

RIIO-2 Sector Specific Methodology Annex: Electricity Transmission

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We are consulting on the application of the RIIO-2 Framework to the electricity transmission owners (TOs). This document sets out our proposals in several areas including the proposed outputs that the TOs would need to deliver over the price control period, the associated incentive mechanisms, and our proposals for managing uncertainty. Network companies' stakeholder engagement will be vital to develop well-justified Business Plans and this document also highlights key areas that should be focused on.

This document is an Annex to the RIIO-2 Sector Specific Methodology consultation and should be read alongside it.

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1. Document structure

This document is intended to be read alongside the RIIO-2 Sector Specific Methodology to gain the full context and detail on each of the topic areas. To aid readers, we have set out the structure of this document and how its content fits within the wider RIIO-2 publications.

Structure of this document and associated documents

- 1.1 In July 2018, we published the RIIO-2 framework decision which set out our proposed approach to the RIIO-2 price control, and highlighted the main areas of proposed change from the current price control, RIIO-1. This consultation comprises the RIIO-2 Sector Specific Methodology (Core Document) and sector specific annex documents for gas distribution (GD), gas transmission (GT), electricity transmission (ET), and the electricity system operator (ESO). The sector specific documents are intended to be read alongside the Core Document.

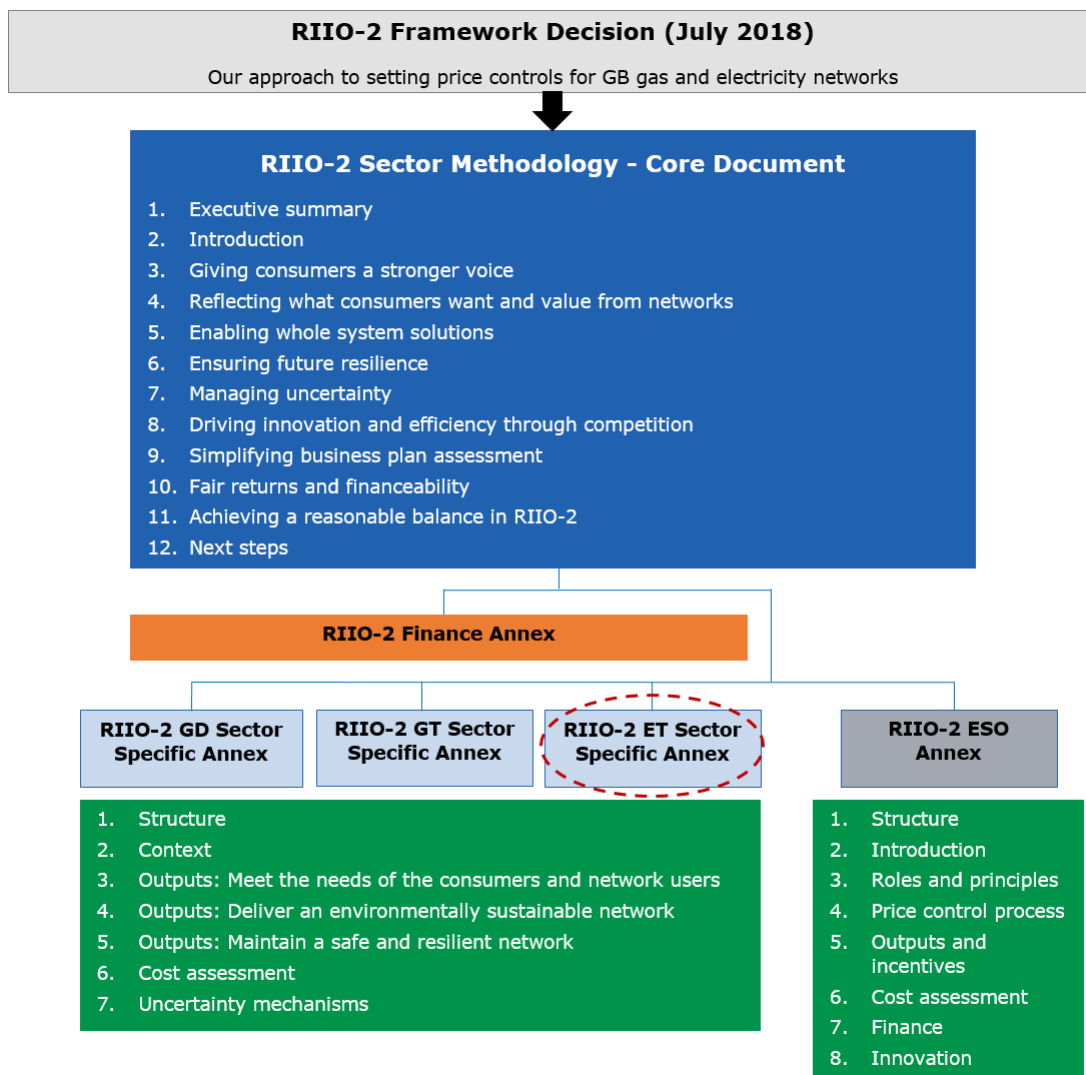
The Core Document

- 1.2 The Core Document provides detail on how we propose to apply the RIIO-2 framework decision to areas that are relevant across the sectors. The proposals in the Core Document apply across the GD, GT and ET networks, and some elements apply to the ESO.

This document

- 1.3 This document is focused on the application of the RIIO-2 Framework, established as part of the RIIO-2 Framework Decision, to ET specific issues. It sets out our sector specific views on the aspects of the RIIO-2 price control that electricity transmission network companies need to understand to be able to put together their business plans.
- 1.4 The ET sector specific consultation document is structured as follows:
- Chapter 2 - an overview of the sector and the key challenges
 - Chapter 3 - potential outputs for consideration in the first output category: Meet the needs of the consumers and network users
 - Chapter 4 - potential outputs for consideration in the second output category: Deliver an environmentally sustainable network
 - Chapter 5 - potential outputs for consideration in the third output category: Maintain a safe and resilient network
 - Chapter 6 - our proposed approach to cost assessment in RIIO-2
 - Chapter 7 - our views on potential uncertainty mechanisms
 - Appendix 1 – further background on RIIO-ET1 performance and outputs
 - Appendix 2 – summary of working group feedback
 - Appendix 3 - questions

Figure 1: RIIO-2 Sector Specific Methodology document map



How to respond to this consultation

- 1.5 We want to hear your views on this consultation. Please send your response to the contact on this document’s front page by 14 March 2019.
- 1.6 Please refer to Chapter 2 of the Core Document for further detail on how to respond, data and confidentiality, and how to track the progress of the consultation.

2. Context

It's important to understand the context in which we will set the next price control for electricity transmission. This includes understanding some of the key challenges and the engagement that has taken place so far to inform this document.

Introduction

What is electricity transmission

- 2.1 Great Britain's (GB) electricity transmission network transmits high-voltage electricity from where it is produced (electricity generators) to where it is needed throughout GB.
- 2.2 Transmission assets consist of high-voltage electricity wires which extend across GB and nearby offshore waters, transporting electricity between power stations, interconnectors with external systems, larger users and interfaces with distribution networks. Transmission owners (TOs) own, develop and maintain the network assets. They provide transmission services to the ESO.
- 2.3 There are currently three onshore TOs who are permitted to develop, operate and maintain a high-voltage system within their own distinct transmission areas. These are National Grid Electricity Transmission plc (NGET) for England and Wales, Scottish Power Transmission Limited (SPT) for southern Scotland and Scottish Hydro Electric Transmission plc (SHE-T) for northern Scotland and the Scottish islands.
- 2.4 The transmission system is operated by the ESO. It is responsible for ensuring the stable and secure operation of the whole transmission system, from the day-to-day operation of the system, through to managing the commercial terms of connecting to and using the transmission network and longer-term network planning. The ESO role is currently being performed by NGET. As of April 2019, National Grid Electricity System Operator Limited (NGESO) will be a new, legally separate company within the National Grid Group. Details of our proposals for the ESO in RIIO-2 can be found in the ESO annex.

Why does transmission matter to consumers?

- 2.5 During 2017-2018, electricity transmission charges made up around 7% of an average household electricity bill.¹
- 2.6 Electricity plays a pivotal role in the lives of GB consumers, and in the context of wider energy infrastructure. The electricity transmission system is essential in providing electricity to end consumers via the distribution network and directly to some large industrial customers. The transmission system is fundamental in keeping the lights on.
- 2.7 Our proposed RIIO-ET2 package reflects the key role that TOs are likely to play over the next price control period by facilitating the energy systems transition, encouraging flexibility and enabling decarbonisation. TOs will play a crucial role as

¹ This figure is the GB average, assuming domestic users with non-standard credit, and a single-rate metering arrangement. The data is available here: https://www.ofgem.gov.uk/system/files/docs/2018/11/annex_3_-_network_cost_allowance_methodology_elec_v1.2.xlsx and here: https://www.ofgem.gov.uk/system/files/docs/2018/11/model_-_default_tariff_cap_level_v1.1.xlsx

society becomes increasingly reliant on electricity through the electrification of heat and transport.

Challenges for RIIO-ET2

- 2.8 During RIIO-ET1, we have seen some improvements in TO performance, including a step-change in a number of areas such as improved stakeholder engagement and a stronger focus on environmental considerations. We have also seen higher than expected returns. These returns have largely been driven by a significant underspend against allowances.
- 2.9 The next price control (RIIO-ET2) will start in April 2021 and run for five years until March 2026. For RIIO-ET2, we propose to build on the successes of RIIO-ET1, while implementing lessons learnt from the first round of RIIO price controls and ensuring value for money for consumers.
- 2.10 Some of the key challenges for RIIO-ET2 that we are seeking to address include:
 - enabling the energy transition
 - managing uncertainty and reflecting changes in how the networks are used
 - embedding RIIO-ET1 performance improvements as business as usual and ensuring a fair deal for all.

Enabling the energy transition

- 2.11 The energy system is changing rapidly. The RIIO-ET2 price control will play a key role in enabling TOs to respond to these changes as necessary and to manage the associated challenges by, where appropriate, improving the level of coordination between sectors and maximising opportunities associated with the energy transition.
- 2.12 The GB generation mix is shifting towards even greater volumes of new smaller scale, intermittent sources of energy which typically connect to the distribution rather than transmission network. At the same time, wider developments are changing how electricity is used and interacts with other sectors such as transport and heat. All of these will bring a greater degree of uncertainty and the need to ensure there is sufficient flexibility to manage this transition. We need to ensure that the frameworks we have in place facilitate innovation and allow efficient new business models to develop.
- 2.13 In this document, we seek to address some of these issues. We are considering ways in which we can improve coordination across parties. This includes coordination between the TOs and the ESO, through existing tools such as the Network Access Policy (see Chapter 5), possible mechanisms proposed to encourage a comprehensive approach across the system as a whole (see Chapter 5) and changes to the innovation stimulus (see Core Document Chapter 8).
- 2.14 Finally, with the introduction of new technologies and business models, we expect to see new and different interactions between existing players. In Chapter 3, we discuss our approach to stakeholder engagement in RIIO-ET2, including for example ways in which we can encourage TOs to engage better with customers seeking a connection.
- 2.15 As highlighted in our RIIO-2 framework decision the price controls should give due attention to mitigating the impact of networks on the environment. In Chapter 4, we set out our proposals for embedding environmental considerations into

business as usual and seek views on the need for additional targeted incentives in specific areas, for example to continue driving down Sulphur hexafluoride (SF₆) emissions.

Managing uncertainty and reflecting changes in how the networks are used

- 2.16 The uncertainty surrounding network activity in the future, even within the next five to ten years, means it is difficult to predict with certainty the allowances the TOs will need to carry out a range of different activities. We therefore decided in our RIIO-2 framework decision to set the default length of price controls at five years.
- 2.17 Forecasting costs and outputs with confidence for the duration of the RIIO-ET2 price control will continue to prove a challenge. Uncertainty in required outputs and associated costs can arise for several reasons, including whether a TO needs to conduct an activity or make an investment, the amount and type of activity they need to conduct, as well as the cost of the activity. For example, the advent of electrified transport and/or heat could create additional demand for network capacity.
- 2.18 We intend to ensure that network company business planning processes take full account of options such as demand side measures and storage as alternatives to new investment in transmission assets. At the same time, where new transmission investment is required, it must be done in an efficient and timely manner.
- 2.19 Where uncertainty could significantly affect costs and arises due to changes outside of the companies' control, then the use of uncertainty mechanisms may reduce our reliance on forecasts and protect consumers from forecasting risk. Our views on managing uncertainty are set out in Chapter 7.

Embedding RIIO-ET1 performance improvements and ensuring a fair deal for all

- 2.20 As outlined in Chapter 4 of the core document, we are proposing to clarify and simplify our outputs and incentives framework for RIIO-ET2, ensuring these drive value for money for consumers. Our proposals for RIIO-ET2 also seek to encourage TOs to embed performance improvements as business-as-usual and to capture the cost savings achieved in RIIO-ET1.
- 2.21 In our RIIO-2 framework decision, we stated that we would apply output delivery incentives (ODIs) where service quality improvements beyond the minimum standard may be in the interests of consumers. In considering a package of ODIs for RIIO-ET2, we are considering the extent to which activities should become business-as-usual, for example around stakeholder engagement (see Chapter 3) and the environment (see Chapter 4). In other areas such as reliability (see Chapter 4), we are seeking views on ensuring our proposals recognise the step-changes in performance already achieved and reflecting continuous improvement throughout the RIIO-2 price control period.
- 2.22 We also recognise the need for further up-front clarity around the delivery of price control deliverables, in particular in terms of timings and quality of delivery of large capital investment projects. We propose options for addressing some of these issues in Chapter 5.
- 2.23 Finally, we propose to bring additional accountability by placing the onus on the TOs to report to their stakeholders in a more transparent way. We identify the

potential to integrate performance monitoring and reporting in a number of areas with our enhanced engagement model and the TO User Groups.

Summary of stakeholder engagement to date

- 2.24 Early stakeholder engagement has been crucial in developing the proposals we set out in this document. As we look to set RIIO-ET2 we have been running electricity transmission-specific and cross-sector events, forums and seminars to get stakeholder input alongside our formal consultation process.
- 2.25 We set up a RIIO-ET2 Policy Working Group ('policy working group') to assist us in identifying and informing policy on issues affecting the electricity transmission system and other cross-cutting issues. These policy working groups focussed on testing and gaining insight on price control deliverables, and ODIs, with input provided by Ofgem and a number of stakeholders. To date, the policy working group has met five times.
- 2.26 Our working group sessions focused mainly on the development of common outputs and incentives. Participants in the working group both provided their thoughts on current arrangements and proposed potential new measures that they consider necessary in RIIO-ET2. For example, Sustainability First put forward a proposal for a low-carbon incentive², NGET tabled proposals for an ESO:TO incentive.³ We discuss some of these in this document and welcome views from the wider stakeholder community on these. We note that some proposals for bespoke outputs were also tabled by NGET.⁴
- 2.27 We also set up a RIIO-ET2 Cost Working Group ('cost working group') to assist us in developing tools for assessing the company Business Plans, as well as developing the Business Plan Data Template. To date, the cost working group has met four times.
- 2.28 We set up these working groups to help inform our policy development and approach to cost assessment in the run-up to this consultation and our upcoming sector specific methodology decision in 2019. As highlighted in the relevant Terms of Reference, these groups are advisory in nature and are not decision making bodies. Further information on our RIIO-ET2 working groups is available on our website.⁵

Potential outputs for consideration in RIIO-ET2

- 2.29 Table 1 below summarises the potential outputs for inclusion in the RIIO-ET2 outputs package that are discussed in this document. The detail of each output category follows in the remainder of this document.
- 2.30 Our approach to Network Asset Risks Metrics (NARMs), cyber-resilience, physical security and whole systems are discussed in the core document. For this reason, they are not discussed in this document or included in the summary table below.

