which requires DNOs to enable system optimisation through collaborating with stakeholders and creating a forward-looking, open and interoperable, digital network mapping platform.

Maintaining world class levels of reliability and customer service and speedy connections of low carbon technologies

- A high-powered package of financial and reputational incentives to drive behavioural changes across the areas that matter to consumers, with stretching targets for any reward and the opportunity to apply penalties for poor performance
- Strengthening quality of service targets in key customer priority areas, including reliability, customer service, and improvements in the time it takes to connect minor connection customers to the network
- Introducing new incentives which aim to protect vulnerable consumers through the cost-of living crisis, improve service delivery for major connections customers and help unlock the transition to a smarter, more flexible, lower cost and lower carbon energy system
- A commitment to further explore what more can be done to speed up connections, including obligations on companies around the overall (ie end to end) time to connect
- An initial funding package of £5.7bn to ensure that key network assets are maintained, repaired, and replaced, with further funding to ensure that the networks remain resilient, including in relation to severe weather
- Funding to strengthen cyber resilience and agile in-period funding mechanisms to adjust allowances where the need becomes clear.

Delivering at lowest cost to energy consumers

- An average downward adjustment of 12% to the levels of ex ante funding sought by the companies in their business plans, reflecting a stretching but achievable efficiency challenge for them to do more with available resources
- Retaining an incentive regime that ensures companies can strive for efficiency but with a higher share of any costs saved to be shared with consumers
- An ongoing efficiency challenge of 1% per year, reflecting an overall increase in productivity that we expect even the most efficient companies to deliver
- Reducing the cost of equity allowance to 5.23% (Consumer Price Index Including Owner Occupiers' Housing Costs (UK) – CPIH)

compared to 6% to 6.4% (Retail Price Index¹ (RPI)) in the RIIO-ED1 control, aligning with current market conditions

- Increased investment in network infrastructure for net zero supported without a corresponding increase in network charges on bills, reflecting these strong efficiency challenges and lowering of investor returns
- The introduction of an additional measure (the Return Adjustment Mechanism) to protect consumers and companies against significant deviations in performance from expectations when the price control was set.

Ensuring that no one is left behind in the energy transition

- Strong representation of the consumer voice at the heart of setting RIIO-ED2, through the enhanced engagement process
- Funding to support the delivery of vulnerability strategies across all DNOs, including support during power interruptions, the delivery of advice and services relating to fuel poverty, and targeted support to overcome barriers related to low carbon technologies
- Inclusion of a combination of stronger, enforceable LOs to hold DNOs to account for delivering minimum standards of service and treating all customers fairly
- Introduction of a new consumer vulnerability incentive framework with stretching targets and common metrics to drive further improvements in services, including to Priority Services Register (PSR) customers.

RIIO-ED2 in a rapidly changing energy system

2.12 Over the five-years of RIIO-ED2 the DNOs will make investments that will:

- help ensure the delivery of a GB-wide network to enable EV charging as we move away from petrol and diesel cars
- increase our grid capacity to power heat pumps as we transition from gas boilers
- support an increase in the number of small-scale renewables connecting directly to the distribution grids
- help make our power supplies more resilient to climate change and more frequent adverse weather events such as the storms experienced by many customers last winter.

¹ Equivalent to an average RIIO-ED1 Cost of Equity allowance for the slow-track DNOs of 6.7% in CPIH terms when we add a 0.7% RPI-CPIH wedge to an allowance of 6% in RPI terms.

- 2.13 In August 2022, BEIS and Ofgem jointly published a strategic framework² setting out the actions the UK Government and Ofgem are taking to ensure the electricity network can act as an enabler of a secure, resilient, net zero energy system at the lowest cost to consumers.
- 2.14 This strategic framework recognises that achieving net zero across the energy system will require a significant increase in investment in new low carbon infrastructure to meet the increased demand for electricity, both on low carbon generation and on upgrading our electricity networks. Delivering GB's net zero ambitions at least cost to consumers and minimising the impact on energy bills also requires new investment in new low carbon infrastructure to be delivered efficiently. We know the importance of unlocking a smarter more flexible system: enabling consumers to shift their demand patterns, and to benefit themselves, and the wider system by doing so.
- 2.15 This means making best use of existing network capacity and the various smart and flexible technologies that are emerging, including through increased data and digitalisation of the sector.
- 2.16 As set out in our Draft Determinations, and emphasised in the Electricity Networks Strategic Framework, a smarter, more flexible grid will give consumers more control to save money through access to better data and more regularly updated prices for peak and off-peak demand.³ It will also enable smart gadgets that draw energy from the grid at cheaper rates when demand is low, supporting the rollout of low carbon technologies like EVs.
- 2.17 These changes will reduce the need for costly new generation and grid capacity in the short-term. In the long-term they could save customers up to £10 billion a year, helping to concurrently keep bills down and achieve our climate change goals.
- 2.18 In summer 2022 we also published our Net Zero Britain package⁴, setting out Ofgem's view on key aspects of Great Britain's energy system where we consider major reform is required to deliver a resilient, low cost, low carbon power sector, as well as a proposed framework of consumer interests to help focus our actions. We believe these changes could facilitate increased infrastructure investment in the right places, at the right times, and deliver a more efficient, flexible system design to meet increased electricity demand.

Infrastructure and Governance - effective system operation for net zero

- 2.19 To better support and enable the transition to net zero, Ofgem considers that key changes are required to the institutional and governance arrangements for the energy system.

² [Electricity networks strategic framework - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/electricity-networks-strategic-framework)

³ [Electricity networks strategic framework - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/electricity-networks-strategic-framework)

⁴ [Net Zero Britain: developing an energy system fit for the future | Ofgem](https://www.ofgem.gov.uk/net-zero-britain-developing-an-energy-system-fit-for-the-future)

- 2.20 Ofgem’s Net Zero Britain package publication set out the vision for a powerful and independent Future System Operator (FSO), working as a strategic planner for the GB energy system, alongside a reformed set of local energy institutions, playing a key role in local energy planning and distribution system operation.
- 2.21 In April 2022, following consideration of stakeholder feedback through a joint consultation, the UK Government and Ofgem ⁵ set out our collective commitment to proceed with the creation of a new, independent FSO as an expert, impartial body with the key responsibility for facilitating net zero while also maintaining a resilient and affordable system. The FSO's remit will also include a role in coordinating and ensuring a whole systems approach to network planning, helping to deliver the strategic changes necessary to achieve net zero in a more efficient and effective manner that best serves the interests of consumers.
- 2.22 Under all scenarios, to meet our future energy goals, we need to move to a smarter more integrated energy system. To achieve that we also need greater strategic planning at the national level and we remain supportive of the independent FSO leading this. The FSO will help plan, deliver and optimise transmission networks and the system nationally, but network constraints and the need for flexible responses will also occur at the distribution level.
- 2.23 We will also need greater planning, coordination and market making at a regional and local level. This is particularly important in the context of growing local generation of power, the need for significant investment in local public charging infrastructure for EVs and the need to plan a transition for heat, which may well vary significantly from place to place.
- 2.24 For this reason, we are reviewing the local institutional framework and governance arrangements, examining the wider roles of markets and institutions at a local level to achieve net zero at lowest cost. In April 2022 Ofgem launched a Call for Input⁶, the purpose of which was to seek views from industry, local authorities, and other interested stakeholders on the effectiveness of arrangements in place to govern the local energy system and the changes that are needed to facilitate a cost-effective transition to net zero. The Call for Input detailed sample framework models outlining a range of future potential arrangements, including some which would reflect a significant departure from the present model where DNOs undertake DSO roles and could require significant changes to be made to give effect to it, including the introduction of new primary legislation. Across the range of models detailed, Ofgem considers it is imperative that key energy system functions are performed by institutions with the necessary authority, appropriate skill-set and incentives to drive

⁵ [Proposals for a Future System Operator role - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/proposals-for-a-future-system-operator-role)

⁶ [Call for Input: Future of local energy institutions and governance | Ofgem](https://www.ofgem.gov.uk/call-for-input-future-of-local-energy-institutions-and-governance)

- net zero at least cost, and that there is clear accountability and coordination in the delivery of these.
- 2.25 Ofgem will undertake further stakeholder engagement and continue to evaluate options for reform, including consideration of responses to the Call for Input, with a view to arriving at conclusions in early 2023 before undertaking further consultation. In the meantime, we see a clear need to make rapid progress on effectively utilising flexibility and planning the local energy systems. We are therefore progressing in parallel our review to establish the institutional and governance arrangements that will best support cost effective net zero in the long term, and the development of a more comprehensive regulatory framework to drive efficient DSO during RIIO-ED2.
- 2.26 DNOs have been developing capabilities to drive more efficient use of the electricity system, typically referred to as DSO roles. For RIIO-ED2 we have defined, standardised and set clear expectations for the DSO roles. DNOs will have clear obligations to fulfil standardised DSO roles as well as incentives related to DSO performance. They will also be required to meet minimum requirements to embed clearer executive level accountability for neutral decision-making between their DSO and DNO business activities, and transparency checks, eg. external audits of decisions.
- 2.27 Achieving the potential benefits of DSO activities will require the full use of smart technologies to minimise cost, provide flexibility to the system, help to balance supply and demand, and actively manage constraints on the network. In turn this will require increased data and digital capabilities and much greater network visibility at all voltage levels. In this document we refer to these collective capabilities as "Smart Optimisation". Further details on our approach to Smart Optimisation are set out in Chapter 7.
- 2.28 New data and digitalisation LOs will also deliver significant improvements in data availability, coordination and transparency by establishing common Data Best Practice Guidance.
- 2.29 DSO activities will include new roles in planning and network development, which will enable smart optimisation of network investments. Through this the DNOs will deliver a rollout of network monitoring on Low Voltage (LV) substations, the development of open data platforms for the sharing of network data and enhanced decision making through modern modelling techniques. We expect this to deliver a significant step forward in data transparency, collaboration and the development of local flexibility markets.
- 2.30 In taking forward all these activities we expect DNOs to proactively identify and work to realise the benefits of consistent and standardised approaches, including engaging with Ofgem where appropriate to help future proof investments against the different potential future models for DSO.

Charging arrangements fit for net zero

- 2.31 The Access SCR was launched in December 2018 to improve price signals for efficient use and development of the network. The objective of the review was to ensure that the electricity networks are used flexibly and efficiently, better reflecting users' needs and allowing customers to benefit from new technologies and services, while avoiding unnecessary costs through energy bills.
- 2.32 The Access SCR is a key part of the process to ensure that regulations governing how energy infrastructure is paid for remains fit for purpose.
- 2.33 In May 2022 we published our final Decision and Direction on the Access SCR,⁷ covering two areas of the original scope: the distribution connection charging boundary; and the definition and choice of access rights. As part of our final Access SCR decision, we directed changes to be made to the connection charging arrangements so that customers pay less towards the reinforcement of the existing network that is triggered by their connection. This will mean more of the costs of new connections will be shared in a fair and proportionate way amongst all network users, making the likes of EV charging points and heat pumps more accessible and affordable for individual customers.
- 2.34 The charging reforms are due to come into effect in April 2023, aligning with the start of RIIO-ED2. Our Draft Determinations did not reflect the increased costs associated with these decisions, because the final RIIO-ED2 Business Plans submitted by the DNOs in December 2021 could not reflect the final Access SCR decision published in May 2022. We proposed to work with the DNOs following DDs to understand the expected cost impact of these changes to ex ante allowances and the design of any appropriate UMs, and to reflect these in our Final Determinations.
- 2.35 To support this, we invited the DNOs to resubmit the estimated impact of Access SCR related costs on their RIIO-ED2 business plans. These resubmissions were received on 31 August 2022. We consulted on these costs and our proposed approach to incorporating the impacts in our Final Determinations during October 2022.⁸
- 2.36 We have set out further details on our consideration of consultation responses and our decisions in Chapter 12 of this Overview Document and Chapter 7 of the Core Methodology Document.

⁷ [Access and Forward-Looking Charges Significant Code Review: Decision and Direction | Ofgem](#)

⁸ [Access SCR Consultation October 2022 \(ofgem.gov.uk\)](#)

3. Quality of Service - setting outputs and incentives for RIIO-ED2

Introduction

- 3.1 Outputs and incentives are a key feature of the RIIO-ED2 framework. They are designed to drive companies to focus on delivering the objectives that matter to existing and future customers. This chapter sets out the package of outputs and incentives that we are applying in RIIO-ED2.⁹
- 3.2 In our SSMD, we established the RIIO-ED2 outputs framework. The outputs framework is made up of three components:
- Licence Obligations (LOs) set minimum standards that network companies must achieve
 - Price Control Deliverables (PCDs) specify the deliverable for the funding allocated, and the mechanism to refund consumers in the event an output is not delivered (or not delivered to a specified standard)
 - Output Delivery Incentives (ODIs) drive service improvement through reputational and financial incentives.
- 3.3 There are also longer standing obligations placed upon the DNOs through statutory instruments that have been put in place, notably in relation to Guaranteed Standards of Performance.
- 3.4 Outputs for RIIO-ED2 are grouped into three consumer-facing output categories:
- meeting the needs of consumers and network users
 - maintaining a safe and resilient network
 - delivering an environmentally sustainable network.
- 3.5 Outputs are either common or bespoke. Common outputs apply to all DNOs. We use common outputs for areas of service quality that are relevant to all consumers in all regions of the electricity network. In contrast, bespoke outputs are specific to individual companies. These seek to reflect the feedback received from companies' consumers and other stakeholders.
- 3.6 Our decisions for all common outputs are set out in more detail in the Core Methodology Document, and our decisions on bespoke outputs are set out in the relevant company annexes. Table 1 outlines all RIIO-ED2 outputs, both common and bespoke, financial and reputational, and sets out where you can find full details of their application.

⁹ The Totex Incentive Mechanism (TIM) and Business Plan Incentive (BPI) are discussed in Chapter 9 of this document.

Table 1 Outputs included in our Final Determinations

Output name	Output Type	Companies applied to	Further detail
Common Outputs			
Annual Environmental Report	ODI-R	All	Chapter 3, Core Methodology Document
DSO	ODI-F	All	Chapter 4, Core Methodology Document
Digitalisation Licence Obligation	LO	All	Chapter 4, Core Methodology Document
Technology Business Management (TBM) taxonomy for classifying digital/IT spend	ODI-R	All	Chapter 4, Core Methodology Document
Collaborative project with networks to develop a new regulatory reporting methodology	ODI-R	All	Chapter 4, Core Methodology Document
Smart Optimisation Output	LO	All	Chapter 4, Core Methodology Document
Customer Satisfaction Survey	ODI-F	All	Chapter 5, Core Methodology Document
Complaints Metric	ODI-F	All	Chapter 5, Core Methodology Document
Time to Connect	ODI-F	All	Chapter 5, Core Methodology Document
Guaranteed standards of performance - Connections	Statutory instrument	All	Chapter 5, Core Methodology Document
Major Connections Incentive	ODI-F	All	Chapter 5, Core Methodology Document
Treating domestic customers fairly	LO	All	Chapter 5, Core Methodology Document
Consumer Vulnerability Incentive	ODI-F	All	Chapter 5, Core Methodology Document
Annual Vulnerability Report	ODI-R	All	Chapter 5, Core Methodology Document

Output name	Output Type	Companies applied to	Further detail
Interruptions Incentive Scheme	ODI-F	All	Chapter 6, Core Methodology Document
Guaranteed standards of performance - Reliability	Statutory Instrument	All	Chapter 6, Core Methodology Document
Network Asset Risk Metric	PCD, ODI-F	All	Chapter 6, Core Methodology Document
Cyber Resilience Information Technology	PCD	All	Chapter 6, Core Methodology Document and Confidential DNO Annexes
Cyber Resilience Operational Technology	PCD	All	Chapter 6, Core Methodology Document and Confidential DNO Annexes
Bespoke Outputs			
Borrowdale Transformers	ODI-R	ENWL	Chapter 2, ENWL Company Annex
Dig, Fix and Go	ODI-F	ENWL	Chapter 2, ENWL Company Annex
LineSIGHT	PCD	ENWL	Chapter 2, ENWL Company Annex
Smart Street	PCD	ENWL	Chapter 2, ENWL Company Annex
SWEST New Depots	PCD	NGED ¹⁰	Chapter 2, NGED Company Annex
SEPD New Control Room	PCD	SSEN	Chapter 2, SSEN Company Annex
SHEPD New Control Room	PCD	SSEN	Chapter 2, SSEN Company Annex
Collaborative Streetworks	ODI-F	UKPN	Chapter 2, UKPN Company Annex
Off-gas grid strategic investment	PCD	UKPN	Chapter 2, UKPN Company Annex

¹⁰ Western Power Distribution (WPD) was renamed National Grid Electricity Distribution (NGED) on 21 September 2022. We refer to NGED throughout the remainder of this document.

Final Determination on Outputs

Licence Obligations

3.7 In our Draft Determinations we proposed four LOs, of which three were common and one was bespoke. In our Final Determinations we retain the three common LOs, albeit one has been retitled from the Whole System LO to the Smart Optimisation Output LO. With regard to the bespoke LO that we had proposed at Draft Determinations on Shetland, we have decided that we no longer see a requirement to apply an additional LO beyond Standard Licence Obligation 50. Details on LOs will also be set out in the statutory consultation on modifications to licence conditions, which will be published in December 2022.

PCDs

3.8 In our Draft Determinations, we proposed three common and five bespoke PCDs. In our Final Determinations, we have decided to retain the three common PCDs and two of the five bespoke PCDs proposed at Draft Determinations. SPEN's PCD on EV Optioneering has been reclassified as a use-it-or-lose-it (UIOLI) allowance and its PCDs on Biodiversity and Network Loss Reduction have been removed. We have also decided to introduce four further bespoke PCDs (one for ENWL, one for NGED and two for SSEN) taking the total number of bespoke PCDs to six.

3.9 Our Draft Determinations set out our intention to set PCDs for outputs that we directly fund through the price control and where the funding provided is not transferrable to a different output or project.¹¹ PCDs might also be attached to new projects that emerge during the price control and are funded via a reopener.

3.10 PCDs are either mechanistic or evaluative. In all cases, outputs, allowances and delivery dates are defined at the start of the price control and specified in the licence. Mechanistic PCDs are set in cases where work is defined by volumes or numbers of units of deliverables, or activities that are typically repeatable and we can set allowances by reference to the unit costs. Potential adjustments to the associated allowance are defined through a formula set out in the relevant licence condition and are intended to be largely automatic. In contrast, evaluative PCDs are set in cases where there is some flexibility in the output to be delivered, either in terms of the scope of works, costs, the specifications delivered, or the timing of delivery. For evaluative PCDs, our approach allows for a proportionate ex-post assessment of PCD delivery and adjustment of allowances in accordance with the methodology specified in the licence. Reporting requirements for evaluative PCDs are set out in the PCD Reporting Requirements and Methodology Document.

¹¹ RIIO-ED2 SSMD Annex 1, Paragraph 3.31 [RIIO-ED2 Sector Specific Methodology Decision | Ofgem](#)

3.11 Where we have proposed to set PCDs, we set out the design features of the specific PCD within the relevant company annexes.

ODIs

3.12 In our Draft Determinations, we set out a suite of common quality of service incentives for RIIO-ED2 which includes seven ODI-Fs. Four of these are existing RIIO-ED1 incentives and three are new to RIIO-ED2. Companies which deliver a high quality of service to their customers have the potential to earn financial rewards in return for their actions, while penalties act as a protection for consumers against poor performance.

3.13 A summary of our final suite of common ODI-Fs for RIIO-ED2 is outlined in Table 2 below. It includes the same seven ODI-Fs albeit there are changes to the strength of the upside incentives for DSO and Interruption Incentive Scheme which adjust the combined Return on Regulatory Equity (RoRE) range of the common incentive package from +1.95%/-4% at Draft Determinations to +2.65%/-4% in our Final Determinations. Further detail on each of these incentives can be found in the Core Methodology Document. Detail on specific targets for each DNO under each incentive can be found in the company specific annexes.

Table 2 Common ODI-Fs in RIIO-ED2

ODI-F name	Purpose	New or existing RIIO-ED1 incentive	Incentive Range as % RoRE^{12, 13}
Customer Satisfaction Survey (CSS)	To incentivise DNOs to improve the quality of customer service and reward exceptional performance	Existing	+0.4% / -0.4%
Complaints Metric (CM)	To incentivise good performance by DNOs when handling complaints	Existing	0% / -0.2%
Time to Connect (TTC)	To incentivise DNOs to reduce the time it takes to connect minor connection customers to the network	Existing	+0.15% / -0.15%

¹² Return on Regulatory Equity is the financial return achieved by shareholders in a licensee during a price control period from its actual performance under the price control.

¹³ We set out our consultation position on the calibration of incentive caps and collars to RoRE in Chapter 10 of our RIIO-ED2 Draft Determinations – Finance Annex.

ODI-F name	Purpose	New or existing RIIO-ED1 incentive	Incentive Range as % RoRE^{12,13}
Major Connections	To incentivise DNOs provide a quality service to major connections customers seeking to connect to the network	New	0.0% / up to -0.35%
Vulnerability	To incentivise the provision of appropriate support services to consumers in vulnerable situations	New	+0.2% / -0.2%
DSO	To incentivise DNOs to more efficiently develop and use their network, considering flexible and smart alternatives to network reinforcement	New	+0.4% / -0.2% ¹⁴
Interruptions Incentive Scheme (IIS)	To incentivise DNOs to improve network reliability and reduce outages	Existing	+1.5 / -2.5%

3.14 We have decided to retain the same four common and one bespoke ODI-Rs that we proposed in our Draft Determinations, albeit one common ODI-R has been retitled as 'Collaborative project with networks to develop a new regulatory reporting methodology'.

Bespoke Outputs

3.15 In our Draft Determinations, we set out our approach to evaluating almost 100 proposals for bespoke outputs which were put forward covering a wide range of themes in the DNOs' business plans. As a result of this review, we proposed to allow seven bespoke outputs in RIIO-ED2. Following a review of consultation responses and further engagement we have decided to allow nine bespoke outputs. Further details on these outputs, which are summarised in Table 1, can be found in the company-specific annexes.

¹⁴ In year 1 of RIIO-ED2, the DSO incentive value will be +0.32% / -0.16% of RoRE as the incentive value that is apportioned to the outturn performance metrics will be set at zero.

4. Ensuring efficient cost of service - setting ex ante allowances

- 4.1 In this chapter, we provide an overview of our decisions in setting RIIO-ED2 total expenditure (totex) allowances for all DNOs.
- 4.2 Totex allowances are a material component of consumers' bills now and in the future given how the costs of investment are recovered over time, and it is important that consumer bills reflect efficient investment decisions and costs. Based on current estimates, the average GB consumer in 2021-22 will pay £91 per year (in real 2020/21 price terms) for electricity distribution costs in their energy bills.
- 4.3 To ensure efficient investment decisions and costs, we have set totex allowances based on well justified costs and stretching but achievable efficiency targets. We have also made provision for the use of uncertainty mechanisms, which may provide additional allowances, where future costs and needs are less certain and are likely to benefit from greater clarity in the future. We consider that our proposals allow companies to maintain high quality services for consumers and are flexible enough to adapt to the needs of the future energy system, while ensuring value for money for consumers.
- 4.4 In our Draft Determinations we set out our approach of applying a broad toolkit to our cost assessment. We use this to build up a picture of whether a company is efficient, making appropriate consideration of the cost information submitted by DNOs in their Business Plans. Following consideration of consultation responses, we continue to make use of quantitative and qualitative assessment, DNOs' narrative and supporting evidence, historical costs and performance data and company forecasts.
- 4.5 In their Business Plans the DNOs submitted forecasts on net zero pathways/scenarios they think are most likely to arise, taking account of the alignment between regional and national decarbonisation targets. Our assessment of this information continues to form part of the qualitative assessment of Business Plans and our overarching modelling approach.
- 4.6 The Totex Incentive Mechanism (TIM) - otherwise known as the 'sharing factor' - determines companies' exposure to under or overspends compared to our totex allowances. Consistent with the approach set out in our Draft Determinations, we have linked the overall strength of the TIM sharing factor rate to the degree of confidence that we have in our cost assessment of ex ante totex. As a result, we are confirming a lowering of incentive rates for companies in RIIO-ED2 compared to RIIO-ED1. We believe that these incentive rates provide a reasonable balance of risk and reward between companies and consumers. Further detail on the TIM can be found in Chapter 9 of this document.
- 4.7 Where we have been able to establish our own view of efficient costs for an investment using technical assessment, we have classified the resulting costs as high confidence for Business Plan Incentive (BPI)

purposes. However, where we cannot establish an independent view of costs (and have accepted the needs case for investment) we have classified them as lower confidence for BPI purposes.

