

Decision

RIIO-ED2 Methodology Decision: Overview

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The next electricity distribution price control (RIIO-ED2) will start on 1 April 2023. This is the overview of our decision on the methodology we will use to set this price control.

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Foreword

The next electricity distribution price control (RIIO-ED2) will cover the five-year period to 31 March 2028. During this time, there will be significant change in how we generate and use energy as we progress towards Net Zero carbon emissions.

In December 2020, the Committee on Climate Change announced the 6th Carbon Budget¹ in which they recommended that 60% of the necessary emissions reduction to 2050 will need to be achieved in the next 15 years. This comes in the wake of the UK Government's 10 Point Plan for a Green Industrial Revolution,² which sets out the steps they are taking to support the continued decarbonisation of power, the electrification of most surface transport, and the move to low carbon energy sources for heat. The Scottish Government have adopted a target for Net Zero by 2045 and in December 2020 published an update³ to their Climate Change Plan laying out a vision for each sector of their economy out to 2032.

We expect further announcements of policy ambitions from the devolved and local governments in the months ahead and will continue to work closely with the UK and devolved governments, industry and wider stakeholders to play our part in their delivery.

Network operators will need to play a proactive role in ensuring the local grids are ready for the Net Zero transition. They will need to plan to accommodate increasing demand that will come from the electrification of heating and transport, while accounting for and maximising the potential of these and other new technologies to provide system flexibility and limit the need for network upgrades. We also expect them to identify and take steps to minimise the impact that uncertainty might have on consumers. At the same time, they must maintain reliable networks, offer great service and protect consumers that are most vulnerable.

We are conscious that the economic impact of COVID-19 makes the affordability of the energy system transition an even more pressing concern for consumers. Our price controls need to respond to this, as well as enable the system of the future.

As the regulator of the gas and electricity markets we therefore have two equally important challenges - to protect today's consumers to make sure they get a fair deal, and to protect consumers both today and in the future by tackling climate change. In

¹ <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

² <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>

³ <https://www.gov.scot/policies/climate-change/latest/>

February this year, we published our Decarbonisation Action Plan,⁴ which sets out the actions we will take to support the transition to Net Zero. We committed to make the network price control regulatory regime more adaptive to deliver the most effective transition to Net Zero at lowest cost to existing and future consumers.

Although binding commitments to meeting the Net Zero target have been made, there remain different pathways that could be taken. Some aspects are more certain – for example the transition to electric vehicles instead of petrol and diesel cars and vans, in response to the government’s announcement to end sales of new combustion engine vehicles by 2030. This will create significantly more electricity demand, although here network upgrades can mostly be avoided by maximising the opportunities for flexible charging. Other aspects are less certain – in particular, how our homes will be heated. Although the 10 point plan is targeting a rollout of 600,000 heat pumps a year by 2028, there is still a degree of uncertainty about the extent to which electricity will be the prime source of heating for most homes, and how much improvement there will be in the energy efficiency of properties. In addition, there will be new and changing patterns of demand. For example, Great Britain continues to experience the COVID-19 crisis and our requirements for energy may change as we adapt to new patterns of work and life. Network companies must proactively identify and account for these changes in how they plan and operate their networks.

This is why the RIIO-ED2 price control must be adaptable. In two years’ time we will set allowances for investment in the networks, but we must do so in a way that enables spending plans to flex so that any pathway to Net Zero can be supported, while ensuring appropriate protections are in place for consumers. This adaptability may also need to extend to the services and functions we expect the companies to deliver and perform, as a better understanding emerges of how the future energy system will operate and what consumers require from it.

⁴ <https://www.ofgem.gov.uk/publications-and-updates/ofgem-s-decarbonisation-action-plan>

1. RIIO-ED2 Methodology Decision at a Glance

- 1.1 We have designed the RIIO-ED2 methodology to support Net Zero targets while keeping the cost to existing and future consumers as low as possible. We consider that this is best achieved by optimising efficiencies across the entire energy system.
- 1.2 Enabling Net Zero will require investment in new infrastructure, the full utilisation of flexibility resources that are becoming increasingly available in a more decentralised energy system, plus the smart use of technology and data.
- 1.3 It will also need the owners of the networks to change how they plan, develop and operate their assets. At the same time, consumers will still require a reliable supply of electricity and support when they need additional services. A considerable portion of the energy bill is used to pay for the distribution networks, so it is important that we use all of our regulatory tools to keep these costs as low as possible.
- 1.4 We are implementing new arrangements in RIIO-ED2 to support Net Zero targets. These will sit alongside a programme of work to enable a smarter and more flexible energy system. These topics are the focus of this overview document and our proposals are summarised below.
- 1.5 In addition, we are publishing two Annexes. One details the range of services that we will require the electricity Distribution Network Operators (DNOs) to deliver and how we will incentivise their performance (Annex 1: Delivering value for money services for consumers). The other describes the regulatory tools and methods we will use to ensure that the costs that consumers pay are as efficient as possible (Annex 2: Keeping bills low for consumers). A short summary of our decisions and next steps in both of these areas is provided later in this chapter.

Supporting Net Zero

- 1.6 DNOs were able to undertake investment ahead of demand in previous price controls, however there may have been factors that restricted their willingness to do so. For RIIO-ED2 we are taking active measures to encourage the investment that will be required to support Net Zero. These will involve clearer guidance on when and how companies should undertake anticipatory investment where there

is significant uncertainty, and through the introduction of new mechanisms to ensure the price control can adapt to changing requirements.

- 1.7 We will therefore be setting out in our updated Business Plan Guidance (to be published in January 2021), the Net Zero pathways that DNOs should take into account in developing their investment plans. We encourage DNOs to engage with stakeholders to establish how these scenarios will materialise at a local level, and such engagement should include the consideration of any other factors that may reflect regional drivers for growth. We have highlighted the type of evidence that might be useful to support proposals for investment emerging from this engagement. We are also signalling the arrangements the industry will need to have in place to ensure that regional plans support a credible forecast of demand at a national level.
- 1.8 The above-mentioned pathways are consistent with Net Zero targets and have taken into account the Government's recent 10 Point Plan for a Green Industrial Revolution. The 10 Point Plan includes critical steps towards achieving Net Zero, notably the phase out of petrol and diesel cars and vans.
- 1.9 The electrification of heat and transport will lead to a very large increase in demand for electricity and therefore investment in network capacity will ultimately be needed. But what is uncertain is by how much demand will increase, particularly at peak times. Much will depend on the rate of uptake of new technologies and how they are used, with smart controls and charging arrangements offering the potential to minimise increases to peak demand. Also, DNOs already have options available to them that enable network constraints to be addressed while avoiding or deferring the need for investment in new capacity. We expect the range and effectiveness of these alternative options to increase, but we cannot be certain by how much. The challenge of Net Zero will require concerted effort over the coming three decades. This price control spans a critical period – network companies cannot wait for everything to become clear but must proactively manage those uncertainties.
- 1.10 We consider that the best way to facilitate the type of investment likely to be needed on the local grids is through a combination of baseline allowances and agile uncertainty mechanisms. This will ensure spending plans can flex to meet the level of reasonably anticipated demand, rather than being fixed to a single view of the future formed at a point in time when there is uncertainty about future requirements.

- 1.11 Our preferred approach is to ensure that, where strategic investment has been identified and agreed as needed to enable Net Zero readiness, such investment does indeed happen. We also want to ensure that network companies can respond to future demand as it becomes clearer. To do this we will allocate baseline allowances, and consider both price control deliverables and the development of an uncertainty mechanism that automatically adjusts revenues in line with expenditure incurred, thereby reducing the delay associated with in-period, administrative decision-making on adjustments to revenue. At this stage we are not making a decision to have an automatic uncertainty mechanism. Our decision on this will depend on whether such a mechanism can be designed in a way that does not expose consumers to a disproportionate risk of higher costs.
- 1.12 If we decide to have an automatic uncertainty mechanism it would be used to enable the price control to adapt to relatively small deviations from forecast assumptions. However, there could be more significant changes to the requirements that are placed on the energy system, including network companies, and these may require a more extensive adjustment to the price control. To ensure RIIO-ED2 can adapt to these changes, we will have a toolkit of uncertainty mechanisms including a Net Zero re-opener, to keep pace with changes in the wider policy and technological environment.
- 1.13 We note that much of the increase in demand, especially from electric vehicles (EVs), can occur off-peak, and networks should plan for and seek to maximise this. However, when network constraints are anticipated to arise, we expect DNOs to first consider whether flexibility, including energy efficiency measures and Demand Side Response (DSR), would provide a more economic and efficient solution than network reinforcement. Building additional capacity to meet a longer-term forecast of demand may sometimes be the most efficient approach, but this also creates some risk of consumers paying for assets that are not needed. We will therefore require persuasive justification for proposals for physical investment in new capacity to meet demand growth over the longer-term, including an assessment of the costs and benefits of such an approach to network investment. Where there is less risk of unnecessary investment, and in light of the size of the challenge ahead, where the endpoint is more certain (eg the requirement for electrified heating in areas of the country not currently served by gas), network companies are encouraged to take a view of the cumulative work requirements for Net Zero and plan accordingly.

1.14 We also recognise that significant support is needed for research and development and trials of innovative technologies and operational practices that might enable the decarbonisation of heat and transport at a lower cost than might otherwise be the case. We are retaining a strong innovation stimulus, including the introduction of a Strategic Innovation Fund (SIF) and the retention of direct innovation funding for DNOs via the Network Innovation Allowance (NIA) to help address issues related to the energy system transition and/or consumer vulnerability.

A smart and flexible energy system

1.15 The efficient operation of the energy system at all voltages is essential if Net Zero targets are to be met at the lowest cost. This will require changes in how the distribution networks are operated in order to maximise the value that flexibility resources can offer.

1.16 Accessible and digitalised data on how the networks are being used is vital to enable providers of new and innovative services the opportunity to meet system needs. Much of this data is held by DNOs and we are introducing new licence conditions to ensure there is consistency across the type of data they collect and how they provide access to it, including a requirement to comply with best practice principles. DNOs have the opportunity to transform their data and monitoring capabilities in order to maximise system efficiencies, and we will need to retain flexibility within the price control so that requirements around digital and data capabilities can evolve over time.

1.17 DNOs are increasingly performing a number of Distribution System Operation (DSO) functions, although there is a lack of consistency in how different DNOs carry out these activities. In RIIO-ED2, we are providing clarity on our expectations for these functions and putting in place an assessment framework with incentives on DNOs depending on how they perform.

1.18 As the energy system transitions to one that is smarter, more flexible and increasingly decentralised, new activities and ways of operating will emerge. This will provide DNOs with the opportunity to undertake measures that will proactively curb anticipated growth in system peaks. We are interested in understanding what actions the DNOs may be able to take and how the price control can enable these.

1.19 Through their delivery of DSO functions, DNOs have helped flexibility markets in Great Britain to grow. However, it is important that we have the right institutional

arrangements in place so that whole system efficiencies are optimised over the longer-term. We will be kicking off a strategic DSO work programme⁵ in early 2021 that will review the industry structure and likely requirements for a future energy system that will become more decentralised.

- 1.20 The outcome of this review may require us to make changes within RIIO-ED2 to some of the arrangements concerning DSO functions. Therefore, we intend to put in place arrangements as part of RIIO-ED2 that will allow for changes to be made.
- 1.21 In carrying out their activities in RIIO-ED2, DNOs will need to act in line with their strategy to drive efficiencies across the whole system while delivering net benefits for consumers in the sector. We will provide innovation funding to support this and arrangements within the period to reassign funding if solutions are better delivered by other networks. Where appropriate, these arrangements will replicate those we have introduced in the gas and electricity transmission sectors.⁶

Delivering value for money services for consumers

- 1.22 The outputs and incentives we are setting for RIIO-ED2 will focus DNOs on delivering the services that matter to current and future consumers, as well as minimising their own environmental impact.
- 1.23 Where appropriate, we will set targets by using existing levels of performance, so that we build upon improvements that have been achieved in RIIO-ED1. Where we are introducing new incentives, we will set clear expectations for the level of performance we expect. We will also remove certain outputs and incentives that were applied in RIIO-ED1 where we no longer consider these to be required.
- 1.24 In addition to common output and incentive arrangements, there will be opportunities for DNOs to bring forward bespoke output proposals for RIIO-ED2, which we will assess as part of our review of company business plans.

Deliver high quality customer service

- 1.25 DNOs will need to ensure that consumers with whom they have an interaction receive good customer service. In particular, we want to ensure that DNOs are responding to the needs of customers installing or using low carbon technologies,

⁵ <https://www.ofgem.gov.uk/publications-and-updates/forward-work-programme-202122-consultation>, point 8

⁶ Chapter 8 https://www.ofgem.gov.uk/system/files/docs/2020/12/final_determinations_-_core_document.pdf

such as a heat pump or an EV charging point. If a complaint is raised in relation to their activities, we expect to see it resolved quickly.

Provide a quality service for consumers seeking a connection

- 1.26 For smaller connections work, DNOs will need to turn around quotes and complete projects in a timely fashion. DNOs will be exposed to penalties if standards start to decline. Larger connections customers have more complex requirements, and DNOs will need to have in place and then deliver a strategy aligned to our baseline expectations.

Support consumers in vulnerable situations

- 1.27 DNOs will need to have in place and deliver a strategy for supporting customers who are most vulnerable to a loss of supply, those who are in fuel poverty and those who are at risk of being left behind by the energy system transition towards Net Zero.

Maintain world class levels of reliability

- 1.28 DNOs will need to continue to focus on ensuring that consumers enjoy high levels of reliability, and, where there is an interruption to supply, that it is resolved quickly. We want DNOs to invest in their infrastructure or use flexibility to ensure even short interruptions are kept to a minimum and improve service to those who are most susceptible to experiencing a power cut.

Ensure long-term safety and resilience

- 1.29 DNOs must act as responsible guardians of essential national infrastructure. They should take action to ensure the long-term physical resilience of their networks and give full consideration to the additional risk associated with climate change. DNOs must also protect consumers from the threat of cyber-attacks and have in place a workforce with the skills required for the future energy system.

Deliver an environmentally sustainable network

- 1.30 DNOs should decarbonise their networks, reduce the wider impact of network activity on the environment and support the transition to a sustainable low carbon energy system. They must have in place, and report performance against, an action plan for doing so.

1.31 We will drive performance improvements in the above-mentioned areas by using both reputational and financial incentives where we are confident in our measures of performance and the value that consumers place on the quality of service they receive.

Keeping consumer bills as low as possible

- 1.32 Our methodology for RIIO-ED2 will ensure that consumers can benefit from high quality network services while bills are kept low. We will seek to achieve this by:
- rigorous scrutiny of each DNO's business plan by their Customer Engagement Group and by the independent Challenge Group
 - using our cost assessment toolkit to set cost allowances at the efficient level
 - retaining strong incentives for companies to find further cost efficiencies and use flexibility, but ensuring that a higher share of any savings generated by the DNOs are returned to consumers, compared to current levels
 - tailoring a Business Plan Incentive to encourage complete and efficiently costed plans for RIIO-ED2, with rewards available for companies that are ambitious and go beyond what we expect as business as usual
 - using a toolkit of uncertainty mechanisms to avoid setting higher than necessary baseline allowances while ensuring that expenditure can flex in line with emerging requirements to meet Net Zero targets
 - increasing the use of competition to drive efficiency, where the benefits are likely to exceed the costs
 - introducing the Return Adjustment Mechanism (RAM) as a backstop measure to avoid excessive returns (as confirmed in our Framework Decision).

Finance

1.33 Decisions on all Regulatory Finance areas for RIIO-ED2, including the working assumptions on the cost of capital and the approach to financeability, will be confirmed on a date in or after February 2021.⁷

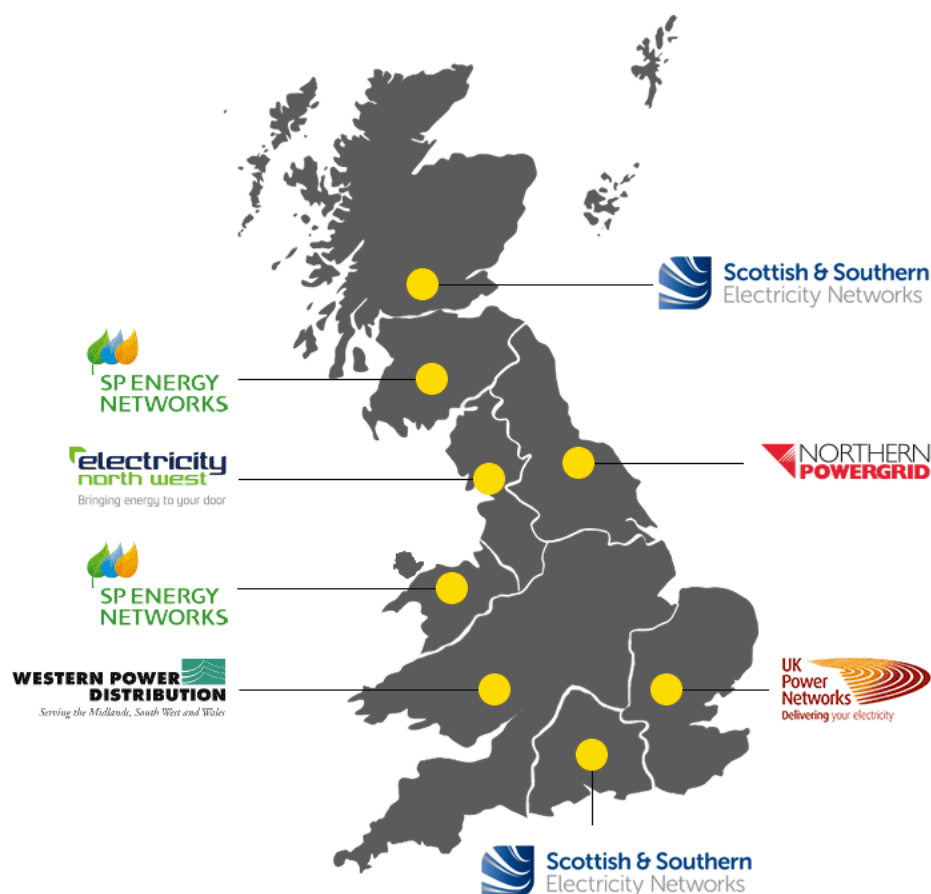
⁷⁷ <https://www.gov.uk/cma-cases/ofwat-price-determinations>

2. Context for RIIO-ED2

Electricity distribution networks

- 2.1 A network of cables and wires spans Great Britain (GB) transporting energy from its place of generation to our homes and businesses. Private companies own and operate these networks, and consumers pay for them through their energy bills.
- 2.2 The electricity distribution network carries electricity from the high voltage transmission network to industrial, commercial, and domestic users, as well as distributing an increasing quantity of power from generation sources that are connected directly to the distribution networks. There are fourteen electricity DNOs operating in GB, which are managed by six companies. These are shown in Figure 1 below.