²http://www.sustainabilityfirst.org.uk/images/publications/other/Sustainability_First_Low_Carbon_Incentive_in_RIIO2_Discussion_Paper_FINAL_web.pdf

³ Please see 'NGET proposals for a whole system incentive' here: <https://www.ofgem.gov.uk/publications-and-updates/riio-et2-working-groups>

⁴ Please see 'NGET proposals for forward-looking incentives' here: <https://www.ofgem.gov.uk/publications-and-updates/riio-et2-working-groups>

⁵ <https://www.ofgem.gov.uk/publications-and-updates/riio-et2-working-groups>

Table 1: Summary of potential outputs for consideration in RIIO-ET2

Output name	Output type*	Company driven target**	Comparison to RIIO-1
Common outputs (expected to apply to all companies)			
Stakeholder engagement	ODI(F/R)	Yes	Revised RIIO-1 output
Stakeholder satisfaction survey	ODI(F/R)	No	Revised RIIO-1 output
Timely connections output	LO	No	Revised RIIO-1 output
Energy Not Supplied	ODI(F)	Yes	Revised RIIO-1 output
Environmental considerations embedded in business plans	PCDs	Yes	n/a
Annual environmental performance reporting (incl. BCF and losses)	LO	No	Revised RIIO-1 output
Sulphur hexafluoride (SF6) and other IIG leakage	ODI(F/R)	No	Revised RIIO-1 output
Mitigating visual amenity impacts in designated areas	PCD	Yes	Revised RIIO-1 output
Network Access Policy	LO	No	Revised RIIO-1 output
Successful delivery of large capital investment projects	PCDs	Yes	Revised RIIO-1 output
Bespoke outputs (companies should consider for potential inclusion in their Business Plan; though not just limited to these areas)			
Additional contribution to low carbon transition	ODI(F/R)	Yes	New outputs

* ODI(R/F) = Output Delivery Incentive (Reputational/Financial), PCD=Price Control Deliverable, LO=Licence Obligation

** Company driven target signifies an output where we expect to see extensive company-led engagement (including with their User Group) to justify a stretching performance target. This could lead to performance targets varying by companies.

- 2.31 While we have engaged extensively with our sector specific working groups, this consultation document is our first opportunity to seek views from wider stakeholders on the issues we set out here. Within this context, this document sets out a number of potential outputs for consideration in RIIO-ET2.
- 2.32 As stated in our RIIO-2 framework decision, we will continue to use outputs and incentives to drive the improvements that consumers value. At this stage, we are therefore seeking views on the extent to which the potential outputs discussed here:
- achieve the appropriate balance and focus on the areas that are of value to consumers
 - align with our overarching outputs framework as described in Chapter 4 of the core document.
- 2.33 We welcome views on whether there are any alternative outputs and/or mechanisms not identified here which we should be considering.
- 2.34 We also set out specific questions for each potential output area in the remainder of this document.
- 2.35 Responses to this consultation will help inform our decision on an appropriate outputs package for RIIO-ET2, including whether to include some or all of the potential outputs discussed in this document.

Next Steps

- 2.36 We also intend to continue holding working group meetings during the consultation process to offer their participants the chance to provide initial views on the content of this consultation document.
- 2.37 We will be continuing the development of the Business Plan Data Templates and cost assessment tools through our cost working group.
- 2.38 Further details on upcoming meetings will be available on our website in due course. We invite stakeholders wishing to get involved to contact us at RIIO2@ofgem.gov.uk

3. Outputs: Meet the needs of consumers and network users

We are considering several potential outputs and incentives for RIIO-ET2 to improve how network companies meet the needs of consumers and other network users. The options we are seeking views on build on our approach for RIIO-ET1 and seek to embed performance improvement achieved as business as usual for RIIO-ET2. This Chapter should also be read in conjunction with the core document, in particular, Chapter 4 on outputs.

Chapter 3 questions

ETQ1. What are your views on the overall outputs package considered for this output category?

ETQ2. For each potential output considered (where relevant):

- a) Is it of benefit to consumers, and why?
- b) How, and at what level should we set targets? (eg should these be relative/absolute)
- c) What are your views on the design of the incentive? (eg reward/penalty/size of allowance)
- d) Where we set out options, what are your views on them and please explain whether there are further options we should consider?

ETQ3. What other outputs should we be considering, if any?

ETQ4. What are your views on the RIIO-ET1 outputs that we propose to remove?

All questions, including additional output specific questions, are set out in Appendix 3.

Introduction

3.1 We expect TOs to deliver a high quality and reliable service to all network users and consumers. Our proposals for this output category are set out below. This chapter should be read in parallel with Chapter 4 of the Core Document which describes:

- the rationale for having an output category to 'Meet the needs of consumers and network users'
- the broad RIIO-2 approach to specific outputs (eg types of output and the approach to developing company specific ('bespoke') outputs).

3.2 Over RIIO-ET1, we have seen TOs make progress in improving the experience for network customers. For example, we have seen an average customer satisfaction score at over 7.5 (out of 10) and average stakeholder surveys score of 7.7 (out of 10). We have also seen TOs meet their obligations to provide a connection offer within the relevant deadline in all but one case. Finally, we have seen TOs consistently outperform their baseline targets for Energy Not Supplied (ENS), reducing ENS to an average of 29MWh per year on the electricity transmission network during RIIO-ET1 so far.

- 3.3 In RIIO-ET1 we sought to drive a step-change in how TOs engage with their stakeholders. However, we have identified a number of expected network challenges over the course of RIIO-ET2 which highlight the need for TOs to continue to focus on effectively meeting the needs of a diverse range of stakeholders, for example around connecting new generation, coordinating with wider groups of stakeholders and ensuring reliability in a changing operating environment.
- 3.4 For RIIO-ET2 we expect TOs to continue to put stakeholder interests at the heart of their activities, as reflected through the introduction of our enhanced stakeholder engagement framework (see Chapter 3 of the Core Document). We also expect to see many of the activities rewarded through RIIO-ET1 becoming business as usual.
- 3.5 We are considering ways in which we can continue to drive positive behaviours in this area through a mixture of stretching targets and commitments which reflect the performance improvements achieved in RIIO-ET1, while simplifying our framework and ensuring value for money for consumers. We are also considering ways in which we can better accommodate the future needs of the system. Key areas we explore in this chapter are:
- our approach to stakeholder engagement, in particular striking the right balance between business as usual activities and the need for further incentivisation
 - our approach to incentivising reliability for RIIO-ET2.
- 3.6 Our proposals for meeting the needs of customers and network users should be considered in parallel with our proposals in other output categories and the wider RIIO-2 framework. We note, for example, significant interactions with our proposals for maintaining a safe and reliable network chapter.

Table 2: Summary of potential outputs for consideration for RIIO-ET2

Output name	Output type*	Company driven target**	Comparison to RIIO-1
Common outputs (expected to apply to all companies)			
Stakeholder Satisfaction Output: Stakeholder engagement	ODI(F) or ODI(R)	Yes	If retained, revised RIIO-1 output
Stakeholder Satisfaction Output: Stakeholder satisfaction survey	ODI(F) or ODI (R)	No	Revised RIIO-1 output
Timely connections output	LO	No	Revised RIIO-1 output
Energy Not Supplied	ODI(F)	Yes	Revised RIIO-1 output

* ODI(R/F) = Output Delivery Incentive (Reputational/Financial), PCD=Price Control Deliverable, LO=Licence Obligation

** Company driven target signifies an output where we expect to see extensive company-led engagement (including with their User Group) to justify a stretching performance target. This could lead to performance targets varying by companies.

Potential outputs for consideration in RIIO-ET2

Stakeholder Satisfaction Output

Purpose	The output is intended to drive network companies to be outward facing and responsive to the needs of their stakeholders for the full duration of the price control.
Proposed approach	<p><u>SSO: SEI</u> We are considering whether an ODI beyond the business plan incentive is necessary for stakeholder engagement. We are consulting on three options: 1) no ODI, 2) a reputational ODI, 3) and a financial ODI.</p> <p><u>SSO: Surveys, Key Performance Indicators (KPIs) and External Assurance (EA)</u> We are consulting on two options: 1) remove all three components or 2) retain only the survey as either a financial or reputational ODI, to be targeted at a number of key areas. Under this option, we are also considering introducing a licence obligation around external assurance.</p>

Introduction

- 3.7 The Stakeholder Satisfaction Output (SSO) was introduced in RIIO-ET1 and was designed to encourage TOs to become more outwardly focused in their business practices and to be more responsive to changing stakeholder needs.
- 3.8 In RIIO-ET1 performance against the SSO was incentivised and assessed through four components.
- 3.9 One of these components is based on an assessment of the quality of network companies' engagement with their stakeholders (the 'Stakeholder Engagement Incentive' or SEI) and is a cross-sectoral incentive which applies to GDNs and TOs. The SEI is a financial incentive and is weighted at +0.5% of a TO's base revenue.
- 3.10 The other three components under the SSO are: a Stakeholder Satisfaction Survey, KPIs and an EA methodology. The aggregate value of these three components contributes to a financial cap/collar of +/-1% of a TO's base revenue.
- 3.11 While the SSO is one output in RIIO-ET1, the SEI scheme was managed independently from the satisfaction surveys, KPIs and EA components.

Views of the RIIO-ET2 Policy Working Group

- 3.12 There was general agreement from the participants of the policy working group that the stakeholder incentives have driven a step change in communicating with and addressing stakeholder's priorities. Policy working group participants felt that the survey, KPIs and external assurance components complemented the SEI well as a quantitative measure of stakeholder satisfaction.
- 3.13 With regards to the future of these components, there were differing views among participants of the policy working group on the extent to which these should be retained and/or financially incentivised. Please see Appendix 1 for further information.

Proposed overarching approach for RIIO-ET2

- 3.14 This section sets out potential options for consideration for the SSO in RIIO-ET2, which seek to reflect the performance improvements achieved during RIIO-ET1 and embed these as business as usual.

- 3.15 In RIIO-ET2 we have identified opportunities to incentivise and reinforce quality stakeholder engagement, for example, through our proposed Business Plan Incentive and the User Groups. We are consulting on whether, in this context, it is appropriate to continue incentivising stakeholder engagement for the full duration of RIIO-ET2 and therefore one of the options we are consulting on is the option to remove the SSO in its entirety.
- 3.16 However, should the SSO be retained, we have identified a number of key considerations, in particular:
- in designing a potential RIIO-ET2 output, we will identify anything that should be considered business as usual (BAU) and which therefore should not be financially incentivised
 - the application of the different SSO components is not consistent across all TOs. Any components retained for RIIO-ET2 should be standardised for all TOs in so far as possible. This will help enable better comparison of performance across all TOs
 - there is a risk of overlap between the SSO and other potential incentives. In RIIO-ET2, we will endeavour to remove any overlaps between the SSO, if retained, and other incentives.
- 3.17 In the following sections, we set out options for the SEI and the remaining components of the SSO.

Potential size of incentive in RIIO-ET2

- 3.18 If we retain a financial incentive for the SSO, we will need to consider the appropriate incentive strength to continue to deliver value for consumers in RIIO-ET2.
- 3.19 There are a number of ways in which we could consider setting the value of the incentive:
- reduce the value of the current incentive, measured in percentage of Totex and apply to both penalties and rewards
 - consider setting a fixed reward pot to reflect the value of good stakeholder engagement to GB consumers, to be potentially competed out across network companies and maintain an absolute penalty measured as a percentage of Totex.
- 3.20 Some policy working group participants raised concerns around the need to ensure performance is comparable across all companies if we choose to introduce a fixed rewards pot. Our initial view is that a fixed reward pot would be appropriate given that activities in this space should be comparable across sectors.

Stakeholder Satisfaction Output: Stakeholder Engagement Incentive

Background

- 3.21 The SEI was introduced in RIIO-ET1 to encourage TOs to engage proactively with a wide range of stakeholders on an ongoing basis to anticipate their needs and deliver a consumer-focused, socially responsible and sustainable energy service.
- 3.22 The SEI was designed to drive behavioural change by financially rewarding those network companies that undertake high quality engagement activities and use the

outputs from this process to inform how they plan and run their business on an ongoing basis.

Performance in RIIO-ET1

Company performance under the SEI has been positive overall.⁶ So far in RIIO-ET1 stakeholder engagement has become increasingly embedded in the businesses and the independent panel has determined that the majority of network companies are committed to engagement. For further details on performance see Appendix 1.

Options for consideration for RIIO-2

3.24 In light of the rate and pace of change in the energy industry, network companies will need to be outward facing and responsive to the needs of their stakeholders in RIIO-ET2. We think that high quality stakeholder engagement should be a business as usual function for each company. We want a culture of engagement embedded within companies and for it to lead to tangible benefits to consumers.

Business plan incentive

3.25 Stakeholder engagement will be critical to developing a good business plan and as part of the business plan incentive, we plan to take account of the quality of engagement in developing the plan.

3.26 We expect companies to submit a clear strategy and plan for stakeholder engagement for the duration of the price control period. This strategy would be informed by company User Groups and would describe how companies will incorporate best practice from RIIO-1 into their activities. It could also list the specific activities, deliverables and targets that the companies are aiming for. Please see Chapter 9 of the Core Document for further information on the business plan incentive.

Potential ODIs

3.27 We are considering whether an additional incentive for stakeholder engagement is required during the control period itself. We are consulting on three options.

- **Option 1: No ODI for stakeholder engagement.** Under this option, we would not have an SEI in RIIO-ET2.
- **Option 2: Reputational incentive.** Under this option, we would report annually on companies' performance on stakeholder engagement.
- **Option 3: Financial incentive.** Under this option, we would reward or penalise companies for their performance on stakeholder engagement.

3.28 Removing the incentive would recognise that it is in the companies' own interest to have strong stakeholder engagement because it facilitates better outcomes for both them and their customers. However, removing it would not necessarily protect against companies choosing to deprioritise stakeholder engagement, which is what a financial or reputational incentive could provide. The main drawback of financial and reputational incentives for stakeholder engagement is that it can be challenging to evaluate objectively and, for financial incentives, it can be difficult to place a financial value on the benefit to consumers.

⁶ The SEI operates on a continual improvement basis, meaning that companies must demonstrate they have improved from one year to the next to obtain the same score from the previous year.

- 3.29 Stakeholder engagement must be central to network operation, but it is not clear that it needs a separate incentive in RIIO-ET2. We also note that the key role of the networks and their impacts are captured by other proposed RIIO-ET2 mechanisms and do not want the TOs focus to be distracted away from these.

Design of a reputational or financial incentive

- 3.30 To effectively operate a reputational or financial incentive, we think it would be important for network companies to propose clear commitments up front that they would be evaluated against.⁷ These could include KPIs, deliverables or stretching targets. Recognising that this is an area that is difficult to be prescriptive on, we are seeking views from stakeholders on whether it would be possible to establish clear and appropriate KPIs and deliverables in this area.
- 3.31 Under a reputational incentive, we would report on performance against the network companies' commitments through our annual report. Under a financial incentive we could apply a discretionary reward or penalty at the end of the price control period. This would penalise companies that have not met their commitments and reward those that have performed beyond their own, and others', commitments. We could consider the use of relative rewards and penalties in order to create a degree of competition between companies.
- 3.32 We could also consider an ongoing role for the companies' Customer Engagement Groups in helping to assess company performance under a reputational or financial incentive.

ETQ5. We welcome views on whether a specific incentive for stakeholder engagement is appropriate in RIIO-ET2, and if so, whether this should be reputational or financial.

ETQ6. Do you think individual components of the SSO should be combined into a single incentive mechanism in RIIO-ET2, should the SEI and components of the SSO be retained?

ETQ7. We invite views on types of business plan commitments that would be appropriate for stakeholder engagement.

ETQ8. We welcome views on the potential approaches to setting a financial incentive for the SSO in RIIO-ET2, if retained. Are there any other considerations we should take into account if we move to a fixed reward pot that network companies compete for?

Stakeholder Satisfaction Output: Satisfaction Survey, KPIs, and External Assurance components

Background

- 3.33 This section sets out potential options for consideration for the Stakeholder Satisfaction Survey, the KPIs and the EA components of the SSO.

⁷ Each company's baseline allowance should enable them to deliver their stakeholder engagement strategy, including the adoption of best practice. We do not propose to provide companies with additional funding for engagement activities. If companies request specific funding then they must justify this by demonstrating that the activity would not be otherwise supported, and that it is likely to result in a measurable benefit to consumers.

- 3.34 In RIIO-ET1 there are differences in how the three components operate for the Scottish TOs (SHE-T and SPT) and NGET. We summarise the different components, including weightings, baselines and cap and collars⁸ in Appendix 1.
- 3.35 The survey, KPIs and external assurance components were introduced at the beginning of RIIO-ET1 but the incentive was 'switched off' for the first three years (2012-2015). This 'switched off' period enabled us to gather performance data to help create an informed baseline for surveying in the remainder of the price control (2016-2021).

RIIO-ET1 performance

- 3.36 These components of SSO were 'switched on' in the year 2016/17. Performance from the last two years in which the incentive was live showed that there has been sector outperformance against the survey baseline of 7.4 (out of 10). We have seen mixed performance from the Scottish TOs (SPT and SHE-T) against the KPIs, with general compliance within the External Assurance component. Please refer to Appendix 1 for a detailed table of performance scores in the 'switched on' years of this incentive.