Setting efficient ex ante Totex allowances

- 4.8 We have set ex ante allowed totex (net before allocations) at £22.2bn¹⁵ across all DNOs. This is because in relation to these costs we are satisfied of the need for and certainty of proposed work, and that there is sufficient certainty of the efficient cost of the work.
- 4.9 These ex ante allowances are £1.3bn higher compared to our Draft Determinations proposals. The change reflects adjustments made to our cost assessment approach after considering additional information and justifications submitted by DNOs and wider stakeholders in their Draft Determination responses.
- 4.10 Our ex ante totex for each DNO is presented below in Table 3, together with submitted ex ante totex, and the corresponding differences.

Table 3 RIIO-ED2 submitted totex vs allowed totex (£m, 2020/21 prices)¹⁶

DNO Group	DNO	Submitted Totex	DD Allowed Totex	FD Allowed Totex	FD vs. Submitted	Difference (%)
ENWL	ENWL	1,890	1,640	1,722	-168	-8.9%
NPG	NPGN	1,393	1,129	1,186	-207	-14.9%
	NPGY	1,838	1,521	1,596	-242	-13.2%
NGED	WMID	1,934	1,588	1,679	-255	-13.2%
	EMID	2,058	1,697	1,838	-220	-10.7%
	SWALES	1,143	953	1,015	-127	-11.1%
	SWEST	1,758	1,343	1,229	-309	-17.6%
UKPN	LPN	1,499	1,323	1,416	-83	-5.6%
	SPN	1,554	1,394	1,476	-78	-5.0%
	EPN	2,470	2,137	2,277	-192	-7.8%
SPEN	SPD	1,676	1,451	1,469	-207	-12.4%
	SPMW	1,721	1,477	1,476	-245	-14.3%
SSEN	SSEH	1,406	1,087	1,227	-179	-12.7%
	SSES	2,835	2,199	2,397	-439	-15.5%
Total		25,175	20,939	22,224	-2,969	-11.7%

- 4.11 The total DNO submitted totex has been reduced by around £60m compared to Draft Determinations. This is the net impact after changes

¹⁵ Allowed totex is net costs, before non-price control allocations, before post-modelling adjustments for uncertainty mechanisms, and excluding RPEs, non-controllable costs, pass-through costs, but includes Ofgem's view of ongoing efficiency.

¹⁶ Submitted totex is net costs, including our cost exclusions and reallocations and excluding RPEs, ongoing efficiency, non-controllable costs, and pass-through costs.

made to reallocations and the inclusion of some additional bespoke cost items.

- 4.12 After accounting for non-price control allocations and post-modelling adjustments and including allowances relating to the change in charging arrangements from the Access SCR decisions, we are setting ex ante totex allowances at £21.4bn. This represents a 17% increase in annual average spend across the sector compared against the latest RIIO-ED1 outturn and forecast spend. This is shown in Table 4.

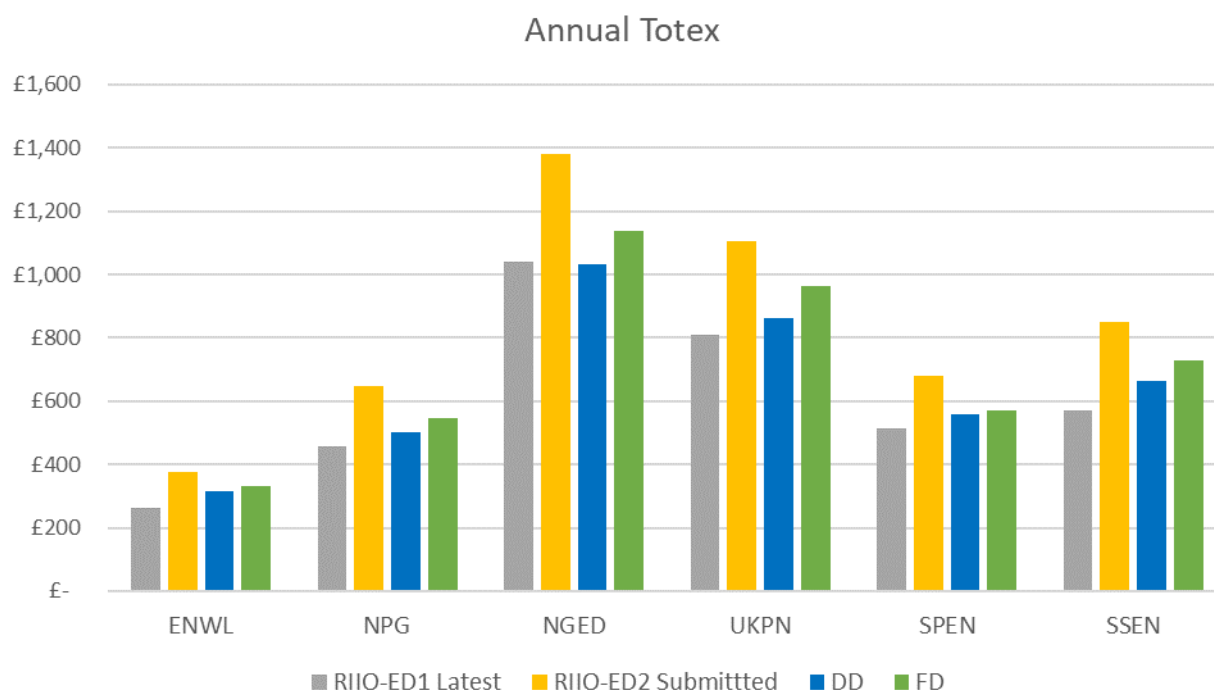
Table 4: RIIO-ED2 Allowed totex before and after allocations, adjustments and Access SCR (£m, 2020/21 prices)^{17,18}

DNO Group	DNO	FD Allowed Totex before adj.	Non-Price Control Allocations and post-modelling adj.	Access SCR	FD Allowed Totex after adj.
ENWL	ENWL	1,722	-68	13	1,667
NPG	NPGN	1,186	-73	17	1,130
	NPGY	1,596	-89	53	1,560
NGED	WMID	1,679	-127	37	1,589
	EMID	1,838	-164	42	1,716
	SWALES	1,015	-62	15	968
	SWEST	1,449	-81	25	1,393
UKPN	LPN	1,416	-171	25	1,270
	SPN	1,476	-112	12	1,377
	EPN	2,277	-239	114	2,152
SPEN	SPD	1,469	-71	9	1,407
	SPMW	1,476	-59	12	1,428
SSEN	SSEH	1,227	182	17	1,427
	SSES	2,397	-122	48	2,323
Total		22,224	-1,257	439	21,407

¹⁷ Non-price control allocations are adjustments to allowances to account for income that sits outside the price control.

¹⁸ Post-modelling adjustments for reversing of ongoing efficiency for Worst Served Customers, and Visual Amenity, adding cyber resilience OT allowances and the Shetland Link RAV transfer, and deducting related party margins, disposals, and other controllable opex. FD Allowed Totex after adjustments excludes RPEs.

Figure 2 RIIO-ED1 and RIIO-ED2 Totex comparison (£m, 2020/21 prices)¹⁹



4.13 We believe the resulting Final Determinations for ex ante Totex allowances provide DNOs with the required funding to:

- deliver the local energy distribution networks needed for net zero, investing efficiently to increase network capacity, strengthening innovation and delivering environmentally sustainable networks
- support a smarter, more flexible and digitally enabled energy system, maximising the potential of flexible and other smart technologies to provide cost effective network solutions
- meet 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
- maintain world class levels of network reliability, further reducing the frequency and duration of power cuts, and ensuring long-term safety and resilience.

Efficiency challenge

4.14 As part of our overall assessment of costs, we set two types of efficiency challenges for the DNOs. These are:

- a catch-up efficiency challenge, where we encourage less efficient companies to 'catch up' on unit costs delivered by the most efficient - or frontier - companies

¹⁹ All costs are presented on the same basis as those shown in Table 4.

- an ongoing efficiency challenge, reflecting an overall increase in productivity that we expect even the most efficient companies to deliver to help drive the best value for consumers.
- 4.15 Following consideration of all data and evidence submitted in response to our Draft Determinations, we are setting the catch-up efficiency challenge with an efficiency frontier using a 3-year glide path from the 75th to the 85th percentile, with the 85th percentile applying to the last two years of the RIIO-ED2 price control period. This is to enable time for less efficient companies to catch up from a starting point in Year 1 of 75th percentile, which is the target benchmark performance set in RIIO-ED1. This will ensure a continuum from the level of efficient performance that the DNOs committed to achieve by the end of RIIO-ED1.
- 4.16 We are also setting the ongoing efficiency challenge at 1.0% per annum for all companies. Following consideration of available evidence and responses to our Draft Determinations proposals, this reflects an appropriately stretching but achievable ongoing efficiency target for RIIO-ED2.
- 4.17 Further detail and supporting evidence for our decisions on catch-up and ongoing efficiency, including consideration of consultation responses to our Draft Determinations, are set out in Chapter 7 of the Core Methodology Document.

5. Ensuring efficient financing

- 5.1 In this Chapter, we set out our decisions on the financial package for RIIO-ED2. Our Final Determinations seek to align the interests of companies and investors with those of consumers by setting an appropriate balance of risk and return.
- 5.2 As set out in previous chapters, we have incentivised companies to deliver stretching levels of efficiency and levels of service that improve over time. Our Final Determinations also seek to ensure that investor returns during RIIO-ED2 fairly reflect the levels of service and cost efficiency delivered for consumers and are commensurate with the level of risk that underpins their investment.
- 5.3 Alongside totex, several core aspects of our finance package are key determinants of the price control's impact on consumer bills.
- 5.4 In line with the wider RIIO-ED2 aims of driving better value for consumers, preparing regulated companies for the energy system of the future and ensuring that the price controls provide sufficient funding for net zero through uncertainty mechanisms and other measures, our finance decisions reduce the cost of capital compared to RIIO-ED1, resetting to levels consistent with current evidence and market conditions.
- 5.5 The Finance Annex sets out our analysis and finance-related decisions in detail, including summaries of responses to our Draft Determinations and our views on them. Our finance-related decisions have applied the methodologies decided on in our SSMD and are calibrated to market evidence.
- 5.6 The key elements of these decisions are summarised in Table 5 below.

Table 5: Baseline allowed return on capital²⁰ (average for the five years ending 31st March 2028, CPIH real)

Component	Infrequent Issuers of debt (All DNOs except EMID, EPN and SSES)	Frequent issuers of debt (EMID, EPN and SSES)
Notional Gearing	60%	60%
Cost of equity allowance	5.23%	5.23%
Cost of debt allowance	3.07%	3.01%

²⁰ We present here a forecast of baseline allowed returns. Final allowances for debt and equity will reflect changes in market observations for debt costs and index-linked gilts, as per the WACC allowance model. Equity values on a post-tax real basis, debt values on a pre-tax real basis.

Component	Infrequent Issuers of debt (All DNOs except EMID, EPN and SSES)	Frequent issuers of debt (EMID, EPN and SSES)
WACC allowance (vanilla)	3.93%	3.90%

Cost of capital decisions

5.7 As set out in our Draft Determinations, we decided at the SSMD stage to set an overall cost of capital by calculating separately the cost of equity and cost of debt. We then take a weighted average of the two, with the weight being the notional gearing (how much of each type of capital we expect a typical company to have in its capital structure). We describe below how we calibrate the allowed return on equity and the allowed return on debt.

Allowed return on equity

5.8 The allowed return on equity is an estimation of the return that equity investors expect. It is a significant part of the price control settlement. It is important because the energy sector requires equity investors who are willing to invest in utility infrastructure to meet consumer needs.

5.9 In these Final Determinations, we have applied the same equity methodology for RIIO-ED2 as that applied in the RIIO-2 controls for transmission and gas distribution.

5.10 Where appropriate, our approach reflects the Competition and Markets Authority’s (CMA) Final Determinations in respect of the RIIO-2 Gas Distribution and Transmission (RIIO-GD&T2) price control appeals, which concluded in October 2021. We have updated our analysis for RIIO-ED2 to capture up-to-date market information, including recent values for the risk-free-rate.

5.11 We have decided to set the allowed return on equity at 5.23%, which is higher than the 4.75% proposed in our Draft Determinations. This reflects an increase in the Risk-Free-Rate, based on the yields observed for Index-Linked Gilts which have increased since our Draft Determinations were published.

Allowed return on debt

5.12 The allowed return on debt is a significant component of companies' allowed returns and the cost to consumers of network services. In our Draft Determinations, we applied the methodology that was set out in our SSMD to calculate the proposed cost of debt for RIIO-ED2. This was consistent with the methodology applied to the RIIO-2 controls for transmission and gas distribution.

5.13 The allowed return on debt has increased from 2.3% at Draft Determinations (2.26% for frequent issuers and 2.32% for infrequent

issuers) to 3.01% (for frequent issuers) or 3.07% (infrequent issuers). This also reflects the increase in market rates since June 2022.

- 5.14 This debt allowance is based on the same 17-year trailing average (of the iBoxx 10yr + Utilities index) as that proposed at Draft Determinations and as applied to the RIIO-2 price controls for transmission and gas distribution. This debt allowance has been adjusted to reflect additional costs of borrowing and specific debt costs during the RIIO-ED2 period. At Draft Determinations, we applied an issuance threshold of £150m but for Final Determinations, we have decided to use a larger threshold of £250m per annum. This 'infrequent issuer premium' applies to all DNOs except for NGED (EMID), UKPN (EPN) and SSEN (SSES). We consider that this approach is consistent with the principle of ensuring the calibration of the index broadly matches the expected sector average debt costs.

Financeability

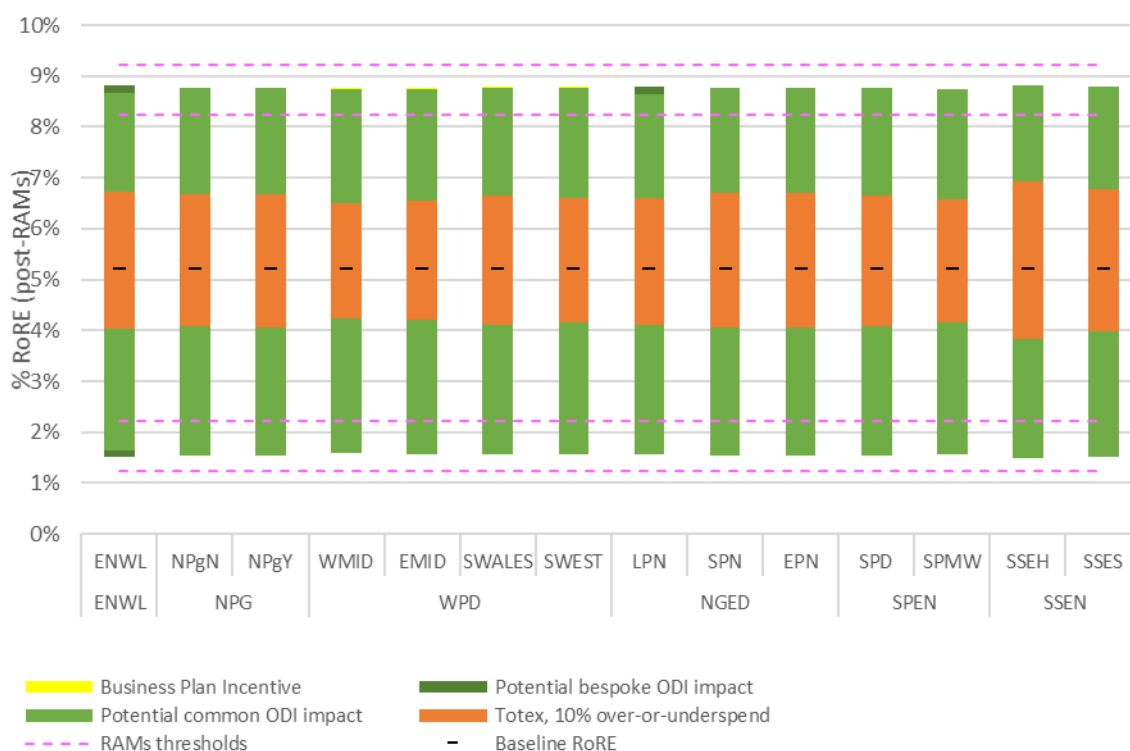
- 5.15 Ofgem has a duty to have regard to the need to secure that companies are able to finance the activities which are the subject of obligations imposed by or under the relevant legislation. Most regulated utilities raise debt finance by issuing bonds in the capital markets. In addition, the DNOs have a licence obligation to take all appropriate steps within their power to maintain an investment grade credit rating.
- 5.16 These ratings are issued by firms called rating agencies. An investment grade credit rating signals a strong likelihood that the company will be able to meet its liabilities.
- 5.17 In our Draft Determinations, we set out our approach of assessing financeability on a notional company basis, using market datapoints to guide our assumptions about it.
- 5.18 In order to confirm the financeability of the RIIO-ED2 package, we take an 'in-the-round' assessment of whether all the individual components of the determinations allow an efficient notional operator to generate cash flows consistent with its financing needs.
- 5.19 For these Final Determinations, we have assessed the financeability of our decisions for each notional network individually based on the ex ante totex allowances set out in Chapter 4. We have also tested the impact of additional totex allowances being provided during the RIIO-ED2 control period via uncertainty mechanisms as described in Chapter 6.
- 5.20 We have also applied the following assumptions for depreciation and capitalisation rates and notional gearing consistent with our Draft Determinations (and SSMD):
- a depreciation policy based on a 45-year asset life
 - that capitalisation rates will reflect the 'natural' balance of capex and opex

- that each notional network is assumed to begin the price control period with a notional gearing of 60%, reduced from 65% in RIIO-ED1.

5.21 Further details on our financeability assessment are set out in the Finance Annex. In summary, we are satisfied that the Final Determinations for RIIO-ED2 provides each notional company with reasonable headroom above a minimum investment grade credit rating and that each notional company is financeable.

5.22 We consider that our RIIO-ED2 price control package strikes an appropriate balance between the scope for outperformance for high performing companies and the scope for underperformance for poorly performing companies. We demonstrate this in Figure 3 below.

Figure 3 Maximum/minimum RoRE ranges for licensees after RAMs are applied



5.23 We also highlight that there is a difference between possible outcomes and probable outcomes. We consider that it would be incorrect to assume that the largest downside shown in this RoRE chart has precisely the same probability as the largest upside. Figure 3 above presents the post-RAMs RoRE ranges to help demonstrate the final calibration of the RIIO-ED2 package after accounting for the potential impact of RAMs thresholds. For further detail, please see the RIIO-ED2 Final Determinations Finance Annex.

Return Adjustment Mechanism (RAMs)

- 5.24 We have decided to implement a symmetrical return adjustment mechanism for RIIO-ED2 price control with the following threshold levels and adjustment rates:
- 300bps either side of the baseline allowed return on equity, with an adjustment rate of 50% of returns above or below the relevant threshold
 - 400bps either side of the baseline allowed return on equity, with an adjustment rate of 90% of returns above or below the relevant threshold.
- 5.25 This mechanism aims to provide protection to consumers and investors in the event that network company returns are significantly higher or lower than anticipated at the time of setting the price control.
- 5.26 Further detail on all finance elements can be found in the Finance Annex to the Final Determinations. This includes our decisions and rationale for allowed returns, debt allowances, financeability assessments, notional gearing, capitalisation rates, regulatory depreciation, indexation of Regulated Asset Value (RAV) and allowances, the calibration of RAMs, tax, pensions and other finance issues.

6. Adjusting allowances for uncertainty

Introduction

- 6.1 This chapter sets out our approach to managing uncertainty for the DNOs, including a summary of our decisions for each UM that will apply to the DNOs during RIIO-ED2.
- 6.2 We are setting ex ante totex allowances for the DNOs only where we are satisfied on the need for and certainty of the proposed work, and where there is sufficient certainty on the efficient cost of delivery.
- 6.3 Where uncertainty remains, we will use a range of UMs to manage this during RIIO-ED2. UMs allow us to adjust a network company's allowance in response to changing developments during the price control period.
- 6.4 The five types of UMs that we have decided to use in RIIO-ED2 are volume drivers, re-openers, pass-through mechanisms, indexation and use-it-or-lose-it allowances:
- volume drivers to adjust allowances in line with the actual volume of work delivered, where the volume of certain types of work that will be required over the price control is uncertain (but where the cost of each unit is stable)
 - re-opener mechanisms to decide, within a price control period, on additional allowances to deliver a project or activity once there is more certainty on the needs case, project scope or quantities
 - cost pass-through mechanisms to adjust allowances for costs incurred by the DNO over which they have limited control and that, in general, we consider the full cost of which should be recoverable (eg business rates)
 - indexation to provide network companies and consumers some protection against the risk that outturn prices are different to those that were forecasted when setting the price control, eg general price inflation or cost pressures
 - UIOLI allowances to adjust allowances where the need for work has been identified, but the specific nature of work or costs are uncertain.
- 6.5 Forecasting costs and outputs with confidence for the duration of a price control is challenging. We set out our decisions on many of the UMs required to manage material uncertainty in the cost and/or scope of work in specific areas of the price control in our SSMD. Where there were outstanding decisions, we make them here and throughout the Core Methodology Document and company specific annexes. We have also considered how companies are managing risk as part of our cost assessment processes and evaluated the numerous bespoke UMs proposed in companies' Business Plans.

RIIO-ED2 Uncertainty Mechanisms

- 6.6 In our Draft Determinations, we proposed 34 common UMs and three bespoke UMs for RIIO-ED2. 19 of the proposed common UMs were automatic (nine pass-through, four indexation, three UIOLI, and three volume drivers) with a further 14 administrative re-openers and one UM for the which the mechanism was to be determined.
- 6.7 Following review of consultation responses to our Draft Determinations and further engagement with DNOs, we have decided to put in place 37 common UMs of which 21 are automatic and 16 are administrative re-openers.
- 6.8 We are increasing the number of automatic UMs by two compared to our Draft Determinations. We have decided to put in place an indirect scaler volume driver for indirect costs associated with our LRE UMs. We provide detail on this decision in paragraphs 6.75 to 6.84 below. We are also increasing the number of pass-through mechanisms. We have removed the miscellaneous pass-through, but we have added pass-throughs for bad debt and supplier of last resort.
- 6.9 We will retain all the common administrative re-openers proposed in our Draft Determinations, but in our Final Determination we make clear that the Cyber IT and OT re-openers are separate mechanisms. We have also decided to put in place a re-opener for wayleaves and diversions. Several DNOs set out in their consultation responses that they faced significant uncertainty about the exact allowances they would require to address wayleaves and diversions. They highlighted that their ex ante allowance requests had been predicated on the ability to access further allowances if required through a UM, and if one were not to be put in place then ex ante allowances would need to increase to mitigate the risk. We have decided that putting in place a re-opener is preferable to substantial increases in ex ante allowances. Further detail on the wayleaves and diversion re-opener can be found in paragraphs 6.65-6.74 below.
- 6.10 We have also decided not to put in place a UM for EV Provider of Last Resort. Further detail on this decision is set out in paragraphs 6.32-6.42 below.
- 6.11 In its consultation response on our Draft Determinations, NGED raised the possibility of a consolidated, single policy delivery re-opener, which would encourage more holistic responses to policy developments. We have reviewed this suggestion but have decided to maintain separate re-openers because each one has a carefully considered purpose and timing of re-opener window(s). We assess that a move to a single policy re-opener regime would in fact be more administratively burdensome because it would be likely to increase the number of windows in which funding could be requested for individual types of activity and it would make it more difficult to monitor the thresholds for funding requests on different aspects of the price control.