Figure 1: Map showing DNOs



- 2.3 We use the RIIO (Revenue = Incentives + Innovation + Outputs) framework to set price controls for the gas and electricity networks. This performance-based

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

- 2.4 The first RIIO price control for the electricity distribution networks (RIIO-ED1) runs from 2015-2023. RIIO-ED2 will run from 2023-2028. DNO price controls run two years behind those we set for the operators of the gas distribution networks and the gas and electricity transmission networks. RIIO-ED2 is a separate process, however in the design of our proposals for RIIO-ED2, we have taken into account the lessons learnt and the feedback we have received from the other sectors.
- 2.5 In designing the methodology for RIIO-ED2, we have also taken into account various developments that are external to the price control, but which will impact on the demands that will be placed on the networks, and how we expect the operators to respond. These include:
- Net Zero legislation and UK and Devolved Administration Government plans for decarbonisation and the response to these from Ofgem and the industry
 - a review of electrical engineering standards
 - a wider programme of work being driven by Ofgem to enable a decentralised, decarbonised and digitalised energy system.
- 2.6 In relation to the last of these developments, our work in this programme has led to changes in the timetable for a decision on reforms to access charging arrangements. We discuss the impact of this on RIIO-ED2 below.

Net Zero & the response from Ofgem and the industry

- 2.7 In 2019, the UK Government passed legislation enshrining in law the target of Net Zero greenhouse gas emissions by 2050.⁸ The Scottish Government also legislated to set a Net Zero target for 2045⁹ and the Welsh Government intends¹⁰ to introduce legislation to amend its existing 2050 target for the achievement of Net Zero emissions.

⁸ The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (S.I. 2019/1056) amending Section 1(1) of the Climate Change Act 2008

⁹ The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 (asp 15), ss. 1, 32(2); S.S.I. 2020/66, reg. 2 inserting Section A1 of The Climate Change (Scotland) Act 2009

¹⁰ <https://gov.wales/wales-accepts-committee-climate-change-95-emissions-reduction-target>

- 2.8 On 18 November, the UK Government announced a 10-point plan for a “Green Industrial Revolution”. Building on this plan, in December 2020 the UK Government published an Energy White Paper¹¹ setting out specific steps the government will take over the next decade to cut emissions from industry, transport, and buildings by 230 million metric tonnes. Many of the elements of this plan could have a significant impact on the distribution networks, including ending sales of new combustion engine cars and vans by 2030, a target to roll out 600,000 heat pumps a year by 2028, and support for hydrogen production.
- 2.9 The Scottish Government published its Update to their Climate Change Plan in December 2020. This follows the adoption of a 2045 target for Net Zero in Scotland in the 2019 Climate Change Act.¹² The Update lays out a vision for a Net Zero Scotland along with emissions envelopes for each sector of the economy out to 2032. It also details the policies and priorities that the Scottish Government will implement to deliver those envelopes.
- 2.10 The Update to the Climate Change Plan shows the need to deliver substantial decarbonisation in several sectors which will have an impact on electricity distribution. In particular, the building sector envelope, which includes space and water heating, shows a drop in emissions of 68% between 2020 and 2030, whilst emissions in the transport sector fall by 41% over the same period. The electricity envelope itself shows that electricity generation in Scotland should achieve zero emissions by 2029.
- 2.11 Ofgem is committed to delivering a greener, fairer, future energy system, working within the policy framework set by government. We welcome the UK Government’s plan for a Green Industrial Revolution and the Scottish Government’s Update to the Climate Change Plan and will continue to work closely with the UK and devolved governments, industry, and wider stakeholders to support decarbonisation and a green economic recovery.

Green recovery

- 2.12 Across Ofgem, we have engaged with industry to consider and progress actions that facilitate a green recovery and bring forward decarbonisation benefits to consumers. In relation to the networks, there have been three areas of focus:

¹¹ <https://www.gov.uk/government/news/government-sets-out-plans-for-clean-energy-system-and-green-jobs-boom-to-build-back-greener>

¹² <https://www.legislation.gov.uk/asp/2019/15/enacted>

- enabling the fastest possible ramp-up of investment programs that had to be scaled back to accommodate COVID-19 restrictions
- accelerating work planned for future years to start now, to help reactivate supply chains and deliver earlier benefits to consumers
- looking for appropriate opportunities to increase investment through new projects to:
 - reduce the cost and time of connecting EVs to the grid across the country
 - prepare homes and streets to be EV-ready
 - support the decarbonisation of heat.

2.13 In electricity distribution, projects valued at around £80 million are being brought forward to start in 2020. These are shovel-ready projects to increase capacity to support new connections as well as preparing the grids for Net Zero and the predicted increases in electricity demand, including from EVs.

2.14 Work is ongoing with the networks to develop further opportunities to stimulate low risk, low carbon strategic investment to support Net Zero and future users' needs in line with government priorities. Further information on these options is expected early in 2021.

Net Zero Advisory Group

2.15 To make ongoing funding decisions on major strategic investments in the most joined-up way, we committed to improve our co-ordination with the UK and devolved governments and other key stakeholders such as the National Infrastructure Commission and the Committee on Climate Change. To do this, we have established a Net Zero Advisory Group¹³ (NZAG), bringing these key players together.

2.16 This Group is intended to discuss key strategic questions on the energy sector transition, helping us to better understand how emerging government policy could impact upon our economic regulation, including for the price controls.

Review of electrical engineering standards

2.17 In 2019, the UK Government and Ofgem jointly commissioned an independent panel to undertake a review of electrical engineering standards and BEIS have

¹³ <https://www.ofgem.gov.uk/publications-and-updates/net-zero-advisory-group-terms-reference>

now published the Panel's findings and recommendations.¹⁴ BEIS and Ofgem will need to consider these recommendations and the impact on RIIO-ED2, particularly around network investment to support load growth. Where we consider it necessary, we will issue further guidance on what implications these recommendations might have for business plans.

Enabling a decentralised, decarbonised and digitalised energy system

- 2.18 RIIO-ED2 sits alongside a wider programme of work that will enable the energy system to become increasingly decentralised, decarbonised and digitalised, while ensuring that the interests of consumers continue to be protected.
- 2.19 As the share of intermittent renewable generation rises, and electricity demand from heat and transport grows, annual electricity system costs could increase significantly.
- 2.20 Flexibility can help to manage this: demand shifting, storage and interconnection can help dampen the peaks in demand and supply, reducing costly curtailment of renewables generation and the need for expensive network upgrades.
- 2.21 In addition, the smart collection and use of energy system data must be an essential part of the energy system as it can enable flexibility, create new sources of value for all energy stakeholders and improve consumer experiences.
- 2.22 Our decisions for RIIO-ED2 support these programmes of work. How and when DNOs invest in their network, and the data they make available to third parties are essential to achieving the energy system transition at least cost.
- 2.23 This is an area of rapid change, and to inform our Full Chain Flexibility Strategic Change Programme,¹⁵ Ofgem is updating our assessment of the applications of flexibility and approaches to unlocking the highest potential sources, focusing on:
- updating our understanding of the greatest needs and benefits from flexibility across the electricity value chain to achieve a secure, cost-effective system as we decarbonise
 - testing how smart EV charging and vehicle-to-grid services can be leveraged for the system's benefit, as the adoption of EVs accelerates

¹⁴ [Electrical engineering standards: independent review - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/674441/electrical-engineering-standards-independent-review-2021-22.pdf)

¹⁵ <https://www.ofgem.gov.uk/publications-and-updates/forward-work-programme-202122-consultation>, Point 5

- evaluating what mechanisms are available to unlock other demand-side flexibility sources (eg domestic heat demand-side responses)
- reviewing the potential contribution from location-specific flexibility, and how it is best enabled
- assessing the viability and benefits of storage and removing barriers where beneficial
- understanding how we can support the decarbonisation of cost-effective ancillary services.

2.24 Through this work, we may identify the need for changes to industry arrangements and the functions that we expect DNOs to perform. RIIO-ED2 will need to be able to adapt to incorporate these changes. One aspect of this work, where the implications for RIIO-ED2 are most apparent, is in relation to a review of how network charges are set.

Access and Forward-looking charges Significant Code Review (SCR)

2.25 Through our Access and Forward-Looking Charges Significant Code Review ('Access SCR'), we are reviewing the arrangements for access to and charging for use of the electricity networks. The objective of the review is 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.

2.26 This could impact on the amount of investment that needs to be funded under RIIO-ED2.¹⁶ Charging reforms may reduce or defer the need for network reinforcement by encouraging users to adjust their behaviour to make better use of existing network capacity. They may also increase the amount of any necessary reinforcement that needs to be funded through RIIO-ED2 allowances if we reduce the extent to which upfront connection charges recover these costs. We therefore need to ensure that DNOs' RIIO-ED2 allowances reflect these changes.

2.27 We have decided to delay publishing our minded-to proposals for the Access SCR to ensure that our decision in this area is aligned with our Full Chain Flexibility Strategic Change Programme. This means that DNOs will not be able to develop their draft business plans for RIIO-ED2 with sight of our minded-to proposals. At this time, we cannot confirm the timetable by which we will have issued our

¹⁶ We will also monitor how any changes resulting from the Access SCR could impact our method of recovering funding provided through the Strategic Innovation Fund

minded-to proposals, or our final decision on the Access SCR. For this reason, we expect DNOs to base their draft business plans on the existing arrangements (ie no change).

- 2.28 We are working with DNOs to decide the best way to manage the implications of potential changes we may make to access arrangements over the course of 2021 in their final business plan. For example, we may require DNOs to update their final business plans in light of our minded-to Access proposals, and then use a re-opener if we need to adjust RIIO-ED2 allowances due to changes between our minded-to and final Access proposals.
- 2.29 We will issue guidance in 2021 on what assumptions DNOs should make on Access arrangements in their final plans. This will be accompanied with detail on how we will enable adjustments to be made to the price control to reflect any subsequent changes in our position on the Access SCR.
- 2.30 Within their draft business plan submissions, we expect DNOs to specify how their spending plans could be impacted by any changes in our Access SCR proposals (eg costs or volumes of connections). This includes any cost increases linked to the implementation of the Access SCR proposals.

3. The RIIO-ED2 process

RIIO-ED2 Framework

- 3.1 We issued our RIIO-ED2 Framework Decision in December 2019.¹⁷ In it we said that our overarching objective for RIIO-ED2 would be to ensure that DNOs deliver services that meet consumers' needs at the lowest possible cost to consumers.
- 3.2 We followed this with a consultation on the methodology for the sector in July 2020 (our "Consultation"). We received sixty-seven responses to our Consultation¹⁸ and we have taken these into account in our decisions on the RIIO-ED2 Methodology.

Putting the consumer voice at the heart of RIIO-ED2

- 3.3 To ensure DNOs adapt and respond to changing consumer requirements, we have strengthened the voice of the consumer so that consumer advocates can challenge company spending plans to make sure they reflect what consumers need and value. In our RIIO-ED2 Framework Decision, we confirmed that we would apply the enhanced engagement arrangements for RIIO-ED2, as we did for the other RIIO sectors. These arrangements involve structured challenge to the company business plans by Customer Engagement Groups (CEGs), consisting of expert consumer advocates and network users.
- 3.4 The CEGs are company-specific groups, which are established by each of the companies and independently chaired. They will provide us with a public report with their views on the companies' business plans for RIIO-ED2.¹⁹ We have also established a RIIO-ED2 Challenge Group, which is also independently chaired. The Challenge Group will provide us with a public report on each of the companies' business plans.
- 3.5 The DNOs are expected to submit a full draft of their business plans to the RIIO-ED2 Challenge Group on 1 July 2021, before their final business plans are submitted to Ofgem on 1 December 2021. Further detail on submission requirements for the final business plans will be provided in our updated RIIO-ED2 Business Plan Guidance due to be published in January 2021.

¹⁷ <https://www.ofgem.gov.uk/publications-and-updates/riio-ed2-framework-decision>

¹⁸ <https://www.ofgem.gov.uk/publications-and-updates/riio-ed2-sector-specific-methodology-consultation>

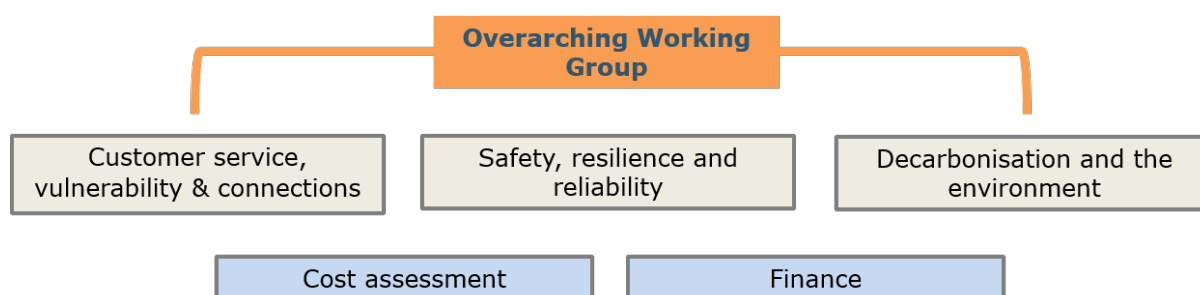
¹⁹ <https://www.ofgem.gov.uk/regulating-energy-networks/riio-policy-challenge-groups>

- 3.6 Once the final business plans have been submitted to Ofgem we will publish a call for evidence seeking feedback on any aspect of the plans. Stakeholders will be able to consider the reports produced by the CEGs and Challenge Group when providing views in the call for evidence.
- 3.7 We expect to hold Open Hearings, subject to any COVID-19 restrictions, prior to our Draft Determinations for RIIO-ED2 in 2022. These hearings will provide the opportunity for Ofgem to hear submissions and evidence on various aspects of the business plans, including areas of disagreement raised by the various groups and areas of support or disagreement from other stakeholders (including those provided in the call for evidence submissions)

RIIO-ED2 Working Groups

- 3.8 Working Groups with DNOs and other stakeholders were set up to help us make these decisions on our Methodology for RIIO-ED2. Details of these Working Groups can be found on our website.²⁰ Figure 2 illustrates the framework for these groups.

Figure 2: RIIO-ED2 Working Groups



Navigating the Methodology Decision

- 3.9 Our Methodology Decision document suite is set out in Figure 3. This document is the Overview document and contains details of our methodology in relation to the following:
- Enabling Net Zero
 - A smart, flexible energy system

²⁰ <https://www.ofgem.gov.uk/publications-and-updates/riio-ed2-working-groups>

3.10 This should be read alongside the following annexes.

- Annex 1 - Delivering value for money services for consumers: this contains our proposals for the outputs we expect companies to deliver in RIIO-ED2
- Annex 2 – Keeping consumer bills low: this contains our proposals for measures to drive efficient costs and ambition in the delivery of services.

3.11 We are also publishing updated draft Business Plan Data Templates to assist DNOs in preparing their business plans. In January 2021 we will publish the updated Business Plan Guidance.

3.12 A draft assessment of the impacts of the decisions we have so far taken for RIIO-ED2 will be issued alongside our Methodology Decision on Finance issues in 2021. Incorporating the impacts associated with our decisions on key financial parameters to the price control, will allow for a more meaningful and comprehensive assessment.

3.13 In making the decisions we are setting out in this suite of documents we have taken into consideration their impact upon consumers and companies. The relevant sections of this document and of our July Consultation should be referred to for the reasoning, evidence, assumptions and calculations we have used to inform our assessment of the impact of these decisions and our conclusions.

3.14 We will only be able to assess fully the impact of RIIO-ED2 when we have confirmed both the methodology and determined the associated revenues, outputs, incentives and uncertainty mechanisms that will apply for the sector. We will assess impacts in accordance with the Ofgem Impact Assessment Guidance²¹, and where appropriate the HM Treasury Green Book.²² We will aspire to apply quantitative assessment where practicable and meaningful. Given the nature of many of the decisions, our assessment is also likely to rely on qualitative techniques.

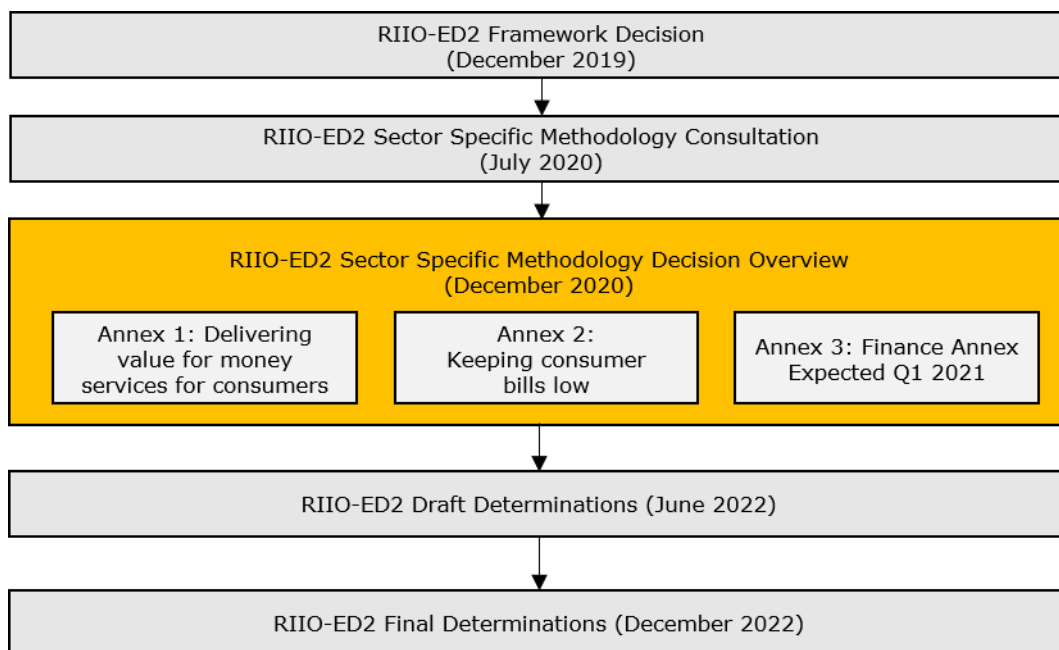
²¹ Ofgem (2016) Impact Assessment Guidance:

https://www.ofgem.gov.uk/system/files/docs/2016/10/impact_assessment_guidance_0.pdf

²² HM Treasury (2018) The Green Book: appraisal and evaluation in central government:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

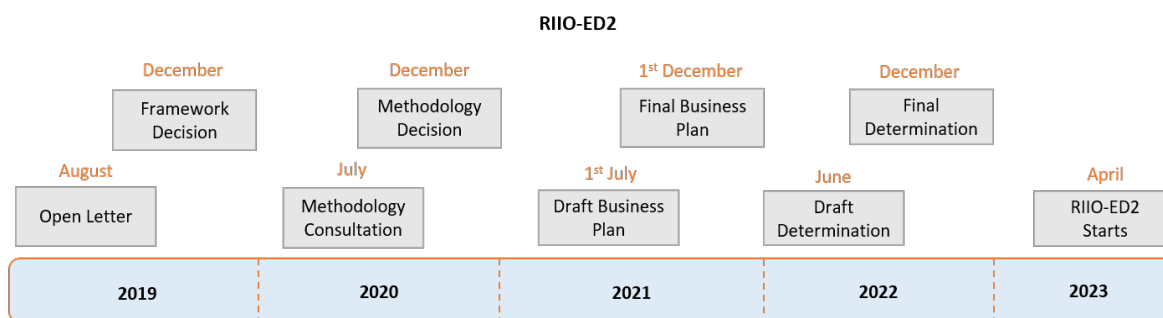
Figure 3: RIIO-ED2 Methodology Decision documents map



RIIO-ED2 timeline

3.15 Figure 4 below, illustrates the timeline that we intend to follow for RIIO-ED2.

Figure 4: RIIO-ED2 timeline



Post appeals review and pre-action correspondence

Our Decision

Table 1: Post appeals review and pre-action correspondence

Purpose	<p>The nature and scope of any post appeals review will ultimately depend on the terms of any successful appeal to and directions made by the CMA. Depending on these directions, it may involve the interlinkages that exist between the components of the RIIO-ED2 price control.</p> <p>The pre-action correspondence stage will allow for early discussions on the scope and intention to appeal, which could ultimately reduce the costs and risks associated with the appeals process and narrow the range of appeal issues in advance of the appeals process.</p>
Decision	<p>We consider that both proposals have merit, for the same reasons set out in our Draft Determination for gas distribution and transmission sectors.</p> <p>We will consult on interlinkages in the RIIO-ED2 package and on the proposed timing for the pre-action correspondence stage.</p>

Our Consultation position

3.16 In Chapter 11 of the Draft Determination for the gas distribution and transmission sectors we consulted on a post appeals review, and set out our expectation that a prospective appellant send pre-action correspondence at a sufficiently early stage before the deadline for making an appeal. We consider that such a mechanism has merit across the sectors, and for the reasons set out in the Draft Determinations, we proposed to take a similar approach for RIIO-ED2.