Options for consideration for RIIO-ET2

- 3.37 As highlighted earlier, stakeholder engagement has become increasingly embedded in TO businesses and it is our view that stakeholder engagement should be moving to business as usual in RIIO-ET2. In addition, we have established User Groups for RIIO-ET2 which could potentially play an on-going role in terms of monitoring and assessing TO performance and challenging them on how they are meeting the expectations of their stakeholders. Please see Chapter 3 of the Core Document for further information on the User Groups.
- 3.38 We are consulting on the following options for the survey, KPIs and external assurance components.

Table 3: Potential options for survey, KPIs, and external assurance in RIIO-ET2

Option 1	Remove all three components.
Option 2	<p>Retain a targeted Satisfaction Survey, focussing on the quality of the connections process and engagement around new transmission projects. Combine with a financial or reputational ODI, as per our proposals for the SEI.</p> <p>Remove financial rewards associated with the KPIs and external assurance components.</p> <p>Consider introducing a licence obligation around external assurance.</p>

Survey Component

- 3.39 Participants of our policy working group identified potential value in retaining the survey element of the SSO within the context of specific areas. It is also our initial view that the survey component of the SSO could continue to provide assurance that TOs are incentivised to be 'outward looking' throughout RIIO-ET2.

⁸ The cap and collar applied to the survey and the KPI. The cap protects the TOs from incurring significant penalties, with penalties capped for any score below 5.8. Conversely, the collar protects consumers from excessive rewards, with rewards capped for any score above 9.

- 3.40 We are consulting on whether the survey component should be retained, whether within a reputational or financial ODI, focusing on two specific policy areas.
- First, to capture the quality of the overall connections process (beyond the timeliness of the offer) in RIIO-ET2. We discuss the timely connections output and our proposals for integration within the survey later on in this chapter.
 - Second, to capture the quality of engagement with stakeholders impacted by new transmission projects. See the visual amenity outputs chapter for more detail on our proposals.
- 3.41 The survey could play an ongoing role in providing assurance that the TOs are improving the quality of communication and engagement with their stakeholders where there is a direct service link.
- 3.42 If retained, we would propose changes to the survey component to introduce a targeted TO Satisfaction Survey which would increase comparability and consistency across all three TOs. We summarise our proposals in Table 4 below.

Table 4: Potential design options for the Satisfaction Survey

Survey Focus	We are proposing to move away from a wider stakeholder survey, to a survey that is targeted at specific stakeholder groups on which the TOs are having a direct impact i.e. through the connections process or through the development of new transmission projects. Subject to consultation, we see more value in the survey being targeted at groups that are directly impacted by the service TOs provide. However, we welcome views on this narrowed focus.
Survey content	We are proposing to retain a single primary survey question, which asks for overall satisfaction on a scale of one to ten, consistent across the board. We note that this approach would also enable TOs to tailor the remainder of the survey to the needs of their stakeholders.
Survey baselines	Our proposal would be to reflect the methodology in RIIO-ET1 using updated performance scores. We propose to calculate the mean of the outturn data over RIIO-ET1, with an improvement factor incorporated to ensure the baseline remains challenging building on RIIO-ET1 performance. However, we also recognise that adjusting the survey sample will impact the performance scores and that this outturn data may no longer be applicable for determining the new baseline.
Survey Sample	We propose that the User Groups could potentially play a role in providing external assurance and/ or guidance around stakeholders surveyed

Proposal for the KPI and external assurance components

- 3.43 From our own review and discussion during the ET policy working groups on the KPIs and the External Assurance, we identified some areas that should be considered business as usual or where there may be overlaps with other outputs within RIIO-ET1.

Based on these principles, we are proposing to remove any financial incentive associated with the KPI and EA components. We consider that these could be retained as reputational incentives. We outline further details in Table 5 below

Table 5: Proposals to amend the KPIs and External Assurance

KPIs	We are proposing to remove any financial incentive around KPIs. We still view the KPIs as useful metrics for the TOs to embed the priorities of their stakeholders within their business operations. Our initial view is that a reputational approach could provide an appropriate incentive for performance in this area. We propose that the KPIs could be reported by the TOs to their User Groups as.
External Assurance	We are proposing to remove any financial incentive around external assurance. We are considering whether the external assurance component should be retained as a minimum standard and/ or licence obligation for the survey component.

ETQ9. Do you have any views on whether we should retain a TO User Survey, targeted at a number of key areas as identified in this document? Are there any alternative mechanisms to address potential issues in these areas we should be considering?

ETQ10. Are there any other areas, beyond those identified in this consultation document, which we should consider targeting through a potential survey?

ETQ11. Do you have any views on our proposal to retain one question on overall satisfaction from which the scores will be collated?

ETQ12. Do you agree that we should use RIIO-ET1 performance as a starting point for setting a RIIO-ET2 baseline? What alternative approach(es) should we consider?

ETQ13. Do you agree that the User Groups could provide guidance on the stakeholders that should be included in the survey sample? Are there any specific stakeholders that you think must be surveyed to improve the validity of the scores?

ETQ14. Do you agree with our proposals to remove the financial incentive associated with the KPI and EA components? Should the EA component be retained as a minimum requirement/ licence obligation?

Interactions with other policy areas

3.44 Due to the nature of this output we believe there are multiple interactions with other policy areas. Naturally, we expect any output that improves the experiences of stakeholders will have a positive impact on stakeholder satisfaction scores, ie Energy Not Supplied, Visual Amenity Projects etc. and vice versa. We have also highlighted key interactions with our proposals around Timely Connections.

Timely Connections Output

Purpose of output	To incentivise high quality and timely offers of connection.
Proposed approach	Retain existing Licence Obligation penalty mechanism and seek to enhance the focus on the quality of connection offer.

Background

3.45 The electricity system is currently undergoing significant change, with a shift away from a traditionally small number of centralised large generating stations towards

a greater number of smaller scale generators, often from renewable sources. This provides a challenge to the transmission system. The connections process is key to ensuring timely and efficient connections to the system.

- 3.46 In 2010 the Department of Energy and Climate Change (DECC), now known as the Department for Business, Energy and Industrial Strategy (BEIS), introduced the 'Connect and Manage' arrangements. These reforms allow a new generator seeking to connect to the transmission system to gain full access once all the 'enabling' works have been completed. The aim of this reform was to significantly reduce the connection dates of new generators, which was a key barrier for large volumes of generation.

Timely connections output in RIIO-ET1

- 3.47 Under the RIIO-ET1 price control arrangements, the connections output is directly incentivised through a penalty-only mechanism which applies at the connection offer stage of the connection process. This is referred to as the Timely Connections Output.
- 3.48 The primary aim of the Timely Connections Output is to improve the timeliness of connection offers provided to applicants looking to connect to the transmission network.
- 3.49 The connection offer process for the electricity transmission system begins with the applicant applying directly to the ESO. The role of the ESO is to facilitate and oversee the end-to-end connection offer process.
- 3.50 While the ESO coordinates the connection offer process, the TOs play a key role and are responsible for undertaking the primary technical assessment of the options available to connect to their networks. The TOs must complete this offer assessment in the required timescales⁹ and provide this to the ESO, in order for the system operator to meet its deadline for delivering the offer to the applicant.¹⁰
- 3.51 The Timely Connections Output applies only to the TO role and, therefore, the associated timescales within this process equally only extend to the TO role. The incentive operates by applying a penalty to any failure by the TO to meet its licence obligations for the delivery of a timely connection offer to the ESO. Where the TOs fail to meet their licence obligation, a penalty is applied of up to 0.5% of allowed base revenue. Further information on the RIIO-ET1 Timely Connections output is available in our RIIO-ET1 Strategy Decision.¹¹
- 3.52 The RIIO-ET1 penalty mechanism currently applies only to the two Scottish TOs, SPT and SHE-T but not to NGET.
- 3.53 Performance against the output to date has been good, with one TO failing to meet its licence obligation in the first two years of RIIO-ET1 and full compliance since.

Views of the RIIO-ET2 Policy Working Group

- 3.54 We discussed the Timely Connections Output at a number of RIIO-ET2 Policy Working Group sessions.

⁹ See Standard Licence Condition D4A (Obligations in relation to offers for connection etc), and Part 2, Para 4.8.1 Section D of the System Operator – Transmission Owner Code (STC).

¹⁰ See para 7(b) of Standard Licence Condition C8 (Requirement to offer terms).

¹¹ https://www.ofgem.gov.uk/sites/default/files/docs/2011/03/t1decisionoutput_0.pdf

- 3.55 Feedback received to date on the RIIO-ET1 experience highlighted that the existing mechanism does not capture the quality of the connection offer and connection process more generally. A high quality and transparent application process is key to an efficient and timely connection to the transmission network and improving the customer experience. This is particularly important within the context of new and smaller players potentially seeking to connect who are less familiar with the process or are seeking different types of connections (eg more flexible connections and arrangements).

Options for consideration for RIIO-ET2

Timeliness of connection offer

- 3.56 We are proposing to retain the Timely Connections Output for RIIO-ET2. Our initial view is that for RIIO-ET2 there remains a need to ensure that the underlying aims of the Timely Connections Output are retained, such that all applicants for connection are provided with an offer within a reasonable timescale. This links into the wider principles of ensuring that TOs deliver an effective and timely connection process.
- 3.57 We are proposing to retain a penalty associated with the current licence obligation on TOs to provide a timely connection offer. We are not proposing to make changes to the timings of the connection offer process or the incentive timescales associated with this.
- 3.58 As highlighted above, NGET is not subject to the penalty incentive mechanism. Our initial view is that the penalty mechanism should be applied consistently across all three TOs, in particular with respect of the upcoming separation of the ESO from NGET. We are therefore proposing to extend the penalty mechanism to NGET for RIIO-ET2.
- 3.59 We note that the penalty is currently set at an equivalent of up to 0.5% of base revenue. When we set the penalty rate in RIIO-ET1, we recognised the importance of timely connections with respect to the delivery of a sustainable energy sector. We consider that the size of the penalty remains fit for purpose and are proposing to retain it for RIIO-ET2.

ETQ15. Do you have any views on whether we should retain the RIIO-ET1 Timely Connections Output (which applies to the connection offer stage) for RIIO-ET2, including the penalty rate, and extend it to NGET?

Quality of connection offer

- 3.60 In addition to proposing to retain the existing output, we also recognise that the timeliness of the connection offer is only one component of the connection offer process. For applicants and prospective applicants, the quality of the connection offer, wider connection process and the associated stakeholder engagement is also of high importance. Therefore, for RIIO-ET2, we are considering options for capturing the quality of the connection offer and connection process more generally, in addition to the existing requirements around the timeliness of the offer.
- 3.61 Earlier in this chapter we discussed potential approaches to stakeholder engagement, in particular the potential for a better targeted survey. Our initial view is that a survey could provide a measure of the quality of a connections offer

as it provides first-hand qualitative feedback from applicants and stakeholders involved in the connection process. This could include seeking feedback on the quality of stakeholder engagement at all stages of the process. Introducing a formalised connections survey component should provide greater transparency of this process, and measures for comparison between TOs.

- 3.62 As already mentioned, the ESO plays an important role in managing new connections and engaging with stakeholders. Therefore, we note that any proposals to capture the quality of the overall connections process and associated stakeholder engagement must ensure that transmission operators are not rewarded and/or penalised for actions taken by the ESO.

ETQ16. Do you have any views on options for capturing the quality of the overall connections process through our stakeholder engagement proposals, for example through the use of a survey?

ETQ17. Are there any alternative options for capturing the quality of the overall connection process, not identified in this consultation document, which we should be considering?

ETQ18. How do you think we can ensure that transmission operators are not rewarded and/or penalised for actions actually undertaken by the System Operator?

- 3.63 We have considered options for introducing a specific obligation relating to the actual time to connect, with a potential for a penalty where the obligation has not been met. An example of such arrangements exists in the electricity distribution price control (Time to Connect incentive). However, the existing electricity transmission codes¹² have mechanisms in place in respect of delays to connection works. Further, as detailed in our RIIO-ET1 decision document, we do not propose to add fixed timescales to the delivery for a connection due to the risk of unintended consequences, such as a reduction in the quality of work.¹³
- 3.64 We have also considered whether an arrangement similar to the Incentive on Connections Engagement (ICE) in the electricity distribution price control could be introduced. The ICE is primarily designed to improve stakeholder engagement within the connection process by considering different approaches to different sizes of connection. This would achieve a similar result to our proposals to link the connections incentive to the SSO. At this stage we are not considering introducing such a mechanism.

Interactions with other policy areas

- 3.65 The connection offer incentive overlaps with a number of existing and proposed outputs and incentives. The main interactions are summarised below.
- SSO: we are considering whether the quality of the connections process could be captured through the SSO, for example through a potential survey, as set out earlier in this chapter.
 - Connection works and wider works: this focuses on the installation of new assets on the network to accommodate changes in electricity generation and

¹² Schedule 9 (TO construction terms) to the STC and Section 3 (Use of system) of the Connection and Use of System Code (CUSC).

¹³ See section 9 https://www.ofgem.gov.uk/sites/default/files/docs/2011/03/t1decisionoutput_0.pdf

demand. This consists of an upfront allowance to deliver a specified threshold capacity, based on the best estimate of projects most certain to proceed at the time, augmented by a volume driver, designed to flex the allowance in accordance with the actual outturn demand and consequential system-wide requirements. The timely connection output interacts with this output by incentivising the timely delivery of the connection offer phase of new connections.

Energy Not Supplied (ENS)

Summary of output	The purpose of the ENS incentive is to encourage TOs to efficiently improve network reliability by managing short-term operational risk and mitigation actions.
Proposed approach	ODI

Background

- 3.66 This section sets out potential options for consideration for the ENS ODI. We also set out options on how the incentive could be applied. This chapter will not set out our proposals relating to longer-term asset risk. Please see Chapter 6 of the Core Document for further details.
- 3.67 For RIIIO-ET2, we are seeking views on the following for the ENS incentive.
- Type of incentive.
 - Setting baseline targets and improvement factors.
 - Incentive value.
 - Taking into account embedded generation in the ENS calculation method.
 - ENS metrics.
 - Definition of excluded and exceptional events.
- 3.68 Electricity is central to GB consumers’ daily lives. Society’s ever-increasing dependency on electricity demands a secure and reliable network for GB consumers. Keeping the lights on is essential for GB to have a thriving and productive economy. Reliability will become increasingly important to facilitate the necessities of our daily lives.
- 3.69 ‘Energy not supplied’ means the volume of energy to customers that is lost as a result of faults or failures on the network. ENS contributes to reliability for consumers. Reducing ENS means minimising interruptions to supply on the electricity system. Faults on the electricity network leading to loss of supply events can occur because of numerous reasons, for example: adverse weather, third party actions, cable faults, overloading of circuits, human error, etc.
- 3.70 The transmission network supplies all of GB, including distribution networks and other large industrial customers (e.g. rail system, industrial plants, etc.). In general, reliability on the transmission system is very high. Disruptions to supply at transmission level voltages typically have a low probability of occurrence, but a high impact on those connected to the network.
- 3.71 Our regulatory framework is designed to ensure that the TOs plan and operate a reliable network based on three main building blocks– the Security and Quality of

Supply Standard (SQSS)¹⁴, Network Asset Risk Metrics (NARMs)¹⁵, and the ENS incentive. The ENS incentive was first introduced to enhance the existing regulatory and legislative framework by providing financial incentives to encourage TOs to go above the minimum standards required by SQSS, and to deliver a higher level of reliability, where it is good value for consumers.

- 3.72 SQSS and NARMs however do not reduce risks to zero in regards to fault and outage planning, nor do they provide short-term operational risk considerations in running the network. The ENS incentive complements this regulatory framework by encouraging network companies to consider short-term operational risks and procedures that not covered by NARMS, and risks, some of which are allowed by SQSS, and therefore seeks to ensure that performance goes above and beyond the minimum standards.
- 3.73 We recognise that it can be disproportionately expensive to try and avoid interruptions altogether by building in extra redundancy¹⁶ on the network. We aim to provide a regulatory environment that ensures that a cost-effective level of reliable electricity supply is available to GB consumers.

ENS in RIIO-ET1

- 3.74 In RIIO-ET1 shorter-term risk and operational management of transmission network reliability is incentivised through the ENS incentive. The purpose of the incentive is to encourage TOs to prioritise and improve network reliability, where reasonably practicable, by reducing the number and duration of loss of supply events by managing shorter term operational risk and mitigation actions. This also includes ensuring the TOs respond in a timely manner to, and mitigate the impact of, incidents when they do occur.
- 3.75 A high level overview of the ENS incentive components in RIIO-ET1 can be found in Appendix 1 and a brief summary is as follows.
- 3.76 ENS is measured in megawatt hours (MWh). TOs are set a target for ENS at the start of the price control. TOs then receive an annual penalty/reward depending on whether their actual ENS in the year is above or below the target level.
- 3.77 The strength of the incentive is based on the incentive value. The incentive value for ENS reflects an agreed value of lost load (VoLL). VoLL represents the value that electricity users attribute to security of electricity supply. Therefore, using VoLL to set the incentive rate ensures that rewards and penalties under the ENS are reflective of the value that consumers place on secure supplies.
- 3.78 During RIIO-ET1 to date all three TOs have performed very well under the incentive and have delivered a sustained decrease in ENS to historically low levels. They have significantly outperformed their baseline targets in several consecutive years - on average, they have performed 84% below those targets. For further information on performance, please see Appendix 1.