- 6.12 We also received consultation responses related to UMs on capitalisation rates. We have set out our position on capitalisation rates in the Finance Annex Chapter 10.
- 6.13 In our Draft Determinations, we outlined proposals for three bespoke UMs (two for SSEN and one for ENWL). Following our review of consultation responses and further engagement with DNOs we have decided to put in place seven bespoke UMs in RIIO-ED2 (five for SSEN, one for ENWL and one for SPEN). One of the additional bespoke UMs arises because we are clarifying in our Final Determinations that there are two separate re-openers relating to Shetland.
- 6.14 The full list of common and bespoke UMs that will apply in RIIO-ED2 is in Table 6 below. We provide further detail in this chapter on the common UMs which have either changed or been introduced since our SSMD and are not discussed elsewhere in our Final Determinations. Where a UM has not changed since our SSMD we have not discussed it any further in these Final Determinations. Further detail on the bespoke UMs can be found in the respective company-specific annexes.

Table 6 Summary of Common and Bespoke UMs to apply in RIIO-ED2

UM Name	UM Type	Further detail	Proposed in DDs
Common UMs			
Cost of Debt	Indexation	Finance Annex, Chapter 2	Yes
Cost of Equity	Indexation	Finance Annex, Chapter 3	Yes
Inflation indexation of RAV and allowed return	Indexation	Finance Annex, Chapter 9	Yes
Real Price Effects	Indexation	Annex 2, Chapter 4 of SSMD	Yes
Bad debt/valid bad debt claims by IDNOs	Pass-through	Finance Annex, Chapter 10	No
Business / Prescribed Rates	Pass-through	Annex 2, Chapter 8 of SSMD	Yes
Ofgem Licence Fee	Pass-through	Annex 2, Chapter 8 of SSMD	Yes
Pension Deficit Repair mechanism	Pass-through	Annex 2, Chapter 8 of SSMD and Finance Annex, Chapter 10	Yes
Ring Fence Costs	Pass-through	Annex 2, Chapter 8 of SSMD	Yes

UM Name	UM Type	Further detail	Proposed in DDs
Severe Weather 1-in-20	Pass-through	Core Methodology Document, Chapter 7	Yes
Smart Meter Communication Costs	Pass-through	Core Methodology Document, Chapter 7	Yes
Smart Meter Information Technology Costs	Pass-through	Core Methodology Document, Chapter 7	Yes
Supplier of Last Resort	Pass-through	Finance Annex, Chapter 10	No
Transmission Connection Point Charges	Pass-through	Annex 2, Chapter 8 of SSMD and Core Methodology Document, Chapter 7	Yes
Cyber Resilience OT	UIOLI	Core Methodology Document, Chapter 6	Yes
Visual Amenity	UIOLI	Core Methodology Document, Chapter 3	Yes
Worst Served Customers	UIOLI	Core Methodology Document, Chapter 6	Yes
LRE - Low Voltage (LV) Services	Volume driver	Core Methodology Document, Chapter 3	Yes
LRE - Secondary Reinforcement	Volume driver	Core Methodology Document, Chapter 3	Yes
Polychlorinated Biphenyls (PCB)	Volume driver	Core Methodology Document, Chapter 3	Yes
Indirect Scaler	Volume Driver	Overview Document, Chapter 6	No
Coordinated Adjustment Mechanism	Re-opener	Overview, Chapter 5 of SSMD	Yes
Cyber Resilience IT	Re-opener	Core Methodology Document, Chapter 6	Yes
Cyber Resilience OT	Re-opener	Core Methodology Document, Chapter 6	Yes
Digitalisation	Re-opener	Core Methodology Document, Chapter 4	Yes
DSO	Re-opener	Core Methodology Document, Chapter 4	Yes

UM Name	UM Type	Further detail	Proposed in DDs
Electricity System Restoration	Re-opener	Core Methodology Document, Chapter 6	Yes
Environmental	Re-opener	Core Methodology Document, Chapter 3	Yes
High Value Projects	Re-opener	Overview Document, Chapter 6	Yes
LRE	Re-opener	Core Methodology Document, Chapter 3	Yes
Net Zero	Re-opener	Core Methodology Document, Chapter 3	Yes
Physical Security	Re-opener	Core Methodology Document, Chapter 6	Yes
Rail Electrification	Re-opener	Core Methodology Document, Chapter 7	Yes
Storm Arwen	Re-opener	Overview Document, Chapter 6	Yes
Streetwork Costs	Re-opener	Core Methodology Document, Chapter 7	Yes
Tax Review	Re-opener	Finance Annex, Chapter 7	Yes
Wayleaves and Diversions	Re-opener	Overview Document, Chapter 6	No
Bespoke UMs			
West Coast of Cumbria (ENWL) ²¹	Re-opener	ENWL Company Annex, Chapter 4	Yes
EV optioneering (SPEN)	UIOLI	SPEN Company Annex, Chapter 4	No
High Cost Distribution Areas (SSEN)	Pass-through	SSEN Company Annex, Chapter 4	No
Shetland Variable Energy Costs (SSEN)	Pass-through	SSEN Company Annex, Chapter 4	No
Hebrides and Orkney Whole System (SSEN)	Re-opener	SSEN Company Annex, Chapter 4	Yes

²¹ Referred to as Moorside in our Draft Determinations

UM Name	UM Type	Further detail	Proposed in DDs
Shetland Enduring Solution (SSEN)	Re-opener	SSEN Company Annex, Chapter 4	Yes
Shetland Extension Fixed Energy Costs (SSEN)	Re-opener	SSEN Company Annex, Chapter 4	Yes

Common design parameters for re-openers

Purpose	To provide clarity on the parameters and process relating to re-openers
Benefits	Protects both consumers and network companies from uncertainty around requirements, unknown and emerging risks/threats, new regulatory requirements, and technology changes.

Background

- 6.15 In the RIIO-2 Final Determinations for transmission and gas distribution, we decided that we would apply a set of common design parameters that would apply as the default position for re-openers, noting that they would not necessarily apply to all re-openers. Our SSMD said that we considered these parameters should also apply to RIIO-ED2, since the framework for re-openers (and the nature of the uncertainties they are designed to address) is broadly comparable.
- 6.16 In our Draft Determinations, we consulted on our proposals for a common materiality threshold for RIIO-ED2.

Final Determination

6.17 The table below provides a summary of our Final Determination.

UM parameter	Final Determination	Draft Determination
Re-opener application windows	Bring forward re-opener application windows from May to January (apart from for the Coordinated Adjustment Mechanism, Cyber, and the Electricity System Restoration re-openers where other arrangements will apply). Reduce re-opener application window from one month to one week.	Same as FD

UM parameter	Final Determination	Draft Determination
Application requirements	Provide additional detail and guidance where necessary in licence conditions and guidance.	Same as FD
Authority triggered re-openers	The decision whether the Authority can trigger a re-opener at any time during the price control will be made on a case-by-case basis.	Same as FD
Aggregation	To not include an aggregation process for re-openers to meet the materiality threshold.	Same as FD
Materiality threshold	For each individual re-opener application, set a materiality threshold such that we propose to only adjust allowances if the changes to allowances resulting from our assessment, multiplied by the TIM incentive rate applicable to that licensee, exceeds a threshold of 0.5% of annual average base revenues. We will not apply a threshold to the Environment and Storm Arwen re-openers where requirements are driven by legislative or compliance arrangements.	1% of annual average base revenue.

Final Determination rationale and Draft Determination responses

- 6.18 We have decided to retain the positions we set out at Draft Determinations on re-opener application windows, application requirements, authority-triggered re-openers and aggregation. On the materiality threshold, we have decided to change our Draft Determination position based on the feedback received through consultation responses. Our decision is that the default position for RIIO-ED2 will be that adjustments to allowed revenue will only be considered if the proposed adjustment, when multiplied by the TIM rate, exceeds 0.5% of annual average base revenue.
- 6.19 We received seven responses to our Draft Determination position which focused on the common materiality threshold for UMs, with two responses also commenting on aggregation.

Aggregation

- 6.20 NGED and UKPN argued that the inability to aggregate projects for UMs is problematic and could create barriers to taking on smaller initiatives which are more likely to apply in RIIO-ED2, than for RIIO-GD&T2.
- 6.21 We disagree with the concern raised about the inability to aggregate re-openers. We continue to think that allowing re-openers to be aggregated would reduce the effectiveness of the materiality threshold in driving

network companies to manage their allowances in the most efficient way. Each individual re-opener exists in RIIO-ED2 for a distinct purpose. There may be instances within a re-opener whereby multiple schemes of work are aggregated into one re-opener submission, but where this is the case, the DNO must ensure and demonstrate that the individual schemes relate to a consistent driver of need.

Materiality threshold

- 6.22 NPG and one consumer group agreed with a 1% materiality threshold.
- 6.23 Five DNOs disagreed with our position for the materiality threshold and all are of the view that the threshold should align with the materiality threshold in the other RIIO-2 sectors which was set at 0.5% of annual average base revenue. These respondents disagreed for the following reasons:
- that it is unclear why a different approach to RIIO-GD&T2 is required in RIIO-ED2. Ofgem has not provided evidence to suggest why RIIO-ED2 should be treated differently to the other sectors, and in their view the ED sector has no structural, administrative or financial reasons to suggest a different rate should be applied.
 - that the materiality threshold should be reduced to reflect the reduced length of RIIO-ED2: 5 years, as compared to RIIO-ED1 at 8 years.
 - that the reliance on UMs and lower upfront allowances creates a higher balance of risk for DNOs if the materiality threshold is too high.
- 6.24 Some of the DNOs noted that in RIIO-ED2 the UM package includes more legislative and compliance-based drivers than in RIIO-GD&T2. Some DNOs were of the view that there should be a zero-materiality threshold where legislative and compliance-based activities are required to avoid consequences of non-compliance.
- 6.25 UKPN and NGED were of the view that the materiality threshold is too high and disproportionately impacts the larger DNOs. They believe that it risks creating funding gaps that would act as a blocker to net zero transition.
- 6.26 SPEN also raised concerns relating to the scope of annual average base revenue. They noted that including all aspects of the definition (fast pot expenditure, non-controllable Opex, RAV depreciation and Return), creates unfairness in the potential exposure of DNOs and should be calibrated to correlate to the size of investment, size of the business and controllable aspects of the business.
- 6.27 NGED was of the view that in addition to moving to a 0.5% materiality threshold, Ofgem should increase the size of ex ante allowances. They argue this will accelerate the expenditure associated with net zero and will also reduce the need for re-openers to be triggered.
- 6.28 We accept that a lower materiality threshold is appropriate to reflect the concerns expressed in responses and therefore we agree that the

materiality threshold should be 0.5% of annual average base revenue in RIIO-ED2.

- 6.29 We disagree with concerns on the scope of the definition of annual average base revenue. We are of the view that including the full definition of annual average base revenue provides an appropriate and fair scope against which to calibrate the UM threshold for all DNOs. We do not agree that including the full definition will materially disadvantage a DNO. Overall, we believe the level of the threshold strikes an appropriate balance in protecting DNOs and customers.
- 6.30 We recognise the concerns raised by DNOs with regards to the materiality threshold associated with compliance or legislative related re-openers. We have therefore changed our Final Determination position for the Environmental re-opener and the Storm Arwen re-opener. We provide our rationale for our change in position in paragraphs 6.54-6.56 below and in Chapter 3 of the Core Methodology Document.
- 6.31 Lastly, we disagree with the views that ex ante allowances need to be increased in relation to the UMs package. Overall, the ex ante allowances have been increased from our Draft Determination position. We believe we have achieved the right balance of ex ante allowances to allow for investment when it is needed and is certain, with the necessary uncertainty mechanisms to allow for allowances to be increased in period where certainty materialises.

Electric Vehicle Provider of Last Resort

Background

- 6.32 In our Draft Determinations, we set out our proposal to manage EV Provider of Last Resort (PoLR) funding for DNOs through either Directly Renumerated Services (DRS) or passthrough UMs, with scope for a mechanism that could be used to provide funding arrangement for PoLR under SLC 31F.

Final Determination

- 6.33 The table below provides a summary of our Final Determination.

Output Parameter	Final Determination	Draft Determination
UM type	None - we consider that SLC31F requires further review, and we intend to consult on whether it should be removed entirely in 2023.	DRS or passthrough
Additional requirements	n/a	n/a
Licence condition	n/a	n/a

Final Determination rationale and Draft Determination responses

- 6.34 We have decided that the introduction of a funding mechanism for PoLR activities is not in the interests of consumers and as such our decision is not to include funding provision for PoLR within any RIIO-ED2 UM. Following concerns raised about SLC 31F in responses and from engagement with stakeholders, we consider that SLC 31F requires further review and we intend to consult on whether it should be removed entirely in 2023.
- 6.35 Six DNOs and five industry stakeholders responded to our Draft Determination proposal to introduce a funding mechanism for PoLR activities.
- 6.36 Views on how PoLR arrangements should be funded were mixed. All six DNOs supported a funding mechanism, if SLC 31F remained in place. ENWL and NPg preferred a cost pass-through over DRS, indicating that pass-through would be the quickest and cleanest solution should a PoLR situation occur. SSEN and UKPN agreed with DRS as the preferred mechanism. SPEN and NGED did not express a preference between DRS and pass-through. Three industry stakeholders supported a DRS approach, so that cost could be easily managed and monitored. Two industry stakeholders did not support a funding mechanism for PoLR on the basis that they did not support SLC 31F.
- 6.37 Four respondents did not support the existence of SLC 31F. One consumer group recommended that SLC 31F is removed and an alternative mechanism, such as government funding directly to the Local Authorities, should be utilised to address the cost of uneconomic charge points. ENWL, UKPN and an energy industry body also agreed that DNOs are not suited to be PoLRs, as DNOs are likely to incur higher costs than necessary for this activity because it is not part of their normal business.
- 6.38 SSEN and NGED suggested further consultation was needed with regards to the implications of DNOs acting as a PoLR.
- 6.39 SPEN supported SLC 31F and the need for funding arrangements for PoLR in RIIO-ED2, stating that they had support from stakeholders they worked with on Project Pace²² for DNOs to undertake PoLR.
- 6.40 We acknowledge the concerns raised in the consultation responses that DNOs may not be best placed to act as PoLR, and that including a funding mechanism for PoLR in RIIO-ED2 carries the potential risk of consumers paying for uneconomic infrastructure. As such, we have decided not to introduce a PoLR funding mechanism for DNOs in RIIO-ED2 because we intend to consult on the merits of removing SLC 31F in 2023.
- 6.41 There are various workstreams being carried forward by the UK Government that we have also taken into consideration in making our

²² <https://www.spenergynetworks.co.uk/pages/pace.aspx>

decision not to include PoLR funding provisions within RIIO-ED2, because the growth of EV charging infrastructure is already being well supported:

- The Government’s EV Infrastructure Strategy²³ sets out a range of commitments to accelerate the EV charging infrastructure rollout. One of these commitments is to introduce an obligation on local authorities to produce local charging strategies and oversee the implementation of these.
- Of the £2.5 billion of Government funding committed to the EV transition since 2020, over £1.6 billion will be used to support charging infrastructure. Of that funding, £450m will directly enable strategic local provision of public EV infrastructure ahead of need to promote a more equitable EV charging experience, through the Local EV Infrastructure Fund.²⁴ It will also be flexible in its approach, to match the level of public subsidy to the specific need in different local areas.

6.42 In the event that the need for a PoLR arises, in the short period between our Final Determinations and when we consult on removing SLC31F, our statutory modification powers can be used to provide funding to the DNOs for the PoLR work, if we agree that its appropriate to do so.

Storm Arwen Re-opener

Purpose	Provides DNOs with the opportunity to apply to adjust their ex ante allowances where they identify a change to the scope of work they expect to deliver, as a result of the Energy Emergencies Executive Committee (E3C’s) or Ofgem’s recommendations from the Storm Arwen review
Benefits	Improves network resilience to severe storm events

Background

6.43 Our review of the DNOs’ response to Storm Arwen was published in June 2022 and included 20 recommendations to minimise the impact of future severe weather events on DNO networks.²⁵ The E3C’s report²⁶ into the

²³ <https://www.gov.uk/government/publications/uk-electric-vehicle-infrastructure-strategy>

²⁴ <https://www.gov.uk/guidance/electric-vehicle-charging-infrastructure-help-for-local-authorities>

²⁵ Our final report on the review on the networks’ response to Storm Arwen is available here: <https://www.ofgem.gov.uk/publications/storm-arwen-report>

²⁶ The E3C’s Storm Arwen electricity distribution disruption review is available here: <https://www.gov.uk/government/publications/storm-arwen-electricity-distribution-disruption-review>

same event included 14 of our recommendations and identified an additional 32 recommendations to be taken forward.

- 6.44 In our Draft Determinations document, we recognised that some of these recommendations could modify the scope of work that DNOs are expected to deliver in RIIO-ED2. We consulted on our proposal to include a re-opener in RIIO-ED2 to deal specifically with the consequences of the recommendations from the Storm Arwen reviews.

Final Determination

- 6.45 The table below provides a summary of our Final Determination.

Output parameter	Final Determination	Draft Determination
UM type	Re-opener	Same as FD
Re-opener Window	January 2024	Same as FD
Trigger	Change to DNOs’ scope of work caused by implementing a recommendation from Ofgem or the E3C’s Storm Arwen reviews. DNO triggered by submission of an application during the re-opener window. Authority triggered outside the re-opener window.	Authority trigger - new to FDs
Materiality Threshold	0% materiality threshold	New to FD. In DDs we proposed to apply a materiality threshold of 1%, in line with our common approach to re-openers.
Licence condition	SpC 3.2 Part J	N/A

Final Determination rationale and Draft Determinations responses

- 6.46 We received nine responses to our consultation. Having considered all of the stakeholder responses, we have decided to implement our Draft Determination position to include a Storm Arwen re-opener in RIIO-ED2 with changes to the materiality threshold and trigger.
- 6.47 We have decided to not set a materiality threshold for re-opener applications. This is to ensure consistency with other resilience-based re-openers (electricity system restoration and physical site security), where DNOs are expected to implement Government recommendations or guidelines. We have also decided to enable the Authority to trigger this re-opener at any point in RIIO-ED2. This will ensure that DNOs can apply for

adjustments to their allowances in cases where they identify any follow-on actions that need to be implemented, as a consequence of the Storm Arwen recommendations.

Scope

- 6.48 All stakeholders including six DNOs and one consumer body, one supplier and one industry party, agreed with the proposed scope of our re-opener.
- 6.49 SPEN commented that the scope could be widened to include costs of activity which have changed as a result of a DNOs' internal reviews into Storm Arwen, noting that had Storm Arwen occurred earlier, these costs would have been incorporated into DNOs' business plans. One industry party also noted that the scope could be widened to include risks such as supply chain issues. We disagree and think that DNOs need to manage their ex ante allowances effectively to deal with activity changes that occur within the price control.

Re-opener window and trigger

- 6.50 Only the six DNOs responded on the proposed re-opener window and trigger. Five out of six of them agreed with our proposed re-opener window stating that it should give DNOs sufficient time to review the impact of the recommendations and identify any changes that need to be implemented in RIIO-ED2. However, SSEN disagreed recommending that it should be brought forward to April 2023 to ensure that any changes can be implemented as early as possible within the price control.
- 6.51 Two DNOs (ENWL and SPEN) also requested additional re-opener windows. ENWL suggested a introducing a second re-opener window in January 2026 to ensure that DNOs have sufficient time to develop their re-opener applications, whereas SPEN suggested having an additional re-opener window in 2025, so that any wider storm resilience opportunities can be considered.
- 6.52 SSEN also suggested that the Authority should have the ability to trigger the Storm Arwen re-opener at any point in RIIO-ED2 to ensure that longer term recommendations can also be considered through the re-opener.
- 6.53 We acknowledge that there may be some uncertainty around the completion of the Storm Arwen recommendations. Therefore, we have decided to allow the re-opener to be Authority triggered outside the application window, where DNOs identify any changes that should be implemented, as a consequence of the Storm Arwen recommendations. We think it is important that customers benefit from any changes that could result in increasing storm resilience and response.

Materiality threshold

- 6.54 A consumer body agreed with our proposal to apply a materiality threshold in line with our common approach to re-openers, stating that this would provide some protection against additional costs being claimed for activity or services which should already be part of BAU.

- 6.55 Conversely four DNOs argued that there should be no materiality threshold, stating that our Draft Determinations position is inconsistent with our approach for other compliance-based re-openers such as the electricity system restoration re-opener or the physical site security re-opener. Materiality thresholds are not applied to these mechanisms to ensure compliance with Government or regulatory guidance.
- 6.56 We acknowledge the DNOs' views and have decided to not set a materiality threshold for this re-opener. This is to ensure consistency with other resilience-based re-openers. However, we also note the consumer body's concerns, and we will endeavour to mitigate this by adding a requirement for DNOs to set out in their re-opener applications how changes to the DNO's scope of work are related to the Storm Arwen recommendations, and how they differ from BAU activities or services. This requirement will be set out in the re-opener guidance, and we will assess this as part of the needs case for adjustment to the DNO's ex ante allowance.

High Value Projects Reopener

Purpose	To help minimise the risks associated with large, high value projects
Benefits	Protects consumers and companies from uncertainty associated with large, high value projects where there are significant risks relating to the needs case and/or proposed solution

Background

- 6.57 High value projects (HVPs) are large, one-off projects that are typically more bespoke in nature due to their size and being delivered less frequently than many of the other day-to-day activities undertaken by the DNOs. In RIIO-ED1 HVPs are defined as discrete projects with specific deliverables valued in excess of £25m.
- 6.58 In our Draft Determinations we set out our consideration that the proposed RIIO-ED2 LRE Re-opener is sufficient to manage the uncertainty around the development and delivery of load-related HVPs. We did, however, consider that it would be appropriate to maintain a HVP re-opener for non-load related expenditure. We proposed a common re-opener for all DNOs with an application window of January 2026, with the materiality threshold maintained at £25m.

Final Determination summary

- 6.59 The table below provides a summary of our Final Determination.

Output Parameter	Final Determination	Draft Determination
UM type	Common re-opener for all DNOs	Same as FD
Re-opener window	January 2026	Same as FD
Trigger	DNO triggered	Same as FD
Materiality threshold	Individual non-load related schemes of £25m or more not included as part of ex ante allowances	Same as FD
Licence condition	SpC 3.2 Part K	N/A

Final Determination rationale and Draft Determination responses

6.60 We received eight responses to our consultation. All of the respondents agreed a high value projects re-opener was necessary and agreed it should not apply to load related projects as these are covered by other mechanisms. Having considered all of the stakeholder responses, we have decided to implement our Draft Determination position to include a high value project re-opener in RIIO-ED2 with no changes to the materiality threshold or trigger.