Responses to our Consultation

3.17 Broadly, the responses provided to OVQ1 and OVQ2 on our proposals for a post appeals review and a pre-action correspondence stage for RIIO-ED2 were similar if not identical to comments provided in response to our proposals in Draft Determination for gas distribution and transmission sectors.

- 3.18 We received 14 responses to OVQ1. In summary, these respondents noted a lack of understanding as to the need for this statement, with the overall majority flagging concerns and objections. There was strong consensus 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 appeal process. There was also concern expressed that this would create both legal issues and uncertainty for licence holders which they considered to be fundamental to a credible environment for investment. A number of respondents also noted that Ofgem does not have the power to overturn elements of a final determination by the CMA or to undo elements of the CMA's determination with which it disagrees.
- 3.19 We received five responses in agreement with our proposal. These respondents endorse the need for a post appeals review, in the event of a successful appeal to the CMA creating knock on impacts to linked decisions in the RIIO-ED2 price control settlement that adversely impacts consumers. Some of these respondents note the National Audit Office's assessment and Citizens Advice's "Many happy returns?" publication that notes that RIIO-1 that returns were overly generous. In these respondents' view, there may be scenarios where flexibility is required to ensure that there is no consumer detriment following a CMA direction.
- 3.20 We received eight responses to OVQ2, with the majority of respondents disagreeing with our proposal. A significant proportion of the responses note that the pre-action correspondence would be unreasonable for a number of reasons including; it threatens stakeholder confidence, it is lopsided in Ofgem's favour and in terms of time scales, it would not be fair to expect details of errors to be provided during the Christmas period.²³ It was suggested that this information is more appropriately included in licensees' applications for permission to appeal to the CMA, rather than at any earlier stage before appellants have fully determined whether or not they intend to seek permission to appeal and on what grounds. Lastly, it was noted that both Ofgem (and in due course the CMA) are likely to already be familiar with the points raised on appeal ahead of time in any event, hence questioning the need for the precautionary appeals process.
- 3.21 We received two responses that agreed with our proposal for a pre-action correspondence review period. These respondents are of the view that appeals

²³ This response was provided in respect of the Draft Determination consultation position specifically.

should be addressed before issues become entrenched and that should be transparent to mitigate the risk of consumer detriment.

Reasons for our Decision

- 3.22 We believe that the post appeals review and pre-action correspondence proposals have merit for the same reasons provided in Final Determinations for the gas distribution and transmission sectors.
- 3.23 As set out in our Draft Determinations and Final Determinations for the gas and transmission sectors, the post appeals review would ultimately 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. Moreover, the scope of any post appeals review will also depend on the particulars of the successful appeal and directions made by the CMA.
- 3.24 Our views on including a post appeals review is not intended to undermine the current appeals framework or regulatory confidence. We note that the objective of any post appeals review would 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 where the outcome of a successful appeal risks creating inconsistencies within the package. For the avoidance of doubt, we do not consider that it would be appropriate for Ofgem to modify the licenses of non-appealing licensees following a successful appeal, nor do we consider that the CMA would direct us to do so.
- 3.25 Depending on these directions, it may involve the interlinkages that exist between the components of the RIIO-ED2 price control. We will consult on interlinkages in respect of the RIIO-ED2 package. We will consider the interlinkages that we set out in both the Draft and Final Determinations for the gas and transmission sectors.
- 3.26 In line with the Final Determination, we believe that it would be beneficial for 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 the grounds on which they intend to appeal.
- 3.27 We also believe that the pre-action correspondence stage could allow for early discussions on the scope and intention to appeal, which could ultimately reduce

the costs and risks associated with the appeals process and narrow the range of appeal issues in advance of the appeals process.

- 3.28 We will consult in respect of the proposed timings for the pre-action correspondence stage through our Draft Determinations.

4. Enabling Net Zero

Chapter summary

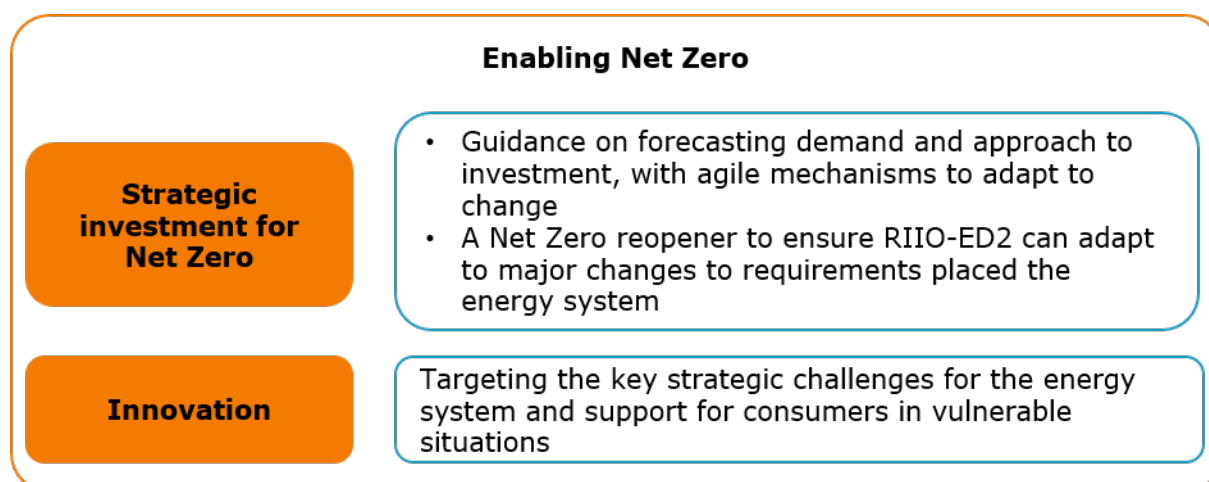
In this chapter, we describe the methods we will use to ensure RIIO-ED2 supports Net Zero. These include new arrangements for strategic investment and the introduction of a Net Zero re-opener to ensure that the price control can adapt to changing requirements.

We will also fund innovation that focuses on the key challenges facing the energy sector and on protecting the interests of vulnerable consumers.

Introduction

- 4.1 A key objective of RIIO-ED2 is to support the delivery of Net Zero at the lowest cost to the consumer. The various pathways to Net Zero indicate that electricity demand will grow significantly, as consumers increasingly rely upon the electricity networks for their power, light, heating and transport. This will place additional demands on the local grids and in some instances, this will exceed existing capacity unless the DNOs take action.
- 4.2 There are two elements to how RIIO-ED2 will support Net Zero. First, we will put in place arrangements to enable strategic investment ahead of need to ensure the networks are preparing for the increased demand from electrification of heat and transport, while also protecting consumers from higher costs than necessary. We will also ensure the price control is adaptable and this will include the use of a Net Zero re-opener so that DNOs are able to respond when there are material changes in demand. Second, innovation will be required to meet the challenges of Net Zero at the lowest cost and RIIO-ED2 will have funding in place to support this and ensure that innovation is focussed on the most critical issues.
- 4.3 This chapter is structured around these themes, as illustrated in Figure 5 below.

Figure 5: Enabling Net Zero themes



Strategic Investment for Net Zero

Our decision

Table 2: Strategic investment

Purpose	To enable investment to support Net Zero at the lowest cost to consumers.
Decision	<ol style="list-style-type: none"> 1. DNOs to use a common set of forecast assumptions derived from compliant Net Zero pathways. 2. DNOs must support proposals for investment with robust evidence. 3. We are considering the use of an automatic mechanism to flex allowances for Net Zero and will undertake further work on its design. Our use of such a mechanism will depend on whether we can establish appropriate controls on how it is used. 4. Where there are major changes in requirements that are placed on the energy system, we will use a wider toolkit of administrative Net Zero uncertainty mechanisms. 5. In responding to new demands, our principal aim is to support long-term whole system optimisation. This means that we expect DNOs in the first instance to use flexibility to address network constraints, while ensuring networks do not become blockers to an uptake in low carbon technologies.

Our Consultation position

- 4.4 In our Consultation, we did not propose to take a specific approach to anticipatory investment. Instead, we discussed the various issues associated with the topic and sought views on how these could be addressed.
- 4.5 A key topic we raised is whether companies should base their investment plans on forecasts derived from a centralised set of assumptions, or instead take a decentralised approach and use engagement with regional stakeholders to establish future demand. We also highlighted the factors that need to be taken into account in deciding on the balance of funding provided through baseline allowances vs uncertainty mechanisms.
- 4.6 We set out four different models to characterise the options available:
- **Model A:** DNOs base their investment proposals on a central forecast. Funding would be provided through baseline allowance
 - **Model B:** DNOs base investment proposals on a central forecast. We assess reasonable certainty of demand to determine baseline allowances and use uncertainty mechanisms to flex these within the period
 - **Model C:** DNO would engage with regional stakeholders to establish investment requirements. Funding for these would be included in the baseline allowance
 - **Model D:** DNOs would base their investment proposals on a regional plan. We assess reasonable certainty of demand to determine what baseline allowances and use uncertainty mechanisms to flex these within the period.
- 4.7 We highlighted the concern that a decentralised approach may see plans that have developed through engagement with local stakeholders being subsequently challenged by us to demonstrate the proposals are credible. As a way of potentially addressing this, we provided a link to guidance on preparing Local Area Energy Plans (LAEPs) issued by the Centre of Sustainable Energy and Energy Systems Catapult,²⁴ and sought views on its application to RIIO-ED2.
- 4.8 We also discussed the different types of uncertainty mechanisms that could enable the price control to adapt to changing requirements. We highlighted how these might need to be accompanied by incentives on DNOs to forecast accurately and

²⁴ <https://www.cse.org.uk/projects/view/1369>

invest efficiently. We presented a range of options for different uncertainty mechanisms and incentives and sought views on these.

Responses to our Consultation

Centralised vs decentralised forecasts

- 4.9 This topic attracted interest from a large number of stakeholders. We have drawn out below the key observations we have taken from responses.
- 4.10 Most respondents accepted that both centralised and decentralised forecasting approaches have challenges and that a more complex, non-binary approach may be needed.
- 4.11 Several respondents, including consumer bodies, industry parties and some DNOs emphasised the importance of a consistent and standardised approach to forecasting for the purposes of setting baseline allowances. This would support, among other things, common and transparent assumptions on key inputs to plans, such as sources of evidence for the projected uptake of electric vehicles.
- 4.12 Some stakeholders commented that national targets are unlikely to capture the requirements for a specific region. It was highlighted that climate change ambitions could vary across the country, and also that requirements could depend upon local factors such as the condition of housing stock and dependency on transportation modes. The proximity to the gas mains (or lack of proximity) was also cited as a relevant factor in establishing what type of decarbonised heating solution might be required.
- 4.13 Although many stakeholders saw the benefits of a more decentralised approach, several were concerned about the risk of using forecasts produced by DNOs as an input to setting their allowances and then providing them with incentives to underspend. Their concern was that this may encourage an overestimation of forecast demand in order to increase allowances. Were we to use these forecasts, stakeholders said there would need to be robust and independent scrutiny to test the methodology. A number of stakeholders highlighted the role that Customer Engagement Groups could play in this regard, and that the credibility of the forecast could be assessed (and rewarded/penalised) through the Business Plan Incentive.

- 4.14 Associated with this, several stakeholders highlighted the role that data must play in providing transparency on assumptions used to identify demand growth and investment required. To support this, stakeholders considered there would need to be better consistency in the data and methodologies used, which should also include enhanced monitoring and reporting on network utilisation.
- 4.15 Other protections that respondents highlighted could include a requirement for DNOs collectively to aggregate local forecasts to test their alignment with a national forecast. Others felt that requiring Distributed Future Energy Scenarios to flow directly from national Future Energy Scenarios could be helpful in limiting the level of discretion that individual DNOs could apply. A supplier felt that the Net Zero Advisory Group could help to assess the credibility of regional forecasts where they deviated from a central forecast.
- 4.16 A number of respondents, including DNOs, industry participants, regional and devolved government and consumers bodies, highlighted how national, devolved and regional government targets can be drivers of both centralised and decentralised forecasts. Stakeholders suggested that to help us gain confidence in these targets, and in the network investment required to achieve them, we should take into account:
- The statutory and/or legal status of these targets, and any implications of these not being achieved
 - Whether the body setting the target is providing any financial or resource commitment required to support the achievement of targets
 - Whether the body setting the target could be considered representative of consumers in a country or region who could face an increase in energy bills as a consequence.

Supporting regional/local plans

- 4.17 Generally, there was a degree of support for the incorporation of the views of regional stakeholders through a more robustly defined engagement framework. In this matter, 21 stakeholders commented on the role of LAEPs, and on the guidance we referenced.
- 4.18 Stakeholders were broadly positive about the guidance on preparing LAEPs. Some DNOs highlighted how this could be used to assess and weight regional inputs to their business plan.

4.19 However, the following points were noted as potential gaps in the guidance:

- at present, the LAEPs guidance does not clearly assign roles and responsibilities to different parties
- the impact on reliability and the costs involved in different options (and how these impacts might be distributed across customer groups and their wider impact on the whole system) did not appear to be taken into consideration.

4.20 Although positive about the guidance, several stakeholders highlighted the variability of technical capability and resourcing that local authorities could dedicate to developing and managing LAEPs. This was noted by DNOs, local government, and consumer representatives. Without the right resource, the quality of the resulting LAEP would be diminished, although one consumer body felt that, even where a fully-fledged LAEP was not available, the inputs from regional stakeholders should still be taken into account.

4.21 The Scottish Government highlighted that LAEPs and UK government targets should not mean that regional or devolved targets should be marginalised or ignored. Post consultation, the Scottish Government, through engagement with stakeholders, have come forward with a draft framework for devolved, regional and local area (DRL) energy planning that DNOs and Ofgem could take into account in assessing the viability of a regionally-led plan. This has been informed by the LAEP guidance, but adapted to be more generally applicable. To allow other stakeholders access to this draft framework, we have published it alongside this Decision.

4.22 During the consultation period, Citizens Advice published "Meeting Net Zero",²⁵ a report which explored options for network companies when considering highly anticipatory investments. Among the conclusions that we consider may be relevant to this subject, are their observations that economic changes which are likely to arise as a result of COVID-19 may mean that:

- reductions in the demand for energy may weaken the case for highly anticipatory investments
- customer willingness to pay for improvements to the quality of service or protection of the environment may be lower

²⁵ <https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/meeting-net-zero-options-for-network-company-highly-anticipatory-investments-in-a-post-covid-19-environment/>

- the case for applying real options analysis is especially strong in the current context with the value of options to defer major investment now likely to be higher.

Uncertainty mechanisms and incentives

- 4.23 Some stakeholders, including a DNO and industry bodies, felt that we should only make limited use of uncertainty mechanisms and instead provide adequate baseline allowances to meet investment for future needs. The use of Price Control Deliverables²⁶ was cited as a means of ensuring baseline allowances would be used for the intended purpose.
- 4.24 Other stakeholders recognised the challenges and risks of setting a fixed allowance and supported the use of uncertainty mechanisms in the face of changing requirements and a shifting technology landscape
- 4.25 Of these stakeholders, some expressed a preference for a particular uncertainty mechanism and/or incentive arrangement. Others were less committed to a specific mechanism or arrangement and instead provided analysis on the strengths and weaknesses of different mechanisms, or made general points about the implementation of these mechanisms.
- 4.26 There was however a general view from respondents that the uncertainty mechanisms should work quickly and avoid delaying investment. Various stakeholders also recognised that more than one mechanism might be needed to deal with different types of uncertainty. For instance, one DNO highlighted that in addition to a volume driver on capacity, an additional mechanism might be needed to manage uncertainty around the volume of service interventions that could be required to deal with increases in low carbon technologies being installed.
- 4.27 The need for uncertainty mechanisms to operate speedily led to many stakeholders supporting the volume driver approach, through which revenues would be adjusted by a fixed amount (a “unit cost”) in line with each unit of capacity added to the network.
- 4.28 However, several respondents highlighted the risk that DNOs could use this type of arrangement to their own advantage. For instance, this could be by using the

²⁶ Through a Price Control Deliverable the DNO’s ability to recover a prescribed level of funding is conditional on their delivery of a predetermined scheme or outcome.

mechanism to increase revenues in order to maximise performance against other price control incentives, without an equivalent benefit to consumers in exchange.