Views of the RIIO-ET2 Policy Working Group

- 3.79 We discussed a number of aspects of the ENS incentive in our policy working group including: RIIO-ET1 performance, how the incentive has influenced TO

¹⁴ <https://www.ofgem.gov.uk/licences-industry-codes-and-standards/standards/security-and-quality-supply-standard-sqss>

¹⁵ This is known as Network Output Measures (NOMs) in RIIO-1.

¹⁶ Redundancy refers to duplicating critical components or functions, to increase reliability in a system. Redundancy measures can include installation of back up equipment, protection measures, etc.

behaviour, how the incentive could be made more reflective of network improvements and developments and of customer expectations. The working group also discussed various options for baseline setting, adjustment mechanisms, different approaches to measuring VoLL, adjusting ENS for embedded generation, and potential new reliability indicators. Further information can be found in Appendix 2.

Options for consideration for RIIO-ET2

- 3.80 We are seeking views on whether to retain the ENS incentive for RIIO-ET2. Our initial view is that any ENS incentive should aim to:
- balance the financial rewards/penalties to which network operators are exposed to: Ofgem recognises that not all loss of supply events are within the control of TOs. There will always be a minimum level of disruption on the transmission system due to a number of possible causes (e.g. transient faults, equipment failures, human error, etc.)
 - encourage TOs to take a balanced approach: by focusing on managing the risks around outage planning and faults, whilst striving to efficiently deliver reliability.
 - be based on baseline targets that are challenging, but also fair and achievable: the incentive should take into account past improvements and best practices in mitigation strategies
 - be calibrated so that it reflects consumers' valuation of ENS: in terms of VoLL, as well as baseline setting. We believe that it is important to engage with stakeholders on what an acceptable baseline looks like. Ofgem particularly welcomes views from the TOs' stakeholders such as directly connected customers (e.g. large industries, steel mills, network rail, etc.). We acknowledge that it may not be cost-effective to attempt to completely avoid loss of supply events by ensuring there is 100% redundancy on the network. The incentive should therefore be reflective of the TOs' customers' expectations and valuation of reliability on the network.
- 3.81 We think that the ENS incentive has worked well so far in RIIO-ET1 and we are therefore seeking views on whether to retain it in RIIO-ET2. We are also proposing that, if retained, it remain a financial incentive, rather than changing it, for example to a reputational incentive. Supply interruptions on the transmission system can be costly, cause major disruptions to large segments of the population and obstruct day-to-day activities - such as transport, hospital care, industrial production, etc. We consider that reducing ENS will likely continue to be a priority for consumers as society increases its dependence on electricity.
- 3.82 In RIIO-ET1 to date, we have observed that TOs have reduced, and have sustained for several consecutive years a level of ENS below that of the previous price control. For that reason, we are proposing to refine the RIIO-ET1 incentive so that it continues to incentivise TOs fairly during RIIO-ET2 to provide a level of ENS that is valued by customers.

Absolute incentive or dynamic incentive

- 3.83 We are seeking views on whether the ENS incentive should remain an absolute incentive, or whether it should move to a dynamic relative incentive. We welcome views on the extent to which sufficient comparability could be achieved to enable the introduction of a dynamic relative incentive.

- 3.84 We consider that an absolute incentive encourages TOs to focus on efficiently delivering operational improvements and mitigating the risk of loss of supply events. This type of incentive aligns TO focus and consumer value on improved reliability.
- 3.85 We recognise that there are benefits to dynamic incentives, as they better replicate a competitive market, which an absolute incentive does not. However, we also note that introducing a dynamic relative incentive in this area could prove challenging, as a key pillar for relative incentives is comparability. It may be difficult to compare ENS across networks due to differences in size, weather, etc. Further, a dynamic relative incentive may drive inefficient behaviour and encourage TOs to reduce ENS to a level not supported by customers. This view was reflected in our policy working group.

Positive financial reward or penalty-only

- 3.86 We are seeking views on whether the ENS should retain a positive financial reward element, or move to a penalty-only scheme; specifically, how considerations and risk mitigation strategies may be affected should the scheme move to penalty only.
- 3.87 On the one hand, TOs have demonstrated through their RIIO-ET1 performance that they are able to consistently reduce and maintain ENS at very low levels. During 2017-2018, the overall reliability of supply for the national electricity transmission system was 99.999975%.¹⁷
- 3.88 During our policy working group, some participants were of the view that with SQSS and NARMS in place the current level of reliability is very high. It is not evident what mitigation actions and behaviours are business as usual, and whether there are any new strategies and behaviours left to incentivise. Our initial view is that consumers should not be paying for ENS risk mitigation that is business as usual and already funded in TOs' baseline costs.
- 3.89 In addition, we welcome further evidence and views from stakeholders, in particular large directly connected customers such as Network Rail, industrial customers, etc. on their level of satisfaction with current reliability levels. We expect customers' view of the value of reliability to inform and be reflected in the TOs' business plan development for RIIO-ET2.
- 3.90 We engaged with TOs to collect evidence on actions and mitigation strategies they have taken to reduce the risk of loss of supply events. Some examples include: offline builds, daily weather reviews, weekly demand at risk process reviews and contingency plans at Grid Supply Points (GSPs). Some policy working group participants considered these actions to be business as usual. TOs will need to demonstrate and articulate in greater detail what considerations and risk mitigation strategies would be affected, should the reward be removed.
- 3.91 On the other hand, some policy working group participants noted that should the reward be removed there is a potential risk that TOs' behaviour would shift to compliance only and risk management considerations on ENS levels would lose focus. We acknowledge that removing the reward from the incentive may introduce a misalignment between TO behaviour and customer valuation of reliability.

¹⁷<https://www.nationalgrideso.com/sites/eso/files/documents/National%20Electricity%20Transmission%20System%20Performance%20Report%202017-2018.pdf> (page 5)

- 3.92 Mitigation actions may be straightforward and part of TOs' regular business processes, but their effect appears to have been substantial. These strategies appear to have had a significant effect on the reduction of ENS during the RIIO-ET1 period to date. Should the incentive move to penalty-only, some mitigation actions may be removed from regular review (e.g. weekly outage reports may turn into fortnightly, or monthly reviews) and may have a significant impact on TOs' behaviour and risk management of ENS levels. We welcome further evidence and examples of how outage planning and other mitigation strategies might be affected if the reward was removed from the ENS incentive.
- 3.93 We note that removing the reward would render the baseline target a dead-band, as there would be no reward for any MWh reduced below the target baseline, and therefore no incentive for TOs to decrease ENS levels any lower than their baseline targets. Dead-bands also imply that consumers do not value each MWh within the dead-band range, which is not supported by studies on consumer VoLL. Standard economic theory and empirical VoLL studies almost always show that consumers value each unit of electricity at a price greater than zero. We discuss VoLL in more detail later on in this chapter.
- 3.94 In order to ensure each MWh is valued by the incentive, we would need to set the baseline target at zero. We acknowledge that there will always be a minimum level of disruption on transmission systems due to a number of possible reasons, making it difficult and costly for TOs to completely eliminate the risks of failure. We recognise it may not always be efficient or economic to try and do so.
- 3.95 There is an inherent level of risk around loss of supply events. A baseline of zero could encourage TOs to overbuild redundancy to ensure they are not penalised under the ENS incentive. This would be extremely costly for consumers. Further, we have not seen any evidence to date that this level of ENS is in the interests of consumers.

ETQ19. Do you have any views on whether we should retain the ENS incentive, and whether we should retain it as a positive reward mechanism, or move towards a penalty-only scheme? What impact could the move to a penalty-only mechanism have on TO decision-making and behaviours? Please evidence.

Setting baseline targets

- 3.96 For RIIO-ET1 TOs forecasted and proposed baseline targets to Ofgem. RIIO-ET1 baseline targets were static over the price control period and were modelled on past performance. So far, TOs have outperformed their RIIO-ET1 targets. Using RIIO-ET1 forecasting methods, the RIIO-ET2 targets would be lower, reflecting improved performance during the RIIO-1 period.
- 3.97 We note that the forecasting method for RIIO-ET1 varied between TOs and we welcome views on whether a more consistent forecasting method among TOs should be used for RIIO-ET2.
- 3.98 We have also considered other options for setting baselines, such as a rolling baseline targets and dead-bands. Rolling baseline targets would take into account the previous year's performance, which would mean that if poor performance occurred in a particular year, the baseline target would be more relaxed the following year, making outperformance more achievable for the TOs. We consider

that this would be inconsistent with the intention of the incentive, which is to encourage TOs to manage and decrease ENS, where possible.

- 3.99 Dead-bands would allow for a degree of volatility of network performance. However, as discussed above, there is no incentive within the dead-band, which implies that MWhs within the dead-band are not valued by customers, which is not the case. Almost all VoLL studies demonstrate that consumers place a value higher than £0 on each unit of electricity.

ETQ20. Do you have any views on how Ofgem should take into account issues other than past performance when determining baseline targets? For example, processes adopted as BAU, increased TO experience and expertise on fault mitigation and management, future modernisation projects, etc. What adjustment mechanisms are appropriate?

Improvement factors

- 3.100 For RIIO-ET2, we are considering whether the baseline target should also take into account step changes and improvements in the electricity network (e.g. new processes for managing risk around loss of supply events). Since RIIO-ET1 was implemented there has been a significant, positive, step change in performance levels of ENS by TOs and how risk is managed to maintain these performance levels.
- 3.101 We are seeking views on whether to introduce an improvement factor for baseline targets, which would mean that baseline targets get tighter over time. This would allow the targets to better reflect experience gained, improvements in asset management practices and encourage TOs to be proactive in evolving current strategies and mitigation actions. This would also be similar to the approach taken in the current Interruption Incentive Scheme (IIS) that applies to Distribution Network Operators (DNOs) in RIIO-ED1.
- 3.102 Some policy working group participants felt that an improvement factor that tightens baselines over time would not be appropriate within the context of the transmission network. They considered that faults on the transmission system are different to those on the distribution system – outages can be longer on the transmission system, therefore mitigation strategies differ, as do the risk profiles of outage planning and flexibility to re-route supply.
- 3.103 We acknowledge that there may be other considerations to take into account when considering baselines. For example, increasing modernisation projects in future years and how they may change the TOs' risk profiles. For RIIO-ET2 we are seeking views on introducing an improvement factor, or any other appropriate adjustment mechanism(s) that are reflective of not only past performance but forward changes and improvements on the electricity network.

ETQ21. Is the introduction of an improvement factor appropriate within the context of the electricity transmission system? What other mechanisms are appropriate?

ETQ22. We welcome views on additional considerations we should take into account when setting baseline targets?

Incentive value

- 3.104 The ENS mechanism uses an agreed VoLL of £16,000/MWh¹⁸ to value the incentive. VoLL represents the value that electricity users place on maintaining supply. We recognise the importance of using a precise value of VoLL that accurately reflects that customer value.
- 3.105 The RIIO-ET1 VoLL value may be outdated, as it was determined in 2011. More recent data and studies have been carried out since implementation of RIIO-ET1. In addition, we recognise that the development of new technologies and increasing reliance on electricity have changed consumers' value of electricity. We intend to consider external developments and wider strategic thinking on VoLL values for RIIO-ET2, from BEIS and other third parties. We intend to apply a common incentive rate across the TOs, adjusted by the efficiency incentive rate (also known as the post-tax totex incentive strength). We note that there was general agreement among policy working group participants to support updating the VoLL value with more recent data from studies to better reflect consumer value of electricity, if applicable.
- 3.106 For RIIO-ET1, the VoLL value was based on a blend of domestic and small to medium sized enterprises (SMEs). We note that on the transmission system, a good proportion of the customers who may be interrupted are likely to be larger industrial consumers who have a much lower VoLL than domestic consumers and SMEs. We will consider how this will affect VoLL for RIIO-ET2.
- 3.107 There are various methods that can be used to estimate VoLL that can lead to different results. These include macroeconomic methods such as a production function approach, customer surveys on willingness to pay or willingness to accept and cost estimates based on previous loss of supply events. We recognise that there are merits and weaknesses for each method.
- 3.108 We are aware of various recent, and ongoing pieces of work currently underway on VoLL, for example, the Electricity North West Ltd. (ENWL) Network Innovation Allowance project¹⁹, and the EU Agency for the Cooperation of Energy Regulators (ACER) report²⁰ and will take these into consideration.

ETQ23. Do you agree with our proposals to base the ENS incentive rate in RIIO-ET2 on an updated, agreed VoLL?

Financial collar

- 3.109 The RIIO-ET1 ENS incentive includes a financial collar on potential penalties of 3% of each TO's base revenue. We propose to retain this in RIIO-ET2 as there has been no evidence from our research, or from feedback from the policy working group that this is inappropriate.
- 3.110 The financial collar limits the potential financial penalty that a TO could face if it fails to meet the baseline level of performance. Without a financial collar, TOs may over-invest in their networks to avoid the risk of large penalties. These costs,

¹⁸ Please see our RIIO-T1 Strategy Decision for further details: <https://www.ofgem.gov.uk/publications-and-updates/decision-strategy-next-transmission-price-control-riio-t1>

¹⁹ Link to ENWL Network Innovation Allowance (NIA) project on VoLL: <https://www.enwl.co.uk/innovation/smaller-projects/network-innovation-allowance/enwl010---value-of-lost-load-to-customers/>

²⁰ Link to ACER report on VoLL: https://www.acer.europa.eu/en/Electricity/Infrastructure_and_network%20development/Infrastructure/Documents/CEPA%20study%20on%20the%20Value%20of%20Lost%20Load%20in%20the%20electricity%20supply.pdf

which may not be reflective of consumer value, are then charged back to consumers. An extreme, downside risk without a financial collar could also have implications for network financeability.

- 3.111 A financial collar can help strike an appropriate balance between a 'reasonable' level of unsupplied energy valued by consumers on the transmission network, and incentivising network operators to avoid such events and improve the reliability of their networks appropriately. We note that the financial collar has not been reached to date in RIIO-ET1.
- 3.112 There is a natural cap on the maximum reward the TOs can achieve (i.e. the best performance that a TO can achieve is 0 MWh of unsupplied energy). Therefore, our view is that an additional cap limiting the potential financial reward is not required.

ETQ24. Do you agree with our proposals to retain the financial collar for the ENS incentive in RIIO-ET2?

Taking into account embedded generation in the ENS metric

- 3.113 Embedded generation consists of electricity generating plants that are connected to a distribution network; this includes wind farms, hydroelectric power and other smaller generation technologies. Under RIIO-ET1 ENS is calculated based on the load observed at GSPs. GSPs are the system connection points at which the transmission system connects to a distribution system.
- 3.114 The RIIO-ET1 calculation method for ENS does not currently capture embedded generation on the electricity distribution network. We recognise that there are some barriers to this, such as issues around metering and accounting for all embedded generation sources. We are therefore seeking views on whether we should capture embedded generation, and if so, how.
- 3.115 The current calculation method underestimates the amount of demand that is actually affected by a loss of supply event on the transmission system. As embedded generation on the distribution network is increasingly providing more energy to the distribution network, less load is seen at the GSPs, therefore reflecting an understated volume of electricity reliant on the TOs to maintain supplies at GSPs. In the event of a power cut, embedded generation on the affected network will switch off, as protection and control processes begin to operate. Therefore, demand affected by an outage at a particular GSP is greater than the amount of power (load) being supplied at the GSP by the transmission system.
- 3.116 Accounting for embedded generation would result in higher declared levels of ENS for TOs at GSPs. Our initial view is that for RIIO-ET2 embedded generation of 50MW and above should be included in the data reported at GSPs. This would allow us to calculate some of the embedded generation impact at GSPs, without introducing increased complexity, which could be result if TOs were required to account for all embedded generation sources.
- 3.117 Policy working group participants expressed concern around the practicality and complexity of taking account of embedded generation into ENS calculation. However, some participants suggested that we should consider ways to include embedded generation in the ENS calculation.

3.118 Participants in the policy working group also suggested that using different metrics, specifically, number of Customers Interrupted (CI) and Customer Minutes Lost (CML) to measure ENS, would account for embedded generation on the distribution network. We discuss these in the following 'Baseline metrics' section.