Scope

6.61 We will retain the principles of the RIIO-ED1 mechanism and will assess application under the HVP re-opener on a project-by-project basis.

6.62 This re-opener may be used for projects that were proposed in Business Plans, but not included in the RIIO-ED2 price control allowances because we considered that they did not have one or more of the following: clear outputs, forecast costs or a need case. This re-opener may also be used for projects that were not included in business plans, for example because the DNO was not aware of the need for the project at the time of submission.

Re-opener window and trigger

6.63 We set a single window for this activity in January 2026. ENWL proposed that by adding an additional window in January 2027, DNOs would be able to incorporate any new requirements as a result of proposals from the Electricity Transmission Operators (ETO) in their next price control period. We retain our view that a re-opener application window in January 2026 is appropriate because DNOs should be aware of large schemes that the ETOs are submitting in their business plans through direct engagement with them early in the RIIO-ED2 period.

Materiality Threshold

6.64 ENWL and SPEN said that the proposed £25m threshold is too high. ENWL proposed a lower threshold of £18m, arguing that the threshold of £25m

may result in projects needing to wait until the next price control period. UKPN and SSEN supported the materiality threshold set in RIIO-ED1 of £25m. No other stakeholders commented. We will maintain the materiality threshold at £25m as UKPN and SSEN support its retention and we have not seen any compelling evidence to deviate from it.

Wayleaves and Diversions Re-Opener

Purpose	A re-opener to recover additional costs associated with wayleaves and diversions costs
Benefits	Protects consumers and companies from uncertain volumes and scope in this area

Background

- 6.65 To operate and maintain network apparatus, including overhead lines and underground cables, DNOs require access rights to privately owned land which its apparatus crosses. To secure access rights DNOs must negotiate land access agreements with property owners. There are two main forms of land access agreement used, wayleave agreements and easements.
- 6.66 Wayleave agreements are personal agreements between the network operator and the landowner, in return for an annual rental or one-off commuted payment. Easement agreements are permanent rights that form a burden on the property title and are binding on successors in title. Wayleaves are a terminable agreement and landowners can seek removal of assets or a diversion of apparatus. DNOs have argued that there is uncertainty around the nature and quantum of wayleave termination and diversion costs.
- 6.67 Diversions themselves can be required for a variety of reasons and give rise to variable costs. Typically, they are third-party triggered and they can relate to proposed development of private land or can be driven by roadbuilding or other public sector projects.

Final Determination summary

6.68 The table below provides a summary of our Final Determination.

Output Parameter	Final Determination	Draft Determination
UM type	Common re-opener for all DNOs	N/A
Re-opener window	January 2026	N/A
Trigger	DNO Triggered	N/A
Materiality threshold	Common materiality threshold of 0.5%	N/A

Output Parameter	Final Determination	Draft Determination
Licence condition	SpC 3.2 Part L	N/A

Final Determination rationale and Draft Determination responses

- 6.69 ENWL, UKPN and SSEN proposed different mechanisms to deal with uncertainty in this activity through their business plans but we rejected these at DDs. In response to our Draft Determinations these DNOs reconfirmed their view that the introduction of an uncertainty mechanism was necessary and raised concerns through the Cost Assessment Working Group (CAWG). In addition, BEIS issued a call for evidence in August 2022 seeking views on the current land rights and consents processes for electricity network infrastructure.²⁷ This raises the prospect of legislative change in this area during RIIO-ED2.
- 6.70 Four options for a UM were discussed in the CAWG following Draft Determinations: a logging up mechanism, a volume driver; a re-opener and a combination of both a volume driver and reopener. In the CAWG all DNOs were supportive of the inclusion of a UM for wayleaves and diversions in RIIO-ED2. The options for a UM ranged in complexity of design and on balance the DNOs supported the use of a re-opener. A volume driver would be complex to set up and it may need to be reviewed following any legislative change. A logging-up mechanism would be a simpler mechanism but it would require DNOs to fund the investments upfront increasing cashflow risks and potentially raise legacy impacts in the next price control.
- 6.71 After reviewing DNOs responses to our Draft Determinations, considering discussions at the CAWG and prospect of legislative change during ED2, we have decided to include a common uncertainty mechanism for this cost area in RIIO-ED2. This is because it relates to an uncertain cost that will be common across GB. We agree with DNOs that a re-opener is the most appropriate mechanism for the reasons stated above. This re-opener is similar to the Pipeline Diversions and Loss of Land Development Claims UM already established in RIIO-GD2.

Scope

- 6.72 We have determined that a broad scope for the Wayleaves and Diversions re-opener is appropriate to align with the scope of the BEIS review and any impact on wayleave and division costs. This re-opener applies to activities and costs reported in tables CV5 (Diversions) and C10 (CAI - Wayleaves) of the Regulatory Instructions and Guidance (RIGs).

²⁷ <https://www.gov.uk/government/consultations/land-rights-and-consents-for-electricity-network-infrastructure-call-for-evidence>

Re-opener window and trigger

6.73 We will have a single reopener window in 2026 at which the DNOs can apply to cover additional wayleave and diversion costs not provided through the ex ante allowance. The re-opener will only be triggered if the additional funding required exceeds the materiality threshold. SPEN requested a second, earlier window, in January 2024. We believe the January 2026 window is suitably timed to mitigate against cashflow risk and will capture the outcome of the BEIS review.

Materiality Threshold

6.74 We have applied the common materiality threshold of 0.5% of average annual RIIO-ED2 base revenues as we believe it is appropriate to keep it consistent with other UMs for RIIO-ED2.

Indirect Scaler Volume Driver

Purpose	To ensure DNOs are funded through an automatic mechanism for varying Closely Associated Indirect (CAI) costs associated with Load Related Expenditure UMs
Benefits	Provides the DNOs with CAI allowances and ensures that those CAI allowances are consistent with those set under the relevant Load Related Expenditure UM

Background

6.75 In response to our Draft Determinations, and in particular the material reduction to load related allowances, many DNOs proposed the introduction of an UM to automatically scale up allowances for indirect costs, as and when capex allowances flex upwards through other UMs. We provide further details on the Indirect Scaler in Chapter 7 of the Core Methodology document.

Final Determination summary

6.76 The table below provides a summary of our Final Determination.

Output Parameter	Final Determination	Draft Determination
UM type	Volume Driver	N/A
Volume Measure	LRE costs	N/A
Unit Rate	10.8% of LRE costs	N/A
Controls	N/A	N/A
TIM application	N/A	N/A
Licence condition	SpC 3.12	N/A

Final Determination rationale and Draft Determination responses

- 6.77 We have decided to put in place an indirect scaler volume driver to enable indirect operational costs to be scaled in line with the award of UM allowances for LRE where there is the possibility of significant shifts (upwards and downwards) in workload levels in-period. We are setting an Indirects Scaler at a value of 10.8% of each unit of capex allowance provided under load-related UMs. We believe this is an appropriate mechanism to manage the uncertainty around indirect allowances associated with LRE.
- 6.78 In their consultation responses to our Draft Determinations, several DNOs highlighted that there was no mechanism in the Draft Determinations that enabled indirect cost allowances to be adjusted in line with direct cost allowances provided through UMs. For instance, if a DNO received significant LRE UM allowances, they would not be matched by associated funding for indirect costs relating to project management and other related management costs.
- 6.79 UKPN submitted regression analysis conducted on its behalf by NERA which sought to estimate the historical relationship between expenditure on indirects and capex. This regression analysis modelled indirect expenditure as a function of MEAV and capex over the period 2011 to 2021. Given the functional form of the model, which was estimated in levels, the coefficient on the capex variable can be interpreted as the increase in indirect expenditure associated with a unit increase in capex. This coefficient can therefore be used to set the value of an indirect scaler, assuming that the historical relationship between capex and indirect costs reflects the efficient level of indirect costs required for a given level of capex.
- 6.80 NERA undertook two versions of this regression analysis, one with the dependent variable for indirect costs defined as the sum of Closely Associated Indirects and Business Support Costs and one defined as only Closely Associated Indirects costs.
- 6.81 The proposal for an Indirects Scaler was discussed in the CAWG and supported by a majority of the DNOs. SSEN provided ratio based analysis which was consistent with the work carried out by NERA but no other alternative proposals were presented by other DNOs.
- 6.82 We have considered the appropriate scope of the Indirects Scaler and determined that it should apply only to load related UMs. This is on the basis that the rationale for introducing the scaler is a product of the materiality of reductions to load related expenditure made in our Final Determinations relative to DNOs' Business Plans. This combined with the high levels of uncertainty around the scale and pace of LCT rollout gives rise to the prospect of material upward adjustments to load allowances in-period through the operation of the load-related UMs which, if left unmitigated, could give rise to a funding gap for the associated indirect expenditure.

- 6.83 In setting the value of the Indirects Scaler we have used the coefficient from the NERA regression which models Closely Associated Indirect costs only (ie 0.108). This is because we do not consider there to be a sufficiently strong relationship between Business Support Costs (such as Finance, HR, CEO costs etc.) and load related expenditure. We note this is also consistent with the operation of the Opex Escalator in the RIIO-T2 price control.
- 6.84 We are persuaded that UKPN's proposal for an Indirects Scaler at a value of 10.8% of each unit of capex allowance provided under load-related UMs is an appropriate mechanism to manage the uncertainty around indirect cost allowances associated with LRE. The Indirects Scaler will apply to the following load-related UMs:
- Secondary Reinforcement Volume Driver
 - LV Services Volume Driver
 - LRE Re-opener.

Smart Meter Volume Driver

- 6.85 The purpose of this volume driver was to provide network companies with additional funding for DNO-related call outs attributable to the rollout of smart meters, due to forecasting uncertainty for costs. This was as a result of it being a new activity without historical cost information to inform allowance-setting. In RIIO-ED1 we recognised that this was an important issue and that there was a risk of substantial underfunding as the rate and cost of call outs was uncertain. In RIIO-ED1 we considered a volume driver to be an appropriate mechanism to manage this uncertainty. In our Draft Determinations we proposed removing the volume driver and providing ex ante funding for assessed RIIO-ED2 costs, as we believe the degree of uncertainty and underfunding risk is substantially reduced for RIIO-ED2.
- 6.86 We received eight responses to our Draft Determinations position, from DNOs, a consumer body and an industry body. SSEN, SPEN, the consumer body and the industry body supported our proposed funding approach but four DNOs disagreed. ENWL, NPg, NGED and UKPN disagreed with our proposal to remove the volume driver and suggested that the timing of the rollout, installation volumes and level of installations were still uncertain.
- 6.87 We maintain that the level of uncertainty in relation to the smart meter rollout will be substantially lower in RIIO-ED2 compared to RIIO-ED1. Current government policy remains that suppliers have binding targets to roll out smart meters to remaining customers by the end of 2025, meaning the quantum of smart meter installations in RIIO-ED2 which could incur DNO call outs should be forecastable. We continue to find that the smart meter interventions data supports setting an industry call out rate and unit cost.

6.88 On this basis we have decided to maintain our Draft Determination position to remove the volume driver for smart meter interventions and fund with ex ante allowances in this area. We set out our position on ex ante allowances in the Core Methodology Document Chapter 7.

7. Smart optimisation

Introduction

- 7.1 Smart optimisation is a cross cutting initiative, which will be delivered by investment in network monitoring, data and digital processes and new DSO functionalities. Network operators need to make full use of smart technologies and whole systems approaches to minimise cost, provide flexibility to the system, help to balance supply and demand, and actively manage constraints on the network.
- 7.2 A smart and flexible energy system is essential to achieving the UK's net zero climate goal while keeping energy bills affordable for everyone. As we change the way we fuel our cars and heat our homes, demand for electricity will increase from millions of new EVs and Heat Pumps (HPs). Being more flexible in how and when we generate and use electricity will help reduce the investment needed in grid capacity to meet this demand, resulting in significant savings on energy bills.
- 7.3 Smart optimisation of the distribution networks will be increasingly beneficial to whole system integration. Decisions about the operation of the distribution networks will significantly affect not only the transmission networks but also the operation of charging networks for EVs, the operation of domestic HPs, and the behaviour of distributed energy resources. Smart optimisation is also about taking a whole system, planned view of the future and enabling other stakeholders, particularly the local authorities and community groups that are progressing net zero in their areas, to plan and operate accordingly.
- 7.4 In this chapter we confirm our approach to achieving smart optimisation through the RIIO-ED2 price control.

Smart optimisation through RIIO-ED2

- 7.5 The smart optimisation of networks requires the utilisation of network data to drive improved decision-making within the DNOs. By optimising decision-making, DNOs will be able to solve the increasingly complex challenges posed by increasing asset connections and the resulting rise in electrical demand. We believe RIIO-ED2 is the right opportunity to drive smart optimisation of distribution networks forward due to the LV monitoring strategies proposed by the DNOs. LV network data provides DNOs with a full suite of network data with which to undertake decisions relating to network and whole system optimisation.
- 7.6 We are driving smart optimisation of the distribution networks through:
- incentivising the rollout of network visibility through DSO-related metrics and other evaluation criteria included within the DSO incentive

- allowing and encouraging the DNOs to invest in the data and digital capabilities required to operate a smart network through the price control
- linking the funding of LRE to real network conditions, so that the DNOs can make optimal choices between the procurement of network upgrades and use of flexibility services to facilitate efficient investment in the distribution network
- creating a whole system LO that will require DNOs to plan strategically to deliver these outcomes. This will be underpinned by a system of monitoring and reporting.

7.7 Our decisions are described at a high level in this chapter, but further information on our decisions is set out in Chapters 3, 4 and 7 of the Core Methodology Document.

Network Monitoring

7.8 As set out in our Draft Determinations, network monitoring is a fundamental building block supporting smart optimisation, future DSO activities and load related planning investment proposals. With network data generally available for higher voltage networks and large substations in RIIO-ED1 and LV network data delivered by the network monitoring rollouts proposed in RIIO-ED2, DNOs will have a more complete understanding of their network.

7.9 LV network data allows for real-time assessment of network conditions across the entire DNO network, reducing the number of assumptions required when DNOs are making decisions about reinforcement, procurement of flexibility and connections.

7.10 Over the course of RIIO-ED1, there have been significant developments in the energy sector with respect to digitalisation, flexibility and smart grid technologies, all of which seek to leverage better network data.

7.11 Through the RIIO-ED1 Network Innovation Competition and NIA mechanisms, there has been significant innovation investment in network monitoring, automation and digital grids. This investment in innovation has allowed network monitoring and automation technologies to mature such that they can be deployed at scale in RIIO-ED2.

7.12 In the RIIO-ED2 Business Plan Guidance we asked DNOs to submit Network Visibility Strategies which outline their approach to visualising the network using a combination of technologies including direct measurement, modelling and smart meter data.

7.13 The DNOs submitted proposals which should enable them to reach full network visibility by the end of RIIO-ED2, however, some DNOs will have full coverage of their networks earlier than this.

7.14 All DNOs have prioritised the physical installation of monitoring to highly utilised network areas and areas with the highest potential flexibility

needs. We consider the networks to have taken a sensible approach to reaching 100% coverage of the networks by the end of RIIO-ED2 by utilising a combination of physical monitoring and advanced data analytics. This is more cost efficient for consumers than installing physical monitoring devices on all network substations.

- 7.15 We consider that these network monitoring strategies are proportionate and should lead to better outcomes for consumers.

DSO

- 7.16 In Chapter 8, we set out our decisions that will support a step change in how DNOs deliver DSO functions and services in RIIO-ED2. This will drive companies to more efficiently develop and use their network, considering flexible and other smart alternatives to network reinforcement, and ultimately support the delivery of net zero at the lowest cost to the consumer.
- 7.17 Enabled by DSO-related investments in network planning, DNOs will be expected to work collaboratively with the ESO, network users and other interested parties to, for example, support the development of local authority and devolved government plans for decarbonisation. Cross-sector, regional engagement will help to ensure transparent processes are adhered to in identifying and assessing options to resolve network needs.
- 7.18 DNOs will also be expected to promote network visibility, as well as operational and market data availability, as part of our baseline expectations for DSO. By generating new insight at lower network voltage levels, and with greater temporal granularity, we anticipate that the companies will be able to develop system visualisation maps or platforms that improve the value of the information they provide to network users.

Data and Digitalisation

- 7.19 The collection of network data provides the DNOs with the ability to be more strategic with their actions, leveraging key network insights to assist internal decision-making and modernisation of business processes. This modernisation, and improved decision-making, requires the development of new digital tools and services. These tools and services should be developed in accordance with stakeholder needs.
- 7.20 In our Draft Determinations we proposed to accept the DNOs' Business Plan proposals with respect to Data and Digitalisation, as we consider that they deliver on the key strategic objectives of smart optimisation and consumer value. We also proposed to introduce a Digitalisation Re-opener to enable DNOs to provide the tools and services required for smart optimisation of the distribution networks during the price control period.
- 7.21 We confirm our decision to introduce a Digitalisation LO, and a Digitalisation Re-opener. Our reasoning is set out in Chapter 4 of the Core Methodology Document.

- 7.22 We confirm our positions on the DNOs' Business Plans with respect to Data and Digitalisation and outline our Data and Digitalisation policy approach to the RIIO-ED2 price control in Chapter 4 of the Core Methodology Document.
- 7.23 As part of their Digitalisation Strategy and Action Plans (DSAP), DNOs submitted proposals for Data and Digitalisation investments which interact with smart optimisation of the network, the key outcomes are:
- Improvements to connection processes – DNOs are proposing improvements to connection processes, which will be achieved via leveraging monitoring data and development on new tools including self-serve connection tools to mitigate the forecast increase in connection volumes through RIIO-ED2 and RIIO-ED3
 - Advanced modelling approaches – DNOs are proposing the development of connectivity models, digital twins and forecasting tools. This will allow improvements to network and scenario planning, better contingency analysis and more robust business plans for future price controls.
- 7.24 Following consideration of responses to our Draft Determinations we consider that the new tools and processes that the DNOs propose to implement appear proportionate and should lead to better outcomes for consumers and wider stakeholders. All respondents to our questions set out in Chapter 4 of the Core Methodology Document at Draft Determinations were aligned with Ofgem's position on digital investments needed by the DNOs.
- 7.25 For effective functioning at a whole system level, transparency of operation is required at all levels of the network, and stakeholders need to understand the format in which DNOs should provide network data. Ofgem has pushed for greater transparency through the Long-Term Development Statement (LTDS), requiring the LTDS to adopt the Common Information Model (CIM) as its data standard.²⁸ We intend to continue to utilise, where suitable, the CIM for network data exchanges required as part of LOs.

Load Related Expenditure (LRE)

- 7.26 Achieving net zero across the energy system will require a significant increase in investment in new low carbon infrastructure, both in generation capacity and upgrading our electricity networks. Doing so at least cost to consumers also requires any new investment to be delivered efficiently. This means making best use of existing network capacity and the various new smart and flexible technologies that are emerging, including through increased digitalisation of the sector. This approach will

²⁸ [The Common Information Model \(CIM\) regulatory approach and the Long Term Development Statement | Ofgem](#)

help ensure any new investment is made in the right place, at the right time, and at the right price.

- 7.27 Our approach to LRE is a key building block of the RIIO-ED2 price control, ensuring the distribution networks are not a blocker to net zero while protecting consumers from the risks of overinvesting ahead of demand, particularly in the face of uncertain pathways to net zero (for example, in relation to the decarbonisation of heat). In our SSMD we set out that we expected DNOs to support long term whole system optimisation in how they responded to new demand, specifically by using flexibility in the first instance before considering traditional network investment. We consider that the LV monitoring rollout will be a key enabler of this due to the use of network visibility data and connectivity models to plan the expansion and reinforcement of the distribution networks.
- 7.28 The importance of network visibility for robust and transparent planning is reflected in the design of the LRE UMs that we have established for RIIO-ED2, which will enable DNOs to be responsive to changing demand.
- 7.29 Key to this responsiveness will be our LRE volumes drivers, for which we have put in place a range of controls, including a monitoring framework, to guard against their inefficient use. The framework aims to leverage the benefits of increased monitoring capabilities and ensure that there are clear indicators of justified investment. This should enable DNOs to mitigate the uncertainties surrounding growth in demand and plan effectively on the LV networks.
- 7.30 While the focus of this section is predominantly on LV monitoring, network monitoring at all voltage levels is key to effective network planning and LRE investments. At higher voltages, we have established the LRE Re-opener to manage uncertain spend. Aligned with the controls for the volume driver, we expect DNOs to use network monitoring data²⁹ to plan effectively and evidence the need for additional allowances. This should include maximising the use of flexibility.
- 7.31 By emphasising the importance of network monitoring data within UM design, we hope to drive the DNOs to plan in a transparent and effective manner which complements the wider set of smart optimisation proposals.
- 7.32 Further information on our LRE UMs and associated controls, as well as our assessment of the LRE plans, can be found in Chapter 3 of our Core Methodology Document.

Smart Optimisation Output

- 7.33 The DNOs have a fundamental role to play in enabling a more integrated and optimised energy system; firstly, by sharing data about their existing networks and presenting a vision of how they see these networks evolving

²⁹ At the higher voltages, network visibility is greater with an established framework, the Load Index (LI) in place for tracking changes in utilisation over time.

in the future and secondly, by collaborating with stakeholders to inform the DNO's own strategic planning activities and to support the creation of least cost decarbonisation pathways for electricity, heat and transport at a regional level, in partnership with others.

- 7.34 As set out in our Draft Determinations, we recognise that protecting consumers depends increasingly on achieving optimised outcomes in our energy system and making decisions with a whole system lens. There is increasing interconnection between different and changing energy vectors as the economy decarbonises and there is a need to account for the impact that decisions made in one part of the energy system have on other areas. In this way investments will create system value rather than only benefiting the networks.
- 7.35 Furthermore, the networks must enable key regional players, such as local authorities and community organisations, to develop policies and investment programmes and to help ensure these enable the transition to net zero at least cost. There is an increasing number of stakeholders (local authorities and in the private sector) who need to take such decisions. These stakeholders need to understand both the existing network state but also future upgrade plans at a level of detail and locational specificity that can assist them. Providing tools that track the state of network investments and sets out future plans so stakeholders can extract useful information will be a critical part of enabling the transition.
- 7.36 We are introducing a new Smart Optimisation Output (SOO) LO for RIIO-ED2. This will require the DNOs to develop a strategy which consists of two parts:
- Part 1. Collaboration Plan: A plan describing how the DNO will collaborate with stakeholders through a more transparent and user-centric approach to the sharing of data and how the DNO will work in partnership with stakeholders to support the development of local and regional net zero strategies
 - Part 2. System Visualisation Interface: A section of the DNOs website and open data portal (once this portal is operational) that provides access to a package of forward-looking, open and accessible digital network tools. These tools should provide detailed asset and spatial information about the DNO's network including, for example, the type, capacity and condition of assets and details of any specific system constraints. The System Visualisation Interface will also include details of future network developments, including when and where network upgrades are likely to occur. The SOO does not require the development of a new digital map or platform.
- 7.37 We set out further details in Chapter 4 of our Core Methodology Document.

8. Distribution System Operation

Introduction

8.1 In this chapter, we provide an overview of our decisions on regulating and incentivising DSO functions. We also set out how we will ensure the price control is adaptable to any changes in roles and responsibilities that may emerge from Ofgem's ongoing programme of work to explore the value of alternative DSO governance arrangements to help us meet government's net zero goals.