- 4.29 To offset these risks, several stakeholders highlighted the need for transparency on both network utilisation and the inputs used to determine the unit cost allowance. It was felt that this was needed to ensure that the networks were not being funded for an inflated cost of adding capacity, and that there was visibility on what impact their expenditure had on network capacity.
- 4.30 An industry stakeholder and a DNO suggested that Ofgem should reserve the right for more wholesale changes within the period, to ensure that the price control can be adjusted if there is a significant deviation in requirements, or if automatic mechanisms are not operating as intended.
- 4.31 Although several stakeholders gave their recommendation on the specific mechanisms we should use, some felt that more detail was needed on how these would operate in practice. Suppliers and a consumer body were also keen to understand what potential impact these mechanisms might have on consumer bills.

Reasons for our decision

Centralised vs decentralised forecasts

- 4.32 There are a range of different Net Zero compliant pathways that could be used to inform investment requirements on the distribution network. Even when considering only a subset that are consistent with Net Zero targets, these diverge from each other due to different assumptions on drivers of demand. In the short-term these divergences may be relatively small, but over a longer-term period they differ to a significant degree.
- 4.33 Without some form of centralised starting point, this could lead to individual DNOs choosing a forecast that is based on different assumptions than those that are adopted elsewhere. This inconsistency in approach is not compatible with our intention to drive outcomes that maximise benefits across the whole system and, potentially, could undermine the delivery of Net Zero targets at a national level. We therefore consider that there are significant benefits to DNOs using common sets of forecast assumptions. We will provide the common sets of forecast

assumptions that DNOs should apply in our Business Plan Guidance. We plan to publish that Guidance in January 2021.

- 4.34 We will include within these assumptions outcomes that are consistent and reasonable across a wide range of different Net Zero compliant scenarios, by the Committee on Climate Change (6th Carbon Budget) and by the Electricity System Operator (Future Energy Scenarios), including electric vehicle and heat pump uptake rates. We will consider government commitments and targets, such as ending sales of new combustion engine cars and vans and for heat pump rollout included within the Government's 10 point plan for a Green Industrial Revolution. These scenarios include an assumption that there will be a rapid take up on electric vehicles in RIIO-ED2 and continued growth of solar photo-voltaics, with demand from heat expected to steadily increase during RIIO-ED2.
- 4.35 We expect DNOs to apply these common assumptions on forecast demand in their investment planning. We consider that, where a DNO can show that these forecasts will lead to constraints on their network, during RIIO-ED2, then there is a strong case for funding to be provided in baseline allowances to support intervention. Equally, where these forecasts are higher than the demand a DNO realistically expects for their region, we expect DNOs to adjust their business plan to reflect and respond to that. At the heart of our proposed approach is that DNOs should plan, and account for, key uncertainties in a transparent manner as part of their business plans.

Supporting regional/local plans

- 4.36 The use of these common sets of assumptions on forecast demand should not restrict DNOs from seeking to get input from local, regional or stakeholders including devolved administrations to understand their plans for energy, transport, housing and other factors that may be relevant for network development. DNOs should take a proactive approach in supporting this engagement and they should give full consideration to the impact that ambitions to decarbonise at a faster rate than the national target might have on their plans. However, in bringing forward investment proposals based on this engagement, DNOs must be capable of justifying projections of anticipated demand.
- 4.37 Where a DNO is seeking to have funding to support investment driven by regional ambitions incorporated into their baseline allowance, then we will require them to provide persuasive evidence. This evidence base should include a justification of

the need for expenditure driven by projections of anticipated demand, as well as the efficiency of the proposed solution.

- 4.38 There may be several ways that a DNO can demonstrate the need for the investment and we are not predetermining the evidence we will require. We are therefore not mandating a requirement to apply either the LAEPs guidance, or the draft framework for DRL energy planning provided by Scottish Government. However, we do consider that these are helpful to illustrate the type of information and evidence that could support a proposal of this nature. In reaching our decision we will take into account all relevant evidence that is provided. We recognise that this may include material that does not fully align with either the LAEPs guidance or the Scottish Government's proposal for a draft DRL energy planning framework.
- 4.39 The network companies will need to have collective arrangements in place to ensure that, when aggregated together, the regional assumptions DNOs have made on future demand support a credible forecast of demand at a national level. We will set out more detail on these arrangements in the Business Plan Guidance.

Baseline allowances, uncertainty mechanisms and incentives

- 4.40 One key uncertainty is when the increased demand will arise, and whether it will arise within the price control period. In bringing forward proposals for baseline funding, we therefore also expect DNOs to consider what arrangements are appropriate to ensure that any funding provided is used for the intended purpose. This might be in the form of a Price Control Deliverable, either for a specific project, or a metric to account for the proposed aggregated investment in increased capacity. We will explore this approach with network companies over the coming year, with a view to achieving long-term outcomes that protect the interests of consumers as well as providing DNOs with certainty on funding and retaining incentives to drive efficient delivery of expenditure.
- 4.41 Any given baseline scenario (national, regional or local) that is assumed for business planning in 2021, will inevitably differ from actual demand on the network, even in the short-term. For this reason, we do not consider it is appropriate to rely solely on baseline allowances to provide funding for the investment required. Given levels of uncertainty, this approach seems highly likely to result in allowances which are either too high or too low, neither of which would be in the consumer interest.

- 4.42 We therefore want allowances in RIIO-ED2 to be able to flex to respond to changes in demand and supply. We consider that generally the type of work that might be required on the electricity distribution networks will likely come in the form of a high volume of relatively low value (ie sub £5m) projects.²⁷ If this is the case, there is a risk that their delivery could be slowed down by an administrative re-opener process, through which the merits of individual projects are considered before a decision is made on funding. Therefore, in addition to the baseline allowances, we are inclined towards the use of an appropriate automatic mechanism to support a fast response from DNOs to changing requirements.
- 4.43 We are however naturally conscious of and share the concerns raised by stakeholders that an automatic mechanism could be exploited by DNOs to their own advantage. We will therefore not confirm what type of uncertainty mechanism we will use until we have developed options further, to ensure there are appropriate controls on how it may be used. This development will require input from the industry and stakeholders.
- 4.44 In the first instance, our focus will be on the design of a Capacity Volume Driver coupled with a utilisation metric. Of the different options we have identified, these two, operating in combination, seem to offer the most potential for enabling agile investment to support Net Zero, while protecting consumers against inefficient investment. If we decide to proceed with these arrangements, we will need further information from the DNOs in relation to existing levels of utilisation and the projected impact that investment proposals in business plans are expected to have on these.
- 4.45 We recognise that some DNOs may require additional automatic mechanisms to deal with uncertainty regarding the volume of a particular type of work that may be required on their network (such as unlooping services). We will work with industry to develop these or, if this is an issue that is only relevant for one DNO, then we will expect the DNO to propose bespoke arrangements in their business plan. In either event, we will only seek to introduce additional mechanisms if we are convinced that the issue is material and cannot be managed by the DNO through baseline allowances.
- 4.46 Although we are inclined towards the use of an automatic uncertainty mechanism to manage the risk of relatively minor forecasting errors, we do not think this

²⁷ This contrasts with work on the transmission networks where there is generally a low volume of projects, but these tend to be of much higher value.

would be suitable to deal with major changes in the profile of demand, such as those that might arise through a government decision on the future of decarbonised heating. Where this is the case then we will use a wider toolkit of administrative uncertainty mechanisms, including the Net Zero re-opener that we discuss in more detail below.

Approach to investment

- 4.47 We have also reflected on the nature of the response we expect from DNOs once they have identified a potential need for network investment. Ultimately our decisions on these matters will be made in our Final Determination once we have companies' business plans and other available evidence. However, currently, we think there is a benefit in sharing our expectations to help guide the approach that DNOs take in preparing their business plans.
- 4.48 When investment is undertaken it should support long-term whole system optimisation, regardless of whether the expenditure is funded through baseline allowances or uncertainty mechanisms.
- 4.49 To support this, we will require DNOs to make the best use of existing network capacity first, by fully utilising flexibility technologies to manage changes in peak demand. This is because there is uncertainty at both the level of future demand, and also the potential increased value that flexible solutions, especially DSR, might be able to offer in the future. For instance, the uptake of electric vehicles will increase overall levels of demand, but if charged smartly they may not necessarily cause an increase in peak demand beyond the level that can be accommodated through existing capacities. Indeed, maximising flexible electric vehicle charging is important for a future low-cost system, not only to manage network constraints now. Although our view on these matters has been reached independently, we note that this is broadly aligned with the conclusions reached by Citizens Advice.
- 4.50 A network capacity upgrade may be necessary where flexibility is likely to be insufficient by itself to meet anticipated growth in peak demand. Where this is the case, DNOs should show that they have considered the option value provided by flexibility in the timing of their upgrades to capacity. In doing so, they should account for the long-term prospects for demand across different future scenarios and size capacity upgrades so they minimise long term costs for consumers;

comparing options for larger, one-off upgrades against smaller, incremental ones to 2050.

- 4.51 DNOs may identify circumstances where adding surplus capacity in the short-term in order to meet anticipated growth in demand over a much longer-term planning horizon is appropriate. For instance, in areas of the country that are not currently 'on' the gas grid, the most likely decarbonised heat solution will require an increased demand for electricity at some point before 2050. We expect these circumstances to be supported with persuasive evidence that this is the most efficient means of addressing future needs. We will also expect there to be controls in place, such as Price Control Deliverables, to ensure that any funding provided to support the provision of additional capacity is only used for the purpose intended.
- 4.52 Establishing the lowest cost solution to new sources of demand such as electric vehicles will require network operators to take into account the impact different solutions might have on costs across the whole system. To do so, they should co-ordinate proposals with other network operators and the electricity system operator. We will use the system-wide Net Zero re-opener (discussed below) to adjust funding where appropriate. We may also use the Co-ordinated Adjustment Mechanism (discussed in the following chapter) to reallocate funding within and across sectors where this is necessary to achieve the best whole system solution, while delivering net benefits to electricity consumers.

Net Zero re-opener

Our decision

Table 3: Net Zero re-opener

Purpose	<p>To provide a means to amend the price control in response to changes connected to the meeting of the Net Zero carbon targets that have an effect on the costs and outputs of network licensees.</p> <p>To provide an increased level of adaptability within the RIIO-ED2 price control.</p>

Decision	To introduce a Net Zero re-opener that will facilitate adjustments to allowances and outputs within RIIO-ED2 in order to align the price control with Net Zero targets.
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Our Consultation position

- 4.53 In our Consultation, we proposed to introduce a re-opener mechanism to allow adjustments to be made to the price control to reflect changes connected to the achievement of the Net Zero carbon targets, not otherwise captured by any other RIIO-ED2 mechanism.
- 4.54 We proposed that the re-opener mechanism could be used by Ofgem at any time throughout the RIIO-ED2 price control and would be subject to a materiality threshold in line with the proposed common approach to re-openers in RIIO-ED2.²⁸
- 4.55 We proposed that the re-opener should have a broad scope to ensure that RIIO-2 can be adaptable to a wide range of potential developments.

Responses to our Consultation

- 4.56 29 stakeholders commented on the Net Zero re-opener. The majority of stakeholders were supportive of the re-opener, some were not.
- 4.57 Four of the six DNOs supported the Net Zero re-opener. They requested additional details on the role of NZAG, the right to trigger the re-opener and the thresholds for the re-opener.
- 4.58 Two DNOs disagreed with our proposals for the re-opener. One argued that the re-opener was too broad and could be used to change the entirety of the price control with limited recourse for network companies. The other argued that, as there should be greater certainty on Net Zero for RIIO-ED2 relative to the transmission and gas distribution price controls, and as NZAG would have the opportunity to feed into the RIIO-ED2 review, a Net Zero re-opener was not required.

²⁸ See paragraphs 11.55-11.58 of [Annex 2 of the Sector Methodology Consultation](#)

- 4.59 Other stakeholders including DNOs were broadly supportive of the re-opener but requested detail on aspects of the proposal, including in relation to:
- NZAG, its composition, terms of reference, and the opportunity for network companies and the energy industry to engage with it.
 - Timing considerations and ensuring that decision making under the re-opener can be sufficiently agile.
 - How costs arising from use of the re-opener will be passed to consumers and how upwards and downwards adjustments to allowances may work in practice.
 - The definition of the re-opener triggers.
- 4.60 DNOs suggested that they should have the ability to trigger the re-opener, in addition to Ofgem. However other stakeholders, including industry, suppliers and consumer representatives considered Ofgem-only triggers to be appropriate. Citizens Advice noted that the involvement of NZAG and others should address network company concerns in this regard.

Reasons for our decision

Overall rationale for mechanism

- 4.61 Respondents to the Consultation generally agreed that arrangements should be put in place to deal with Net Zero-related uncertainties.
- 4.62 In our view, it is critical that the price controls enable the gas and electricity networks to support the achievement of Net Zero targets. We recognise that Net Zero policy will not develop in five-year segments, aligned with our RIIO-2 timetable. Accordingly, there may be circumstances during the price control period where assumptions made to set the price control are no longer appropriate, due to changes related to the transition to Net Zero.
- 4.63 Where material changes requiring significant adjustment to expenditure due to, for example, changes in government policy, the role of network companies, or technological or market developments occur it may be necessary to make adjustments. The effect of these adjustments could be, among other things, to increase or decrease allowed revenues during the period rather than waiting until the next price control review. For these reasons we have decided that there should be a Net Zero re-opener in RIIO-ED2.

Scope

4.64 We are not making a decision on the precise scope of the re-opener at this stage. We consider that a narrowly framed re-opener may be ineffective in enabling us to respond to a broad range of potential developments in RIIO-ED2, as this might mean that we miss opportunities in RIIO-ED2 to facilitate the achievement of the Net Zero targets. We consider that it may be appropriate for the re-opener to facilitate adjustments to the price control in order to reflect a wider set of developments including changes in government policy, the successful trial of new technologies or other technological advances, changes in the pace or nature of the uptake of low carbon technologies and new obligations arising from the agreement of Local Area Energy Plans (or equivalent arrangements). We will consult on the scope of the re-opener as part of our Draft Determinations.

Other matters

4.65 We proposed that the re-opener mechanism could be used by Ofgem at any time throughout the RIIO-ED2 price control and that a materiality threshold in line with the proposed common approach to re-openers should apply. In the Final Determinations for RIIO-T2 and RIIO-GD2, we decided that Ofgem alone should have the ability to trigger the mechanism at any time during the price control and that, for a materiality threshold, in line with our common approach to re-openers, adjustments when multiplied by the Totex Incentive Mechanism (TIM) rate must exceed 0.5% of annual average base revenue.²⁹ We are not at this stage concluding on the detail of the mechanism that will be implemented in RIIO-ED2 and will return to these points when we consult as part of our Draft Determinations.

4.66 We note that some respondents requested detail on the role of NZAG. We have provided more information in Chapter 2.

²⁹ See [RIIO-2 Final Determinations - Core Document](#) paragraphs 7.5 and 7.21-7.24.

Innovation

Our decision

Table 4: Innovation summary

Purpose	To enable innovation to drive down costs to consumers, facilitate the attainment of Net Zero Targets and support consumers in vulnerable situations
Decision	<ol style="list-style-type: none"> 1. We will introduce measures to encourage companies to do more innovation as business as usual (BAU) using their totex allowances. 2. We will put in place a Strategic Innovation Fund (SIF) to replace the Network Innovation Competition (NIC). The SIF will support large scale, strategic innovation projects in RIIO-ED2. 3. We will retain the opportunity for additional innovation funding in the form of the Network Innovation Allowance (NIA) focussed on the energy system transition and vulnerable consumers.

Our Consultation position

4.67 In our Framework Consultation, we proposed to adopt a similar position on innovation-related methodology for RIIO-ED2 as we did for the transmission and gas distribution sectors and the ESO.³⁰ Our intention was that this would facilitate collaboration and shared learning across the energy sector for the benefit of all consumers.

4.68 Accordingly, in the RIIO-ED2 Framework Decision, we decided to:

- Remove the Innovation Rollout Mechanism (IRM) re-opener.
- Introduce a new innovation funding pot that targets future-facing strategic challenges, replacing the Network Innovation Competition (NIC).
- Retain the opportunity for network companies to receive Network Innovation Allowance (NIA) funding.

³⁰ Details of arrangements for innovation in RIIO-2 for the transmission and gas sectors can be found in paragraphs 8.52 - 8.89 of the Final Determinations: <https://www.ofgem.gov.uk/publications-and-updates/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator>

4.69 In our Consultation, we developed this Framework and set out our proposals to:

- drive more innovation through DNOs' business as usual activities
- replace the NIC with the Strategic Innovation Fund (SIF), through which we would drive forward large scale, strategic innovation projects in RIIO-ED2
- retain the opportunity for DNOs to receive funding through a NIA focussed on the energy system transition and vulnerable consumers, with an improved NIA Framework
- set levels of NIA funding on the basis of the quality of a DNO's business plan submissions and the justifications for NIA funding set out in the business plan.

Responses to our Consultation

4.70 We received 25 responses to our proposals in relation to the RIIO-ED2 innovation stimulus. Respondents included the DNOs, suppliers and consumer representatives.

Driving innovation within BAU activities

4.71 Respondents were generally supportive of our proposed methodology for increasing levels of BAU innovation.

4.72 DNOs said that a higher sharing factor in the TIM would increase incentives to be innovative. Consumer groups noted that there was a risk that BAU innovation would not be shared with other DNOs due to the fact that the focus on the dissemination of learning was confined to innovation funded through the RIIO-ED2 innovation stimulus. Additionally, one DNO noted that Ofgem should not over rely on BAU innovation but consider it within the broader context of innovation spending required in the price control.

4.73 Industry respondents suggested that Ofgem should monitor BAU innovation in RIIO-2 and place an obligation on network companies to consult affected market participants prior to beginning BAU innovation. They considered this would avoid undermining the competitive development of flexibility markets outside the scope of the innovation stimulus.

4.74 One industry respondent proposed an extension of DNO collaboration with third parties to include BAU innovation, and a consumer group requested additional guidance on the balance of risk expected to be taken in BAU. It also noted a

potential role for CEGs in challenging innovation funding requests received as part of DNO's business plans.

Strategic Innovation Fund

- 4.75 Most stakeholders were supportive of our proposals for the SIF, and their comments reflected ideas for how SIF could be managed or improved.
- 4.76 Generally DNO's responses asked for further details on the role of Net Zero Advisory Group (NZAG) and Net Zero Innovation Board (NZIB), as well as information on how public funding streams would be aligned, the timing of Innovation Challenges, the role, responsibilities and accountability of the SIF administrator, and the timing of submissions for funding. Further information on these points will be provided in the RIIO-ED2 Draft Determinations.
- 4.77 There were suggestions for the qualifications of those on the proposed expert panel or Net Zero Innovation Board from various stakeholder groups, and ideas for innovation challenges based on strategic network wide issues, such as the reduction of substation monitoring costs.
- 4.78 One consumer group proposed that CBAs that capture the social return on investment be used in the assessment of bids, while proposals on third-party collaboration were raised by local government and industry stakeholders. Another industry stakeholder suggested that the SIF should allow for a less prescriptive and more engagement-based approach for third parties to suggest new projects and ideas.
- 4.79 There were several suggestions relating to the level and treatment of funding. One consumer group proposed that SIF projects could be funded via cost savings derived from the implementation of past successful projects, which would reduce the amount of money recovered via Use of System Charges. Another suggested that the proposed amount of funding made available through the SIF appeared low within the context of the environmental crisis.