ETQ25. We welcome views on approaches to estimating embedded generation at GSP points.

ETQ26. What measures need to be in place to facilitate the collection of data on embedded generations and other real time information? How do you propose to approximate embedded generation data?

Baseline metrics

3.119 We are seeking views on the potential use of CI and CML to measure ENS.

3.120 There are currently two units used to estimate ENS — the duration of the loss of supply event (in hours) and the demand (energy) lost (in Megawatts (MW)). The product of these units yields the volume of energy not supplied (in MWh). Some policy working group participants have proposed that Ofgem should consider using the metrics CI and CML to measure ENS, which are used on the electricity distribution system as part of the IIS.

3.121 We consider that on the one hand these metrics would refine data and measurement of the length and impact of loss of supply events on end users, which would potentially encourage TOs to think more about the end user. In addition, using CI/CML would require no adjustment in ENS calculations to take into account embedded generation on the distribution network.

3.122 On the other hand, however, CI/CML targets may lead TOs to prioritise energy supply to DNOs, rather than directly connected customers, as DNOs would supply a larger number of consumers and would have a bigger impact on CI/CML scores.

3.123 CI/CML data is currently collected by all DNOs. However, there may be some practical issues with transferring this data between DNOs and the TOs. These issues may be easier to address in Scotland, as the TO/DNO model differs from that in England and Wales. In Scotland the TOs and DNOs sit under the same corporate entity, but in England and Wales National Grid is required to gather this information from 6 different DNOs holding 12 individual operating licences. We welcome views from stakeholders on how these potential issues might be overcome.

3.124 We welcome views on the advantages and disadvantages of using CI and CML to measure ENS on the transmission system, as well as how to overcome barriers in data collection and assurance processes (e.g. metering, information systems, data auditing, etc.). We also intend to consider these areas for longer-term policy development ie RIIO-ET3, as we recognise there may be some challenges to data gathering and sharing. We welcome any views from stakeholders on this.

ETQ27. We invite views on changing the metrics used to measure reliability on the transmission system from MWh lost to CI/CML. What measures and processes (e.g. data sharing frameworks) need to be in place to facilitate the collection of CI/CML data?

Definition of excluded events and exceptional events

3.125 Some exceptional events and loss of supply events are excluded from the RIIO-ET1 ENS incentive. These are defined in Special Condition 1A²¹ 'Definitions and interpretation' of the TOs' licences under 'exceptional event' and 'incentivised loss of supply event'.

- The definition of 'exceptional event' includes, for example, severe weather, threat of war, vandalism, etc.
- The definition of 'incentivised loss of supply event' highlights a number of circumstances under which a loss of supply event is 'excluded' from the scheme, for example, events lasting less than or equal to three minute, any energy not supplied resulting from emergency de-energisation by a user, loss of supply events due to a shortage of available generation, etc.

3.126 Some of these definitions have not been updated since the previous price control. As the electricity system continues to change, current definitions may need to be updated to reflect the changing electricity environment and new events. For example, some working group participants noted that the definition could be extended to explicitly capture cyber-security. During RIIO-ET1, there have also only been few instances of TOs submitting claims for exceptional events.

ETQ28. Do you have any views on whether all loss of supply events should be incentivised? Do you have any views on amending the scope of the definition of events excluded as 'loss of supply events' and/or 'exceptional events'?

Interlinkages with other policy areas

3.127 Reliability today is influenced by planning and operating standards (SQSS), and asset management activities and investments of several years/decades in the past (NARMs). Together with ENS, these elements are foundational building blocks for helping to determine long-term reliability in the transmission network.

3.128 Cyber security will have impacts on the reliability and resilience of the electricity transmission system. We intend to engage with TOs to help ensure a stepped improvement in cyber resilience to enable prioritisation of cyber risk mitigation and establish a mind-set of enabling flexible and agile networks and systems for the future. More information on cyber resilience can be found in Chapter 6 of the Core Document.

3.129 ENS also interacts with measures of stakeholder satisfaction, as interruptions in supply are likely to have an impact on these measures.

3.130 Finally, we note that the ENS incentive is complementary to the Network Access Policy (NAP). Together, they encourage a comprehensive approach to outage planning and balancing the TO objectives of cost efficiency and reliability.

Business plans – informational requirements

3.131 The ENS incentive should reflect the value consumers place on reliability. We welcome evidence of company engagement with stakeholders on reliability and the level at which they value and are willing to pay for it. We would be particularly

²¹ See for example Special Condition 1A of NGET's licence here: <https://epr.ofgem.gov.uk/Content/Documents/National%20Grid%20Electricity%20Transmission%20Plc%20-%20Special%20Conditions%20-%20Current%20Version.pdf> (page 11)

interested in hearing about the VoLL and reliability satisfaction placed on large directly connected customers such as Network Rail, industrial customers, etc. We expect consumer value of reliability to inform and be reflected in the TOs' business plan development for RIIO-ET2.

- 3.132 We note that TOs could also propose more challenging baseline targets for themselves, in consultation with their stakeholders, and that this could potentially feed into our assessment of performance under our proposed business plan incentive (see Chapter 9 of the Core Document).

4. Outputs: Deliver an environmentally sustainable network

A high level objective of the RIIO price control framework is for network owners to mitigate the impact of their networks and business activities on the environment and to support the transition to a low-carbon energy future. This section sets out potential outputs and price control measures for consideration in RIIO-ET2 for TOs to fully contribute to the low carbon energy transition and deliver an environmentally sustainable network and transition. This chapter should also be read in conjunction with the Core Document, in particular, Chapter 4 on outputs and Chapter 9 on business plan incentives.

Chapter 4 questions

ETQ29. What are your views on the overall outputs package considered for this output category?

ETQ30. For each potential output considered (where relevant):

- a) Is it of benefit to consumers, and why?
- b) How, and at what level should we set targets? (eg should these be relative/absolute)
- c) What are your views on the design of the incentive? (eg reward/penalty/size of allowance)
- d) Where we set out options, what are your views on them and please explain whether there are further options we should consider?

ETQ31. What other outputs should we be considering, if any?

ETQ32. What are your views on the RIIO-ET1 outputs that we propose to remove?

All questions, including additional output specific questions, are set out in Appendix 3.

Introduction

- 4.1 The electricity and gas networks make up the system that brings energy to UK homes and businesses. However, energy networks and the related business activities can also be harmful to the environment.
- 4.2 In our July 2018 RIIO-2 framework decision document, we stated that “network companies must play a stronger role in minimising their environmental impact and facilitating the decarbonisation of the energy system”, and that “RIIO-2 has to endeavour to mitigate the impact of networks on the environment”.
- 4.3 Network infrastructure typically has a long asset life. It is important that TOs’ decisions in RIIO-2 about network investment take appropriate account of the environmental impacts, as these will persist for many decades to come. Network investment decisions based on life cycle costs will generally result in a better outcome for existing and future energy consumers who pay for network investment and the longer-term environmental consequences of those decisions.
- 4.4 For RIIO-ET2 we are proposing that our environmental framework should focus on the decarbonisation of the energy system. We also welcome views on the extent to which other environmental impacts should be captured, for example:

- climate change
 - pollution to the local environment
 - resource waste
 - biodiversity loss
 - visual amenity issues relating to infrastructure.
- 4.5 In RIIO-ET1 we have seen some evidence of network owners doing more to support and address the challenges of the low-carbon transition. This includes tailoring guidance and information on the connection process for prospective generation developers, as well as demonstrating innovative technology to address technical issues that might otherwise limit the capacity of the existing network to connect additional renewable generation.
- 4.6 We have also seen the electricity transmission owners make progress in improving the direct environmental impact of their networks. For example, the total business carbon footprint of the three electricity transmission owners has fallen 18% compared to levels in 2013/14.
- 4.7 Over RIIO-ET2, we want to see the TOs continue to make improvements across the relevant areas we highlight in Paragraph 4.4 and to include activities for achieving this up front within their business plans. We are now consulting on whether to introduce outputs and price control measures for TOs to deliver an environmentally sustainable network and fully contribute to the transition to a low carbon energy system. Some of the areas we have been exploring with the policy working group are:
- ensuring that network companies' decisions on network investment and related business activities take into account environmental impacts. We are proposing that the TOs take greater responsibility for these and embed efficient mitigation actions in their RIIO-ET2 business plan. Price control deliverables will hold the TOs to account for what they will deliver from baseline funding
 - making the environmental impacts of networks more transparent and strengthening reputational incentives. For example, we are proposing that the TOs publish an annual environmental impact report that will detail the progress made in implementing the environmental action plan and performance against their environmental impact reduction targets
 - addressing the worst sources of network greenhouse gas emissions. We propose to seek to drive a step change in the long-term reduction of sulphur hexafluoride (SF₆) emissions, a potent greenhouse gas, through output delivery incentives and stretching baseline targets in RIIO-ET2
 - encouraging the TOs to play a full role in the low carbon energy transition. We are also consulting on whether additional regulatory mechanisms are needed to drive the TOs to be more proactive in contributing to that system transition.
- 4.8 In this chapter we also discuss ways in which the price control could address visual amenity issues relate to infrastructure in certain designated areas and improve engagement with stakeholders on new transmission projects.

Summary of potential RIIO-ET2 outputs for consideration

4.9 For RIIO-ET2 we think that companies should embed environmental considerations within their business plans, and that we should consider ways in which we can improve the transparency of reporting and its reputational impact. We are also seeking views on whether to introduce a number of specific outputs, summarised in Table 6 below.

Table 6: Summary of potential outputs for consideration in RIIO-ET2

Output name	Output type*	Company driven target**	Comparison to RIIO-1
Common outputs (expected to apply to all companies)			
Environmental considerations embedded in business plans (incl. for example BCF, losses and SF ₆)	PCDs	Yes	n/a
Annual environmental performance reporting (incl. BCF and losses)	LO	No	Revised RIIO-1 output
Sulphur hexafluoride (SF ₆) and other IIG leakage	ODI(F)	No	Revised RIIO-1 output
Mitigating visual amenity impacts in designated areas	PCD	Yes	Revised RIIO-1 output
Bespoke outputs (companies should consider for potential inclusion in their Business Plan; though not just limited to these areas)			
Additional contribution to low carbon transition	ODI(F/R)	Yes	New outputs

* ODI(R/F) = Output Delivery Incentive (Reputational/Financial), PCD=Price Control Deliverable, LO=Licence Obligation

** Company driven target signifies an output where we expect to see extensive company-led engagement (including with their User Group) to justify a stretching performance target. This could lead to performance targets varying by companies.

Potential outputs for consideration in RIIO-ET2

Environmental framework - Business Plans and annual monitoring

4.10 In this section, we discuss ways in which RIIO-ET2 could help ensure the TOs are efficiently minimising the environmental impacts of their networks.

Overview of the RIIO-ET1 environmental output measures

4.11 In the RIIO-ET1 price control the TOs are encouraged to take greater responsibility for the environmental impact of their business and network activities through five explicit environmental outputs and incentives. These are summarised in the following table.

Table 7: RIIO-ET1 environmental output measures

Output name	Output type*
Business carbon footprint from network and related business activities	Reputational incentive
Energy losses from transporting electricity across transmission network	Reputational incentive
Leakage of sulphur hexafluoride gas from network equipment	Financial incentive
Environmental discretionary reward scheme to increase companies' focus on strategic environmental considerations and facilitating the low carbon energy system	Financial incentive
Mitigating visual amenity impacts of pre-existing infrastructure in designated areas	Reputational incentive with efficient project funding

- 4.12 For RIIO-ET2 we are considering ways in which we can develop an environmental framework focused around business as usual activities embedded in business plans. This would capture for example company activities relating to BCF, losses and SF₆. We discuss this in this section.
- 4.13 We then seek views on whether additional, specific, outputs are required. These are discussed in the remainder of this chapter.

Views of RIIO-ET2 Policy Working Group

- 4.14 In our policy working group we carried out a detailed review of RIIO-ET1 incentives performance and discussed options for how we can increase the TOs' contribution to reducing their BCF in RIIO-ET2. A number of proposals were considered by the working group. For more on the working group discussions and considerations see Appendix 2.

Potential options for consideration for RIIO-ET2

- 4.15 We think that an environmental framework in RIIO-ET2 should aim to:
- encourage companies to integrate environmental and low carbon commitments in their RIIO-ET2 business plan
 - drive effective and efficient carbon reduction (Low Carbon Transition) and environmentally responsible practices
 - focus on areas in companies' direct control or ability to influence, not areas out of company control
 - improve transparency of performance – good and bad
 - be holistic and consistent across sectors where appropriate.
- 4.16 We welcome views on whether we should require TOs to identify and explain how they intend to take environmental considerations into account in their Business Plans. Under such an approach, in collaboration with their User Groups, the TOs would identify potential actions to address within their environmental impacts. TOs in consultation with their User Groups, could consider environmental impacts that may be broader than those outlined in Paragraph 4.4.
- 4.17 Funding for environmental actions and initiatives will be included as a baseline expenditure allowance. However, we do not expect environmental components to generate large increases in baseline funding. We expect that there may be some incremental costs associated with delivering aspects of the business plan in a more environmentally sustainable way (e.g. lower loss transformers), where justified. Where appropriate, we will identify clear Price Control Deliverables (PCDs) (including consequences for failure to deliver). We are also considering potential mechanisms for returning unspent allowances. Ofgem will need to consider and assess all options before they are funded.
- 4.18 Therefore, we would expect TOs to outline how they will deliver better environmental performance through the actions embedded in the Business Plan that they will undertake during RIIO-ET2. Activities having a positive environmental impact should be identified explicitly in the business plans, for example through the introduction of a short annex. TOs should also provide detail of the key performance indicators they are monitoring in each area and the targets they aim to achieve by the end of the price control. Where appropriate, companies will need to develop and agree common metrics to be used within the

sector for measuring and reporting their environmental impact for each aspect. Business Plans will be subject to Ofgem's scrutiny.

ETQ33. Do you have any views on the extent to which company activities relating to environmental impacts should be embedded in Business Plans?

Environmental impacts to be considered

4.19 We welcome views on the kinds of environmental impacts that could be captured by the TOs in their business plans. These could potentially include:

- BCF: targets and actions to reduce Scope 1 and 2 emissions and strategies to implement and report on Scope 1, 2 and 3 (other indirect emissions)²² using the BEIS streamlined energy and carbon reporting²³ methodologies
- transmission losses: the TO's RIIO-ET2 strategy to minimise controllable losses on its network
- embedded carbon: capturing and reporting embedded carbon for each project and for the whole network, including the possibility of reducing the carbon intensity of construction projects, for example through frameworks for managing whole life carbon in delivering infrastructure assets and programs of work such as the PAS 2080:2016 carbon management in infrastructure²⁴
- supply chain management: actions to build an environmentally sound supply chain and metrics to monitor performance improvement.

4.20 We also welcome views on whether broader environmental impacts should be captured, and how, such as for example:

- resource use and waste management: measuring and reporting on actions to reduce, reuse or recycle waste as well as reduction targets
- biodiversity and/or natural capital: identification of metrics for measuring baselines, and additional environmental value, and actions to increase environmental value.

ETQ34. We invite views on whether the proposed environmental impact categories are appropriate areas to focus on. Are there any areas that should be excluded and/ or other areas that should be covered? We also invite views on the potential indicators and/ or metrics that are appropriate for each environmental impact category.

4.21 We propose that any targets put forward in business plans should be based on a bottom up analysis of the:

- initiatives and actions the company will undertake to meet its targets

²² Scope 3 (Other indirect): Emissions that are a consequence of your actions, which occur at sources which you do not own or control and which are not classed as Scope 2 emissions. Examples of Scope 3 emissions are business travel by means not owned or controlled by your organisation, waste disposal which is not owned or controlled, or purchased materials or fuels.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/652410/SECR_Consultation_-_Final_with_IA_v2.pdf (page 24)

²³ <https://www.gov.uk/government/consultations/streamlined-energy-and-carbon-reporting>

²⁴ <https://shop.bsigroup.com/ProductDetail?pid=00000000030323493>

- costs of these initiatives and actions relative to the business as usual costs
- key milestones and metrics that can be used by Ofgem and stakeholders to monitor their implementation and impact.

Improving transparency of reporting around environmental activities

- 4.22 We welcome views on whether TOs should be required to develop annual reports detailing their progress in activities outlined in their Business Plans and against their targets, using the agreed metrics from their action plans. These annual reports would be submitted to and reviewed by Ofgem as part of the annual reporting cycles. We also propose that these reports could be published in a single location accessible by the public, such as the ENA website, in order to aid transparency and enhance the reputational effect.
- 4.23 We welcome views on ways to improve the transparency and accessibility of reporting in this area. We think TOs should be required to collaborate to develop a common approach for annual reporting and test this with stakeholders. We expect the companies to build on existing approaches and/or templates where possible. We also think there could be scope for improved reporting in areas such as Scope 3 emissions, embedded carbon and resource use and waste management. The final form of the annual environmental impact report will be subject to Ofgem's final review.
- 4.24 In addition, we are proposing that the annual report could be reviewed by the TO User Groups each year, should these continue to play an ongoing role during the price control. The User Groups could help provide expert feedback on the validity of the content of these annual environmental reports and enhance the reputational nature of these outputs.