Regulating DSO functions

8.2 A key objective of RIIO-ED2 is to support the delivery of net zero at the lowest cost to the consumer, and the efficient operation of the energy system at all voltages is essential if this vision is to be realised. Changes are required to the operation of electricity distribution networks to maximise the value of decentralised, local markets for flexibility services and to enhance the visibility of network data. DSO is the set of activities that are needed to support this transition to a smarter, more flexible and digitally enabled local energy system.

8.3 In our Draft Determinations, we proposed to:

- Provide appropriate ex ante funding for DSO functions, in line with our baseline expectations for DSO and our assessment that the companies' DSO strategies met the minimum requirements under the BPI
- Implement a new financial DSO incentive to drive DNOs to more efficiently develop and use their network, taking into account flexible alternatives to network reinforcement.

8.4 We have decided to accept the majority of the DNO's DSO strategy proposals without amendment. While we recognise the benefits that greater standardisation could bring, we are also mindful that there is value in giving DNOs the space to innovate and tailor their approach to reflect the DSO transition issues prevalent in their region.

8.5 Following consideration of stakeholder responses, we have decided to change the DSO incentive value to + 0.4% / -0.2% of RoRE per year. This reflects the substantial consumer benefits that DSO can unlock and the need to have an upside incentive value that is sufficient to motivate excellent performance. We also consider that a relatively stronger upside will mitigate the risk that the DNOs do not stretch themselves in more novel areas due to loss aversion bias.

8.6 We set out our decisions for regulating DSO functions in Chapter 4 of the Core Methodology Document.

Changing roles and responsibilities

- 8.7 Our immediate priority is to ensure DNOs continue to develop DSO capabilities. However, we are conscious that as DSO functions evolve, we will need to consider whether there may be a case for greater separation of certain DSO activities from traditional DNO functions, or wider reforms to institutional arrangements at the distribution level.
- 8.8 Given this, we proposed in our Draft Determinations to introduce a DSO re-opener to increase the adaptability of the price control to wider policy thinking in relation to changing roles, responsibilities, and governance arrangements. This includes:
- Our review into the effectiveness of institutional and governance arrangements at a sub-national level, which we launched in April 2022.³⁰ We are intending to arrive at conclusions in early 2023 and then undertake further consultation
 - We intend to engage with industry on the future vision for flexibility, setting out forward options for feedback, including the Flexibility Exchange concept for distributed energy resource (DER) and energy services that will encourage deep, consecutive, concurrent markets for different products.
- 8.9 Following consideration of responses to our Draft Determinations, we have decided to implement the DSO re-opener in our Final Determinations. Further information on our decisions with respect to changing roles and responsibilities are set out in Chapter 4 of the Core Methodology Document.
- 8.10 In our Draft Determinations, we also set out the need to clarify the role of DNOs in contestable markets to ensure that DNOs neutrally procure grid operational services and facilitate the development of - and coordination between - flexibility markets. In March 2022, we consulted on our minded-to position for the regulatory treatment in RIIO-ED2 of DNOs providing network voltage control services, via the remote management of deployed network assets, to the electricity system operator for its balancing services activities.³¹ This service is commonly referred to as Customer Load Active System Services (CLASS). We expect to publish our decision on this matter in December 2022.

³⁰Call for Input: Future of local energy institutions and governance: <https://www.ofgem.gov.uk/publications/call-input-future-local-energy-institutions-and-governance>

³¹ Regulatory treatment of CLASS as a balancing service in RIIO-ED2 network price control (2022 consultation) <https://www.ofgem.gov.uk/publications/regulatory-treatment-class-balancing-service-riio-ed2-network-pricecontrol-2022-consultation>

9. Approach to the Totex and Business Plan Incentive Mechanisms

9.1 In this chapter, we set out our decisions on the RIIO-2 Totex Incentive Mechanism (TIM) and the Business Plan Incentive (BPI).

Totex Incentive Mechanism

Overview of TIM outcome

9.2 The TIM is designed to encourage network companies to improve their efficiency in delivery and ensures that the benefits of these efficiencies are shared with consumers. It also provides some protection to consumers from any company overspend of their allowances as the cost of these overspends are shared with consumers.

Table 7: Final TIM incentive rates for each DNO³²

DNO	Final Determination	Draft Determination
ENWL	49.4%	50.0%
NPg	49.9%	49.9%
NGED	50.0%	50.0%
UKPN	50.0%	50.0%
SPEN	50.0%	49.9%
SSEN	49.3%	49.2%

9.3 As set out in our Draft Determinations, we have applied confidence-dependent incentive rates specific to each company that would determine the exposure of companies to under- or overspends against ex ante totex allowances. The TIM incentive rates set out in the table above are the effective incentive rates (after paying tax) that will apply to network companies in RIIO-ED2.

9.4 This confidence-dependent incentive rate is specific to each licensee and has been calculated as follows:

$$\text{Incentive rate (\%)} = [50\% * \text{confidence metric}] + [15\% * (1 - \text{confidence metric})]$$

9.5 The confidence metric for each licensee is the ratio of high-confidence ex ante costs to totex, where the aggregate efficient cost benchmark for high-confidence ex ante costs is the numerator and the network company's overall totex allowance is the denominator.

³² Where there is more than one licensee per company, these are based on each network company's incentive rate weighted by allowed totex.

9.6 In line with the approach set out in Draft Determinations, we categorised ex ante costs based on our confidence in our ability to independently set expenditure allowances in respect of those costs:

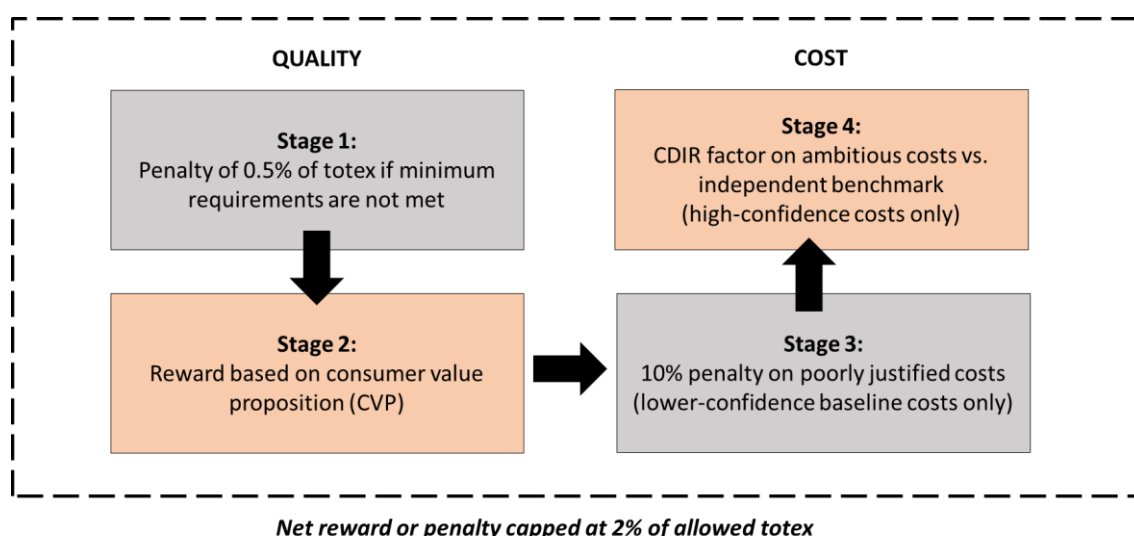
- high-confidence ex ante costs are those costs for which we have a high level of confidence in our ability to independently set a cost allowance
- all other ex ante costs would be categorised as lower confidence ex ante costs.

The Business Plan Incentive

9.7 The BPI was developed to encourage network companies to submit ambitious business plans that contain the information Ofgem requires to undertake a robust assessment of the business plans. High-quality business plans are essential to enable us to have sufficient high-quality information to set the price control that delivers for consumers at a reasonable cost.

9.8 The four stages of assessment under the BPI are set out in Figure 4 below. In our SSMD, we decided that for each company rewards and penalties (aggregated across all four stages of the BPI) are capped at 2% of our proposed totex allowances.

Figure 4: Summary of the four stages of assessment under the BPI



9.9 The BPI rewards companies where, in our view, their business plan represents genuine additional value for money compared to business-as-usual and provides information that helps us to set a better price control. In contrast, inefficient, lower quality business plans are subject to financial penalties.

9.10 In this chapter we provide an overview of our BPI decisions for each company and set out some of the key points raised by stakeholders on the BPI and our responses to those points. Further details on our BPI decisions for each company are set out in Company Annexes.

Final Determination: Overall BPI

9.11 The final outcomes of the BPI are set out in Table 8 or all companies.

Table 8: Final outcomes of the BPI for all companies³³

DNO	Stage 1	Stage 2 (£m)	Stage 3 (£m)	Stage 4 (£m)	Applicable cap/collar (+/- 2% Totex) (£m)	Total Reward / Penalty (£m)
ENWL	Pass	0	0	0	36.6	0
NPg	Pass	0	0	0	59.8	0
NGED	Pass	4.6	0	0	128.8	4.6
UKPN	Pass	0	0	25.5	108.6	25.5
SPEN	Pass	0	0	0	62.8	0
SSEN	Pass	3.5	0	0	77.4	3.5

Stage 1 of BPI

Background

9.12 The purpose of Stage 1 of the BPI is to incentivise the timely provision of adequate information within the business plans upfront, and to incentivise the network companies to submit business plans that contain the minimum necessary material to allow us to assess those plans.

9.13 At Draft Determinations we proposed that we were satisfied that all DNOs had passed Stage 1 of the BPI. We noted that we had identified areas where business plans were not of satisfactory quality to be considered as meeting the minimum requirements for most of the DNOs. However, following an assessment of the materiality of these failures of the individual minimum requirements, we considered these failures to be limited in number, materiality and scope. On this basis, we proposed that all business plans passed Stage 1 of the BPI.

Final Determination

9.14 The table below provides a summary of our Final Determination position.

Table 9: Final outcomes of Stage 1 of BPI

DNO	Draft Determination	Final Determination
ENWL	Pass	Pass
NPg	Pass	Pass

³³ As with other financial incentives in RIIO-2, we propose to make separate tax adjustments so that the figures in the table represent the estimated financial impact on the company after paying corporation tax.

NGED	Pass	Pass
UKPN	Pass	Pass
SPEN	Pass	Pass
SSEN	Pass	Pass

Final Determination rationale and Draft Determination responses: Stage 1 BPI

- 9.15 We have decided to implement our Draft Determinations position and confirm all DNOs have passed Stage 1 of the BPI.
- 9.16 There were nine respondents to this consultation position. Only UKPN disagreed with our overall position that all DNOs passed Stage 1. Several of those supporting our position noted that Ofgem was best placed to make this assessment.
- 9.17 UKPN considered that the proposed position signalled to DNOs that there is no consequence to ignoring Ofgem’s guidance. In particular, UKPN sought more explanation as to why those DNOs failing elements of the minimum requirements were considered to have passed Stage 1 overall.
- 9.18 SSEN disputed its own failure of two minimum requirements, citing sections of its business plan that supported its position that it had in fact passed those requirements.
- 9.19 With regard to UKPN's concerns, we do not consider that the individual failures identified are sufficiently material to result in an overall failure of stage 1 of the BPI. As set out in our Business Plan Guidance (BPG), and explained in our Draft Determinations, we applied a materiality assessment to any business plan that did not meet a particular minimum requirement among over 100 individual requirements. This involved consideration of the number of minimum requirements that had been failed, the extent to which our ability to set the RIIO-ED2 price control has been compromised by the failure in question, and assessment of any consumer detriment that may be expected as a result of the failure. On this basis, we assessed that all companies should pass Stage 1 of the BPI.
- 9.20 With regard to DSO, as noted by another respondent, we consider that NGED's failure to set out sufficient detail on performance measures for its DSO strategy is addressed by our implementing a common DSO incentive framework for all licensees. On Whole Systems, we consider the failures in NGED and ENWL's business plans were not material enough to affect the overall outcome of Stage 1 of the BPI.
- 9.21 Despite SSEN's consultation response we continue to assess that SSEN failed two individual minimum requirements. Nevertheless, our view remains that these failings were not of sufficient materiality to result in SSEN failing Stage 1 of the BPI.

Stage 2 of BPI

Background

- 9.22 Under Stage 2 of the BPI, DNOs could submit consumer value propositions (CVPs) to demonstrate the ways in which their plans go beyond the minimum requirements and the functions typically undertaken by an energy network company as business as usual, and how this would lead to benefits for consumers.
- 9.23 The DNOs put forward 24 CVP proposals with a total proposed value in excess of £800m. We assessed the CVP proposals against the criteria in the BPG.
- 9.24 In our Draft Determinations, we proposed that three CVPs should receive rewards:
- £3.6m for NGED’s CVP to offer 1.2 million PSR customers a bespoke smart energy action plan every two years
 - £2.8m for two SSEN CVPs to: improve biodiversity in the seas around its island communities (£1.7m); and to help those most medically vulnerable with access to a battery backup, in case supplies are interrupted (£1.1m).
- 9.25 The CVP reward is calculated by multiplying the net consumer value by the company’s efficiency incentive rate.³⁴ We proposed to accept a further 12 proposals to be delivered but without a reward.
- 9.26 We also proposed the following treatment for CVPs with rewards:
- Introducing an annual reporting requirement regarding delivery status and a requirement for detailed reporting at close-out of RIIO-ED2
 - Introducing an ex post clawback mechanism to recover a proportion of the reward in the event of non-delivery
 - Submission of performance metrics from the relevant DNO as part of its consultation response for us to consider ahead of Final Determinations. These should detail measurable activities or outputs the company will complete to deliver proposed consumer benefits.

Final Determination

- 9.27 Table 10 below summarises the final outcomes of Stage 2 of the BPI, and Table 11 summarises our treatment of CVP rewards.

³⁴ The net consumer value is the monetised consumer benefit from delivering the CVP. The DNO’s efficiency incentive rate can be found in table 7 further up this chapter.

Table 10: Final outcomes of Stage 2 of BPI

	Submitted	Accepted CVP with reward	Accepted CVP with no reward	Reject CVP but activity accepted	Rejected CVP and activity
ENWL	2	0	1	0	1
NPg	4	0	3	1	0
NGED	6	1	1	2	2
UKPN	3	0	2	0	1
SPEN	4	0	1	2	1
SSEN	5	2	1	0	2
Total	24	3	9	5	7

Table 11: Stage 2 Rewards for DNOs

DNO	Final Determination (£m)	Draft Determination (£m)
ENWL	0	0
NPg	0	0
NGED	4.6	3.6
UKPN	0	0
SPEN	0	0
SSEN	3.5	2.8

9.28 CVP rewards have increased for both SSEN and NGED from our Draft Determinations proposals as a result of our consideration of both DNOs' updated valuations of the benefits the projects deliver. SSEN's reward has increased due to our decision to accept one of its CVPs with full reward, which is a change from our Draft Determinations position. Further detail on our CVP decisions is set out in the Company Annexes.

9.29 The table below outlines our approach to treatment of CVP rewards.

Incentive parameter	Final Determination	Draft Determination
Reporting Requirements	For all proposals that receive a CVP reward, we propose to introduce an annual reporting requirement regarding delivery	Same as FD

Incentive parameter	Final Determination	Draft Determination
	status and require detailed reporting at close-out of RIIO-ED2.	
Clawback	We propose to introduce an ex-post clawback mechanism to recover a proportion of the reward in the event of non-delivery	Same as FD

Final Determination rationale and Draft Determination responses

- 9.30 We have decided to maintain our Draft Determinations position on our approach to CVP assessment and rewards for Final Determinations. Details on the assessment of individual CVPs can be found in the Company Annexes. Where we provide ex ante allowances, we still expect the activity to be carried out, regardless of whether the CVP proposal was rewarded.
- 9.31 There were ten responses to this consultation question. Responses covered individual CVPs, reporting requirements and the Stage 2 process overall.
- 9.32 Five DNOs responded on specific CVPs to highlight disagreement where we proposed to reject a reward for an individual CVP. We discuss these responses in the sections of the Company Annexes covering specific CVPs.
- 9.33 The five respondents commenting on our proposed treatment for CVP rewards broadly agreed with our proposals. NGED emphasised that CVP reward mechanisms must be robust and there should be no questions of customers paying for a reward where net benefits are not delivered. One consumer body encouraged DNOs to publicly report ex ante funded activity that was previously submitted as a CVP given the substantial stakeholder engagement that was undertaken to develop a CVP proposal and the likelihood of continuing stakeholder interest in the activity.
- 9.34 With regard to the overall assessment approach, NGED considered that there were no detailed criteria for how to determine whether an activity exceeded the minimum standards set by the assessment criteria.
- 9.35 NPg suggested that benchmarking of costs for activities submitted as CVPs would require it to review and prioritise costs in order to be able to deliver these outputs within its ex ante allowance. SSEN considered that costs associated with CVPs should be separately technically assessed rather than included in modelled costs if they are to be funded in ex ante allowances.
- 9.36 Two respondents generally supported the balance of rewards, given the proposals put forward. However, the UKPN CEG considered the outcome of the CVP process is disproportionate to the effort in developing them, including gaining the support of the relevant CEGs. The RIIO-ED2 CG also

noted that CVP rewards are not a meaningful indicator of the overall quality of the business plans.

- 9.37 UKPN's CEG, SSEN, SPEN, and the RIIO-ED2 CG considered that Stage 2 of the BPI should be subject to overall review ahead of any future price controls. SPEN and SSEN highlighted that the low number of proposed rewards compared to the number of proposals could result in companies omitting such proposals from their business plans in future. The RIIO-ED2 CG considered that the ambition related to CVPs has been promoted more effectively through enhanced engagement rather than through the CVP process.
- 9.38 With regard to the clawback mechanism, one consumer body, SPEN and SSEN agree with the principle of clawing back rewards where outputs have not been delivered. SSEN suggested that further discussion is required to consider circumstances where the additional consumer value is achieved despite the output being partially delivered.

CVP framework and assessment

- 9.39 We have decided to confirm our approach, which was based on published criteria in the BPG provided for the DNOs to develop their CVPs. The CVP framework is intended to reward specific proposals and activities that go beyond BAU and demonstrate additional consumer value. As consumers ultimately fund any reward, we must be satisfied the proposals provide clear additional value to consumers. Ofgem as the regulator must exercise its judgement in assessing CVPs, and we consider our assessment and rationale for rejecting CVP proposals to be justified and proportionate. We also maintain our position in Draft Determinations that the CVPs which have been rejected for a reward do not provide sufficient additional value for consumers beyond the business as usual functions of a DNO.
- 9.40 We were not provided with suitable additional evidence or alternative suggestions to persuade us to amend the valuation of CVPs.
- 9.41 We set out our decision on the cost treatment of CVPs and bespoke, depending on their acceptance or rejection, within paragraphs 7.53 and 7.58 of our Core Methodology Document. Some DNOs noted in their consultation responses that they found the cost treatment of bespoke and CVPs unclear. NPg interpreted their costs as being disallowed for two accepted CVPs when in fact the costs for these had been separately assessed³⁵ and allowed. To clarify, we agree with SSEN that the costs associated with accepted and rewarded CVPs should be separately assessed rather than included in the cost benchmarking. We have applied this approach for the twelve CVPs that we have accepted (with and without reward) in our Final Determinations. There are a further five proposals for which we have rejected the treatment as a CVP but accepted

³⁵ Separately assessed bespoke and CVPs are included in 'Technically assessed totex' in DNO company annexes

that the activity should be included in DNO costs, and so have been included in cost benchmarking.

- 9.42 We disagree with Draft Determination responses that the low number of CVPs which received an award indicates a failure of policy intent or a disincentive to provide CVP proposals in the future.
- 9.43 Many CVP proposals submitted as part of the RIIO-ED2 Business Plans were not of sufficiently high quality, nor were sufficiently evidenced to demonstrate that the CVP should be accepted and the DNO rewarded. While we note the concerns over the relatively small number of proposals rewarded, we have provided specific ex ante allowances for 12 of 24 CVPs, with a further five provided with ex ante allowances that were subject to cost benchmarking. As a result, we consider this demonstrates that the mechanism has encouraged DNOs to bring forward additional proposals that have a net consumer benefit.

Treatment of CVP rewards

Reporting requirements

- 9.44 We maintain the position set out in our Draft Determinations that where DNOs are rewarded for CVPs, they should provide annual reporting to monitor progress on the delivery of their CVPs during the RIIO-ED2 period, as well as a more detailed reporting to be submitted during RIIO-ED2 close out. This reporting will be based on common templates and should relate to the performance metrics agreed. We have set out these metrics in the Company Annexes for CVPs that have been rewarded.
- 9.45 Our standard licence condition, SLC50 Business Plan Commitment Reporting, requires DNOs to report on their business plan delivery which will capture CVPs that have not been awarded, but have been funded through allowances.

Clawback

- 9.46 We maintain our Draft Determination position to include a clawback mechanism for CVP rewards in the event that a network company does not deliver some or all of the agreed CVP output at the end of RIIO-ED2.
- 9.47 We will assess whether a CVP output has been delivered as part of RIIO-ED2 close-out. Network companies will submit a CVP Report to Ofgem at the end of RIIO-ED2 detailing how they have delivered their CVP outputs (where applicable).
- 9.48 We will recoup the proportion of the reward attributable to any CVP value that is not delivered. After a clawback decision has been made, any sum to be clawed back will be completed by revising the incentive term within the PCFM.
- 9.49 We have set out our position on associated clawback within the Company Annexes where CVP rewards have been accepted.

Submission of performance metrics

9.50 In our Draft Determinations, we set out expectations that DNOs should submit proposed performance metrics for those CVPs we proposed to reward in their consultation response. These metrics should be:

- based on specific measurable actions or outputs, rather than actual consumer benefit
- clearly related to the total reward, such that we can determine, if necessary, what proportion of the reward is subject to a clawback at closeout.

9.51 We received these proposed performance metrics in consultation responses. Where relevant, in the Company Annexes we set out the performance metrics we require DNOs to report against and our rationale.

Stage 3 of BPI

9.52 Table 12 sets out our Final Determination position on Stage 3 of the BPI.

Table 12: Final outcomes of Stage 3 of the BPI

DNO	Final Determination (£m)	Draft Determination (£m)
ENWL	0	0
NPg	0	0
NGED	0	0
UKPN	0	0
SPEN	0	0
SSEN	0	-4.4

Final Determination rationale and Draft Determination responses: Stage 3 BPI

9.53 In this section we set out our decision on the outcome of Stage 3 of the BPI. The approach that we have taken is mechanistic in that costs that are deemed as lower-confidence, and poorly justified, are subject to a 10% penalty. The outcome of our approach for individual DNOs has also been set out in the respective Company Annexes.

Stage 4 of BPI

Table 13: Final outcomes of Stage 4 of BPI

DNO	Final Determination (£m)	Draft Determination (£m)
ENWL	0	0
NPg	0	0
NGED	0	0

DNO	Final Determination (£m)	Draft Determination (£m)
UKPN	25.5	0
SPEN	0	0
SSEN	0	0

Final Determination and Draft Determination responses: Stage 4 BPI

- 9.54 In this section we set out our decision on the outcome of Stage 4 of the BPI. Similar to Stage 3, the approach we have taken on Stage 4 is mechanistic in that DNOs are rewarded where their high-confidence costs beat our benchmark based on the Confidence Dependent Incentive Rate (CDIR). The outcome of our approach for individual DNOs has also been set out in the respective Company Annexes.
- 9.55 Overall, we assess that the BPI has helped ensure Ofgem received high-quality plans as demonstrated by the fact that all DNOs passed their Stage 1 assessment and no DNO has received any penalties in our Stage 3 assessment. It has also helped to incentive ambitious plans and where DNOs have demonstrated they have gone beyond expectations, we have rewarded them in our Stage 2 and Stage 4 assessments. We will, however, review the BPI process as part of our future reviews of price controls.