Network Innovation Allowance

Alignment with RIIO-ET2, RIIO-GT2 and RIIO-GD2

- 4.80 All respondents were supportive of our proposal to align the NIA with the other sectors in RIIO-2, allowing for a strategic focus on the energy system transition

and/or vulnerable consumers and the employment of a consistent reporting framework. One DNO commented that, given time-lags between the price controls, improvements based on experience could be incorporated into RIIO-ED2.

Strengthening the NIA framework

4.81 Stakeholders responding to our proposals to strengthen the NIA framework also provided their own suggestions on how we might achieve improvements.

Proposals included:

- Strengthening the monitoring of benefits through the development of a consumer stakeholder panel and surveys, and the establishment of baselines. A DNO also noted that a common impact assessment for consumer vulnerability could be developed.
- The allocation of funding specifically to vulnerability was raised by some consumer groups.
- A wider scope for NIA: stakeholders, including DNOs, consumer interest groups and academics, suggested broadening the scope of NIA to permit the funding of projects that deliver consumer benefits unrelated to the energy system transition or consumer vulnerability.
- Funding of commercially available technology: DNOs and industry bodies considered that commercially available technology should be funded through NIA because there may be significant costs associated with adapting and rolling out proven technology.
- Ease of access for third parties: a number of stakeholders suggested that collaboration with third parties should be encouraged. One consumer group proposed that each project should involve at least one third party, whose selection should be well justified.
- Quality assurance: stakeholders were generally supportive of peer reviews, and project-related reporting. one industry stakeholder suggested that suppliers should review projects, while DNOs tended to prefer peer review and highlighted that collective work by DNOs and other network companies on an industry-led reporting framework provided quality assurance.
- Data and output sharing: consumer groups and academia noted that the results and information generated by NIA projects, which are customer funded, should be shared widely.

Setting NIA allowances

- 4.82 Most stakeholders were supportive of our methodology for setting allowances. Some industry stakeholders considered that we should assess DNO plans on a forward-looking basis rather than use their RIIO-1 NIA as a reference point. Other stakeholders including DNOs considered their RIIO-1 NIA allowance and innovation achievements should be considered.
- 4.83 DNOs pointed out that Ofgem's approach may result in increased allowances given new challenges in the energy sector. One noted that the given the removal of the NIC and the as yet undetermined threshold for the SIF, the NIA allowances may need to be higher. Similar points were made by other DNOs.

Reasons for our decision

Driving innovation as BAU

- 4.84 We expect DNOs to fund more innovation as part of their BAU activities in RIIO-ED2, using their totex allowance and relying less on ring-fenced innovation funding for lower risk innovations that can be deployed within the price control period.
- 4.85 We anticipate that the TIM could provide sufficient incentive for such innovation together with the assistance of CEGs and the RIIO-ED2 Challenge Group to drive DNOs' ambition in relation to BAU innovation.

Strategic Innovation Fund

- 4.86 We confirm that in RIIO-ED2 we will replace the NIC with the SIF. The SIF will support strategic innovation that contributes to the achievement of Net Zero targets. The SIF will be designed with the intention of increasing strategic alignment and coordination of network innovation funding with other public sector funding initiatives in order to close funding gaps.
- 4.87 The SIF will invite project proposals to address the Innovation Challenges set by Ofgem after its engagement with the other public funders of innovation at the Net Zero Innovation Board.
- 4.88 The SIF will be designed with the intention of fostering collaboration with third parties and across sectors. £450 million will be made available through the SIF for

RIIO-ET2, RIIO-GT2 and RIIO-GD2 as set out in their Final Determinations.³¹ We will consult upon whether the level of SIF funding made available will need to increase to accommodate RIIO-ED2 innovation at a later stage.

- 4.89 We expect funds for the SIF will be recovered from Transmission Network Use of System (TNUoS) charges, in a similar manner as they currently are for the NIC, but we will consult on the method we will use for recovering funding at a later stage. Individual projects are expected to be high-value. There will be a minimum threshold for project funding and we intend to consider what percentage of project funding should be provided by the SIF.

Network Innovation Allowance

- 4.90 We confirm that the RIIO-ED2 NIA framework will be broadly consistent with the other sectors, allowing for collaboration across sectors on projects where this is likely to maximise network customer benefits. Our methodology will also facilitate accessibility to third party contributions by employing common governance arrangements across all sectors.
- 4.91 Accordingly, NIA will fund projects related to the energy system transition and/or consumer vulnerability, including novel applications of commercially available technologies, and our methodology will be informed by that set out for transmission, gas distribution, and the ESO.
- 4.92 We confirm that NIA funding will be provided as a single allowance to cover the duration of the price control, allowing greater flexibility on the timing of projects.
- 4.93 We will require DNOs to conduct an impact assessment of innovative solutions and their effects upon vulnerable consumers and to implement the improved industry-led reporting in RIIO-2 NIA governance arrangements.³² Furthermore, we will require network companies to produce guidance for third parties on the treatment of Intellectual Property Rights within NIA projects.

³¹ p100 of Final Determinations for the gas and transmission sectors: <https://www.ofgem.gov.uk/publications-and-updates/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator>

³² Paragraph 8.61 of Final Determinations for the gas and transmission sectors: <https://www.ofgem.gov.uk/publications-and-updates/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator>

4.94 Quality assurance measures will be introduced in relation to projects funded by the NIA to improve their outputs and increase the likelihood of projects delivering consumer benefits.

Setting NIA allowances

4.95 In line with other sectors, we will set any individual DNO allowances based on the justification provided in their business plan. Companies requesting high levels of RIIO-2 NIA funding will be expected to provide clear evidence justifying an increase in NIA funding relative to RIIO-1. We also expect them to provide evidence of strong delivery arrangements, with plans to collaborate, involve third parties, disseminate learnings and rollout any proven innovation into the wider business.

4.96 When setting allowances, we will take into account the following, along with other information that may be relevant:

- Companies' proposals for these allowances in their business plans
- The extent to which companies are undertaking other innovation as BAU activities.
- The extent to which companies' proposals incorporate the application of best practices.
- The processes companies have in place to roll out proven innovation into BAU and the evidence that they are already doing so.
- The processes companies have in place to monitor, report and track innovation spending and the evidence that they are already doing so.

4.97 There is substantial NIA funding available in RIIO-ED1 and providing a higher level of funding would raise the short-term costs imposed on customers for the uncertain benefits of innovation. We therefore do not intend to raise this funding level above RIIO-ED1 levels without good cause, such as a very strong proposal brought forward by DNOs. We have also clearly stated that we expect companies to fund more innovation as part of their BAU activities, relying less on innovation stimulus funds.

4.98 We may consider increases in funding where innovation proposals are fully justified with reference to the above-mentioned criteria, and the need for an increased level of NIA funding is strongly evidenced and supported by a clear delivery plan.

5. A smart, flexible energy system

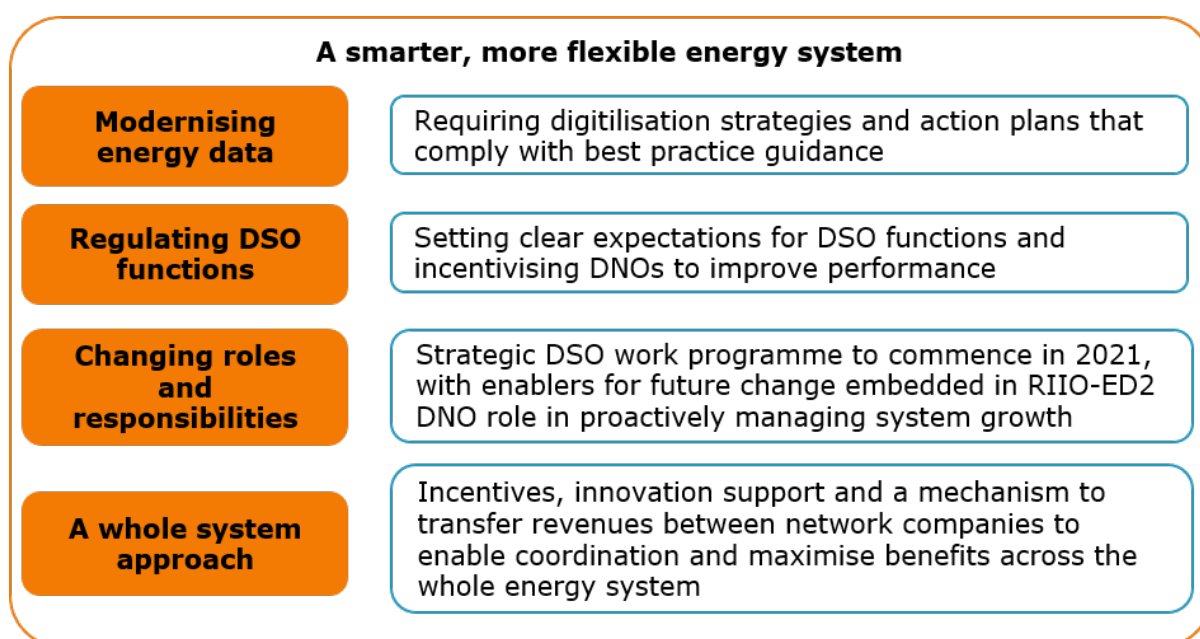
Chapter summary

In this chapter, we describe how RIIO-ED2 will support a smart, flexible energy system. These include new arrangements for modernising energy data and regulating DSO functions. We are putting in place arrangements to enable changes to roles and responsibilities, if required, and we are interested in understanding the role that DSOs may play in proactively managing future growth. We are also using incentives and implementing mechanisms to drive whole system solutions.

Introduction

- 5.1 A smart, flexible energy system will require more active management of the flows of energy across the networks. The interconnected nature of the electricity networks and the wide variety of resources that are now connected at different voltage levels, requires DNOs to act in a way that maximises efficiencies across the whole energy system. New technologies and resources can help to smooth out peaks and minimise the need for infrastructure. All of this will require better and more easily accessible data than is currently available.
- 5.2 There are four strands to how RIIO-ED2 will support the energy system transition.
- First, we will introduce requirements on DNOs for how they manage data
 - Second, we will define and regulate the DSO functions the DNOs need to undertake
 - Third, we recognise there is scope for DSO roles to evolve and questions about enduring institutional arrangements. In early 2021 we will be kicking off a programme of work to review DSO governance arrangements. As such, we must ensure that the price control can adapt to any changes in current arrangements. We also want to understand the extent to which DNOs can proactively manage future system growth.
 - Finally, we need arrangements to ensure that DNOs take into account the impacts across the whole system in the operation of the distribution networks.
- 5.3 This chapter is structured around these strands, as illustrated in Figure 6 below.

Figure 6: Enabling a smarter, more flexible energy system



Modernising Energy Data

Our decision

Table 5: Data

Table 5: Data	
Purpose	To ensure DNOs carry out energy system digitalisation and improve their effective use of data, ensuring a consistent and coordinated approach to unlocking the benefits of data for consumers.
Decision	<p>We have decided to adopt the policy position applied to the RIIO-2 price controls for transmission, gas distribution and the Electricity System Operator and introduce requirements on DNOs to:</p> <ul style="list-style-type: none"> • Publish and regularly review a Digitalisation Strategy & Action Plan in accordance with our guidance. • Use data in a way that meets the expectations of Data Best Practice guidance. <p>The two sets of guidance for the gas and transmission sectors are currently available in draft. We will carry out a consultation to finalise their content in the first quarter of 2021.</p>

Our Consultation position

5.4 We proposed to apply the cross-sector policy position³³ we adopted for the RIIO price controls relating to transmission, gas distribution and the Electricity System Operator in RIIO-2 as a starting point for our position on DNOs. The core elements of that policy position were:

- A Licence Obligation requiring the publication and regular review of a Digitalisation Strategy & Action Plan (DSAP) in accordance with our guidance.³⁴
- A Licence Obligation requiring the use of data to meet the expectations of Data Best Practice (DBP) guidance.³⁵
- A rise in the baseline expected of network company use and management of data as a result of progress they have made towards digitalisation since December 2020 (when we made our final determinations about the RIIO-2 price controls).

5.5 We are currently developing the DBP and DSAP sets of guidance in collaboration with stakeholders. We will be carrying out a consultation on these in Q1 of 2021.

Response to our Consultation

5.6 We asked whether respondents agreed with our approach to regulating digitalisation and better use of data through the introduction of cross-sector licence obligations.

5.7 There were 26 respondents to our question. All of the respondents were in agreement with our approach to modernising the UK energy system through licence obligations to comply with our two sets of guidance, DBP and DSAP. Stakeholders particularly welcomed the prospect of our DBP guidance including requirements for a principle that treats data as 'presumed open' for all to access. Respondents said that these licence obligations will provide good progress towards digitalisation, Net Zero and decarbonisation in the energy sector. However, some queries and comments were raised which we have summarised below.

³³ Chapter 4, https://www.ofgem.gov.uk/system/files/docs/2020/07/draft_determinations_-_core_document_redacted.pdf

³⁴ This guidance is currently available in draft form and will be subject to consultation <https://www.ofgem.gov.uk/publications-and-updates/early-draft-digitalisation-strategy-and-action-plan-guidance-available>

³⁵ This guidance is currently available in draft form and will be subject to consultation <https://www.ofgem.gov.uk/publications-and-updates/we-are-creating-data-best-practice-guidance>

- 5.8 Ten respondents felt there would be benefit from a more centralised obligation to ensure consistency across companies. Four respondents wanted clarity on the phrase 'demonstrable value' to justify equipment rollout and clarity on data equipment included during rollouts. One DNO felt the six-monthly update to the Action Plan was too frequent.
- 5.9 One DNO raised concerns about whether it was appropriate to have a Licence Obligation requiring compliance with "best practice", suggesting instead that compliance with explicit standards would be more appropriate. However, several other respondents felt that a best practice approach was appropriate as it would prevent Ofgem from being too prescriptive and provide network companies with scope to develop different approaches to achieve compliance.
- 5.10 A number of respondents suggested we include the concept of data being 'presumed created/collected' as part of the DBP guidance. The intention behind the suggestion being that as DNOs carry out work on the energy system that they take a much more speculative approach to the installation of monitoring equipment and sensors that generate data about the energy system.
- 5.11 Four respondents raised concerns over data sharing with DNOs and the data needs of flexibility markets. In particular, they highlighted that currently DNOs can have access to half-hourly metered data without reciprocity of data sharing. Related to this, another respondent raised a concern about how DNOs are able to access this data, while the Government and the Regulator cannot.

Reasons for our decision

- 5.12 The DBP and DSAP licence obligations were arrived at based on evidence gathered from the sector and stakeholders, in particular evidence obtained through the Energy Data Task Force's industry-wide engagement. This was reflected in the consultation responses received, which strongly support our proposals and agree that the obligations will be effective at progressing the digitalisation agenda and will ensure better use of data for consumers.
- 5.13 Data and digitalisation are continuously developing and changing at pace. We agree that explicit data standards may have a role to play but consider that setting prescriptive explicit standards at this stage would risk preventing DNOs from developing solutions tailored to consumer needs and so may slow overall progress towards effective digitalisation of the energy sector. For that reason, we

consider it appropriate to regulate using a less prescriptive, principles-based approach that will allow for DNOs to explore and develop data solutions more closely tailored to their stakeholders' needs. We remain open to additionally introducing more explicit standards, should a need for them become apparent.

- 5.14 The design of our DBP guidance is intended to address concerns such as for circumstances in which DNOs might have access to data that the Regulator and the Government do not have access to. The guidance also provides requirements for how DNO's must provide greater visibility of the data they hold and how this is to be made either openly available or available to all appropriate stakeholders, providing doing so complies with important rules like the General Data Protection Regulations for the benefit of people's data privacy.

Next steps

- 5.15 We have published initial drafts of the Digitalisation Strategy and Action Plan (DSAP)³⁶ and Data Best Practice (DBP)³⁷ guidance on our website. We have also been hosting workshops on the DSAP guidance throughout December 2020 and will host further workshops on both sets of guidance in Q1 2021.
- 5.16 We will take account of the feedback we received relating to the content of the guidance. Our position on these topics (such as whether to include a principle on 'presumed creation/collection' of data) will be included as part of our consultation on the guidance, to be held in Q1 of 2021.
- 5.17 We published an open letter to network companies in May 2020³⁸ asking them to publish an update to their Digitalisation Strategy and Action Plan by 31 December 2020. We will also use these updates and stakeholders' feedback on the updates to inform our position on our development of the guidance.
- 5.18 For the RIIO-2 price controls relating to transmission, gas distribution and the Electricity System Operator, following consultation we decided to require Digitalisation Strategies to be updated every two years, instead of annually. We did not, however, change our position on the frequency of the update to Digitalisation Action Plans, which is required once every six months. We did

³⁶ Draft of DSAP guidance <https://www.ofgem.gov.uk/publications-and-updates/early-draft-digitalisation-strategy-and-action-plan-guidance-available>

³⁷ Draft of DBP guidance: <https://www.ofgem.gov.uk/publications-and-updates/early-draft-data-best-practice-guidance-available>

³⁸ Our open letter giving feedback on network companies' Digitalisation Strategies <https://www.ofgem.gov.uk/publications-and-updates/review-and-next-steps-riio-digitalisation-strategies>

acknowledge that if evidence shows a need to amend the frequency of reporting, we will adapt this accordingly. To ensure a consistent cross sector approach we will apply the same approach in RIIO-ED2.

5.19 We recommend that, until the beginning of RIIO-ED2, DNOs voluntarily adopt the ‘Modernising Energy Data’ policy that will apply to transmission, gas distribution and the Electricity System Operator companies regulated by the RIIO-2 price controls. This will help to accelerate consistent cross-sector progress towards digitalisation of the energy system for the benefit of consumers. Their doing this will also help ensure DNOs are fully prepared for the introduction of data and digitalisation licence obligations at the start of RIIO-ED2, from April 2023.

Regulating DSO functions

Our decision

Table 6: Regulating DSO functions

Purpose	To drive DNOs to more efficiently develop and use their network, taking into account flexible alternatives to network reinforcement.
Decision	<p>We are introducing a new DSO incentive framework</p> <ul style="list-style-type: none"> • DNOs to set out DSO strategies that will be subject to assessment under the Business Plan Incentive. • DSO strategies must meet our DSO baseline expectations • A new Output Delivery Incentive (ODI) – a DSO strategy delivery incentive – through which we will undertake an ex post review of DNOs’ delivery of their DSO activities.