ETQ35. We welcome views on the option of an annual reporting framework to increase transparency of the transmission networks' impact on the environment.

Interactions with other policy areas

- 4.25 We discuss potential interactions between business plans and the ODI for SF₆ reduction later on in this chapter. It is important that all areas of potential interactions are identified to ensure that the risk of duplication and potential double funding are minimised and also to ensure that baseline targets and allowances are set appropriately and adjusted accordingly.
- 4.26 We also discuss incorporating requirements around electricity system transmission losses within this framework later on in this chapter.

Considerations for network companies' stakeholder engagement and Business Plans

- 4.27 The approach we outline here would encourage companies to integrate environmental and low carbon commitments in their Business Plan. This approach supports improved assessment of potential interactions with other policy areas and output areas across the business plan and is likely to ensure better outcomes for consumers.
- 4.28 Areas where we consider interactions may occur are in the assessment of asset refurbishment/replacement and new projects, innovation projects, whole systems

considerations and lifecycle cost assessment. We outline our approach to assessing costs in Chapter 6.

Potential for bespoke ODIs around the low carbon transition

Summary of output	A potential output incentive for network operators to reward delivery of a new contribution to the low carbon energy transition
Proposed approach	We are considering whether bespoke ODI(F/R) are needed in this area.

Introduction

- 4.29 One of the overriding objectives of the RIIO-ET2 framework is that network companies make a full contribution to the low carbon transition. This includes taking responsibility for the direct environmental impacts of their networks as well as playing their role in the energy system transition.
- 4.30 Earlier in this chapter we set out our proposals to make the TOs more accountable for delivering environmental commitments in RIIO-ET2 in respect of the direct impacts of their networks. In this section we look at the potential regulatory measures needed to drive the TOs to support the energy sector to decarbonise, as well as being proactive in overcoming related challenges and capitalising on opportunities that benefit consumers.
- 4.31 We consider that opportunities may exist for some bespoke areas to be developed. As with all potential bespoke mechanisms in RIIO-ET2, proposals would be assessed using the criteria proposed for bespoke outputs outlined in Chapter 4 of the Core Document. In assessing proposals in this area, we will consider whether proposals deliver value for money and are backed by robust evidence and justification.
- 4.32 Proposals could also be captured within the context of a potential business plan incentive, discussed in Chapter 9 of the Core Document.
- 4.33 Finally, we think that User Groups could play a key role in a number of areas including:
- challenging companies' ambitions when setting targets in this area
 - providing views on metrics that are transparent and meaningful to stakeholders and
 - considering the need for bespoke output proposals to cover additional environmental impacts.

Potential options for consideration for RIIO-ET2

- 4.34 The nature and design of bespoke ODIs could be specific to the activity in question and would need to be developed based on a clear outline of the actions that companies would take and the level of consumer benefit. ODIs could be either financial or reputational.
- 4.35 Such outputs could capture, for example, activities that drive the TOs to seize the opportunities presented by new technologies, new ways of operating, big data, new market participants, whole systems thinking and innovative commercial arrangements.

ETQ36. We welcome views on whether we should introduce an option for the TOs to develop bespoke ODIs with stakeholders for delivering an additional contribution to the low carbon transition.

ETQ37. We invite views on the kind of activities, not captured elsewhere, that could be captured through such ODIs.

Assessment criteria

- 4.36 It is important that the price control arrangements strike the right balance. Financial incentives can be a powerful tool to spur the TOs to bring forward innovative solutions over the course of the price control. However, it is important that financial incentives are designed properly in order that they offer genuine value for money for consumers.
- 4.37 If progressed, we propose to assess proposals for a bespoke ODI for additional contribution against the criteria set out in Chapter 4 of the Core Document.
- 4.38 In considering proposals for new output measures and incentives in the area of additional contribution to the low carbon transition we will also take into account:
- clarity on contribution (output) and delivery timeframes
 - availability of data and/or indicators to verify the TO's individual contribution
 - absence of incentive(s) for the output through other schemes or obligations
 - clarity on the materiality of the output, including benefits to the TO and consumers.
- 4.39 For the avoidance of doubt any potential bespoke ODI for additional contributions would only be for new outputs that are not captured by the price control framework. It is not intended that research and development trials, innovation projects or large capital projects (which are covered by other parts of the price control) would be captured here.

Form of reward (financial ODIs only)

- 4.40 We welcome views on whether any bespoke financial ODI that is approved for RIIIO-ET2 should only be rewarded upon delivery of the output. It is also our expectation that the TO fund the delivery of a bespoke output through their baseline funding.
- 4.41 We are also considering whether proposals submitted for a bespoke additional contribution ODI are included or incorporated in our assessment for the business plan incentive score. Well justified proposals could lead to a higher score and a reward, conversely a poor justification could lead a lower score and a penalty.

ETQ38. We invite views on how such an ODI might operate, and any other factors we should take into account in considering bespoke ODI for the low carbon transition.

Interactions with other policy areas

4.42 In setting outputs and incentives we need to consider carefully any interactions with other components of the price control. The main interactions we have identified to date are summarised below.

- Proposed Business Plan incentive: The quality of justification submitted for a potential additional contribution ODI could contribute to the overall Business Plan incentive assessment.
- Licence obligations: The Standard and Special Transmission Operator Licence Conditions (as well as industry codes), define the requirements on both the SO and TO for the connection process and link to the codes of practice and milestones for delivery.

Considerations for network companies' stakeholder engagement and Business Plans

4.43 We propose that TOs should work with their stakeholders and User Groups to consider suitable initiatives. We are also proposing to encourage initiatives that involve, where appropriate, collaboration with other network owners and, where appropriate, third parties. We would only introduce bespoke ODIs in the case that there is a clear, demonstrable consumer benefit and clarity around the activities that companies may be able to undertake to benefit consumers.

4.44 We expect User Groups to be involved in:

- challenging companies' ambitions when developing proposals in this area
- providing views on metrics that are transparent and meaningful to stakeholders.

SF₆ and other insulation and interruption gases (IIG) leakage

Summary of output	To incentivise a reduction in harmful GHG emissions from leakage of SF ₆ and other insulation and IIG, and to support the development of low GHG IIG.
Proposed approach	We are proposing to retain an ODI. We are consulting on three options: reward and penalty ODI, a penalty only ODI, or a reputational ODI.

Introduction

4.45 TO activities involve the emissions of several environmentally damaging gases – carbon dioxide (CO₂) and SF₆ are the most significant of these. SF₆ is a particularly potent greenhouse gas (GHG). It has a global warming potential (GWP) approximately 24,000 times stronger than CO₂ but it is emitted in much lower quantities.

4.46 SF₆ gas is used in some high voltage (HV) switchgear, because it has excellent insulating properties that cannot commonly be matched by other insulation and interruption gases (IIG) available in the market. SF₆ assets are used when air insulated switchgear is not a viable option, due to limitations such as available building space. The network assets that contain SF₆ include:

- circuit breakers: used for high current and high voltage switching to control power flows or fault interruption
- current transformers: a HV device connected to the power system that transforms the large currents in the electrical system into small signal

currents that are used by protection and control systems to monitor the behaviour of the electrical system

- gas insulated line (GIL): an over ground pipe which uses gas as an insulation medium allowing it to be significantly more compact than normal overhead lines (OHL) or busbars.

4.47 Fugitive emissions from SF₆ leakage are the biggest single component of the networks' carbon footprint directly within company control. SF₆ leakage from transmission assets in 2018 was approximately 240,000 tonnes CO₂e (Table 18). This is equivalent to emissions from around 51,000 cars over the course of a year.²⁵

Sulphur hexafluoride output incentive in RIIO-ET1

4.48 Although the emissions from SF₆ leakage are captured by the RIIO-ET1 BCF output measure, we also have a specific output incentive in RIIO-ET1 to reduce SF₆ leakage. The RIIO-ET1 SF₆ incentive is designed to drive companies to fully consider lifetime costs (including the environmental impact of the expected emissions) when making decisions about SF₆ assets and to improve the management of, and reduce leakage rates from, SF₆ assets operating on the system.

4.49 In RIIO-ET1 each TO has a different leakage target depending on its assets, and baselines adjust each year to account for new assets containing SF₆ that are added to the network. TOs are subject to a reward/penalty based on the difference between their actual emissions and their baseline leakage target.

4.50 In RIIO-ET1 the value of the incentive is set each year based on prevailing non-traded annual carbon price recommended by the Department for Business, Energy & Industrial Strategy (BEIS).²⁶

4.51 In RIIO-ET1 there has been a 12% reduction in total SF₆ emissions between 2013/14 and 2017/18. For the period 2013-2018, TOs have received £11.8m total incentive payments (2009/10 prices).

4.52 The SF₆ incentive in RIIO-ET1 has been effective in driving improved management of SF₆ assets, as shown by the overall decrease in emissions from leakage. However, due to new assets being constructed, the total volume of SF₆ used on the electricity networks is increasing.

4.53 Commercial alternatives already exist for GIS up to 145kV. There is scope for transmission and distribution companies that hold assets at 145kV to start implementing such alternatives as part of their scheduled replacement.

4.54 For example, during RIIO-ET1, consumers are funding trials for a number of alternative HV IIG through the Network Innovation Allowance (NIA). One such alternative, which is being trialled for HV switchgear²⁷, is green gas for grid (g³).²⁸ Research, development and trials are continuing to investigate alternatives for all

²⁵ Calculated via EPA Calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

²⁶ BEIS set non-traded carbon value for each year out to 2100. BEIS's long term non-traded carbon values are reviewed every five years (<https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal>). The non-traded carbon prices to 2100 can be found in table 3 of https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/696677/Data_tables_1-19_supporting_the_toolkit_and_the_guidance_2017_180403.xlsx.

²⁷ https://www.gegridsolutions.com/press/gepress/Grid-GS-L5-Sellindge_GIL_g3-1597-2017_08-EN.pdf

²⁸ g³ has a GWP of 327 tCO₂e.

HV assets. Some companies also have ambitions to develop IIG alternatives with a GWP of less than 10, which is lower again than g^3 .

Views of the RIIO-ET2 Policy Working Group

4.55 The policy working group examined RIIO-ET1 performance and discussed how the incentive has influenced TO behaviour. Some participants held a strong view that a separate financial incentive should be retained for SF₆ leakage, based on the positive improvements over RIIO-ET1. The working group considered that maintaining a reward/penalty mechanism for RIIO-ET2 would recognise the scope for continued improvement in this area. Additional discussions and considerations by the working group are in Appendix 2.

Options for consideration for RIIO-ET2

4.56 Taking into account the significant environmental harm of SF₆ emissions, the views of the working group, and the state of play of alternatives, including the networks' innovation trials funded by consumers, we are considering ways in which RIIO-ET2 can contribute to driving a long-term reduction in SF₆ on the electricity network. We consider this is a timely opportunity to position RIIO-ET2 such that it helps to drive the network companies to work collaboratively with the supply chain to bring to market less harmful IIG.

4.57 We consider that outputs relating to SF₆ should aim to:

- continue to drive improvements in leakage prevention, detection and reduction where SF₆ is on the system
- encourage the use of less harmful IIG (i.e. deter the use of SF₆), where efficient
- encourage TOs to work collaboratively to demonstrate viable low carbon intensive IIG and install these going forward.

Proposed form and scope of the SF₆ incentive

4.58 Our initial view is that any financial incentive, if retained, should focus on reducing the leakage rates and improving management of SF₆ assets, and where possible, driving a reduction in SF₆ on the system. We propose that any financial incentive for leakage in RIIO-ET2 should:

- continue to base the value of the financial incentive on the non-traded value of carbon
- contain a metric that covers CO₂ emissions from all IIGs on the network rather than from SF₆ leakage only
- continue to set baseline targets as a volume of emissions but make these more challenging. This could include setting a target for an overall decrease in emissions by the end of RIIO-ET2.

Baseline targets

4.59 We are considering whether we should adjust baseline targets up slightly if new assets are installed on the network that contain an IIG with a low GWP.

4.60 We also note that there are potential interactions between this incentive and a TO's business plans, for example if the latter includes some refurbishment of poor performing SF₆/other IIG assets or scheduled replacement works. We propose that

these planned works should be taken into account when setting the baseline target to mitigate potential double reward. This is discussed in more detail below.

- 4.61 Finally, we think this is an area where we need to ensure that all companies are using a consistent methodology for measuring and reporting leakage of SF₆ and all IIG from their assets. This is consistent with our ambition for the overarching environmental sustainability framework for the sector.

ETQ39. We welcome views on whether we should retain a financial reward and penalty incentive for the leakage of SF₆ in RIIO-ET2, or move to a penalty only or reputational incentive.

ETQ40. We welcome views on the potential impact of a move away from a financial incentive (or move to penalty-only) on TO behaviours.

ETQ41. We invite views on whether leakage from other IIGs should also be captured in the incentive measure.

Exceptional events

- 4.62 Currently some leakage events may not count towards a licensee's leakage. Where the licensee considers that an event on its Transmission System that causes leakage of SF₆ has been wholly or partly caused by an 'SF₆ Exceptional Event' the licensee must notify the Authority. Based on the evidence provided, the Authority may adjust the licensee's leakage in the relevant year. An SF₆ Exceptional Event is defined in the licence²⁹ as: "an event or circumstance that is beyond the reasonable control of the licensee and results in, causes, and/or prohibits the timely prevention of the leakage of SF₆ (and includes but not limited to) any event or circumstance where the risk of significant danger to the public requires the licensee to prioritise health and safety objectives over the reduction of leakage of SF₆ at a particular site".³⁰

- 4.63 During RIIO-ET1 there have been few instances of TOs submitting claims for exceptional events.

ETQ42. We welcome views on whether some leakage events should continue to be excluded from the incentive.

Interactions with other policy areas

- 4.64 The main interaction this output has with other policy areas is with our proposals around business plans and annual monitoring. To avoid potential double funding, we will need to understand the extent to which TOs are requesting funding to replace SF₆ (or swap to other IIG) assets as part of their business plans. For example, where assets are identified for replacement and are funded as part of core activities, the target baseline for SF₆/IIG reduction would need to be adjusted accordingly.

²⁹ Special Condition 3E. 'Incentive in Respect of Sulphur Hexafluoride (SF₆) Gas Emissions'

³⁰ <https://epr.ofgem.gov.uk/Content/Documents/SPTL%20-%20special%20conditions%20consolidated%20-%20Current%20Version.pdf>

Considerations for network companies’ stakeholder engagement and Business Plans

- 4.65 In order to appropriately set leakage targets, we will be seeking additional information from companies on their SF₆/IIG asset base to ensure we correctly identify and account for efficient and cost effective opportunities to reduce the environmental impact of SF₆/IIGs.
- 4.66 This is a key area where we consider that User Groups could play a role in challenging companies' actions to drive a step change in reducing the environmental impact from switchgear on the electricity network.

Electricity losses from the transmission network

Summary of output	To embed effective strategies for the minimising of losses on the transmission networks into business plans
Proposed approach	We are proposing to retain the existing licence obligation and to enhance the reputation incentive by incorporating this area in the annual environment report.

Introduction

- 4.67 Losses are an inevitable outcome of the operation of the electricity transmission system. They are generally defined as the difference between the electricity that is fed onto the network and the amount of electricity that is consumed or exported from the network.
- 4.68 There are number of factors that affect transmission losses, such as the materials and design of the assets on the network (eg the wires and transformers), the distance the electricity has to travel between supply and demand and the voltage at which the electricity is transported.
- 4.69 Total transmission system losses in 2016/17 were 1.77% of the electricity generated, or 5.28 terawatt hours (TWh).³¹ Losses also contribute to the total CO₂ emitted from the electricity system, either directly through the operation of the network assets but also indirectly through the carbon intensity of the sources of generation connected to the transmission network. The latter is not directly controllable by the TOs.