10. Increasing competition

- 10.1 In our SSMD, we confirmed that we would look to extend the use of early and late competition in the RIIO-ED2 price control where it is in consumers' interest to do so.
- 10.2 This chapter sets out our Final Determinations on the treatment of early and late competition within the RIIO-ED2 package.

Background

- 10.3 Early competition refers to a competition to determine a solution to a need on the network that is run before detailed design of the preferred solution has been carried out. It encourages additional innovation in the design, delivery and operation of infrastructure. This should help ensure that solutions can be delivered quicker and at lower cost.
- 10.4 Late competition refers to a competition for delivery of a project, once a solution for meeting a system need is specified and sufficiently developed. It can produce benefits to consumers by reducing the cost of project construction and operation and can introduce innovation into project delivery, as well as new sources of labour and capital.

Final Determination

- 10.5 The table below provides a summary of our Final Determination position.

Early competition		
Parameter	Final Determination	Draft Determination
Application of the early competition model	<p>We have decided not to apply early competition to any projects that were identified in DNO business plans and included within ex ante allowances.</p> <p>Once the early competition model is sufficiently developed in the ET sector, we will consider whether it is in consumers interests for the model to be applied to the ED sector in the context of re-openers. Where we consider it is, we will consult on our views, and on how early competition may interact with other processes, such as UMs and the late model competition arrangements.</p>	Same as FD

Late competition		
Parameter	Final Determination	Draft Determination
Application of late model to projects funded in ex ante allowances	We have decided not to apply late models of competition to projects that were identified in DNO business plans and included within ex ante allowances. This is because there were no stand-alone projects submitted that satisfy the late model competition criteria of being new, separable, and of a value exceeding £100m.	Same as FD
Application of late competition models to projects eligible for re-openers	All projects that meet the criteria for late model competition and are brought forward under a re-opener during RIIO-ED2 will be considered for delivery through a late competition model. Network companies should develop projects in a way that avoids creating unnecessary barriers to these projects being delivered efficiently through a late competition model.	Same as FD
When we will make our decision on whether or not to apply a late competition model to projects eligible for re-openers	We will aim to reach our decision on individual projects as soon as practically possible alongside our assessment under the relevant re-openers.	Same as FD

Final Determination rationale and Draft Determination responses

10.6 We have decided to confirm our position set out at Draft Determinations. We received ten responses on our proposed position on early and late competition. All responses agreed with our proposals in relation to both early and late competition.

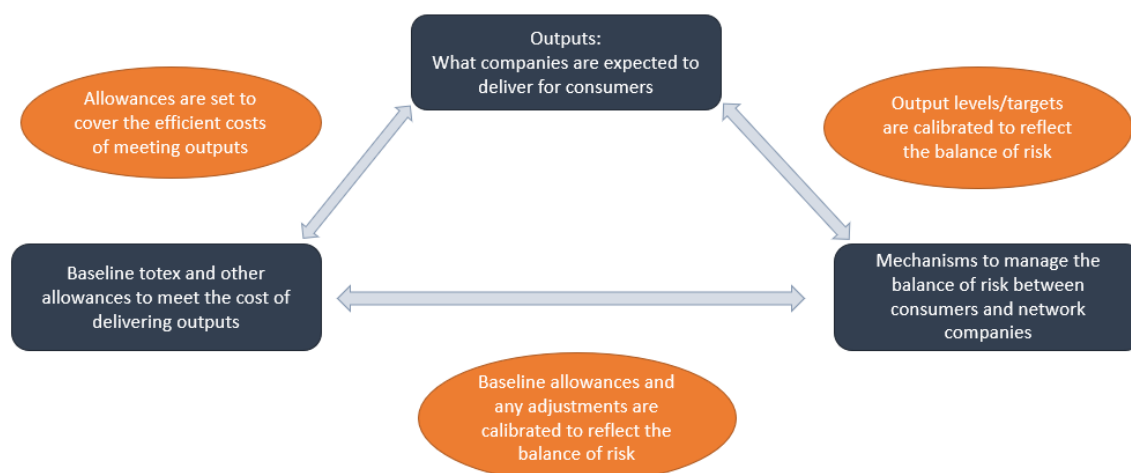
11. RIIO-ED2 in the round, post-appeals review and pre-action correspondence

- 11.1 In this chapter, we seek to explain how different elements of the RIIO-ED2 price control relate to each other (interlinkages) and how our RIIO-ED2 price control package represents a balanced and fair settlement for consumers and licensees that should be looked at 'in the round'. In doing so, we seek to provide clarity for licensees and stakeholders on the overall RIIO-ED2 framework.
- 11.2 We also set out our decisions on pre-action correspondence and the Final Determinations questions (FDQ) process and confirm our expectations of how a post-appeals review may take place.

RIIO-ED2 in the round and interlinkages

- 11.3 In our Draft Determinations, we described our RIIO-ED2 package as a system made up of closely linked but distinct pillars:
- outputs, which are the activities and outcomes that we expect the companies to deliver for consumers during the RIIO-ED2 period. This includes, but is not limited to, statutory obligations, PCDs, ODI targets, LOs and ongoing efficiency improvements
 - expenditure allowances, which allow companies to recover the efficient costs of delivering those outputs for consumers through regulated revenues. This includes ex ante totex allowances and other allowances that we set to meet the cost of delivering outputs such as the Weighted Average Cost of Capital (WACC), ODI rewards and penalties, and uncertainty mechanism revenues
 - uncertainty and other risk mitigating mechanisms to manage and maintain a fair balance of risk between consumers and companies. This includes, but is not limited to, UMs, Real Price Effects (RPE) indexation, the TIM sharing factor, BPI, and RAMs.

Figure 5: High-level overview of interlinkages between outputs, expenditure allowances, and uncertainty/other risk mitigating mechanisms



11.4 We also sought to demonstrate the intrinsic links between these pillars, which means that each of them affects, and is affected by, decisions taken in relation to the other pillars. We said that the existence of these links means that changes to a component inside one of these pillars may have an effect on one or more pillars, and the impact the change has on the other pillars would need to be taken into consideration.

11.5 We set out how we consider the price control package taken 'in the round' represents a fair and balanced settlement for consumers and licensees within the context of two tests:

- the “notionally efficient licensee”: looking across the package of outputs, allowances, ODIs and UMs, have we set the RIIO-ED2 price control such that a notionally efficient licensee is able to recover the costs of delivering its outputs and meeting its statutory obligations and LOs? Has our RIIO-ED2 package, in terms of design, adequately addressed the sources of outperformance within RIIO-ED1? Does our RIIO-ED2 package ensure that licensees' allowances will adjust to meet changes in the external environment?
- the “equity and debt financeability” question: have we set the allowed return on capital so that the notionally efficient licensee is able to maintain an adequate level of credit quality and attract sufficient equity financing to meet its investment requirements and play its part in meeting the UK’s net zero commitments?

11.6 Lastly, we provided a more detailed explanation of how we have taken the price control 'in the round' and examples of how interlinkages manifest within the price control package. We did not receive any consultation responses which disagreed with how we consider the price control package is taken 'in the round' or on the examples of interlinkages that exist between our decisions. We consider these examples apply also to our Final Determinations.

Post-appeals review and pre-action correspondence

- 11.7 We consulted in Draft Determinations on our view of the value of pre-action correspondence and on an FDQ process.
- 11.8 On the post-appeals review, we said that any review would be consistent with the final decision of the CMA on any appeal. We also said that save for material methodological errors which would be in the consumer interest to correct on a symmetric basis, we continue to consider that in general it would not be appropriate for Ofgem to modify the licences of non-appealing licensees following a successful appeal.³⁶

Final Determination

Policy Parameter	Final Determination	Draft Determination
Pre-action correspondence	We expect licensees to engage with us and give us advance notice of any appeal they are proposing to bring in pre-action correspondence at a sufficiently early stage after the publication of Final Determinations, and ahead of the deadline for making an application for permission to appeal. That correspondence should explain their intention to appeal, the elements of the RIIO-ED2 price control that they plan to appeal and why. This should include the scope of any such appeal including, in sufficient detail, the alleged errors, and why that particular component of the price control is wrong having regard to any interlinked aspects of the decision and by reference to the price control in the round.	Same as FD
FDQ process	We expect any prospective appellant to use the FDQ process to signal any aspects of the Final Determinations that contain errors, particularly material methodological errors, so that we can seek to consider and potentially resolve any such issues before we direct the licence modifications.	Same as FD
Post-appeals Review	Same as SSMD	Same as SSMD

³⁶ By non-appealing, we mean a licensee that accepts its Final Determinations and does not appeal any aspect of our decision to the CMA.

Final Determination rationale and Draft Determination responses

Pre-action correspondence

- 11.9 We expect prospective appellants to send pre-action correspondence following the publication of Final Determinations and prior to the appeals window closing.
- 11.10 We received eight responses to our consultation position.
- 11.11 Broadly, respondents raised concerns and objections to our position on the pre-action correspondence. The majority of respondents were of the view that our position on pre-action correspondence goes beyond what the CMA set out in its open letter response to Ofgem and its recent consultation.³⁷ Respondents also suggested that this position is unreasonable because of the following: it threatens investor confidence, would provide Ofgem with an advantage in timescales for preparing its response to the notice of appeal and would be lopsided in its effect, and it would be unrealistic to expect prospective appellants to identify and provide notice of errors to Ofgem over the Christmas period.
- 11.12 NPG and UKPN also believe that it is unreasonable for prospective appellants to provide notice of an appeal ahead of the licence modifications being published because they would not yet have had sight of the final licence modifications against which an appeal would be filed.
- 11.13 Some DNOs noted that Ofgem is likely to be familiar with the points of concern and potential notices of appeal through engagement in the lead up to and post Final Determinations.
- 11.14 SPEN noted that they will continue to engage constructively with Ofgem and should they decide to appeal, they will seek to notify us through pre-action correspondence. However, they noted that any correspondence should be limited to a high-level overview of the potential scope of an appeal to allow appellants to allocate resources appropriately when preparing their appeals.
- 11.15 One stakeholder supported the use of the pre-action correspondence as in its view, it is in consumers' interests to resolve as many issues as possible without resorting to a costly appeals process.
- 11.16 We continue to think that a pre-action correspondence stage would be beneficial. We therefore invite prospective appellants to send pre-action correspondence, outlining any intention to appeal, the elements of the RIIO-ED2 price control that they plan to appeal and an outline of the grounds on which they intend to appeal.
- 11.17 We think that such steps promote early engagement and will be beneficial for all parties. We think that the pre-action correspondence stage will allow for early discussions on the intention to and scope of any appeal,

³⁷ The CMA's response to our Open Letter can be found [here](#), and its consultation on amending the Energy Licence Modification Appeals rules and guide is [here](#).

which could ultimately reduce the costs and risks associated with the appeals process, narrow the range of appeal grounds, and in some cases, avoid them entirely.

11.18 We also note that in its recent amendments to the energy licence modification appeals guide, the CMA has included the following:³⁸

- "The CMA would also encourage a prospective appellant to inform the Authority that it is considering bringing an appeal. A prospective appellant should tell the CMA in its pre-appeal contacts if it has also contacted the Authority or if it plans to do so."

11.19 Prospective appellants who wish to engage with us should do so between early December 2022 and early February 2023 - after the publication of Final Determinations and before we are due to publish a decision on the corresponding RIIO-ED2 licence modifications.

11.20 For the avoidance of doubt, Ofgem is not placing an obligation on the licensee to set out its intention to appeal, nor will the licensee be subject to penalties as a result of not engaging with Ofgem within the pre-action correspondence period. However, Ofgem reserves the right to make appropriate submissions to the CMA about costs in the event that an appellant declines to engage in pre-appeals correspondence (for example, in a situation where an appellant incurs unnecessary costs by raising an issue in an appeal which would have been easily disposed of by way of pre-appeals correspondence).

11.21 We disagree that engaging in pre-appeals correspondence would threaten investor confidence or that this goes beyond the expectations of the CMA Open Letter. The pre-action correspondence stage is not intended to undermine the current appeals framework. The objective is to bring forward active engagement between Ofgem and potential appellants, thereby minimising substantive and procedural issues.

11.22 Additionally, from our experience of the RIIO-GT&T2 appeals, we did not observe pre-action correspondence threatening investor confidence. Instead, we found that where it was utilised by appellants, it was successful in allowing parties to resource appropriately.

Final Determination Questions (FDQ) process

11.23 We have decided to introduce an FDQ process for RIIO-ED2. We see value in running such a process following the publication of our Final Determinations because it will allow stakeholders to ask clarificatory questions on our positions and for any errors to be addressed ahead of the appeals window.

³⁸ Paragraph 3.12 [Energy licence modification appeals: Guide \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

- 11.24 We believe that this position, combined with our position on pre-action correspondence, is aligned with the CMA's recent amendments to the Energy Licence Modification Appeals Guide.³⁹
- 11.25 We will invite stakeholders to engage in this process from 5th December 2022 until 20th January 2023.
- 11.26 FDQs should be limited to:
- seeking clarification on the text within the Final Determinations document suite
 - notifying Ofgem of any methodological errors in, for example, the cost models. Where an error has been identified, we expect stakeholders to set out the alleged error, their view on how this can be corrected, and any knock-on effects elsewhere in the price control, eg. on other models, any interlinked decisions etc.
- 11.27 For the avoidance of doubt, this process is not an opportunity to seek to reopen positions decided in our Final Determinations.
- 11.28 Respondents requested further information on how the FDQ process would work in practice. NGED and SSEN noted that the detail and complexity of the Final Determinations impact the speed at which a licensee can identify errors and engage with the FDQ process and that there may be uncertainty from a prospective appellant as to whether a decision is a genuine error or a deliberate policy decision that may need to be appealed.
- 11.29 One energy industry body noted that the FDQ process may operate so as to be beneficial only to licensees and not consumers as licensees may be more inclined to highlight errors that disadvantage them. This respondent considers there should be an equivalent FDQ process that focusses on correcting those errors that would benefit consumers.
- 11.30 We recognise that the period between publishing Final Determinations and the opening of the appeals window is short. However, we continue to believe that it is in the interests of stakeholders and consumers that any methodological errors or misunderstood policies are addressed via an FDQ process to prevent unnecessary issues featuring in a CMA appeal. Our experience of RIIO-GD&T2 was that the FDQ process was successful in narrowing issues of dispute and potentially avoiding appeals on these issues being bought altogether. For this reason, we think the process would be beneficial for RIIO-ED2.
- 11.31 We also believe that stakeholders will be able to distinguish between a genuine error and a policy decision when using the FDQ process.
- 11.32 As regards the concern that the FDQ process may operate in licensees' rather than in consumers' favour, we agree that all interested

³⁹ Paragraphs 3.13 and 3.14 of the [Energy licence modification appeals: guide \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

stakeholders should be able to ask FDQs. For the avoidance of doubt, the FDQ process is not limited to licensees, and we will be sharing details on how to send FDQs on the same page of our website as where Final Determinations have been published.

Post-appeals review

- 11.33 Whilst we did not consult in Draft Determinations on our position with regards to the post-appeals review as we had already set out our position in the SSMD, we set out further clarification on our expectations of how a post-appeals review may take place.
- 11.34 There was strong consensus amongst the DNOs that the proposed statement of policy would be unnecessary and risks undermining the statutory role of the CMA as well as the integrity and transparency of the appeals process. Respondents also expressed concern that this would create both legal issues and uncertainty for licence holders. They noted that certainty of the statutory framework is fundamental to a credible environment for investment.
- 11.35 Other views included that Ofgem does not have the power to overturn elements of a determination of the CMA, and that the CMA has the powers to consider interlinkages within its determination. One DNO noted concern about the lack of clarity on the process to support a post-appeals review.
- 11.36 We consider that the post-appeals review has merit for the same reasons set out in SSMD and Draft Determinations.⁴⁰
- 11.37 We remain of the view that it may be appropriate to conduct a post-appeals review in certain circumstances, namely where the CMA has directed it or asked us to reconsider an aspect of our decision following a successful appeal.
- 11.38 As set out in our Draft Determinations, this could apply to the following scenarios:
- the CMA quashes the decision(s) appealed and remits to Ofgem for reconsideration with a direction that Ofgem reconsider the decision and consider interlinkages
 - the CMA quashes the decision(s) appealed, retakes the decision itself but directs Ofgem to consider interlinkages.
- 11.39 We consider that there is merit in making clear, at this stage, that this is a possible consequence of an appeal to the CMA. The post-appeals review is not intended to undermine the current appeals framework, which we made clear in our SSMC, SSMD and Draft Determinations. The objective of any post-appeals review will be to implement the decision or directions of the CMA, which may seek to ensure that we maintain a coherent regulatory settlement in the round having regard to interlinked areas

⁴⁰ RIIO-ED2 SSMD Overview document paragraph 3.17 and RIIO-ED2 Draft Determinations Overview Document paragraphs 11.37-11.46.

where the outcome of a successful appeal risks creating inconsistencies within the package.

- 11.40 The policy intention of the post-appeals review is not to undermine investor confidence.
- 11.41 We respond below to concerns about how a post-appeals review would be conducted.

Structure and scope of the post-appeals review

- 11.42 As set out in RIIO-GD&T2 Final Determinations, a post-appeals review would be carried out following a direction by the CMA or where the CMA has requested Ofgem to reconsider a decision or an aspect of the regulatory settlement.⁴¹
- 11.43 Where appropriate, we will review the associated interlinkage components of the price control that may need to be adjusted in order to maintain a coherent regulatory settlement for RIIO-ED2.
- 11.44 Following this review, we would consult on any elements of the price control that we consider should be adjusted, as well as any consequential changes to cost allowances.
- 11.45 The scope of any post-appeals review will ultimately depend on the particulars of the successful appeal and the directions made by the CMA.
- 11.46 Depending on these directions, it may involve considering the interlinkages that exist between the components of the RIIO-ED2 price control. We have laid out the principles by which the RIIO-ED2 pillars are interlinked and provided several examples in our Draft Determinations to illustrate the nature of the interlinkages. The examples provided throughout our RIIO-ED2 documentation are not an exhaustive list of every way in which individual aspects of the price control may be linked.
- 11.47 In the event of a post-appeals review, we may need to consider whether it is necessary to adjust elements of the price control that are interlinked with the aspects of a decision overturned by the CMA. We will take into consideration any relevant interlinkages proposed by the appellant and the CMA, in addition to the interlinkages highlighted in Draft and Final Determinations (where the CMA has asked us to consider them).
- 11.48 As set out above, it should be noted that the scope of the post-appeals review will be limited to the licensee(s) that are impacted by a direction granted by the CMA to modify their regulatory settlement. We do not consider that it would be appropriate for Ofgem to modify the licences of non-appealing licensees (ie. those who have not appealed any aspect of our Final Determinations to the CMA) following a successful appeal, nor do we consider that the CMA would direct us to do so.

⁴¹ RIIO-2 Final Determination Core Document paragraph 11.47

12. Access and Forward-looking Charges Significant Code Review

12.1 In this chapter, we explain how we are managing the impact of the Access and Forward-looking Charges Significant Code Review (Access SCR) on our RIIO-ED2 Final Determinations.

Background

- 12.2 We published our final decision on the Access SCR on 3 May 2022.⁴² The objective of the review was to ensure electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services, while avoiding unnecessary costs on energy bills in general.
- 12.3 As part of our decision, we directed changes to be made to the connection charging arrangements so that connection customers pay less towards the reinforcement of the existing network that is triggered by their connection request. This work will be funded through RIIO-ED2 allowances instead.
- 12.4 It is not clear how and to what extent customers will respond to the changes. However, even in the absence of any further behavioural change, there will be an increase in DNOs' costs as work is funded through the price control that would otherwise have been borne by the connection customer. The Access SCR therefore introduces significant uncertainty in DNOs' forecasting of the investment needed in RIIO-ED2.
- 12.5 We had not published our decision on the Access SCR at the time final RIIO-ED2 business plans were submitted. DNOs were therefore asked to take cognisance of the proposals as they were understood at the time, but not reflect them in ex ante funding requests. We included additional memo tables within the business plan data templates to enable DNOs to identify additional costs associated with the Access SCR. DNOs' best view of the potential impact ranged from £32.5m to £325.9m per DNO. Subsequent discussions however revealed that DNOs took different approaches to assessing the impact which makes direct comparisons difficult. We therefore concluded that the costs presented by DNOs had not been calculated on a comparable basis and could not therefore be reflected in our ex ante totex assumptions at Draft Determinations.
- 12.6 In our Draft Determinations, we indicated we would require a resubmission of Access SCR-related costs if those costs were to be included in ex ante allowances. We also said that we would consult on our assessment of the resubmissions and how best to reflect Access SCR costs in RIIO-ED2 ahead of Final Determinations.

⁴² [Access and Forward-Looking Charges Significant Code Review: Decision and Direction | Ofgem](#)

12.7 The DNOs resubmitted costs relating to Access SCR on 31 August 2022. We subsequently ran a consultation in October 2022⁴³ on our proposals for managing the uncertainty relating to the Access SCR decision and treatment of ex ante allowances.

12.8 The October 2022 consultation set out our view that due to the uncertainty associated with the impact of the Access SCR, providing ex ante funding that is broadly equivalent to the first two years of DNOs forecast impact of the Access SCR (£356.7m across all DNOs) would be best for consumers. This would ensure that DNOs are funded in the immediate term, with an ability to request further allowances through the LRE re-opener in January 2025 and January 2027, whilst not committing consumers to higher costs than may be necessary.

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12.9 For RIIO-ED2 we have decided to provide DNOs an allowance of £439m in relation to the additional costs that they may face a result of our Access SCR decision. This is 39% of the allowances that they sought in their August 2022 resubmission.

12.10 We believe there is significant uncertainty inherent in providing allowances in this area, so have provided allowances that broadly reflect two years of DNOs cost forecasts for the impact of the Access SCR. Further costs can then be considered through the LRE Re-opener in Year 2 of RIIO-ED2, when more is known about the actual impact of the Access SCR.

Table 14: Additional DNO allowances resulting from the Access SCR

DNO	August 2022 Access Resubmission (£m)	Final Determination (£m)
ENWL	36	13
NPg	81	70
NGED	340	119
UKPN	420	151
SPEN	60	21
SSEN	195	65

12.11 We received nine responses to our October 2022 consultation on how to reflect the costs arising from the Access SCR in RIIO-ED2.

⁴³ <https://www.ofgem.gov.uk/publications/consultation-access-scr-assessment-methodology>

Ex ante allowances

- 12.12 Four responses, including NPg and ENWL, supported our proposal to only provide two years of additional Access SCR related allowances, agreeing with our view that uncertainty in this area would make it challenging to robustly set allowances for a five-year period. SSEN, acknowledging the uncertainty around setting these costs, instead proposed that allowances be set for an equivalent of three years of the DNOs' requests.
- 12.13 NPg did not agree with the cut that we proposed to its requested allowance, because it considered that it had already provided estimated costs for only the first two years of the price control. However, we consider that NPg's estimated Access SCR impact for two years looks significantly inflated relative to other DNOs, so we have decided that it is reasonable to adjust its allowance to a level consistent with the other DNOs because we do not expect that the impact should be materially different in NPg's regions.
- 12.14 NGED, SPEN and UKPN disagreed with our proposal. NGED argued that Closely Associated Indirect (CAI) costs and Business Support costs should be funded for the full five years, rather than just the first two years. SPEN and UKPN argued that direct cost transfers between cost categories within the C2 Connections category caused by the change in charging boundary should be funded in full for the five years. SPEN also stated that we should provide allowances for specific primary reinforcement and fault level related works for the five-year period.
- 12.15 Overall, we do not think the concerns expressed by the DNOs are substantiated at present. That is because we consider that the scale at which all of these cost areas will need to grow during RIIO-ED2 will be dependent on changes to customer behaviour as a result of the Access SCR, which remains highly uncertain.
- 12.16 One consumer group and one energy industry body signalled that we should not fund costs related to Active Network Management (ANM) at all, because changes to these costs would be dependent on the Access SCR changing customer behaviour. There were mixed views from DNOs on ANM, and this was reflected by differing cost assumptions in their resubmissions. We consider that taking an approach consistent with our overall approach to treating Access SCR costs (ie funding an amount broadly equivalent to two years of forecast allowances) strikes an appropriate balance between these viewpoints. We will be able to revisit the issue, if necessary, through the LRE Re-opener.
- 12.17 Allowances have increased from those that we consulted on in October due to the inclusion of some CAIs that were erroneously excluded from UKPN's proposed allowances and because, as described in Chapter 7 of the Core Methodology Document, we have reduced our overall RIIO-ED2 totex allowance due to methodological updates, which have been reflected in our adjustments here.