Our Consultation position

5.20 We proposed to require DNOs to submit DSO strategies that would be subject to the Business Plan Incentive (BPI). In these strategies, plans for compliance with the baseline expectations we included in Appendix 5 of our Consultation would form part of the minimum requirements, ie Stage 1 of the BPI assessment. We proposed to incentivise ambition in plans by offering potential rewards through the CVP for DNOs who demonstrate standards of performance that go beyond the baseline expectations.

- 5.21 We proposed to introduce an ODI comprising an ex post assessment of companies' performance during RIIO-ED2. We said we planned to revise baseline expectations following submission of business plans and the BPI assessment, and DNOs would be held to account on their delivery against the revised baselines. We said we may include good practice set out by any individual DNO in their DSO strategy as part of the new baseline. In addition to the baseline expectations, we would set out metrics to assess companies' performance, and invited DNOs to include suggestions for these metrics in their DSO strategies.
- 5.22 We proposed to undertake the ex post performance assessment in the middle and at the end of the price control.

Response to our Consultation

- 5.23 We asked whether stakeholders agreed with our intention to use the BPI to encourage DNOs to submit DSO strategies that exceed our baseline expectations (OVQ18). 19 of the 25 respondents agreed. DNOs highlighted inherent differences between DNOs could make it inappropriate to require other DNOs to adopt activities proposed in other DNOs' DSO strategies.
- 5.24 24 respondents addressed OVQ23, in which we asked whether stakeholders agreed with the DSO roles and baseline expectations. While respondents made diverse comments on the specific baseline expectations, 15 respondents agreed with or otherwise broadly welcomed them. None disagreed on the whole, though nine did not explicitly state whether they agreed or disagreed. We discuss responses and set out our revised baseline expectations in Appendix 1.
- 5.25 We asked four questions (OVQ19-22) about our intention to introduce a new ODI involving an ex post assessment of DNO performance, and the operation of the incentive. 14 of 21 respondents agreed with introducing the ODI, three presented unclear views and five respondents disagreed. Some respondents highlighted the role for the ODI to capture elements of DSO performance that would not be incentivised through the TIM and Interruptions Incentive Scheme (IIS). Most network companies agreed with our proposals but cautioned against standard metrics, performance benchmarks and deliverables due to regional differences between DNOs. Meanwhile, many non-DNO stakeholders welcomed the standardisation and adoption of good practice that the ODI could drive.

- 5.26 Another key theme across respondents was the need for predictability of the ODI, and for it to be sufficiently strong to incentivise behaviour change. Non-DNO respondents highlighted the importance of a wide range of stakeholders in the design of metrics and other parts of the assessment. Six respondents agreed that it would be appropriate to assess performance at the middle and end of the price control, while ten disagreed. Most of the remaining respondents preferred more frequent assessments (often annual) to provide companies with the opportunity to take account of evolving stakeholder expectations and take corrective action. There were few specific recommendations on the strength of the incentive or the circumstances in which rewards or penalties would be appropriate. Several DNOs suggested there should be more opportunity for reward than penalty to encourage ambition and avoid risk-averseness. More generally, stakeholders highlighted the importance of rewards being significant enough to outweigh reporting burdens and drive genuine behaviour change.
- 5.27 Some DSO functions rely upon enhanced hardware, software and competencies. However, often the specific hardware, software and competency requirements to undertake a DSO function are not well established or require further clarification through time. For instance, we received many representations regarding network monitoring. We found that, while there is significant appetite for enhanced network monitoring, there was limited information or evidence presented on what would constitute the best approach to delivering enhancements, including how to define the needs cases and benefits for specific monitoring data programmes of work, either for networks or non-networks parties. Non-network parties responded that networks alone should not define the benefits cases of network monitoring.

Reasons for our decision

Baseline expectations, Business Plan Incentive and Strategy Delivery Incentive

- 5.28 There are a range of institutional and governance models for how DSO is delivered in the long-term. But in the near-term we need to develop the core DSO capabilities that would be required under any future model. As such, it is imperative we give DNOs the right obligations and incentives to drive forward the DSO transition.
- 5.29 We appreciate that regional factors may mean there are differences in how DNOs should best deliver DSO roles, but we consider that there are baseline

expectations for DSO functions that represent the minimum standard of behaviours, activities, outputs expected of DNOs.

- 5.30 We have revised the baseline expectations since the Consultation; we include the revised expectations in Appendix 1. Some baseline expectations will be required by current or soon to apply licence conditions. But there is value in DNOs explaining, and in a single place, how they plan to deliver against these. Doing so can aid sharing and adoption of best practice. As set out in paragraph 5.40 we will work with stakeholders to consider an enduring role for baseline expectations and DSO strategies, including how they may evolve, in the DSO strategy delivery incentive. However, we do not intend to revise baseline expectations based on review of draft plans for the purpose of the business plan incentive.
- 5.31 DNOs can, and are encouraged to, set out plans that go above and beyond these baseline expectations, and to adapt their actions to their own circumstances based on stakeholder engagement. But the baseline expectations represent the minimum levels of service we expect from DNOs. This will drive standardisation in delivery. Also, it means it's appropriate that DNOs who fail to develop plans that include information on how they will deliver baseline expectations can be penalised for not meeting that minimum requirement under our Stage 1 assessment of the BPI. We set out our decision on the BPI in Chapter 10 of Annex 2, explaining how failure to meet minimum requirements can lead to penalties.
- 5.32 As DSO is an area where there is scope for innovation, it is appropriate to allow DNOs to seek CVP rewards for ambitious DSO strategies under our Stage 2 assessment of the BPI. While there are benefits to convergence around best practice, we will not limit CVP rewards to practices which all DNOs should adopt. We recognise views of respondents that activities that are of great value in one region may be unsuitable for adoption by all DNOs. We set out criteria for CVP rewards in more detail in Chapter 10 of Annex 2.
- 5.33 We will introduce a DSO strategy delivery incentive to assess companies' performance within period, but we are not now deciding how this ODI will operate or the financial exposure. We agree with the stakeholders who highlighted the importance of transparency, innovation and adoption of best practice in DSO. We agree there is a need for an incentive that encourages activities that are not captured in existing mechanistic incentives like the TIM and IIS, for example because net benefits are realised by other parties. At the same time, we understand the importance of predictability, proportionality of reporting, and the

right financial exposure in creating a strong incentive which delivers the right outcomes for consumers. As such we will need to see DNOs' DSO strategies and where appropriate, collaborate with stakeholders to further develop the detail.

Data and monitoring

5.34 Among the baseline expectations are our views on network monitoring and the use of data. We are not prescribing technical specifications and volumes for monitoring roll-out, rather we are offering DNOs the opportunity to justify network monitoring approaches based on their analysis of use cases, specifications, and cost effectiveness. As part of this analysis, DNOs should explore future potential use cases. In bringing these proposals forward, DNOs should demonstrate how these will improve on current arrangements and cost effectively provide DNOs and other parties with the knowledge and control arrangements to operate the system more flexibly and efficiently. For instance, we might expect the DSO strategy to set out their approach to and justification for:

- Real time knowledge of what load and generation is on the distribution network at any time.
- Real time monitoring of network asset health, with greater automation in predicting preventative network maintenance needs.
- The capability to support smart charging of EVs and vehicle to grid supply.

5.35 At Stage 3 of our BPI (see Chapter 10 of Annex 2) DNOs may be penalised for certain costs that are deemed to be inefficient. This should not temper ambition for deploying monitoring and related infrastructure in relation to the above, although obviously we expect the cost of doing so to be efficient. In relation to data and monitoring, our main concern will be with DNOs that lack ambition. As we note above, it is appropriate to allow DNOs to seek rewards where they are innovating to drive improvement in DSO functions.

5.36 This is an area where the requirement for DNOs to deploy monitoring and related infrastructure may need to change as we get a better understanding of what data and monitoring is needed, both by DNOs and third parties. DNO business plans will help to inform our understanding, but we recognise that certain requirements may continue to evolve beyond submission of these plans.

5.37 We therefore invite DNOs to give consideration in their business plans to how uncertainty at future monitoring and data requirements can best be managed, and whether in their view, new uncertainty mechanisms are required.

Next steps

5.38 We are not yet deciding on the operation or value of the DSO strategy delivery ODI. We plan to consult on the mechanism and the value of the incentive at Draft Determinations in 2022. Between now and then we will be engaging with stakeholders to develop options and consider lessons from similar regulatory regimes including the ESO incentive framework.

5.39 DSO strategies in their business plans will inform development of the ODI. The ambition of strategies including the scale of system benefits that can be achieved will help inform our position on the scale of rewards and penalties that could be available. While we are yet to decide the role for the DNOs' DSO strategies in the ODI, they should be specific, measurable and time-bound so that performance against strategies can be monitored within RIIO-ED2. We will work with DNOs and other stakeholders to consider if and how strategies should be updated before the start of and within RIIO-ED2. In our Consultation we proposed to revise the baseline expectations once we had received business plans. Then, we would hold DNOs to account to delivery against these revised standards during RIIO-ED2. We are not at this stage deciding to employ that approach in the DSO strategy delivery ODI. Nor are we ruling it out. We think it is important that the ODI balances predictability with the flexibility to reflect ongoing identification of best practice, changing stakeholder needs and innovation.

5.40 We are inviting companies to propose metrics and performance benchmarks to be used in assessments. We are not now taking a decision on what metrics will be accepted, but generally consider good metrics will be clearly related to consumer outcomes, should measure performance that is within the DNOs' control, and should aid comparative assessment (unless there is evidence this would be inappropriate). In proposing metrics, DNOs should indicate and justify benchmarks that would indicate performance at and above baseline expectations. We also invite DNOs to indicate opportunities where comparative qualitative assessment is viable and rewards could be appropriate, ie where best practice is identifiable and delivers consumer value but cannot be quantifiably measured. Stakeholder engagement in the business plan development process should help DNOs propose ambitious, practical, and relevant deliverables, metrics and other assessment

opportunities. Nonetheless, we retain the right to reject proposals, amend or determine our own metrics and assessment opportunities. We will collaborate with wider (including non-DNO) stakeholders to develop our position on how performance will be measured and consult ahead of reaching our decisions.

- 5.41 Part of our development work will be to consider how mechanistic the incentive should be. We understand that mechanistic incentives promote predictability, and the importance of that in driving good behaviours. But we also recognise the value of applying flexibility in assessments. This is especially the case where it is difficult to set targets given limited historical performance, and to encourage DNOs to be ambitious, take appropriate risks, and change plans where new evidence emerges.
- 5.42 Similarly, we will consider how far assessments should be consistent across DNOs. As set out in the response summary, stakeholder views on this matter were mixed. We will explore to what extent, in what circumstances, and with what justification it is appropriate that DNOs are held to account on bespoke metrics, benchmarks and other assessment criteria. As part of this we will consider where a DNO should be required or otherwise incentivised to adopt best practice planned or delivered by any other DNO.
- 5.43 In determining the frequency of reporting and assessments in the DSO ODI we will need to balance administrative burden with transparency and opportunity to steer DNOs' progress.

Changing roles and responsibilities

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

Our decision

Table 7: Changing roles and responsibilities

Purpose	To increase adaptability of the price control to wider policy thinking in relation to changing roles, responsibilities, and governance arrangements
Decision	<p>We are including provisions around separability, interoperability, and data standards in the baseline expectations.</p> <p>We will require DNOs to identify costs associated with DSO roles in the Business Plan Data Templates</p> <p>We will develop tools we can use within the price control framework, such as a DSO re-opener, to reassign costs and outputs if needed within the RIIO-ED2 period.</p>

Our Consultation position

5.45 In our Consultation, we set out our intention to ensure the RIIO-ED2 Methodology would not be an obstacle to any part or full separation of DSO functions from DNOs should we later decide that that is appropriate. Any decision on governance or institutional change is far wider than the price control. Nonetheless, we suggested ways in which our methodology could support optionality for any outcome of such a decision.

5.46 We proposed to use the price control and other regulatory mechanisms to drive interoperability and ensure data standards that do not limit who could operate equipment or access data in future, while remaining cyber secure. We proposed to reform the Business Plan Data Templates (BPDTs) to isolate costs associated with flexibility, and reform how we capture costs associated with planning, operation and market development. We considered that the DSO incentive framework would, by enhancing scrutiny and transparency of DNOs’ DSO roles, inform any decision taken on separation.

5.47 Finally, we highlighted that we are prepared to change the price control within the RIIO-ED2 period to reflect any decision made around institutional change. We proposed the inclusion of a DSO re-opener.

Response to our Consultation

- 5.48 Twenty-five respondents submitted a response to our question on proposals for optionality (OVQ17). Twelve respondents including five DNOs agreed with proposals to support optionality, three disagreed, and ten presented mixed views or did not state whether they agreed or disagreed.
- 5.49 Fewer respondents made comments on the specifics of the proposals. There was broad support for measures to promote interoperability and data standards. Some non-DNO stakeholders called for stronger separation of governance arrangements and IT systems within DNOs. Meanwhile DNOs highlighted the risks that internal separation could result in losing synergies between network ownership and system operation, and duplicating costs.
- 5.50 There was wide support for identification of DSO costs through the BPDTs, though several DNOs highlighted complexity and grey areas between DNO and DSO roles. Meanwhile three non-DNO stakeholders called for separate allowances for DSO roles.
- 5.51 DNOs generally considered a proposal for a DSO re-opener would add risk and uncertainty. One DNO thought it would only be appropriate as a last resort if DNOs had failed to meet expectations, while another said a decision on the re-opener should not be made until after the start of RIIO-ED2 to maintain focus on writing good DSO strategies in business plans.

Reasons for our decision

- 5.52 While work is underway to consider enduring governance models, we think it is right to embed appropriate measures to facilitate separability of DSO capabilities from the DNO. Not doing so could lead to unnecessarily higher costs if in the future we decide that someone else should take on a DSO function or if there needs to be greater internal separation. We do however recognise that requiring separation or duplication of systems and processes comes at a cost. As such we have not included additional separability measures in the revised baseline expectations. As referred to in the Next Steps section below, we will undertake further work before taking more decisions in this space.
- 5.53 Isolating DSO costs in BPDTs can inform our strategic work programme on governance models for DSO. Meanwhile the methodology for mapping DSO costs

to existing cost categories, and to new categories where appropriate, is important for transparency and consistency in how these costs are reported. This can aid the cost assessment process. We do not agree with the respondents who say allowances should be separated for DSO roles. Isolating DSO costs is complex; there are several shared services, activities and assets that are dual purpose. Inconsistencies across how DNOs allocate these costs could undermine the cost assessment process, while splitting shared services and duplicating dual purpose activities would increase costs. As set out below, we will be carrying out further work to identify where further internal separation is appropriate.

- 5.54 Similarly, we do not think entirely separating incentives is appropriate at this stage. The TIM and IIS drive DNOs to make trade-offs between DNO and DSO solutions, to find the optimal mix.
- 5.55 While we are prepared to make appropriate changes to the price control to better enable or enact any decision on alternative governance arrangements, we are not now deciding on the specific mechanisms to do so. We first need to better identify DNOs' current DSO costs and processes, consider the costs and benefits of alternative governance models, and the implications of these for price control funding and outputs. We also want any re-opener or other mechanism to be developed in collaboration with stakeholders to ensure it is usable while minimising disruption and distraction from the core objective of DNOs delivering DSO roles.

Next steps

- 5.56 Next year we will be kicking off a programme of work to review governance arrangements of DSO. We will consider the challenges for system operation at distribution level, the effectiveness of the current governance model, and trade-offs between alternative models. We will coordinate with our wider full-chain flexibility work and the review of GB system operation that we launched earlier this year.³⁹
- 5.57 A part of this work will be to identify risks of path-dependence and the needs-case for further separability of DSO. We will seek to avoid DNOs setting up DSO capability in a way that makes it more difficult to be cost-effectively removed later if deemed necessary. In doing so, we will take a deeper dive into how DSO is

³⁹ <https://www.ofgem.gov.uk/publications-and-updates/ofgem-review-gb-system-operation-terms-reference>

delivered in practice. We will seek to map DNOs' IT architectures, governance structures and processes. This will aid our understanding of any current conflicts of interest, economies of scope between DNO and DSO, and separability and interoperability of systems and processes. We can then consider whether we need to enhance requirements around interoperability or require further separability of responsibilities.

- 5.58 We will identify the tools we would need to enact or enable any decision on separation or separability. Recognising these actions could have impacts on licences, funding, and outputs, we will develop any tools needed within the price control framework such as a DSO re-opener. We intend to consult on any such re-opener or other tool before the start of RIIO-ED2.

Proactive management of future system growth

- 5.59 Electrification of heat and transport will increase demand on the system. We have set out earlier in this document that DNOs need to consider, and evidence, where strategic investment may be needed to meet this future demand. When they do this, they need to consider first whether the system needs can be effectively met through using flexibility markets or technological innovation. We have also said that we do not expect DNOs to directly control assets connected to their system, unless in very clearly defined circumstances, that are established in collaboration with stakeholders. In addition, DNOs will, from the end of this year, have a new licence condition to promote the uptake of energy efficiency measures where this cost effectively alleviates the need to upgrade or replace electricity capacity.
- 5.60 Against this context, we want to see DNOs play a more proactive role in managing future system growth. Taking part in measures to reduce growth now might be cheaper than reactively responding in the future. We are interested in understanding more about what actions they could take, without undermining competition or duplicating measures already funded elsewhere.
- 5.61 So, we would like to see proposals in the business plans for how DNOs can help to proactively curb anticipated growth in system peaks; helping to meet the challenge of delivering a Net Zero system at least cost to consumers. In considering the activities that they could undertake, we want DNOs to demonstrate that they have taken into account the role that other parties could play. This should include the potential impact that a DNO's involvement might

have on the development and operation of flexibility markets, as well as any potential overlap with initiatives funded by Government.

5.62 We anticipate that DNOs will work with suppliers, aggregators, local authorities, and other third parties to develop mutually beneficial proposals. These might include working with local councils to identify priority areas to upgrade the energy efficiency of buildings to proactively help to curb demand growth. Or collaborating with relevant parties to facilitate the installation of smart technologies and appliances in regions the DNO has identified as likely to need closer management in the future; making use of the increasing digitalisation of the system to support a framework where signals enable smart technologies to help shift or lower peak usage.

5.63 We are interested in understanding if the package of measures in our price control sufficiently encourages DNOs to take actions in RIIO-ED2 that would help reduce demand in the long-run and thereby reduce the need for investment in future price control periods. We are interested in understanding what the scale of this problem is and whether additional measures are needed to spur DNOs to take these actions. Separate to business plans, we therefore invite DNOs and other stakeholders to propose if and how the price control might better enable this. Please provide your response to RIIO2@ofgem.gov.uk. We welcome responses by 5 March 2021.