Transmission losses incentive in RIIO-ET1

- 4.70 A significant proportion of the total losses on the network is not within the direct control of the TOs. This is partly because the mix and volume of generation that is exporting power onto the network is primarily the outcome of market conditions and because losses are affected by the operation of the entire transmission system by the ESO.
- 4.71 In recognition of these significant factors, the incentive arrangements in RIIO-ET1 on transmission losses are reputational in nature. This reflects the practical challenge of measuring the proportion of losses that are controllable by a TO. The aim of the incentive is to provide more transparency for stakeholders on a TO’s consideration of the impact on losses of different investment options when installing new or replacement assets (such as transformers or substations) on their networks.
- 4.72 The TOs were required under their licences to publish a strategy document at the start of RIIO-ET1, detailing the measures they are undertaking to minimise controllable losses on their respective networks. The TOs are then required to

³¹ Source: National Grid ESO (Transmission Operator losses reports)

publish an annual progress update to this strategy, along with the total volume of losses on their respective networks over the same period.

Views from the RIIO-ET2 Policy Working Group

- 4.73 The policy working group recognised the practical difficulties of introducing an output measure that accurately measures the contribution of the TOs on transmission losses. For the same reason it considered it inappropriate to introduce a financial penalty or reward on transmission losses for the TOs.
- 4.74 However, the policy working group recommended refining the current arrangements to sharpen the reputational incentive. This could be achieved by embedding it within the RIIO-ET2 business plans and RIIO-ET2 annual reporting.
- 4.75 We welcome any additional views stakeholders may have on the RIIO-ET1 measures or additional measures needed in RIIO-ET2.

Potential options for consideration for RIIO-ET2

- 4.76 TOs influence transmission system losses through investment choices in network infrastructure. There is a close to constant relationship between losses and TOs' actions once assets are in place. Therefore, we are proposing to retain a reputational incentive on losses for RIIO-ET2. Our initial view is that this will help ensure that companies, as part of their network planning practices, fully take into account considerations around losses.
- 4.77 We are proposing to retain the requirements in the current licence obligation³² for the publication of an annual report detailing the total losses on the network within the last year, an update on the losses strategy and any changes to this strategy.
- 4.78 In order to sharpen the reputational incentive, we propose that it is incorporated into the overarching framework we are proposing for RIIO-ET2 as set out earlier in this chapter. This would involve:
- embedding the losses strategy requirements (as detailed in the licence obligations) into the business plans. We are proposing to retain the current content requirements for these strategy reports
 - embedding the annual losses report within an overarching environmental report. The losses section would look to cover similar content, with an increased focus on the environmental impact of losses. This could include publishing the total carbon intensity of each network and CO₂ equivalent emissions of losses on the network.
- 4.79 We have previously considered options for introducing financial incentives on elements of losses that are controllable by the TOs. However, as per our decision in the RIIO-T1 decision document³³ we do not believe that it is appropriate to set an output on the actual volume of losses, as actual losses are unlikely to show the impact of low loss investment on the system and it would be very complex to model. Therefore, we do not believe this would provide value for money for consumers.

³² See Special Condition 2K

<https://epr.ofgem.gov.uk/Content/Documents/National%20Grid%20Electricity%20Transmission%20Plc%20-%20Special%20Conditions%20-%20Current%20Version.pdf>

³³ 4.42 Strategy for the next transmission price control - RIIO-T1 Outputs and incentives (Supplementary Annex) https://www.ofgem.gov.uk/sites/default/files/docs/2011/03/t1decisionoutput_0.pdf

- 4.80 We have considered introducing an arrangement similar to the electricity distribution Losses Discretionary Reward (LDR). The LDR is designed to ensure that DNOs focus on activities that manage losses effectively and to try to lower these as much as possible on their networks. With the proposal to remove the wider Environmental Discretionary Reward (discussed later on in this chapter) and the proposals to embed losses within an overarching framework, however, our initial view is that a separate LDR type incentive is not required.
- 4.81 We are not currently proposing to add an incentive on improving energy efficiency and reducing losses on substation auxiliary loads, due to a lack of data on the potential benefits of an incentive in this area. We are aware that SPT is currently undertaking a trial in this area and we will therefore consider the results of this trial, once this has concluded.

ETQ43. Do you have any views on the proposed approach for integrating any losses reporting requirements into the proposed business plan and annual public reporting framework?

ETQ44. Do you have any views on the introduction of a target or measure for improving metering at and the energy efficiency of substations? How could this work in practice?

Interactions with other policy areas

- 4.82 The approach discussed here should be read in conjunction with our options for a wider environmental framework covered earlier in this chapter.

Considerations for network companies' stakeholder engagement and Business Plans

- 4.83 We expect the TOs to work with their stakeholders and User Groups to propose initiatives under this output.
- 4.84 We expect User Groups to be involved in:
- challenging companies' ambitions when developing proposals in this area
 - to provide views on methods for minimising losses that are transparent and meaningful to stakeholders.

Visual amenity impacts of transmission infrastructure

Summary of output	Efficiently reduce visual amenity impacts of pre-existing lines on protected landscapes. Improve engagement with stakeholders around new transmission projects.
Proposed approach	We are proposing to retain a mitigation scheme in protected landscapes and setting PCDs for RIIO-ET2 projects. We are seeking views on whether the stakeholder survey (if retained) should cover stakeholders' satisfaction with engaging with TOs on new transmission projects.

Introduction

- 4.85 The high voltage grid infrastructure in the UK primarily comprises overhead lines, supported on steel towers, and substations which connect generation and demand and interconnect the whole power system. The prominent nature of the network

infrastructure can impact visual amenity and these effects can be spread across a wide area because of the linear nature of the overhead lines.

- 4.86 Some stakeholders are concerned about the negative visual impacts of new and existing transmission infrastructure on the landscape and the effect of this infrastructure on the socio-economic well-being of local communities. For example, some say that towers and lines detract from the host landscape's natural beauty, negatively affect visitors' experiences, harm local tourism and reduce employment opportunities in local communities.
- 4.87 Network companies plan and construct electricity networks. It is for network companies to identify what investment is needed in their networks, they are responsible for designing any works necessary and obtaining the relevant planning consent. Ofgem does not have a direct role in the planning process, which manages development. Our role is to ensure compliance with the price control framework, which enables companies to address, where necessary, the impacts of developments on natural beauty.
- 4.88 Fostering greater public support for grid infrastructure is in consumers' interest. The timely development of the infrastructure needed to integrate large shares of renewable energy is important for meeting the UK's climate change targets. In addition, delays to connecting additional renewable and low carbon generation sources could have potentially negative knock on impacts on the UK's energy and climate change targets or on security of supply.

Mitigating visual amenity impacts in RIIO-ET1

- 4.89 There are two policies in the RIIO-ET1 price control for mitigating the impacts of transmission infrastructure on visual amenity.

New transmission projects

- 4.90 For new transmission projects the RIIO-ET1 price control policy enables transmission companies to efficiently address a new transmission project's impacts, including visual, as needed to obtain planning consent. We adopted this policy position for the price control because it is consistent with:
- the transmission owners' obligation under the Electricity Act 1989 to develop and maintain an efficient, coordinated and economical system of electricity transmission
 - the National Policy Statement for Electricity Networks Infrastructure³⁴ that new transmission lines be designed on the basis of their specific circumstances, and to balance the visual, environmental and other impacts of grid infrastructure, along with the overall cost.
- 4.91 To support the delivery of this policy objective there are flexible funding arrangements for new transmission projects in place. The arrangements also cover the efficient costs of alternative installation methods e.g. underground cables (which are more expensive than conventional overhead lines), if these are needed to obtain planning consent.

³⁴ National Policy statement for Electricity Network Infrastructure
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf

- 4.92 Since the start of the RIIO-ET1 price control we assessed project specific funding submissions for large new transmission projects.³⁵ Several of these included explicit consideration of the projects' impacts on the visual amenity of the host landscape. We also note that the transmission owners typically evaluate each project on a case-by-case basis, in line with the National Policy Statement for Electricity Networks Infrastructure, to ensure visual amenity impacts of the proposed project are acceptable in planning terms.
- 4.93 The TOs' proposals included mitigation in their design, for example, overhead line routing to avoid sensitive areas. Where such measures are insufficient to make proposals acceptable in planning terms, proposals have also included additional mitigation, such as putting the new line underground or alternative installation methods, where these are justified by guidance and/or consumer willingness to pay.
- 4.94 Notwithstanding the examples of mitigation in new grid projects that the TOs are or were developing plans for during the course of RIIO-ET1, we note that some stakeholders have expressed concerns to us directly about proposed new projects. Stakeholders have told us that they are frustrated by a lack of transparency on how a transmission owner weighs up the different factors when designing new grid developments e.g. technical considerations, visual and socio-economic impacts and cost to energy bills.

Pre-existing infrastructure in highly valued landscapes

- 4.95 The second RIIO-ET1 price control policy allows transmission owners to reduce the impacts of pre-existing infrastructure³⁶ on the visual amenity of national parks, areas of outstanding natural beauty (AONB) and national scenic areas. In doing so, the transmission owners should seek to maximise the benefit to consumers from delivering these outputs efficiently using a fixed amount of funding allowed in the price control.
- 4.96 This policy was introduced in RIIO-ET1 for the electricity transmission sector because some stakeholders thought that consumers would value such mitigation projects. For example, there may be pre-existing transmission lines that have highly adverse visual impacts, which may be considered unacceptable, in planning terms, by today's standards. It was suggested that the price control include a defined allowance to reduce visual impacts in designated areas if there was evidence of sufficient consumer willingness to pay to enable the transmission owners to deliver mitigation projects.
- 4.97 An expenditure allowance of £500m (2009/10 prices) was set in RIIO-ET1 for the TOs to deliver mitigation projects. The amount of the allowance was informed by a 2012 National Grid survey of GB consumer willingness to pay³⁷ for measures to reduce the impacts through measures such as replacing overhead lines with

³⁵ We've assessed these under the RIIO-ET1 Strategic Wider Works arrangements. Additional information on the projects assessed under the SWW mechanism is on our website: <https://www.ofgem.gov.uk/electricity/transmission-networks/critical-investments/strategic-wider-works>

³⁶ Pre-existing transmission infrastructure is defined in Special Condition 6G (Mitigating the impact of Pre-existing Transmission Infrastructure on the visual amenity of Designated Areas) of the electricity transmission licence as network equipment such as lines and towers that are part of the licensee's transmission network as at 1 April 2013.

³⁷ Please see National Grid's website for the willingness to pay survey report: www.nationalgrid.com/NR/rdonlyres/88431596-2009-4CDE-BE51-EC5E536FF2BC/55358/NationalGridWTPPreport.pdf

underground cables, re-routeing of pre-existing lines and softer engineering works, eg tree screening and landscaping.

- 4.98 Over the course of RIIO-ET1 we have reviewed and approved a policy from each of the TOs that details how they will identify and prioritise mitigation projects for pre-existing infrastructure. These policies must fulfil certain requirements set out in the transmission licence.³⁸ These include a method for evaluating opportunities to reduce the effect of its transmission network in designated areas, considering cultural, historical and ecological factors, involving stakeholders in project selection and promoting economic efficiency.
- 4.99 All three TOs have been working with stakeholders over the course of RIIO-ET1 to shortlist mitigation projects within designated areas. The types of mitigation considered include replacing sections of pre-existing overhead lines with underground cable, as well as lower-value landscape enhancement projects to reduce the impact of pre-existing lines on people's experience of the designated area.³⁹
- 4.100 Based on the progress made with stakeholders on project selection to date, we expect the TOs to submit funding requests for mitigation projects over the remainder of current price control, that in total value will be equal to the £500 million expenditure allowed for RIIO-ET1.

Views of the RIIO-ET2 Policy Working Group

- 4.101 Policy working group participants reviewed the RIIO-ET1 visual amenity policies and discussed whether the policy objectives remain relevant and if any further refinement is needed to the arrangements for RIIO-ET2. More details are available in Annex 1.

Proposed approach for RIIO-ET2

- 4.102 We welcome views on whether we should maintain the current RIIO-ET1 policies in relation to addressing transmission impacts on visual amenity, subject to the two proposed changes below. First, for new transmission projects, we are consulting on some changes to explicitly capture stakeholders' satisfaction with TOs' engagement on new transmission projects.
- 4.103 Second, in relation to the scheme for mitigating the visual impacts of pre-existing transmission infrastructure in designated areas, we are proposing modifying the implementation process by which funding requests for mitigation projects are submitted and approved, if the scheme is retained. We are also of the view that it would also be necessary to re-survey consumer willingness to pay for mitigation projects in RIIO-ET2.

Proposal for stakeholder engagement on new transmission projects

- 4.104 We are considering ways in which we could incentivise a TO's engagement and interactions with stakeholders affected by new grid projects. To do this, we are proposing that TO engagement with their stakeholders in this space could be captured through our wider proposals around stakeholder engagement, for

³⁸ The requirements are set out in paragraph 6G.6 of Special Condition 6G (Mitigating the impact of Pre-existing Transmission Infrastructure on the visual amenity of Designated Areas) of National Grid's transmission licence. <https://www.ofgem.gov.uk/ofgem-publications/53520/ngspcmodes.pdf>

³⁹ Please see Ofgem's website for further detail on the TO's pre-existing infrastructure mitigation policies and the projects being delivered during RIIO-ET1: <https://www.ofgem.gov.uk/electricity/transmission-networks/network-price-controls/visual-amenity>

example through the use of a survey. A survey could be used to cover stakeholders' satisfaction with the TOs on new projects, for example on:

- engagement opportunities
- quality of information about a project
- transparency of TO decision making.

4.105 Please see Chapter 3 further details on our proposals around stakeholder engagement.

ETQ45. We welcome views on incentivising the TOs' engagement with stakeholders on the development of new transmission projects through our stakeholder engagement proposals, for example through the use of a survey.

Proposal for pre-existing transmission infrastructure mitigation projects

4.106 We welcome views on whether we should retain the provision for TOs to deliver mitigation projects for pre-existing infrastructure in designated areas, subject to the TOs providing new evidence on consumer willingness to pay to inform the expenditure allowance available in RIIO-ET2 for mitigation projects. We consider it would be necessary to re-survey consumer willingness to pay for mitigation projects in RIIO-ET2 as the 2012 National Grid study explicitly covered only the RIIO-ET1 price control period.

ETQ46. Do you have views on the retaining the existing scheme to mitigate the visual impact of pre-existing transmission infrastructure in designated areas? Do you agree that any decision to implement new funding arrangements should be subject to updated analysis around willingness to pay?

4.107 We have also considered ways in which we could improve processes for awarding funding should we retain an expenditure allowance for RIIO-ET2.

4.108 We are proposing to modify the implementation process by which funding requests for mitigation projects would be submitted and approved. We think that the TOs should include proposals for mitigation projects as part of their RIIO-ET2 business plan submission. In our view the TOs are in a relatively good position to do this given the information that they have gathered on candidate projects over RIIO-ET1. We think this approach is beneficial as it would enable greater transparency of a company's full business plan, be subject to scrutiny by the TO's User Group, will allow more integrated business planning with other activities such as asset refurbishment/replacement and will give stakeholders an upfront commitment on visual amenity price control deliverables. We think there are some potential issues with this proposed approach which will need to be considered further. These include potential uncertainty on project cost at the time of the business plan submission because the projects are at an early stage of development.

4.109 For RIIO-ET2 we propose that new mitigation projects that involve engineering solutions, which are typically high cost, are classified as price control deliverables (PCD). To ensure value for money for consumers we propose retaining the assessment of efficient costs we undertake in RIIO-ET1 for determining the

adjustment made to the TOs allowed expenditure for a high value mitigation project in RIIO-ET2.

- 4.110 For new mitigation projects involving low cost solutions⁴⁰ eg screening, landscape enhancement, we are proposing to assess and set an expenditure cap at the start of RIIO-ET2 for each TO. We propose that the expenditure cap is set as a relatively small proportion (ie 2.5%) of the overall consumer willingness to pay for mitigation projects in RIIO-ET2. We propose that the TOs work with stakeholders to develop low cost mitigation projects and report annually on project delivery and expenditure. We consider that this is a practical and proportionate approach to achieve the easily obtained reduction in visual impact that can be realised from these type of projects.

ETQ47. Do you agree with our proposals to modify the implementation process by which funding requests for mitigation projects are submitted and approved?

- 4.111 We are proposing to retain the scope of the scheme on national parks, AONBs and national scenic areas. We think it is difficult to make a compelling case to extend the scheme to cover pre-existing transmission infrastructure in other designated areas such as world heritage sites and non-designated areas. The current scheme reflects the legislative duties of Ofgem and the TOs in respect of national parks and AONB. The latter category is only designated in England and Wales. To address the potential issue of regional fairness in RIIO-ET1 we decided to include national scenic areas designated in Scotland as these have a similar standing as AONB. We also understand that there is a high degree of overlap between the world heritage sites in GB and the designated areas covered by the scheme. In practical terms this means that the visual impacts of nearly all pre-existing transmission infrastructure located in a world heritage site have been considered.⁴¹ We also think that potential mitigation projects in designated areas are likely to offer greater benefits (in terms of mitigating significant and important visual impacts) than projects in non-designated areas would.