Managing uncertainty

- 12.18 In our Draft Determinations and in our October consultation we proposed to not have a specific UM to manage the impact of the Access SCR above ex ante allowances. This is because while DNOs may face uncertain costs, whether the driver is the Access SCR or not is largely irrelevant. What is important is that new network investment is needed. There are also practical challenges with identifying whether an investment would not have gone ahead in the absence of the Access SCR.
- 12.19 All respondents to both consultations agreed with this approach, agreeing that our suite of proposed UMs for managing LRE uncertainty were an appropriate means of managing the uncertainty arising from the Access SCR, particularly if the LRE Re-opener had a window earlier in the price control, which it now does.
- 12.20 For the avoidance of doubt, the fact that we have provided allowances that are broadly equivalent to two years' worth of DNOs' resubmitted Access SCR costs does not mean it is definite that we will provide additional funding for Years 3-5 of RIIO-ED2 through the LRE Re-opener. Our Final Determination position reflects the uncertainty in this area, and we consider that this uncertainty could mean that the allowances we have provided are sufficient for the full five years of the price control, though we also accept that this may not be the case. The re-opener provides for this uncertainty to be addressed at a time when better information is available about the impact of Access SCR on consumer behaviour and licensee's costs.

13. Outcome of Storm Arwen on RIIO-ED2

- 13.1 Storm Arwen brought widespread disruption to the UK and resulted in over one million 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.
- 13.2 Due to the severity of the event and the long duration that many customers endured without power, we conducted a review of the DNOs' response to Storm Arwen. Our report into the incident, which was published in June 2022,⁴⁴ included 20 recommendations to minimise the impact of future severe weather events.
- 13.3 In parallel, the BEIS Secretary of State commissioned the Energy Emergencies Executive Committee (E3C) to undertake a similar review. This was published alongside the Ofgem review in June 2022.⁴⁵ Where appropriate, our recommendations aligned with the E3C's to ensure a consistent response across the energy sector.
- 13.4 18 of the 20 Ofgem recommendations, have been completed as planned, ahead of the upcoming winter with the remaining 2 actions expected to be completed by the end of December 2022 and April 2023 respectively. 25 of the additional 33 E3C recommendations, have also been completed as scheduled, with the remaining 8 actions on track to be completed by the end of December 2022. All actions are expected to be completed before the start of RIIO-ED2. A summary of the Ofgem recommendations and an update on their progress is provided in Table 15.
- 13.5 In Chapter 13 of our Draft Determinations Overview Document we noted that some recommendations may require further work or could result in changes that will need to be factored into the RIIO-ED2 price control. In Table 1, we also highlight where in our Final Determinations documents you can find more information on the provisions we are making in RIIO-ED2 to ensure our recommendations from the Storm Arwen review are duly implemented and funded.
- 13.6 We recognise that severe weather events are likely to become more common, as the effects of the climate change are felt, so it is imperative that all DNOs are well prepared. Recommendation 5 from our report proposed that DNOs should submit winter preparedness plans to us.
- 13.7 Winter preparedness plans are provided to provide assurance that network operators have taken appropriate actions to ensure customers, including those in a vulnerable position, are effectively supported during power disruptions.
- 13.8 We have reviewed the plans for 2022/23. These plans focus on maximising system resilience, improving customer welfare and

⁴⁴ [Storm Arwen Report | Ofgem](#)

⁴⁵ [Storm Arwen electricity distribution disruption review - GOV.UK \(www.gov.uk\)](#)

communication and measures to support network restoration after storm events across the winter period. We note that:

- all DNOs have completed or will complete their pre-winter checks,⁴⁶ ahead of the winter, and have developed outage strategies that balance system resilience against the ongoing delivery of works
- there is a strong focus from all DNOs on vegetation management. The individual tree cutting programmes⁴⁷ are on track, with a number of DNO’s undertaking additional targeted tree-cutting to reduce the risk of falling trees on strategic circuits
- all DNOs have confirmed that they have sufficient staff, equipment and operational support to effectively respond to a reasonable worst case weather event and restore consumers in a timely manner
- all DNOs have confirmed they have stress tested their telephony platforms and websites to ensure they can handle customer demand during a reasonable worst-case storm
- all DNOs are updating their processes to pay compensation to eligible customers, accurately and in a timely manner.

Table 15: Storm Arwen recommendations progress update and further detail

No.	Storm Arwen Report recommendation	Due	Progress update	RIIO-ED2 provision and further detail
1	E3C should review current network infrastructure standards and guidance, including those for vegetation management and overhead line designs, to identify economic and efficient improvements that could increase network resilience to severe weather events	30 September 2022	Complete - the Energy Networks Association, Overhead Line (OHL) Panel and Emergency Planning Managers Forum have produced the OHL Design Review and OHL Arwen Action Summary documents. These reports provide the technical considerations of overhead line design and measures for understanding, and	Storm Arwen Re-opener, Chapter 6, Overview document

⁴⁶ This includes activities such as undertaking maintenance checks on assets and returning circuits that are currently on planned outage, to operation, to increase system resilience

⁴⁷ This involves the clearance of trees from areas near overhead lines to reduce the risk of vegetation falling onto them during severe weather and causing outages

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No.	Storm Arwen Report recommendation	Due	Progress update	RIIO-ED2 provision and further detail
			potentially improving, resilience	
2	DNOs and Ofgem to commission a review into how pole health is assessed, to identify changes that will improve pole condition reporting	30 July 2022	Complete - this review has been commissioned. Findings show that pole failures were predominantly associated with equipment manufactured to legacy pre-1980 specifications. These will be replaced in line with DNO asset replacement programmes	Storm Arwen Re-opener, Chapter 6, Overview document
3	E3C should assess the feasibility and benefits of developing a standard-based approach to organisational resilience to improve the speed of customer restoration during severe weather events	30 September 2022	Ongoing - feasibility and benefits largely understood however findings to be summarised to close out this action. Completion expected by December	Storm Arwen Re-opener, Chapter 6, Overview document
4	E3C to put forward proposals for an outcome-focused resilience standard that could set Government and public expectations on restoration times during disruptions caused by severe weather	30 September 2022	Complete - DNOs have developed an interactive model which can be used to predict the impact of severe weather on power supplies. Work is ongoing to take this from a proposal to a working model.	Storm Arwen Re-opener, Chapter 6, Overview document
5	DNOs should submit their winter preparedness plans for 2022/23 to Ofgem by 30 September 2022. We will confirm how DNO winter preparedness plans fit within the RIIO-ED2 framework in our Final	30 September 2022	Complete - DNOs submitted their plans to Ofgem in September. We have set out the enduring role for the submission of these plans in Chapter 5 of our Core Methodology	Annual Vulnerability Report - Winter Preparedness Planning, Chapter 5, Core Methodology Document

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No.	Storm Arwen Report recommendation	Due	Progress update	RIIO-ED2 provision and further detail
	Determinations document			
6	E3C should review and update industry best practice for identifying faults and assessing the extent of network damage, to reduce customer restoration times	1 April 2023	Ongoing - a draft best practice document has been developed. A final version is on track to be completed by April 2023	N/A
7	E3C should identify other appropriate areas where mutual aid could be appropriately and effectively deployed to reduce customer restoration times and enhance customer support during power outages	30 September 2022	Complete - DNOs have produced a good practice guide which sets out enhanced procedures to ensure customers receive timely and appropriate support	N/A
8	E3C should identify options to enhance the use of mobile generators in reducing the length of power disruptions	1 August 2022	Complete - DNOs have developed a good practice guide which sets out the approach for using mobile generators during severe weather events	N/A
9	E3C should review and update "reasonable worst-case scenario" planning assumptions for customer call volumes	1 August 2022	Complete - DNOs have updated their reasonable worst-case scenarios for a significant power disruption and have updated their planning assumptions for customer call volumes to reflect this	N/A
10	DNOs should stress test their telephony systems and websites to ensure adequate capacity during severe weather events	30 September 2022	Complete - DNOs have confirmed they have stress tested communications architecture and website capability	

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No.	Storm Arwen Report recommendation	Due	Progress update	RIIO-ED2 provision and further detail
11	Ofgem and DNOs to develop additional reporting metrics for communication channels, such as websites, applications, and social media. We will confirm how these reporting metrics will fit within the RIIO-ED2 framework in our Final Determinations publication	31 December 2022	Complete - we have set out the new reporting metrics that we will introduce for RIIO-ED2, in Chapter 5 of our Core Methodology Document	Storm Arwen Customer Service Recommendations - Chapter 5, Core Methodology Document
12	Ofgem to review incentive framework for customer service (Broad Measure of Customer Service incentive), in relation to call-backs, and ensure that it drives overall benefits for consumers. We will confirm any changes to the RIIO-ED2 framework in our Final Determinations publication by 31 December 2022	31 December 2022	Complete - we have set out our findings from our review in Chapter 5 of our Core Methodology Document	Storm Arwen Customer Service Recommendations - Chapter 5, Core Methodology Document
13	DNOs should improve their assumptions for estimating restoration times and improve the quality of their communication to customers, so that customers can make informed choices about meeting their needs	30 September 2022	Complete - DNOs have developed a good practice guide focused on providing estimated restoration time information to customers	N/A
14	DNOs, in consultation with local resilience partners, should develop principles-based industry guidance on best practice in the provision of welfare support	30 September 2022	Complete - DNOs have engaged with local resilience partners, local and central government to develop a good practice guide which provides a	N/A

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No.	Storm Arwen Report recommendation	Due	Progress update	RIIO-ED2 provision and further detail
15	DNOs should work with local resilience partners to agree clear roles and responsibilities during severe weather events	30 September 2022	framework for engagement during emergencies to ensure customer welfare and meet the requirements of the Civil Contingencies Act	
16	Where DNOs are providing discretionary support (e.g. accommodation, hot meals), they should make clear to customers what support is available and how they can access it. DNOs should outline how this is being achieved in their winter preparedness reporting to BEIS and Ofgem	30 September 2022		
17	DNOs to adopt lessons learned from 2021/2022 storms in their processes, to enable timely and accurate compensation payments to customers	30 September 2022	Complete - DNOs have reviewed their internal compensation payment processes and confirmed these can deliver payments at scale	N/A
18	DNOs to develop more robust mechanisms to enable the delivery of compensation payments at scale	30 September 2022		N/A
19	Ofgem to commission a review of the Guaranteed Standards of Performance (GSoP) for Severe Weather. This could result in removing/changing the compensation cap, the payment structure or the thresholds for different storm categories	31 July 2022	Complete - this review has been commissioned. We expect any revised GSoP coming into effect by summer 2023	Guaranteed standards of performance (GSoPs), Chapter 6, Core Methodology Document
20	Until any proposed changes from the GSoP review are	31 July 2022	Complete - the ENA has written to Ofgem confirming	N/A

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No.	Storm Arwen Report recommendation	Due	Progress update	RIIO-ED2 provision and further detail
	implemented, DNOs should voluntarily lift the cap for future storms		that until any changes to the GSoPs are implemented, DNO members will continue with the existing practice of making payments over and above the GSoP compensation requirements cap, on a voluntary, case-by-case basis, should it become necessary due to an extreme event	

14. Assessing the impact of our Final Determinations

- 14.1 Across the full suite of Final Determinations documents, we have set out the assumptions, reasoning and evidence used to inform these Final Determinations. The Impact Assessment Annex sets out our overall assessment of the impacts of our Final Determinations on consumers and network companies. This section presents a high-level overview of the key impacts.
- 14.2 The methodology applied for calculating these impacts is consistent with that used in our June 2022 Draft Determinations and the RIIO-ED2 Sector Specific Methodology Impact Assessment published in March 2021. The analysis has been updated to reflect the decisions taken in these Final Determinations and any changes from proposals and associated assumptions made at Draft Determinations.
- 14.3 Over the five-year RIIO-ED2 price control period, we believe these Final Determinations will deliver net benefits to consumers of around £433m, relative to the counterfactual. The dominant quantified effect arises from a resetting of the cost of equity to market rates, which drives a large transfer from investors to consumers, compared to the counterfactual.
- 14.4 The £433m net benefits to consumers value is lower compared to the £1.3bn value assessed at Draft Determinations. This reflects changes in market conditions (higher interest rates) that influence the cost of capital and higher totex allowances proposed for each of the companies.
- 14.5 Based on our Final Determinations proposals we calculate that domestic consumers will see average savings of £4.67 (2021/21 prices) a year/per household based on medium typical domestic consumption values, compared to the average bill in RIIO-ED1. Further detail can be found in Chapter 4 of the Impact Assessment Annex.
- 14.6 There are different ways consumer benefits can be calculated. In the Impact Assessment the values are expressed in Net Present Value (NPV) terms relative to the defined counterfactual. Elsewhere in our Final Determinations publications we may use an alternative estimate derived from the net change in overall revenues in Final Determinations relative to the RIIO-ED1 outturn positions.
- 14.7 As a public body, Ofgem is subject to the requirements of the public sector equality duty, as set out in section 149 of Equality Act 2010 (PSED). This means we must look for ways to eliminate discrimination, advance equality of opportunity and foster good relations between people who share protected characteristics, and those who do not.
- 14.8 In our equality, diversity and inclusion strategy⁴⁸ we state:
“As the regulator of the energy sector, we recognise the real-life impact of the work that we do and the decisions we make. For example, we have

⁴⁸ [Ofgem's Diversity and Inclusion Strategy](#)

heard directly from consumers of the detrimental impact of the rise in energy bills particularly on those who are on low incomes and are vulnerable. In all these areas, and many others, we will be a more effective regulator if we understand as much as possible about the different groups of people who will be affected by our work.”

14.9 In the RIIO-ED2 price control, we have had due regard to the impact of our Final Determinations on vulnerable consumers.

14.10 Our vulnerability package for RIIO-ED2 will ensure DNOs provide appropriate support and services to consumers in vulnerable situations and address the key vulnerability priorities for those:

- most at risk during a loss of supply
- in, or at risk of, fuel poverty
- most at risk of being left behind in the energy system transition towards net zero.

14.11 While we have considered the impact of the RIIO-ED2 price control on consumers with all protected characteristics, elderly consumers and consumers with disabilities may be most affected by loss of supply, fuel poverty and/or of being left behind in the net zero transition. Those categories of consumers will be particularly supported by the RIIO-ED2 vulnerability package contained in these Final Determinations and by the average consumer savings that the Final Determinations achieve.

Appendix 1 – Glossary

A

Allowed revenue

The amount of money that a network company can earn on its regulated business.

Annual Environmental Report (AER)

The report that the licensees provide each year of RIIO-ED2 to give an update on their progress in implementing the initiatives and commitments made in their Environmental Action Plan, and their efforts to reduce the environmental impacts of the network.

Asset stranding

Assets which have subsequently become either not used or underused as compared with initial expectations.

Associated Document

A document issued and amended by the Authority in accordance with the Special Condition 1.3 (Common procedure) and any reference to an Associated Document is to that document as amended from time to time unless otherwise specified. It does not include the RIIO-ED2 Price Control Financial Instruments.

The Authority/Ofgem/GEMA

Ofgem is the Office of Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority (GEMA or 'the Authority'), the body established by section 1 of the Utilities Act 2000 to regulate the gas and electricity markets in Great Britain.

B

Base revenue

For RIIO-ED2, our proposed definition of base revenue is a subset of overall revenue calculating in the price control financial model: fast-pot expenditure, non-controllable opex, RAV depreciation and return.⁴⁹

Baseline Allowed Return

Our estimation, taking into account expectations, of the efficient return for debt and equity capital. Based on a weighted average of the pre-tax cost of debt and the post-tax cost of equity, adjusted for ex ante expectations if any. The weighting uses notional gearing.

⁴⁹ Base revenue may have a different definition depending on the price control and context (such as the definition of "BR" in RIIO-1 special conditions, or the RIIO-GD&T2 price controls). In RIIO-ED1, it was the amount of revenue network companies were allowed to recover as set up front at the beginning of the price control. In RIIO-GD&T2, base revenue is a subset of overall revenue allowances similar to ED2 proposals but including equity issuance.

Basis Points ('bps')

Used in finance to express small changes in rates. One basis point is 0.01% or one hundredth of 1%. 50bps is 0.5%.

Benchmarking

The process used to compare a company's performance (eg its costs) to that of best practice or to average levels within the sector.

Bond

A type of debt instrument used by companies and governments to finance their activities. Issuers of bonds usually pay regular cash flow payments (coupons) to bond holders at a pre-specified interest rate and for a fixed period of time.

Business Carbon Footprint (BCF)

A measure of the total greenhouse gas emissions (in tonnes of CO₂ equivalent) caused directly and indirectly by the reporting company. Direct and indirect emissions sources are categorised into scope 1, 2 and 3 emissions.

Business Plan Data Template (BPDT)

A set of data templates that the electricity distribution network companies use when submitting their Business Plans to Ofgem.

Business Plan Incentive (BPI)

A RIIO-2 incentive to encourage companies to submit ambitious business plans. Business Plans will be assessed in four stages in terms of their cost and quality, with rewards available for business plans representing genuine value for money and which provide information that helps Ofgem to set better price controls. Inefficient, low quality plans may be subject to a financial penalty.

Business Support Costs

The indirect operating costs that are required to support the DNOs overall business, such as corporate governance arrangements.

C

Capital Asset Pricing Model (CAPM)

A theoretical model that describes the relationship between risk and required return of financial securities. The basic idea behind the CAPM is that investors require a return for the level of risk in their investment.

Capital expenditure (capex)

Expenditure on investment in long-term distribution and transmission assets, such as electricity distribution cables or overhead lines.

Capitalisation policy

The approach that the regulator follows in deciding the percentage of total expenditure added to the RAV (and thus remunerated over time) and the percentage of expenditure remunerated in the year that it is incurred.

Caps and collars

The limits on outperformance and underperformance payments for an ODI, respectively.

Catch-up efficiency

The efficiency challenge we set for less efficient companies to “catch-up” with the most efficient ones.

Climate Resilience

The ability to anticipate, prepare for, and respond to hazardous events, trends or disturbances related to climate.

Closely Associated Indirects

These costs include the back-office functions directly involved in the construction and operation of the network assets, such as project management and network design.

Common Evaluation Methodology (CEM)

In 2020 the Open Networks Project initiated a product to develop a common methodology, to be used by DNOs, for evaluating the intervention options to solve an identified network meet. This product was managed under Workstream 1A and was initially titled the Active Network Management (ANM) vs Flexibility vs Reinforcement Common Methodology as the aim of the product was to develop a tool that could evaluate alternative options like flexibility or ANM against traditional reinforcement. The developed approach and the tool have been renamed as the Common Evaluation Methodology (CEM) and Tool.

Common Network Asset Indices Methodology (CNAIM)

A common framework of definitions, principles and calculation methodologies that apply to the DNOs for the assessment, forecasting and regulatory reporting of asset risk.

Company Specific Factors

The additional costs associated with operating a particular DNO’s network.

Competition and Markets Authority (CMA)

A non-ministerial government department in the UK that considers regulatory references and appeals, conducts in depth inquiries into mergers, markets and aspects of regulation of the major regulated industries.

Competition Proxy Model (CPM)

The CPM is one of the late competition models that may be applied to projects that meet the Criteria for late competition during RIIO-ED2. Under the CPM, Ofgem would utilise relevant benchmarks from other regimes, alongside other market information, to set a project-specific revenue for the incumbent network licensee that we consider would have eventuated from an efficient competitive process for construction and long-term operation (25 years) of a project.

Competitively Appointed Distribution Owner (CADO)

The late CADO regime is one of the late competition models that may be applied to projects that meet the Criteria for late competition during RIIO-ED2. Under late CADO build, a 'preliminary works party' (most likely a network company's licensee) would complete all necessary preliminary works for a new, separable and high value project. Ofgem or another appropriate party would then run a tender to determine a CADO responsible for construction and operation of the project. The CADO would bid a 'tender revenue stream' to construct, own and operate the asset for a long-term operational period (currently expected to be 25 years). CADO is the same premise as the Competitive Appointed Transmission Owner (CATO) but applied in the distribution sector.

Consumer

Within the regulatory framework we consider consumers to be the end users of gas and electricity, whether for domestic or business use.

Consumer Prices Index (CPI/CPIH)

The CPI is an aggregate measure of changes in the cost of living in the UK. It differs from the RPI in that it does not measure changes in housing costs and mortgage interest repayments – whereas the RPI does. CPI and RPI are calculated using different formulae, and have a number of other subtler differences. CPIH includes a measure of owner-occupiers' housing costs.

Consumer Value Proposition (CVP)

Consumer Value Proposition is Stage 2 of the Business Plan Incentive, where a DNO could bid for reward by demonstrating the additional value its business plan will generate for existing and future consumers and consumers in vulnerable situations.

Coordinated Adjustment Mechanism (CAM)

A whole system focused re-opener to protect consumer interests by supporting the reallocation of project revenues and responsibilities to the network best placed to deliver the relevant projects.

Corporation tax

A UK tax levied on a company's profits.

Cost of capital

The cost of capital is the combined cost of debt and cost of equity.

Cost of debt

The effective interest rate that a company pays on its current debt. Ofgem calculates the cost of debt on a pre-tax basis with reference to a trailing average index of debt costs.

Cost of equity

The rate of return on investment that is required by a company's shareholders. The return consists both of dividend and capital gains (ie increases in the share price). Ofgem calculates the cost of equity on a post-tax basis.

Credit rating

An evaluation of a potential borrower's ability to repay debt. Credit ratings are calculated using a number of factors including financial history and current assets and liabilities. There are three major credit rating agencies (Standard and Poor's, Fitch, and Moody's) who use broadly similar credit rating scales, with D being the lowest rating (highest risk) and AAA being the highest rating (negligible risk).

Criteria for late competition

The criteria used to identify projects that may be suitable for late model competition across all sectors. These criteria are as follows: new; separable; high-value projects of above £100m expected capital expenditure.

Curtailement

Curtailement refers to a network user's ability to import or export from the network being restricted ie the network user's access to the network is said to be curtailed. Typically, applicable to generator export but can be applied to demand from large industrial sites. Under defined arrangements this is a temporary reduction, typically in the allowed exports from a generator, below a customer's agreed export capacity. Activated in response to a notification or signal that the generator is required to curtail its generation.

Customer Engagement Group (CEG)

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. These groups challenged the DNOs to develop business plans that address the needs and preferences of their stakeholders and provided Ofgem with a public report on their views and the business plans.

Customer Interruptions (CIs)

A measure of the number of customers, per 100 connected customers, that are interrupted on a DNO's network over the course of a year. For example, 50 customers interrupted out of a total of 100 connected customers would result in a CI of 0.5.