5.64 For now, we are keen to understand the situation and options that could be available to us. In due course, we may issue more direct guidance on our expectations for DNOs and what this may mean for their business plan, or RIIO-ED2 more generally.

A whole system approach

Our decision

Table 8: Whole system

Purpose	To enable more coordination between network companies to maximise benefits across the whole energy system.

Decision	<p>We will introduce:</p> <ul style="list-style-type: none">• a whole system element to the minimum requirements of the Business Plan Incentive• an increased focus on the whole system in the innovation stimulus• a whole system re-opener called the 'Coordinated Adjustment Mechanism' (the CAM). <p>The Coordinated Adjustment Mechanism will:</p> <ul style="list-style-type: none">• have annual application windows in May, to be submitted with consent of both network companies• have no materiality threshold, and no additional financial incentive to make an application• set no rules or caps on commercial compensation agreements networks may make between themselves• be consistent with decisions made in FDs for transmission and gas distribution licensees• be introduced to the RIIO-ED1 price control, as well as RIIO-ED2
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Our Consultation position

5.65 To capture efficiencies across the whole system, we proposed introducing three elements for RIIO-ED2:

- The incorporation within the Business Plan Incentive of an assessment of each DNO's whole system plan.
- A whole system element to the innovation stimulus.
- A new re-opener (the CAM).

5.66 In our Consultation, we proposed that the scope of 'whole system' as set out in paragraph 8.2 of the Sector Specific Methodology Decision⁴⁰ for the other sectors would also apply to electricity distribution licensees. We proposed to also require DNOs to adopt a broad scope for 'whole system' where, in addition to the gas and electricity sectors, the scope is expanded to apply to any other area, such as transport, water or waste. We proposed that whole system coordination must

⁴⁰ https://www.ofgem.gov.uk/system/files/docs/2019/05/riio-2_sector_specific_methodology_decision_-_core_30.5.19.pdf

produce net benefits for the existing and future consumers of the relevant network sector.⁴¹

Response to our Consultation

Business Plan Incentive

- 5.67 We asked if there were any additional whole system electricity distribution issues that should be accounted for in the Business Plan Incentive.
- 5.68 We received twelve responses to this question, the majority of which raised no additional issues to be covered by the BPI. Most responses agreed with the need to incentivise greater coordination in the assessment, to be assured that more options will be discovered, particularly for heat networks and rapid charging hubs.
- 5.69 A number of respondents also considered that the BPI should evaluate how far whole system thinking in the business plan has been informed by the DFES Scenarios and relevant decentralised forecasting plans where they exist, such as Local Authority planning forecasts.

Whole System element to the innovation stimulus

- 5.70 We asked if whole system elements should be included in the innovation stimulus.
- 5.71 We received twenty responses to this question, all of whom said yes. A number of responses made the point that the scope of 'whole system' should be as wide as possible in the context of innovation.
- 5.72 A number of respondents raised the joint electricity and gas strategy that the ENA are developing, but suggested that it also include transport, water and sewerage as part of its innovation plans, as well as including more third parties. The same respondents also suggested a new cost benefit analysis method would be needed to include more social benefits, including impacts on consumers in vulnerable situations.

⁴¹ 'Sector' refers to the distribution, transmission and operation of a single energy source. For example, the 'gas sector' includes the firms responsible for gas transmission, distribution, and system operation. By 'cross-sector', we refer to any licensee in one energy source sector, eg electricity, working with any entity in another energy source sector, eg gas, or non-energy sector, eg water or communications.

5.73 One respondent stated that the NIA requirement for an innovation project to benefit that sector's consumers, rather than energy consumers as a whole, was still a barrier to joint working.

Whole system re-opener (the CAM)

5.74 We asked for views on the operation of the CAM re-opener, which enables outputs and associated revenues to be reallocated from one network company's price control to another network company's price control.

5.75 We received 18 responses, the majority of which were in favour of introducing the re-opener, although one respondent did not believe it would be utilised. Another respondent suggested Ofgem retain the ability to trigger the re-opener in case networks were not able to reach agreement on a potential transfer.

5.76 There was majority agreement that any application must be mutually agreed, have no materiality threshold, and that networks should make commercial arrangements between themselves for potential loss/gain resulting from the transfer, rather than be paid an incentive to utilise the re-opener.

5.77 One respondent considered that, as the Directly Remunerated Services (DRS) allowed for smaller payments to networks, there should be a materiality threshold, using the example of High Value Projects to suggest a threshold of £25m per application.

5.78 Three respondents considered that a financial incentive was appropriate, to ensure joint working and to compensate for any potential reduction in RAV due to transferring an output. Two respondents considered that networks should be allowed to reclaim exploratory costs prior to submitting the application.

5.79 We asked whether there should be annual re-opener windows for the CAM, and whether those windows should be in January (as the default timing for re-opener windows), or May.

5.80 We received 12 responses, the majority of which favoured annual re-opener windows, although two respondents suggested two windows (in 2024 and 2026), and one respondent suggested just one window in 2023 for all licensees in all sectors.

- 5.81 Of the four responses that had a preference for a specific month for the re-opener, all agreed that May was more suitable, allowing networks to reassess options after deciding whether to submit re-opener bids in other areas in January.
- 5.82 We asked if the re-opener should be introduced to the RIIO-ED1 price controls, to align with its introduction to the 2021 RIIO-2 price controls for transmission and gas.
- 5.83 We received 17 responses, of which the majority considered the re-opener should be introduced to the electricity distribution RIIO-1 price control as early as possible. Two respondents did not see many opportunities for them to utilise this in the next two years or thought DRS and business planning may meet their needs.

Reasons for our decision

Business Plan Incentive

- 5.84 Greater coordination of activity and investment planning will minimise costs across network and sectoral boundaries, but only if it is timely and consistent.
- 5.85 We believe that including a whole system element as a category in the BPI incentivises networks to embed whole system thinking into ongoing processes and investment planning, rather than relying on ad hoc opportunities to present themselves. This is particularly the case where joint investment should be forecast and planned across sectors, such as the development of heat networks.
- 5.86 We agree with respondents that whole system thinking in the business plan should be informed by DFES Scenarios and relevant decentralised forecasting plans. This will help ensure that planning across sectors are aligned according to common assumptions.
- 5.87 We will provide details on the Stage 1 minimum requirements and evidence for whole system thinking, planning, and coordination in the Business Plan Guidance. This includes evidence of cross-sector activity and coordination with sectors or vectors other than electricity, as well as effective use of relevant central and decentralised planning forecasts.

Supporting whole system projects via the innovation stimulus

- 5.88 The innovation stimulus is discussed in full in Chapter 4. We think that the NIA and the SIF will provide DNOs with the ability to take forward innovative whole system projects.
- 5.89 We agree with respondents that focus on whole system innovation will support the decarbonisation agenda by allowing ideas and projects to be tested where these include joint development across sectors, which may not otherwise be funded by a single sector network or group of networks.
- 5.90 One respondent stated that the requirement that NIA innovation projects must benefit that sector's consumers was a barrier to joint working. The new governance arrangements for NIA and the SIF will both introduce the net benefits test, which, providing the projects deliver a benefit to the relevant sector(s) consumers, will enable whole system projects to be taken forward.
- 5.91 We encourage the ENA to develop a joint gas and electricity innovation strategy that coordinates with all relevant sectors and vectors, particularly those most likely to have a direct impact on, or be directly impacted by, decisions taken on the energy networks. The ENA are also developing a whole system CBA for use in the whole system re-opener (see para. 5.102) which may also support cross-sector innovation thinking.

Whole system re-opener (the CAM)

- 5.92 We have decided to introduce the CAM re-opener in the electricity distribution sector.
- 5.93 We have decided that we will introduce the CAM in the electricity distribution next year to allow the re-opener to operate on a cross-sector and within sector basis with the other sectors. We have provided further information on our proposed statutory consultation to modify the RIIO-ED1 licence to include the CAM re-opener below. We consider that introducing the CAM next year will also support DNOs to fulfil their obligations under the proposed new whole electricity system licence condition for RIIO-ED1 electricity licensees concerning cooperation and

collaboration,⁴² by enabling them to move activities between networks where such collaboration uncovers greater overall consumer value in doing so.

- 5.94 We consider – as do the majority of the responses – that annual windows provide greater flexibility to transfer outputs across network boundaries, particularly so where the decarbonisation agenda requires more rapid alternative solutions. Having windows only every other year, or only one window, would result in lost value for consumers where projects are time-critical and cannot wait additional years to be approved.
- 5.95 We have decided that the annual window will be in May, as we agree with the respondents that there may be more opportunities to collaborate once networks have decided whether to submit re-openers in other areas in January.
- 5.96 We do not consider it appropriate for Ofgem to trigger this re-opener, which is intended for use by networks as the culmination of joint planning resulting in an agreed path forward. The majority of respondents agree, sharing our view that this voluntary re-opener is a tool for network collaboration, and not a tool whereby Ofgem is asked to determine where activities should be carried out across the regulated networks.
- 5.97 The application itself should come from a single licensee, but must contain a statement of agreement on the contents of the application between the licensee who was originally allocated the responsibility and associated revenues for the output or project and the licensee who is able to deliver the output or project with greater overall value to consumers.
- 5.98 We will not introduce a financial incentive for networks to utilise the CAM. Although the reallocation or addition of outputs under this re-opener may affect under- or over-performance penalty or rewards, or affect a network's Regulatory Asset Value, we are requiring networks to consider the impact of their activities across the whole system. Networks will be allowed to use their commercial judgement to agree potential compensatory payments with their partner network that takes any such impact into account. We will not set fixed rules for, or caps on, these agreements.

⁴²<https://www.ofgem.gov.uk/publications-and-updates/statutory-consultation-proposed-whole-electricity-system-licence-condition-d177a-electricity-distributors-and-transmission-owners>

- 5.99 The re-opener may not be used to reclaim exploratory costs. Given networks are required to investigate and undertake joint planning, activity, and investment opportunities through the BPI, we do not think the consumer should pay again for further cooperation.
- 5.100 We will not set a materiality threshold for this re-opener, as the added value of this re-opener is the scale of the benefits to the consumer resulting from the proposed alternative solution, not the costs relating to delivering the activity.
- 5.101 Although one network thought that allowable payments to other networks under DRS (which are capped) meant a materiality threshold for the CAM should start where the DRS limit ended, other networks are concerned that DRS payments are not always suitable for services that subsequently involve ongoing responsibilities, eg future asset maintenance. For this reason, we think setting a materiality threshold would potentially be a barrier to the reallocation of smaller activities, and so lose the proposed value to the consumer associated with the change.
- 5.102 The re-opener application will be assessed on the level of overall benefits to be gained by the consumer from the alteration in activities. Further information on benefits will be published in the associated re-opener guidance document. The ENA are developing a whole system CBA methodology and template to assess these benefits, which we will expect networks to utilise when putting applications in under the CAM. This methodology includes further detail on types of benefits, and allocation of benefits across networks and consumers.
- 5.103 To ensure that the CAM operates on equal terms for all licensees, we have decided to publish a licence statutory consultation to introduce this re-opener into the RIIO-ED1 price control next year, as well as the RIIO-ED2 price control. As it is designed to allow transfers across the licensees in regulated sectors and will be available to transmission and gas from 2021, we consider that it would be a missed opportunity for DNOs if they were unable to utilise the CAM in cooperation with licensees in the other sectors for a further two years. Nor should consumers miss out on the potential efficiencies and added value that may arise over this time period.

Next steps

5.104 We asked if there were any barriers to whole system solutions specific to electricity distribution, and if so, what price control mechanisms might address these.

5.105 We received 26 responses to this question; five respondents did not think there were any electricity distribution specific whole system barriers, but other respondents raised issues around the following points:

- a) As a general point, all existing processes, standards, codes etc should be checked for compatibility with whole system goals, as, for example, the Guaranteed Standards of Performance do not consider whole system goals during connection applications.
- b) Transparency and credibility of data is poor for DNO assets, making it hard to understand how each interacts with the wider system, or introduce locational pricing that would incentivise local flexibility solutions. The lack of granular data on the network is particularly a problem where heat/transport assets may hold flexibility that is not being utilised.
- c) Responses from local government, in particular, considered visibility of local data across all sectors to be asymmetric, as was the regulatory approach across the whole system.
- d) DNO billing systems are a barrier to implementing more granular and dynamic charging regimes, and so are blocking domestic flexibility potential.

5.106 We will consider these points raised above, looking for evidence of genuine barriers and where other developments, for example new data related requirements, may already address these, before consulting on any further proposals for change. We note some investigative work is already being carried out by the ENA in, for example, provision and consistency of data coming to and from local authorities. We will engage with stakeholders to ascertain if there is a role for the regulator in these issues, and if so, publish our proposals in the Draft Determinations.

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Appendix 1 DSO roles and baseline expectations

Overview

A1.1 Through these roles and activities, we explain our proposed baseline expectations on DNOs delivering DSO functions in RIIO-ED2. In some cases, we are prescriptive about the specific actions and outputs that form this baseline. But generally, the activities and associated guidance below serve to outline behavioural standards and outcomes.

Role	Activity
Role 1: Planning and network development	1.1. Plan efficiently in the context of uncertainty, taking account of whole system outcomes, and promote planning data availability
Role 2: network operation	2.1. Promote operational network visibility and data availability
	2.2. Facilitate efficient dispatch of distribution flexibility services
Role 3: Market development	3.1. Provide accurate, user-friendly, and comprehensive market information
	3.2. Embed simple, fair, and transparent rules and processes for procuring distribution flexibility services

Purpose and application of baseline expectations

A1.2 DNOs will set out how they plan to meet these baseline expectations in their DSO strategies, a part of their business plan. Including this information is part of the minimum requirements for the Business Plan Incentive (BPI); failure to do so can result in a penalty per Stage 1 of the BPI. Meanwhile, DNOs who commit to delivering actions that go above and beyond these baseline expectations could be eligible for Consumer Value Proposition (CVP) reward, ie as part of Stage 1 of the BPI.⁴³

A1.3 In our Consultation we proposed to revise these baseline expectations once we had received business plans. Then, we would hold DNOs to account to deliver against these revised standards during RIIO-ED2. We are not at this stage

⁴³ See Chapter 10 of Annex 2

deciding to employ that approach in the DSO strategy delivery ODI. Nor are we ruling it out. As we discuss in the section 'Regulating DSO functions', we will continue to develop the approach to this ODI. Stakeholder engagement and a review of DSO strategies will inform our position.

- A1.4 As set out above, we expect DNOs to make significant DSO progress prior to RIIO-ED2, and some of the baseline expectations below will already be obligated through licence conditions. Where that is the case, their inclusion as part of the DSO incentive framework allows for identification of best practice in delivery, a tool for monitoring and benchmarking performance, and as a driver for continuous improvement.
- A1.5 We will publish the RIIO-ED2 Business Plan Guidance in January 2021. In that document, we will set out the information we will require from the companies regarding their plans for meeting baseline expectations.

Changes to baseline expectations since our Consultation

- A1.6 In our Consultation, we set out the roles and activities of DNOs during RIIO-ED2 through the baseline expectations. After considering responses received, we have revised some of the baseline expectations. Generally, we have made revisions to better clarify the requirements and actions DNOs must demonstrate in their business plans, rather than changing the intent of the expectation.
- A1.7 Several respondents noted the absence of reference to vulnerability. They raised concerns that some groups could be left behind in the energy transition, including because they may be less able to participate in flexibility markets. We have revised the expectations in activity 3.1 to explicitly require DNOs to consider how to adapt their stakeholder engagement to reflect the needs of vulnerable customers. We expect there could be additional ways DNOs can engage vulnerable customers in flexibility markets or otherwise promote their interests as DNOs develop DSO capabilities. As such, we invite DNOs to include other proposals in their DSO strategies and highlight how their DSO strategy is coherent with their vulnerability strategy.
- A1.8 We received several comments on enhanced network monitoring. Some respondents sought clarity on what monitoring data should be made available and others pushed for more data to be collected. We have now included some specific examples of data DNOs could make available in activity 2.1. However, while we

recognise there is likely to be value in collecting more data, it comes at a cost, and there was limited information or evidence presented on the needs case and benefit for some data. So, we invite DNOs to give consideration in their DSO strategies to how uncertain future use-cases can best be managed, and whether new uncertainty mechanisms are required. We provide more information in paragraphs 5.34 to 5.37.

A1.9 We have not made other significant changes to the baseline expectations. This is because we think the suggestions made require more time to be considered, need further stakeholder engagement, or will require regulatory changes that are outside the scope of the price control framework. For example, several responses concerned the coordination between curtailment obligations contained in connections contracts and flexibility markets. We are considering these interactions as part of our Full Chain Flexibility Strategic Change Programme and review of access arrangements. The network companies are also considering this as part of the ENA's Open Networks Project. Several responses also called for stronger conflict of interest mitigations. We will be better able to consider any specific mitigation requirements once we have seen the DNOs' proposals and gathered more information through our programme of work to review the governance arrangements of DSO. Acting prematurely may be ineffective or needlessly remove efficiencies of DNOs delivering DSO. In the meantime, though, we have set out that companies should be proactive in this space and should implement measures to provide stakeholders with greater confidence in their market facilitation role.

Roles and baseline expectations

Role 1: Planning and network development

A1.10 The drivers for network investment in RIIO-ED2 are different and more complex than at the start of RIIO-ED1. For example, electrification of heat and transport could result in greater and more volatile demand and generation patterns. At the same time, DNOs will have an increasingly comprehensive array of tools to forecast their network needs, and a wider range of options to resolve those needs.

A1.11 Consumers will benefit where DNOs ensure efficient levels of capacity, using both network and flexibility solutions. Decisions on network needs and solutions must be transparent and made on robust evidence bases that quantify uncertainty.

A1.12 Flexibility must be valued fairly, recognising the option value it provides.

Meanwhile, providing more insight into the development of the network can signal opportunities for market participants to provide economical flexibility solutions.

A1.13 DNO network planning and forecasting processes are opaque at present, limiting scrutiny on best practice and reliable data driven decision-making. Further, where there are recognisable actions, there is a lack of clarity on how processes are joined together. 'End-to-end network planning' must be better articulated, not least as network developments and decision-making becomes more complex.

A1.14 Some of the provisions in the baseline expectations around planning data availability are covered by new and forthcoming licence conditions, such as the Network Development Plan and the revised Long-Term Development Statement (LTDS) data licences respectively. We are also introducing a new licence condition to require DNOs to have in place transparent, non-discriminatory and market-based flexibility procurement procedures (SLC31).⁴⁴ We expect to see plans for making this information available in DSO strategies.

Activity 1.1: Plan efficiently in the context of uncertainty, taking account of whole system outcomes, and promote planning data availability

A1.15 The purpose of this activity is to ensure that DNOs' planning processes are clear, that high quality, data driven decisions are made, and that DNOs provide stakeholders with relevant information to inform their own decision-making.