Customer Minutes Lost (CMLs)

A measure of the average number of minutes a customer is without power over the course of a year, per 100 customers. For example, if 50 out of 100 customers are without supply for 10 minutes in a year, this would result in a CML of 5.

D

Data Best Practice

A set of principles that ensures data is treated as an asset and used effectively for the benefit of consumers, stakeholders, and the public interest. These principles are outlined in Ofgem's Data Best Practice guidance document.

Deadband

A specified range of performance levels where the ODI underperformance or outperformance payment is zero.

Decarbonisation

In a network price control context, the role of network operators in facilitating the reduction or removal of carbon dioxide emissions from energy and other sectors of the economy, eg transport.

Depreciation

A measure of the consumption, use or wearing out of an asset over the period of its economic life.

Digitalisation

The use of digital technologies to change an organisation's operating model and provide new revenue or equivalent value-creating opportunities; it is the process of moving to a digital business/organisation.

Digitalisation Strategy and Action Plan (DSAP)

Requirement for networks to produce digitalisation strategy documents and action plans outlining their vision for digitalisation and their order of activities leading to this vision respectively.

Distributed generation (DG)

Any generation connected directly to the local distribution network, as opposed to the transmission network, as well as combined heat and power schemes of any scale.

Distribution Network Operators (DNOs)

A DNO is a company that operates the electricity distribution network, which includes all parts of the network from 132kV down to 230V in England and Wales. In Scotland 132kV is considered to be a part of transmission rather than distribution so their operation is not included in the DNOs' activities. There are 14 DNO licensees that are subject to RIIO price controls. These are owned by six different groups.

Distribution System

The system of low voltage electric lines and low-pressure pipelines providing for the transfer of electricity and gas within specific regions of GB.

Distribution System Operation

The set of activities that are needed to support the transition to a smarter, flexible and digitally enabled local energy system. DNOs have been building capabilities in planning, operating and market facilitation of flexible resources to drive more efficient development and use of the decarbonising electricity system. This differs from the more traditional responsibility of a DNO, which is to take power from the transmission network and deliver it at safe, lower voltages to homes and businesses.

Disaggregated Cost Assessment

Cost assessment undertaken for individual activities, or small pools of closely related activities, enabling a more focused analysis of cost drivers.

Distribution Use of System (DUoS)

DUoS is a cost paid by suppliers to DNOs for the building and maintenance of the local distribution network. Suppliers then pass this DUoS charge on to energy consumers.

E

Economic life

The period over which an asset performs a useful function.

Electricity System Operator (ESO)

The entity responsible for operating the electricity transmission system and for entering into contracts with those who want to connect to and/or use the electricity transmission system. National Grid Electricity System Operator Limited is the electricity system operator in Great Britain.

Embedded Carbon

All the CO₂ emitted in producing materials. It's estimated from the energy used to extract and transport raw materials as well as emissions from manufacturing processes.

Energy Networks Associated (ENA)

The Energy Networks Association represents the companies which operate the electricity wires, gas pipes and energy system in the UK and Ireland.

End-use energy efficiency

A reduction in the amount of energy required to provide equivalent energy services to consumers. For example, loft, cavity wall insulation and double glazing allows a building to use less heating and leads to a reduction in base heat demand.

Environmental Action Plan (EAP)

These are DNO plans to address the impacts of their business and network activities on the environment and set out their commitments to addressing these impacts. These plans are required to be submitted with the DNOs' business plans.

Engineering Justification Paper

A decision support tool to provide justifications for investments, which is open to scrutiny and challenge.

Equity beta

The equity beta measures the covariance of the returns on a stock with the market return. The weaker this covariance, the lower the return that investors would require on that stock.

Equity risk premium

A measure of the expected return, on top of the risk-free rate, that an investor would expect for a portfolio of risk-bearing assets. This captures the non-diversifiable risk that is inherent to the market. Sometimes also referred to as the Market Risk Premium.

Ex ante

Refers to a value or parameter established upfront (eg at the price control review to be used in the price control period ahead).

Ex post

Refers to a value or parameter established after the event (eg following commencement of the price control period).

Exceptional Event

A circumstance beyond a DNO's control which, subject to the relevant thresholds being met/exceeded, results in an adjustment to the DNO's IIS performance. There are two types of exceptional event: a Severe Weather Exceptional Event (SWEE) and an Other Exceptional Event (OEE).

F

Fast money

Fast money allows network companies to recover a percentage of total expenditure within a one-year period with the rest being capitalised into the RAV (slow money).

Financeability

Financeability relates to licence holders' ability to finance the activities which are the subject of obligations imposed by or under the relevant licence or legislation.

Financeability is assessed using a range of different qualitative and quantitative measures, including financial ratios.

Flexibility

The ability to modify generation and/or consumption patterns in reaction to an external signal (such as a change in price, or a message).

Fluid Filled Cables

Pressurised fluid filled underground cables.

Frontier Shift

The rate at which a company at or close to the efficiency frontier can change its outputs relative to inputs.

Fuel poverty

In England, a household is considered to be fuel poor if it has above-average required fuel costs, in circumstances where, if it were to spend the amount needed to meet its energy needs fully, it would be left with a residual income below the official poverty line.

As part of its new Fuel Poverty Strategy for England, the Department for Business, Energy and Industrial Strategy has consulted on amending this definition to refer to households living in a property with an energy efficiency rating of Band D, E, F or G, where disposable income after housing and energy costs is below the poverty line.⁵⁰

In Wales, a household is considered to be fuel poor if it would have to spend more than 10% of income to maintain a satisfactory heating regime.

In Scotland a household is considered to be fuel poor if, after having paid its housing costs, it would need more than 10% of its remaining net income to pay for its reasonable fuel needs and, having paid for its reasonable fuel needs, its childcare costs and its housing costs, this then leaves the household unable to maintain an acceptable standard of living.

Future Energy Scenarios (FES)

The FES are developed annually by the ESO to represent a range of different, credible ways to decarbonise the energy system.

Future System Operator (FSO)

In July 2021 BEIS and Ofgem launched the FSO consultation and subsequently confirmed the decision to create an independent FSO in April 2022.

The FSO will take on all the main existing roles and responsibilities of National Grid ESO and the longer-term planning, forecasting and market strategy functions in respect of gas (but not real-time gas system operation or Network Emergency Coordinator functions).

G

Gas Distribution Networks (GDNs)

GDNs transport gas from the National Transmission System to final consumers and to connected system exit points. There are eight network areas managed by four companies that are subject to RIIO price controls.

Gearing

A ratio measuring the extent to which a company is financed through borrowing. Ofgem calculates gearing as the percentage of net debt relative to the RAV.

Gilts

A bond issued by the UK government.

Groups

The RIIO-ED2 Challenge Group (CG) and Customer Engagement Groups (CEGs).

⁵⁰ [Fuel poverty strategy for England - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/fuel-poverty-strategy-for-england)

H

Headroom

A term in finance related to borrowing which has different meanings in different contexts. Here we use it to mean the safety margin of a borrower.

High-confidence ex ante costs

Costs included in ex ante totex allowances or forecasts for which Ofgem has a high level of confidence in its ability to independently set a cost allowance. See also 'Lower-confidence ex ante costs'.

I

Indexation

The adjustment of an economic variable so that the variable rises or falls in accordance with index movements (eg inflation indices, bond indices).

Inflation index

This is a measure of the changes in given price levels over time. Common examples are the Retail Prices Index (RPI) the Consumer Prices Index (CPI) and the Consumer Prices Index including housing costs (CPIH), which are all measures of the aggregate change in consumer prices over time.

Interconnector

Equipment used to link electricity or gas systems across borders.

Intermittent generation

Electricity generation technology that produces electricity at irregular and, to an extent, unpredictable intervals, eg wind turbines.

Interruption

A loss of electricity supply lasting 3 minutes or longer.

Interruptions Incentive Scheme (IIS)

An incentive on DNOs to improve overall the reliability of their networks by reducing the number and duration of interruptions. It sets target levels of performance for DNOs to achieve; rewards are provided for DNOs who beat their targets, and penalties apply for DNOs who fail to achieve their targets.

L

Licence conditions

These are the conditions under which a licensee holds its licence to operate as a gas transporter or electricity transporter and address various detailed matters including requirements to meet certain standards of performance, how the company's allowed revenue is to be calculated and procedures for modifying various documents.

Licence obligations (LO)

This is one of the RIIO building blocks, an output that is contained within the licence conditions of a network company. The Authority has the power to take appropriate enforcement action in the case of a failure to meet these obligations.

Load Related Expenditure

The investment required to ensure the network has sufficient capacity to accommodate the load on it.

Load Index (LI)

A framework for collating information on the utilisation of the distribution assets supplying each demand group and for tracking changes in their utilisation over time.

Losses

A measure of the difference between units entering and units exiting the DNO network through different connection points.

Low carbon technology (LCT)

Low carbon technology is the term given to technologies that emit low levels of CO₂ emissions, or no net CO₂ emissions. Examples of LCTs include electric vehicles and heat pumps.

Lower-confidence ex ante costs

Costs included in ex ante totex allowances or forecasts that are not High-confidence baseline costs. See also 'High-confidence ex ante costs'.

LV Services

The service line from the LV distributing main to the DNO's protection device situated upon the customer's premises. It does not include the joint and associated components connecting the service line to the distributing main.

LVSSA

A small low voltage demand connection to single premises, involving a single-phase connection and no significant other work.

LVSSB

A low voltage demand connection, where the scheme requires i) more than one but less than five single-phase connections at domestic premises ii) fewer than five single-phase connections at domestic premises and an extension of the existing network, or iii) single premises requiring a two-phase or three-phase connection.

M

Major Connections

Major Connections refers to connections at higher voltage levels and relates to connections undertaken in the Relevant Market Segments. See also 'Relevant Market Segments' definition in this annex.

Market to Asset Ratios (MAR)

The MAR represents the ratio between the market enterprise value, ie the market valuation of a company, of a regulated network and its regulatory asset value (RAV).

Minor Connections

Minor Connections refers to connections at lower voltages and related to customers requiring single service low voltage demand connections (LVSSA) and small project demand connections (LVSSB). See 'LVSSA' and 'LVSSB' in this glossary for more detail.

N

Network Asset Risk Metric (NARM)

The framework for which monetised risk outputs are calculated for NARM asset interventions.

Net Present Value (NPV)

NPV is the discounted sum of future cash flows, whether positive or negative, minus any initial investment.

Net Zero Advisory Group (NZAG)

A group set up by Ofgem that is intended to strengthen strategic coordination among key government departments and public sector organisations involved in the energy system transition, including around the heat, power, and transport sectors.

Network charges

These are charges recovered for the use of network services.

Network Company

A transmission network owner or distribution network operator. The ESO does not fall under this term, see the term Electricity System Operator (ESO).

Network Innovation Allowance

A use-it-or-lose-it allowance to fund small innovative projects focused on the energy system transition and vulnerable consumers.

Network Operating Costs

The day-to-day costs incurred by DNOs as part of the work required to maintain and operate the distribution networks.

Network Options Assessment (NOA)

The NOA is the process for assessing options for reinforcing the National Electricity Transmission System (NETS) to meet the requirements that the Electricity System Operator (ESO) finds from its analysis of the FES.

Network users

Companies along the gas and electricity supply chain (ie producers and generators, transmission and distribution network companies, and energy suppliers) and consumers.

Network Visibility

The ability of DNOs to collect and utilise data related to the operation of their network in planning and operational timescales.

Network-wide Peak Demand

The gross peak demand of the distribution network in the regulatory year measured in megawatts.

Non-controllable costs

Costs incurred by DNOs that are deemed to be outside of management control.

Non-Load Related Capex

The replacement or refurbishment of assets which are either at the end of their useful life due to their age or condition, or need to be replaced on safety or environmental grounds.

Non-op Capex

The capital costs incurred from activities that are unrelated to core activities, but essential to DNOs in being able to carry out these activities.

Normalisation

A part of the cost assessment process undertaken by Ofgem aimed at making any necessary adjustments to company submitted data to ensure they are consistent across all DNOs. These adjustments generally fall into the following categories:

- Regional factors
- Company-specific factors
- Exclusions
- Other adjustments

Notional company/business

A hypothetical, but typical, network company.

O

Offshore transmission

The majority of offshore generation will be connected to the electricity grid through offshore transmission cables. Offshore transmission is defined as being any offshore transmission network that operates at 132kV or above.

Offshore Transmission Owners (OFTOs)

OFTOs operate and maintain the offshore transmission assets.

Ongoing Efficiency

The reduction in the volume of inputs required to produce a given volume of output - ie the productivity improvements that we consider even the most efficient company is capable of achieving.

Operating Expenditure (opex)

The costs of the day-to-day operation of the network such as staff costs, repairs and maintenance expenditures and overheads.

Outputs

Services, requirements, and deliverables that network companies are funded or incentivised to deliver through the price control. These can be LOs, ODIs or PCDs. Common outputs apply to all or some of the energy sectors, whereas bespoke outputs apply to one network company.

Output Delivery Incentives (ODIs)

In RIIO-ED2, ODIs will apply where service quality improvements beyond a level that is funded through base revenues may be in the interests of consumers. ODIs can be financial (ODI-F) or reputational (ODI-R).

P

Pass-through (of costs)

Costs for which companies can vary their annual revenue in line with the actual cost, either because they are outside network companies' control or because they have been subject to separate price control measures.

Price control

The control developed by the regulator to set targets and allowed revenues for network companies. The characteristics and mechanisms are developed by the regulator in the price control review period depending on network company performance over the last control period and predicted expenditure (companies' business plans) in the next.

Primary Network

Network assets where the primary voltage is EHV or above (EHV refers to voltages equal to or greater than 22kV but less than 132kV).

Price Control Deliverables (PCDs)

In RIIO-ED2, we will use PCDs to capture those outputs that are directly funded through the price control and where the funding provided is not transferrable to a different output or project. The purpose of a PCD will be to ensure the conditions attached to the funding are clear up-front.

Priority Services Register (PSR)

The free support service register to help people in vulnerable situations, offered by suppliers and network operators.

Polychlorinated Biphenyls (PCBs)

PCBs are a group of synthetic chemicals, typically oil liquids or solids, that were banned in the UK in 1987.

R

Real Price Effects (RPEs)

We set price control allowances which can include a general inflation measure (CPIH) and certain price indices that reflect the external pressures on companies' costs. We refer to the difference between CPIH and certain price indices as RPEs.

Regional Factors

Uncontrollable factors that are either unique to, or disproportionately affect, the region in which a DNO operates, resulting in efficient costs that are higher or lower than the national average.

Regulatory Asset Value (RAV)

The value ascribed by Ofgem to the capital employed in the licensee's regulated business (the 'regulated asset base'). The RAV is calculated by summing an estimate of the initial market value of each licensee's regulated asset base at privatisation and all subsequent allowed additions to it at historical cost, and deducting annual depreciation amounts calculated in accordance with established regulatory methods. These vary between classes of licensee. A deduction is also made in certain cases to reflect the value realised from the disposal of assets comprised in the regulatory asset base. The RAV is indexed to allow for the effects of inflation on the licensee's capital stock.

Regulatory burden

A term used to describe the cost to regulated companies – both monetary and opportunity – of regulation.

Regulatory Instructions and Guidance (RIGs)

A document that is published as part of the price control settlement which sets out further detail on how the price control is to be implemented and how compliance with it will be monitored.

Reinforcement

The installation of new network assets to accommodate changes in the level or pattern of electricity or gas supply and demand.

Relevant Market Segments (RMS)

RMS refers to nine market segments defined by reference to the nature and volume of the connection activities and the work associated with them.

Re-openers

An Uncertainty Mechanism used in certain limited and pre-defined circumstances, which may amend revenue allowances, outputs and/or delivery dates within the price control period.

Research and development (R&D)

Work undertaken in order to increase knowledge and used to create new processes or technologies that will advance capabilities.

Retail Price Index (RPI)

The RPI is an aggregate measure of changes in the cost of living in the UK. It has a different formula to CPI; for example, it measures changes in housing costs and mortgage interest repayments, whereas the CPI does not.

Return Adjustment Mechanisms (RAMs)

Failsafe mechanisms to mitigate the future risk of companies earning materially higher or lower than expected returns in a changing system.

Return on Regulatory Equity (RoRE)

RoRE is the financial return achieved by shareholders in a licensee during a price control period from its actual performance under the price control. RoRE is calculated post-tax and is estimated using certain regulatory assumptions, such as the assumed gearing ratio of the companies, to ensure comparability across the sector. We use a mix of actual and forecast performance to calculate five-year average returns. These returns may not equal the actual returns seen by shareholders.

Revenue Driver

An Uncertainty Mechanism used to adjust allowed revenue during the price control if specific measurable events occur. Revenue drivers are used by Ofgem to increase the accuracy of the revenue allowances. See also 'volume driver'.

RIIO (Revenue = Incentives + Innovation + Outputs)

Ofgem's regulatory framework, stemming from the conclusions of the RPI-X@20 project. It builds on the success of the previous RPI-X regime, but better meets the investment and innovation challenge by placing much more emphasis on incentives to drive the innovation needed to deliver a sustainable energy network at value for money to existing and future consumers.

RIIO Electricity Distribution Price Control (RIIO-ED1)

The price control applied to the electricity distribution network operators. It runs from 1 April 2015 to 31 March 2023.

RIIO-ED2 Challenge Group (CG)

Ofgem has set up a central RIIO-ED2 challenge group that is independently chaired and which provided Ofgem with a public report on companies' business plans from the perspective of end consumers.

Ring-fence

The Ring-fence conditions in gas and electricity network operator licences provide assurance that network operators always have the financial and operational resources necessary to fulfil their obligations under legislation and their licences.

Risk-free rate

The rate of return that an investor would expect to earn on a riskless asset. Typically, government-issued securities are considered the best available indicator of the risk-free rate due to the extremely low likelihood of the government defaulting on its obligations.

RPI-X

The form of price control applied to regulated energy network companies before RIIO. Each company was given a revenue allowance in the first year of the control period. The price control then specified that in each subsequent year the allowance would move by 'X' per cent in real terms.⁵¹

RPI-X@20

Ofgem's comprehensive review of how we regulate energy network companies, announced in March 2008. Its conclusions, published in October 2010, resulted in the implementation of a new regulatory framework, known as the RIIO model.

S

Scope 1 emissions

Direct emissions from sources owned or controlled by the reporting company that release emissions straight into the atmosphere.

Examples of Scope 1 emissions include emissions from combustion in owned or controlled boilers, furnaces, vehicles; and emissions from chemical production in owned or controlled process equipment.

Scope 2 emissions

Indirect emissions being released into the atmosphere associated with the reporting company's consumption of purchased electricity, heat, steam and cooling. These are indirect emissions that are a consequence of the reporting company's activities but which occur at sources they do not own or control. This includes losses of electricity for electricity transmission and distribution companies.

Scope 3 emissions

Other indirect emissions that occur that are a consequence of the reporting company's actions, which occur at sources they do not own or control and which are not classed as Scope 2 emissions. Examples of Scope 3 emissions are business travel by means not owned or controlled by the reporting company, waste disposal, or purchased materials or fuels.

Secondary Network

Network assets where the primary voltage is HV or below.

⁵¹ [RPI-X@20 review | Ofgem](#)

Short interruption

A loss of electricity supply lasting less than three minutes.

Slow money

Slow money is where costs are added to the RAV and therefore revenues are recovered slowly (eg over 20 years) from both existing and future consumers.

Smart Optimisation

Utilising network data to improve decision-making on all aspects of network functions, particularly with respect to load-related expenditure, the establishment of DSO functions, and collaboration with local stakeholders.

Smart Optimisation Output

The Smart Optimisation Output licence obligation is formed of two parts; a collaboration plan and a system visualisation interface. These outputs will enable effective collaboration with stakeholders by ensuring a more holistic and open approach to the sharing of network data and strategies, to both inform the DNO's own strategic planning activities and to support the creation of least cost decarbonisation pathways for electricity, heat and transport, at a regional level, in partnership with others.

Social Return on Investment (SROI)

Social Return on Investment is a framework for measuring and accounting for typically qualitative indicators. It measures social, environmental and economic outcomes and uses monetary values to represent them.

Special Purpose Vehicle (SPV) model

The SPV model is one of the late competition models that may be applied to projects that meet the Criteria for late competition during RIIO-2. Under the SPV model, the incumbent network licensee would run a tender to appoint an SPV to finance, deliver and operate a new, separable and high value project on the licensee's behalf through a contract in effect for a specified revenue period. The allowed revenue for delivering the project would be set over the period of its construction and a long-term operational period (currently expected to be 25 years).

Storage (electricity)

Storage refers to any mechanism that can store energy, which has been converted into electricity. This can be primary (super-conducting and capacitor technologies), mechanical (pumped hydro, compressed air, flywheels) and electrochemical (batteries).

Strategic Innovation Fund (SIF)

A funding mechanism for strategic energy system transition innovation projects in the RIIO-2 price controls.

Strategic Investment

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, helping to keep longer term costs as low as possible for consumers.

Sulphur hexafluoride (SF₆)

A gas that is used as both an insulating and arc extinction medium in electrical plant. SF₆ has a global warming potential approximately 23,500 times more than CO₂ and makes up a portion of companies' BCF emissions.

Supplier

Any person authorised to supply gas and/or electricity by virtue of a Gas Supply Licence and/or Electricity Supply Licence.

Supply chain

Refers to all the parties involved in the delivery of electricity and gas to the final consumer - from electricity generators and gas shippers, through to electricity and gas suppliers.

Sustainable energy sector

A sustainable energy sector is one that promotes security of supply over time; delivers a low carbon economy and associated environmental targets; and delivers related social objectives (eg fuel poverty targets).

System Operator (SO)

The SO is the entity responsible for operating the transmission system and for entering into contracts with those who want to connect to the transmission system. In relation to electricity and gas, this role is performed by National Grid.

T

Technology Business Management Taxonomy

A standard taxonomy used to describe cost sources, technologies, IT resources, applications, and services.

Third party

Within the innovation context, third party refers to any person other than network companies. It may include, for example, private companies, academics, small and medium-sized enterprises, and trade bodies. It is often used interchangeably with non-network company.

Total expenditure (totex)

Totex includes both capital expenditure (capex) and operating expenditure (opex). Totex is made up of fast money and slow money.

Total Market Return (TMR)

A measure of return that equity investors expect for the market-average level of risk.

Totex Benchmarking

A cost assessment approach that includes all normalised controllable costs in a single benchmarking model.

Transmission Owner (TO)

Means, in the electricity sector, National Grid Electricity Transmission, Scottish Power Transmission or Scottish Hydro Electric Transmission and, in the gas sector, National Grid Gas Transmission.

Transmission system

The system of high voltage electric lines and high-pressure pipelines providing for the bulk transfer of electricity and gas across GB.

U

Uncertainty Mechanisms (UMs)

Uncertainty mechanisms allow changes to the base revenue during the price control period to reflect significant cost changes that are expected to be outside the company's control. Common UMs apply to all or some of the energy sectors, whereas bespoke UMs apply to one network company.

V

Value of Lost Load

A measure of the value that domestic and SME customers' place on the security of their supply of electricity.

Volume driver

An Uncertainty Mechanism allowing revenue to vary as a function of a volume measure (eg number of new connections).

W

Whole system solutions

Solutions arising from energy network companies and system operators coordinating effectively, between each other and with broader areas, which deliver value for consumers.

Worst served customer

Customer experiencing on average at least four interruptions at higher voltage distribution per regulatory year, over a three regulatory year period (ie 12 or more interruptions over three regulatory years, with a minimum of two interruptions per regulatory year).