A1.16 Our baseline expectations are:

- DNOs to define and develop enhanced forecasting, simulation and network modelling capabilities, with processes in place to drive continual improvement to meet network and user needs. We expect increased monitoring equipment to be rolled out across their network where it has demonstrable net value. We expect demonstrable value to include a rigorous presentation and analysis of needs and use of data for networks and non-networks parties, well-established functional and technical specifications, and cost-effectiveness analysis. DNOs should also explore all reasonable options to use data from third parties, including harnessing smart meter data subject to data sharing agreements, to improve their simulated forecasting.

⁴⁴ See details of the Statutory Instrument inserted by BEIS at <https://www.legislation.gov.uk/ukxi/2020/1401/made>

- DNOs to have in place standard and effective processes for sharing network planning information with other network licensees, including the ESO, network users and other interested parties, for example to enable innovation and support the development of local government plans for decarbonisation. As part of this, we expect DNOs to liaise with their network users to collate and share data, to publish comprehensive and comparable heat maps that provide network users high value information about where to connect, and to inform their operations. These geographic information system datasets should be available for download or for access independently of DNO websites (for example, via Web Map Service server connections). Ofgem-led reforms to the LTDS will seek to licence minimum standards against these improvements.
- DNOs to have in place transparent and robust processes for identifying and assessing options to resolve network needs, using competition where efficient. This should include demonstrable cross-sector⁴⁵ engagement, optioneering, and planning with sectors or vectors other than their own. DNOs should consider flexibility and promoting energy efficiency in addition to innovative use of existing network assets and traditional reinforcement. The process of identifying options should include engaging with other network licence holders and current and prospective network users. Options must be fairly compared against one another, with flexibility used where it is economic and efficient compared to investing in traditional reinforcement or technological solutions. We expect a consistent approach for valuing flexibility, taking into account the option value it provides in the context of uncertainty. DNOs must ensure transparency in their approach to allow scrutiny of decision-making.

Role 2: Network operation

A1.17 DNOs must operate their networks safely, adapting their behaviours to reflect new variable generation and loads. We also expect DNOs to identify and use new operability tools and approaches that minimise network losses and maximise the efficiency of network capacity. This includes smarter use of existing assets, and the deployment of flexibility on an economic and efficient basis. This will require

⁴⁵ 'Sector' refers to the distribution, transmission and operation of a single energy source. For example, the 'gas sector' includes the firms responsible for gas transmission, distribution, and system operation. By 'cross-sector', we refer to any licensee in one energy source sector, eg electricity, working with any licensee in another energy source sector, eg gas

sufficient availability of network and Distributed Energy Resource (DER) data, and the sharing of that data with the ESO to manage conflicting requirements.

A1.18 While we have clearly stated that DNOs should provide a range of DSO functions, the capabilities under network operations should not be developed in such a way that precludes a third party from accessing data or operating systems in future.

Activity 2.1: Promote operational network visibility and data availability

A1.19 The purpose of this activity is to ensure that DNOs share relevant data on network operations with stakeholders, and to ensure that DNOs have sufficient network knowledge to operate their network under safe and reliable conditions.

A1.20 We have signalled our intention to consult on an operational data licence, to require a minimum standard of operational data be made available. If this is implemented, we expect DNOs to demonstrate compliance with this licence through the baseline expectations, as well as making wider efforts to improve operational information availability.

A1.21 Our baseline expectations are:

- DNOs to improve network visibility and identification and sharing of operability constraints, including publishing this data to help avoid conflicting actions being taken by other network and system operators. DNOs must take reasonable steps to access and subsequently share, including by publishing, data and operability constraint information in a timely manner.
- DNOs to provide the ESO with information across timescales about the DER it is planning to instruct to dispatch. Data should include contracted parties, availability and information on scheduled and unscheduled utilisation. Sharing this information in a timely manner should enable the ESO to identify which DER are available for its own needs and improve the ability of DER to stack value across markets.
- DNOs to gather sufficient information on DER characteristics and parameters to provide information and inform decisions to secure against events that could lead to disconnection of DER.
- DNOs to make available operational data that supports network users and other relevant stakeholders to make better decisions about how to use the network. Data should be readily available in agreed and common data formats. This could include, but is not limited to:

- Working network configuration data
- Losses recorded at substation level
- Outages both planned and unplanned
- As recorded historic Feeder MW/MVA Utilisation and calculated headroom/footroom
- Utilisation and curtailment of areas under the control of capacity management systems such as Active Network Management systems

Activity 2.2: Facilitate efficient dispatch of distribution flexibility services

A1.22 This activity is about defining and developing system operability capabilities and the actions network companies take to operate the distribution system safely. The aim is to ensure DNOs facilitate dispatch of DER that is economic and efficient.

A1.23 Principally that means (i) applying a transparent, economic and efficient framework for sending dispatch instructions to the relevant controller, and (ii) that the underpinning IT and OT infrastructure is scalable and allows cost-efficient participation.

A1.24 In the near term, including for the start of RIIO-ED2, the DNO is the right entity to own the decision-making framework for what should be dispatched in real-time on their networks and for sending the dispatch instructions for distribution flexibility services. This will ensure the DNOs maintain the distribution network within operability limits. DNOs need to have clear governance arrangements for the development of that framework and the associated IT and OT infrastructure. Arrangements may include raising code modifications, gathering stakeholder input, and transparency in how governance arrangements are applied.

A1.25 In RIIO-ED2, DNOs shall not procure ancillary services from flexibility providers on behalf of the ESO or otherwise act as the commercial route to ESO markets for flexibility providers. We recognise there will in some cases be a need for DNOs to set parameters for what the ESO can procure from the distribution network to maintain safe operation of the network.

A1.26 Our baseline expectations are:

- DNOs to have and regularly review a decision-making framework for when DER are instructed to dispatch in real-time. The decision-making process, including alternatives considered, should be transparent. This should promote

coordination across services (including curtailment as part of non-firm connection agreements and ESO flexibility services), maximise liquidity, avoid market fragmentation and ensure dispatch results in the best outcome for the whole system; this includes service provision to the ESO and other distribution networks.

- As part of this decision-making framework, there must be rules in place for coordinating dispatch instructions for DSO and ESO flexibility services. This could be through primacy rules or more comprehensive optimisation processes that better enable stacking of revenues for DER. The rules should be transparent, objective, and promote whole system efficiencies.
- The DNOs shall facilitate secondary trading of distribution flexibility services and curtailment obligations. In this context, facilitating means providing the relevant operational data, ensuring the DNO has processes in place to collect the relevant data about the trade, and making the operational parameters clear (and justified in the context of network reliability and efficiency).
- DNOs to introduce clear processes for the design, development, and communication of the decision-making framework. These should include transparent and participatory processes for stakeholder input.
- DNOs to develop efficient, scalable dispatch instruction infrastructure and avoid proprietary systems.
- We expect clear definitions of different types of dispatch instruction for distribution flexibility services and transparent rules about when and in which markets they should be used. Circumstances for different dispatch instructions should be well-justified. Definitions of these circumstances should be developed with input and cooperation from network users.
- The application of hard dispatch controls shall be for the improved reliance on market-based mechanisms, not to the detriment of their development.
- Capabilities in network operations, for example in dispatch instructions and associated system architectures shall not be hard coded to the DNO. These must be developed so that they can be cost effectively assigned to another party in future, if this is needed.

Role 3: Market development

A1.27 Effective, coordinated flexibility markets will be essential to efficiently use network capacity and support national system balancing in a context of highly distributed and variable generation and load. The DNO must act as a neutral facilitator of markets. Network users should be able to simply identify opportunities to

participate in markets, understand how the markets interact, be able to trade with other network users, and offer network and system services to the ESO and the DNO, and for those services to be coordinated to result in whole system efficiencies.

A1.28 We recognise activities in 'insights, planning and forecasting' and 'network operation' roles contribute to market facilitation.

Activity 3.1: Provide accurate, user-friendly and comprehensive market information

A1.29 The purpose of this activity is to ensure that DNOs sufficiently inform stakeholders of information that will assist them in participating in, managing or otherwise engaging with markets in the long and short term. We recognise there are overlaps across other activities, but at the same time believe this information is sufficiently critical to warrant its own statement, and to also include wider information than that mentioned in prior activities.

A1.30 It is incumbent on DNOs to share all relevant and valuable information to enable markets wherever possible. DNOs will be obligated to report certain market information through the new licence condition C31E. Similarly, revisions to the LTDS and the new Network Development Plan licence condition will require DNOs to publish more information about their network conditions and where they expect to need flexibility services. Through the business plans we expect DNOs to show how they are building on minimum levels of compliance.

A1.31 Ensuring the information is comprehensive, user-friendly and accurate is essential for the efficient development and operation of flexibility markets. This applies to all the information required under other activities, as well as other information that supports the development of flexibility markets.

A1.32 Our baseline expectations are:

- DNOs collate and publish as much relevant data and information as reasonable that will help market participants identify and value opportunities to provide network services to DNOs and take market actions that support efficient whole system outcomes. Relevant data and information include planning and operational data (such as that set out in Activity 1.1 and 2.1). This should be provided with sufficient lead times to enable wider participation in distribution flexibility services markets. It also includes information on

historic and future distribution flexibility services market actions. This should include tender results, prices bid and paid, the carbon content of aggregated units, how often DER is dispatched (and volumes) and other actions taken by the DNO (with anonymisation as required), including curtailment as part of non-firm connection agreements. The information should include all requirements set out in licence conditions to support DER to identify revenue opportunities. This increases the accessibility of tendering for distribution flexibility services for flexibility providers (while also taking account of DNOs flexibility needs). DNOs should, with stakeholder input, develop robust strategies for how they will collate and publish more helpful information, wherever possible consistently and in coordination with other network licence holders, and communicate this clearly.

- DNOs should regularly and actively engage with market participants to understand what data and information is helpful to support market development. While there will be minimum legal requirements set out in licences, we expect DNOs to use their stakeholder engagement to consider the most effective format and frequency of publishing that data to ensure it is user-friendly. The information must be easily accessible and navigable. We expect this includes publishing data in machine-readable formats. DNOs should, where reasonable, tailor both their information provision and engagement approaches to reflect different needs of potential market participants, including groups in vulnerable situations. In many instances, collaboration across DNOs in engagement is expected to reduce duplication, make it easier for stakeholders to engage and avoid stakeholder fatigue.
- DNOs should seek to ensure the information they publish is as accurate and unbiased as reasonable (ie correct at time of publication, as close as possible to the actual value and not skewed in any direction).

Activity 3.2: Embed simple, fair, and transparent rules and processes for procuring distribution flexibility services

A1.33 The purpose of this activity is to ensure distribution flexibility service market design leads to good competitive outcomes, including downward pressure on prices and innovative services.

A1.34 The widest reasonable range of DER should be able to simply engage with the DNO's distribution flexibility services markets and stack value across multiple flexibility markets. DER should be able to access revenues where they provide value to the DNO via simple market processes. Synergies in procurement with

other markets (ie where one flexibility action can meet two system needs at the same time) should be harnessed, and conflicts (eg where a flexibility action to meet an ESO need creates a distribution cost) should be minimised. This activity is distinguished from Activity 2.2 by its focus on the network user-centric aspects of market engagement rather than the DNOs' operability processes (which might not be visible to network users). Primarily, this activity means DNOs design market-based mechanisms that allow market parties to operate effectively across multiple markets and provide value to the energy system.

A1.35 We will soon introduce SLC 31E which will require DNOs to procure flexibility services in a transparent, non-discriminatory and market-based manner. Through the DSO strategies we expect to see DNOs setting out how they will comply with that licence, as well as wider activities they will undertake to ensure markets are effective.

A1.36 Our baseline expectations are:

- DNOs to have clear processes in place for developing and amending distribution flexibility services products, contracts, and qualification criteria, that are, wherever possible, standardised.⁴⁶ The processes should be transparent and participatory, involving other DNOs, the ESO, and current and potential distribution flexibility service providers. DNOs should also coordinate and engage with third party platform providers, who can offer system value by providing new routes to market and driving whole system outcomes. DNOs should not prevent the emergence of this sector and should enable third party platforms to 'plug-in' to DNOs' flexibility procurement processes. Products and contracts should be adaptive to reflect prevailing system needs, type, and availability of flexible resources. The objective of these processes is to enable as wide participation in distribution flexibility services markets as possible.
- DNOs should identify the optimum combination of longer and shorter term lengths of markets and contract lengths reflecting the network need. Needs should be neutrally defined, to allow for a range of flexibility providers to participate. This will help improve market liquidity and the opportunities for innovation and dynamic competition. Individual decisions and frameworks for deciding market timeframes and contract lengths should be transparent, informed by stakeholders and justified as being the most economic and

⁴⁶ Standardisation of the technical parameters of the product, processes and the applicable contracts, not just in branding, with clear justification for any deviations, as well as data standards and methods for sharing this information.

efficient solution. Notwithstanding, deviations from the standard should be justified with clear governance processes for managing change that should be clearly communicated.

- DNOs should have clear, comprehensive and transparent mechanisms and associated commercial structures for coordinating distribution flexibility services and ESO flexibility services procurement. DNOs shall not act as the commercial route for DER accessing ESO flexibility services. Transparent (and possibly tripartite) commercial agreements may be required to reflect the potential effects of DER dispatch on distribution system operability and the role of DNOs in setting dispatch parameters (as set out in Activity 2.1 and 2.2). These agreements should remove exclusivity clauses as far as possible, including with regard to non-firm connections. Coordination on dispatch parameters should enable a closer to real-time understanding of what DER needs to be armed and available for a particular service, and what can be available to provide other services. DNOs should consider arrangements to support DERs to provide services that meet both DNO and ESO needs.
- DNOs should make available the necessary data to enable secondary trading, for example capacity and other peer- to-peer trading. Enabling includes defining, communicating and justifying the parameters in which these trades can take place for operability purposes.
- Market support services, such as pre-qualification, credit-checking and settlement must enable simple and cost-efficient participation in markets. DNOs should enable, and never prevent, the opportunity for third parties to provide these services where they could do so more efficiently.
- DNOs to introduce other proportionate measures, developed with robust stakeholder engagement, to identify and address actual and perceived conflicts between its market development and network ownership roles or other business interests.⁴⁷ Measures to address might include ring-fencing of particular teams and external auditing of objectivity in addition to measures that promote transparency and enable scrutiny.

⁴⁷ Other business interests could include services DNOs are able to provide outside of their regulated income. Earlier this year we consulted on DNOs using remote voltage control to provide the ESO with balancing services (CLASS) in RIIO-ED2. We are carefully considering the responses to this consultation and expect to provide an update in early 2021.

Appendix 2 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-2 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.

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

Base revenue (also referred to as baseline revenue) is the amount of revenue network companies are allowed to recover as set up front at the beginning of the price control. Additional revenue may be allowed during the price control under certain, specified circumstances, for example, if it is triggered under an Uncertainty Mechanism.

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.

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.

The greenhouse gases that may be reported include carbon dioxide (CO₂), methane (CH₄), sulphur hexafluoride (SF₆) and specified kinds of hydro fluorocarbons and perfluorocarbons.

Greenhouse gas emissions are measured as tonnes of carbon dioxide equivalence (tCO₂-e). This means that the amount of a greenhouse gas that a business emits is measured as an equivalent amount of carbon dioxide, which has a global warming potential of one. For example, in 2019–20, one tonne of SF₆ released into the atmosphere will cause the same amount of global warming as 23,500 tonnes of carbon dioxide over the next 100 years.⁴⁸ So, one tonne of SF₆ is expressed as 23,500 tonnes of carbon dioxide equivalence, or 23,500 tCO₂-e.

Business Plan Data Template (BPDT)

⁴⁸ https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-PotentialValues%20%28Feb%2016%202016%29_1.pdf

A set of data templates that the electricity distribution network companies will use when submitting both draft business plans to the RIIO-ED2 Challenge Group, and final 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 under 4 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.

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 gas pipelines or electricity 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.

Consumer Challenge Group (CG)

Ofgem has set up a central RIIO-ED2 Challenge Group that is independently chaired to provide Ofgem with a public report on companies' business plans from the perspective of end consumers.

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.

The 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 competition during RIIO-2. 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 Transmission/Distribution Owner (CATO/CADO)

The late CATO regime is one of the late competition models that may be applied to projects that meet the Criteria for competition during RIIO-2. Under late CATO 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 CATO responsible for construction and operation of the project. The CATO 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 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 for competition is 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.

Customer Engagement Group (CEG)

For RIIO-ED2, DNOs are required to set up a Customer Engagement Group. These Groups provided Ofgem with a public report on their views and the companies' business plans from the perspective of local stakeholders.

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

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

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

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 licenced DNOs 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 (DSO) roles

The development of distribution system operation roles is a live and evolving policy area with various workstreams currently in progress. In general, DSO roles refer to innovative techniques and use of market-based solutions as alternatives to network reinforcement, as well as greater coordination with other network and system operators to achieve efficient outcomes in a whole system context.

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.

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.

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).

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.⁴⁹

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.

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.

H

Headroom

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

High-confidence baseline costs

⁴⁹ <https://www.gov.uk/government/consultations/fuel-poverty-strategy-for-england>

Costs included in baseline 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 baseline 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 Capex

Capital expenditure on new assets to accommodate changes in the level or pattern of electricity or gas supply and demand.

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 baseline costs

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

M

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).

N

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 Access Policy (NAP)

A policy that is designed to facilitate efficient performance and effective liaison between the ESO and the TOs in relation to the planning, management and operation of the National Electricity Transmission System (NETS) for the benefit of consumers.

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 projects focused on the energy system transition and vulnerable consumers.

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 Future Energy Scenarios (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.

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.

Notional company/business

A hypothetical, but typical, network company.

O

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.

Price Control Deliverables (PCDs)

In RIIO-2, 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.

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.

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.

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 occurs. 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 Review 1 (RIIO-ED1)

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

RIIO-Gas Distribution Price Control Review 1 (RIIO-GD1)

The price control review applied to the gas distribution network operators. It runs from 1 April 2013 to 31 March 2021.

RIIO-Transmission Price Control Review 1 (RIIO-T1)

The price control review applied to the electricity and gas transmission network operators. It runs from 1 April 2013 to 31 March 2021.

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.

RPI-X@20

Ofgem's comprehensive review of how we regulate energy network companies, announced in March 2008.⁵⁰ 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

⁵⁰ <https://www.ofgem.gov.uk/network-regulation-riio-model/current-network-price-controls-riio-1/backgroundrpi-x20-review>

owned or controlled by the reporting company, waste disposal, or purchased materials or fuels.

Short interruption

A loss of electricity supply lasting less than 3 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.

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.

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

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)

The TMR is a measure of return that equity investors expect for the market-average level of risk.

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.