ETQ48. We welcome stakeholders' views on any other considerations they think are relevant to policy development for visual amenity issues in RIIO-ET2.

Interactions with other policy areas

- 4.112 The main interactions we have identified to date are summarised below.

- Proposed business plan incentives: we are considering whether the quality of justification submitted for a potential mitigation projects could potentially contribute overall to the business plan incentive assessment.
- Stakeholder engagement: We are proposing that the quality of a TO's interaction and engagement with stakeholders on new projects could be captured through the SSO, for example through a potential survey, as set out in Chapter 3.

⁴⁰ A low cost mitigation project would have a maximum value of £200,000 or less

⁴¹ There is a 132KV overhead line in part of the Hadrian's Wall World Heritage Site which is not within a national park or AONB.

- Competition: It is possible that some mitigation projects might meet the criteria for competition. Please see Chapter 8 in the Core Document for details.

Considerations for network companies' stakeholder engagement and Business Plans

4.113 We propose that TOs' business plans include plans for delivering mitigation projects for pre-existing infrastructure in RIIO-ET2. We also propose that the level of ambition should be supported by new evidence on consumers' willingness to pay and also evidence of the TOs working with stakeholders to identify priorities for mitigation projects in the RIIO-ET2 price control period.

4.114 We propose that the TOs should also highlight any relevant uncertainties around the mitigation projects in their business plan. This might include project scope and costs because projects are at an early stage of development, as well as project timing because of project dependencies that are outside the control of the TO. In addition, we propose that the TOs should also set out propositions for managing these uncertainties.

Outputs considered for removal

Table 8: Summary of outputs we propose to remove for RIIO-ET2

Name	RIIO-ET1 licence condition
Environmental Discretionary Reward	Special Condition 3F

Environmental Discretionary Reward in RIIO-ET1

4.115 In RIIO-ET1 a key objective is that the price control package enables the TOs to contribute to the UK's environmental and energy targets. Accordingly, a combination of output incentives as well as other parts of the regulatory framework were introduced to drive better performance in traditional areas e.g. connections and also to encourage the TOs to play a full part in meeting the UK's targets.

4.116 The RIIO-ET1 mechanisms included the business plan fast-track incentive, an innovation stimulus package, stakeholder engagement and satisfaction incentives, connections output, as well as a broad environmental output measure called the Environmental Discretionary Reward (EDR).

4.117 The purpose of the EDR scheme in RIIO-ET1 is to sharpen the focus of the TOs on strategic environmental considerations and to drive organisational and cultural changes to facilitate growth in low carbon energy. Using a balanced scorecard, companies are assessed on their performance across seven categories.

- Strategic understanding and commitment to low carbon objectives.
- Whole electricity system planning.
- Connections for low carbon generators.
- Collaboration on innovation.
- Network development solutions that avoid the need to reinforce the network.
- Direct environmental impact.
- Business greenhouse gas emissions.

- 4.118 The EDR incentive scheme has an annual value of £4m plus any applicable rolled-over amounts from previous years. In any scheme year we might award all, some or none of the incentive reward. Companies only received a reward if they achieve the top tier score on the balanced scorecard.⁴²
- 4.119 All three TOs have submitted an application in all scheme years in RIIO-ET1 to date. Company performance has been variable, each TO has received a reward at least once during the RIIO-ET1 price control and SPT has been rewarded in two consecutively years. For the period 2013-2018 TOs have been rewarded £14m out of a total £20m (2009/10 prices).

Views of RIIO-ET2 Policy Working Group

- 4.120 Policy working group participants told us that the EDR has helped to raise the profile of sustainability initiatives, environmental impact and the low carbon transition within companies. However, participants also raised concerns with the mechanism, and highlighted the need for a more coherent approach to the environment in RIIO-ET2.
- 4.121 Participants discussed a number of potential mechanisms, including Sustainability First's proposal for a low-carbon incentive, along with another approach more embedded in the business planning process and potentially complimented by an additional discrete ODI. These are set out earlier in this chapter. Further information on policy working group feedback is available in Appendix 2.

Proposed approach for RIIO-ET2

- 4.122 We propose to remove the EDR in RIIO-ET2. Based on our experience of the RIIO-ET1 scheme, including the companies' performance, stakeholder feedback, and in light of the RIIO-ET2 proposals in this consultation, we do not think retaining the EDR would represent good value for money for consumers in the next price control period.
- 4.123 We are not consulting on introducing Sustainability First's proposal of a low-carbon incentive in RIIO-ET2. Similar to the EDR we consider that the option is unlikely to provide better value to consumers as compared to the proposals put forward in this consultation.

⁴²For further information on the scheme please see the EDR guidance: https://www.ofgem.gov.uk/system/files/docs/2016/06/environmental_discretionary_reward_scheme_guidance_revision_3.pdf

5. Outputs: Maintain a safe and resilient network

We are proposing a range of outputs for RIIO-ET2, designed to ensure the TOs continue to efficiently deliver a safe and resilient network that is also responsive to change. This chapter should be read in conjunction with the core document, in particular, Chapter 4 on outputs.

Chapter 5 questions

ETQ49. What are your views on the overall outputs package considered for this output category?

ETQ50. For each potential output considered (where relevant):

- a) Is it of benefit to consumers, and why?
- b) How, and at what level should we set targets? (eg should these be relative/absolute)
- c) What are your views on the design of the incentive? (eg reward/penalty/size of allowance)
- d) Where we set out options, what are your views on them and please explain whether there are further options we should consider?

ETQ51. What other outputs should we be considering, if any?

ETQ52. What are your views on the RIIO-ET1 outputs that we propose to remove?

All questions, including additional output specific questions, are set out in Appendix 3.

Introduction

5.1 Network companies need to deliver a safe and resilient network that is also efficient and responsive to change. We set out our proposals for this output category here. This chapter should be read in parallel with Chapter 4 of the Core Document which describes:

- the rationale for having an output category to 'Maintain a safe and resilient network'
- the broad RIIO-2 approach to specific outputs (e.g. types and the approach to developing company ('bespoke') outputs).

5.2 In RIIO-ET1 we introduced a number of output measures relating to the safety and reliability of the network, and its availability. For RIIO-ET2 we are proposing a package of measures which continues to reflect the importance of maintaining safety and reliability against a backdrop of significant changes in how the energy system operates.

5.3 Our package covers both shorter-term aspects (for example through our proposals on safety in this chapter, or the ENS, in Chapter 3) and longer-term considerations of risks, in particular through on our proposals on the Network Asset Risk Metric (NARM) set out in Chapter 6 of the Core Document. We also outline our proposals relating to cybersecurity and physical security in Chapter 6 of the Core Document.

5.4 In this chapter, we focus on measures to ensure TOs plan and manage outages efficiently in cooperation with the ESO. We note that there are potential interactions in this space with our proposals around whole systems in Chapter 5 of the Core Document. We also outline options for ensuring the timely and high quality delivery of large capital projects.

Compliance with safety legislation

5.5 In RIIO-ET1 we introduced a safety output in respect of the requirement to comply with Health and Safety Executive (HSE) safety legislation. This reflected the fact that TOs are required to design and operate their networks to ensure the safety of the public and their employees. The HSE, further to applicable legislation, monitors and enforces performance in this area.

5.6 We are proposing to retain the RIIO-ET1 approach to safety. Our view is that it is not appropriate to attach additional outputs to safety given existing HSE legislation requiring TOs to design and operate their networks to ensure the safety of the public and their employees.

ETQ53. Do you agree with our proposed approach to safety?

Summary of potential outputs for consideration in RIIO-ET2

5.7 The table below summarises outputs for consideration in RIIO-ET2 discussed in this chapter.

5.8 Network Asset Risk Metrics (NARMs), cyber resilience and physical security are outputs that are cross sector covering RIIO-GD2 and RIIO-T2. Further information on these outputs can be found in the Core Document. The Core Document also discusses our approach to whole systems.

Table 9: Summary of potential outputs for consideration in RIIO-ET2

Proposed output name	Output type*	Company driven target**		Comparison to RIIO-1
Common outputs (expected to apply to all companies)				
Network Access Policy	LO	No		Revised RIIO-1 output
Successful delivery of large capital investment	PCDs	N/A		N/A

* ODI(R/F) = Output Delivery Incentive (Reputational/Financial), PCD=Price Control Deliverable, LO=Licence Obligation

** Company driven target signifies an output where we expect to see extensive company-led engagement (including with their User Group) to justify a stretching performance target. This could lead to performance targets varying by companies.

Potential outputs for consideration in RIIO-ET2

Network Access Policy (NAP)

Purpose	This output sets out the obligation for the TOs to have a network access policy in place to support engagement between the TOs and ESO (and potentially other relevant parties) around outage planning.
Proposed approach	We are proposing to retain the RIIO-ET1 NAP arrangements. In addition, we are considering whether to introduce one NAP for the whole of GB and the extent to which the NAP could be expanded to capture third-party interactions.

Background

- 5.9 The TOs own and maintain assets on the electricity transmission network, whereas the ESO operates the entire system. The ESO and TOs have inherently different responsibilities but a common goal to ensure the electricity system is functioning as needed. Therefore, they must coordinate their activities to fulfil both sets of responsibilities and meet their common goal.
- 5.10 The ESO incurs costs when it takes actions to resolve constraints that arise where there is insufficient capacity on the transmission system. These costs are ultimately passed on to consumers. The ESO is incentivised to reduce these constraint costs.
- 5.11 Constraint costs are affected by the availability of the transmission network. When the TO replaces elements of the system or connects new infrastructure to the transmission system, parts of the network are required to be temporarily switched out. Switching out parts of the network is referred to as an 'outage', and therefore reduces availability of the network. Planning and undertaking outages will require coordination and/or notification of both demand side connections (mainly Distribution Network Operators (DNOs)) and generators as they may be directly or indirectly impacted by an outage.
- 5.12 The ESO is incentivised to minimise constraint costs, while TOs currently have no direct incentive to do so as part of their price control. In addition, they may even incur additional costs to accommodate the ESO's preferred outage plan (to reduce constraint costs). In RIIO-ET1 we identified a need for the TOs to take constraint costs into consideration when planning their activities. This was to ensure that reducing the costs of their own activities which is incentivised through the price control, would not be a barrier to the TOs considering the overall benefits to consumers in terms of reducing constraint costs.
- 5.13 The NAP⁴³ 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. The requirement to publish and act consistently with the NAP is set

⁴³ In our RIIO-T1 strategy documents, the NAP is referred to as the Network Availability Policy. The name was later changed to Network Access Policy

out in special licence condition 2J⁴⁴ and builds on the requirements of the ESO:TO Code (STC)⁴⁵ and the procedures that sit under the code (STCPs). The NAP sets out the commitment by the TOs to effectively communicate and coordinate (as far as possible) outage planning and to identify ways in which TO actions can help the ESO minimise constraint costs. This sits alongside the TOs' statutory obligations to operate an economic, efficient and coordinated system.

- 5.14 In our RIIO-T1 Strategy Decision⁴⁶, we said that failure to comply with the NAP agreed at the start of the price control period would be a breach of the licence, which could trigger enforcement action, including a financial penalty. We also said that the scale of any such penalty would reflect the potential harm to consumers, and that in assessing this harm, we would give particular attention to the potential for non-compliance to lead to higher constraint costs. We said that this could include analysis of the additional constraint costs that can be reasonably attributed to the specific breach of the network availability policy.
- 5.15 When the output was developed for RIIO-ET1, NGET acted as both the ESO and the TO. NGET as one entity was therefore incentivised to reduce constraint costs through its ESO incentive and had its own NAP. As a result, two separate NAPs were approved by Ofgem - one for NGET and one for the Scottish TOs.

Views of the RIIO-ET2 Policy Working Group

- 5.16 In our policy working group, we discussed the impact the NAP has had in RIIO-T1 on the interaction between TOs and ESO in managing of outages. We also discussed options for the NAP in RIIO-ET2, such as consolidating the two existing NAPs into one, extending to capture interactions with third parties and monitoring the impact of the NAP and its associated benefits.
- 5.17 The working group also highlighted that there might be scope for an additional incentive, above and beyond the obligations set out by the NAP, to encourage TOs to further contribute to reducing constraint costs. Proposals for such an incentive were tabled at working group 5 and are available on our website.⁴⁷
- 5.18 More detailed feedback can be found in Appendix 2.

Options for consideration for RIIO-ET2

- 5.19 Our initial view is that the NAP plays a key role in ensuring a coordinated approach to network planning. Therefore, we are proposing to retain the NAP as a licence obligation for RIIO-ET2 but are seeking views on our proposals to amend the NAP to better reflect the issues discussed in this chapter. We also note that proposals around whole systems are discussed in Chapter 5 of the Core Document.

ETQ54. Do you agree with our proposal to retain the NAP as a licence obligation?

⁴⁴ See for example special licence condition 2J in SPT licence:

<https://epr.ofgem.gov.uk/Content/Documents/SPTL%20-%20special%20conditions%20consolidated%20-%20Current%20Version.pdf>

⁴⁵ <https://www.ofgem.gov.uk/licences-industry-codes-and-standards/industry-codes/electricity-codes/system-operator-transmission-owner-code-stc>

⁴⁶ <https://www.ofgem.gov.uk/ofgem-publications/53835/t1decisionoutput.pdf>

⁴⁷ <https://www.ofgem.gov.uk/publications-and-updates/riio-et2-working-groups> and

https://www.ofgem.gov.uk/system/files/docs/2018/12/18-12-07_nget_thoughts_on_so-to_incentives.pdf

- 5.20 To date, our consideration of the NAP in RIIO-ET2 has focussed on three key issues, mostly related to the following changes in the roles and responsibilities of relevant stakeholders.
- The separation of the ESO and TO and whether there is scope to align and consolidate the two existing NAPs into one;
 - The growing impact of DNOs (future Distribution System Operators) and other third parties (e.g. generators) as a result of changing use of the network and consideration of the scope of the NAP in this regard.
 - The need to monitor the impact of the NAP on encouraging transparency around the activities TOs are taking to reduce constraint costs.
- 5.21 We have also reviewed the interaction between the NAP and the relevant STC procedures – specifically STCP11-3,⁴⁸ which covers the procedures around outage change management. This procedure currently allows the ESO to compensate SPT and SHE-T for costs incurred in accommodating a change in outage plans within 49 weeks of a final outage plan being issued by the ESO. We note that a new procedure - STCP 11.4⁴⁹ will enable the ESO to buy a services from a TO where that service would assist the ESO in reducing constraint costs beyond the current 49 week period.

Introduction of one consolidated NAP

- 5.22 We welcome views on the introduction of a single, consolidated NAP for the whole of GB in RIIO-ET2. In light of the impending separation of NGET TO and the ESO in April 2019, we consider that the introduction of one single NAP could enable processes and procedures relating to outages to be streamlined, for example around ways of working, communication channels, and agreement procedures for outages etc.
- 5.23 We note that the working group highlighted that separate NAPs could better reflect individual TOs priorities and/ or specificities and we welcome views on whether this could be achieved in a single NAP.

Third party engagement

- 5.24 The NAP currently only covers ESO-TO interaction, although we note that informal engagement already takes place between the TOs and other stakeholders such as DNOs and generators. We also recognise that DNOs will play a more active role in the future in relation to outages given growing amounts of embedded generation on the distribution system. We are seeking views on the extent to which the NAP could be expanded to include and formalise TO/ DNO engagement, and potentially wider third party interactions (e.g. generators). We also welcome views on how such proposals might interact with our proposed approach to whole systems for consultation, as highlighted in Chapter 5 of the Core Document.

ETQ55. Do you have any views on the potential risks and benefits of introducing a single, consolidated NAP, and of expanding the NAP to cover interactions with third parties?

⁴⁸ <https://www.nationalgrideso.com/sites/eso/files/documents/28826-STCP11-3%20-%20TO%20Outage%20Change%20Costing.pdf>

⁴⁹ <https://www.nationalgrideso.com/codes/system-operator-transmission-owner-code/modifications/stcp-114-enhanced-service-provision>

Monitoring of NAP impact and benefits

5.25 There are currently no quantitative metrics in place to measure the impact of the NAP or any associated benefits for consumers. For example, we do not have detailed data on the impact of the NAP in terms of its contribution to reducing constraint costs, or the extent to which engagement between TOs and SO is improving. We are considering the inclusion of reporting metrics that could potentially assist us in understanding the impact of the NAP and associated benefits, eg in terms of a reduction in constraint costs. We welcome views on the kind of reporting metrics that could be introduced in order to measure the impact of the NAP.

Interactions with other policy areas

5.26 We note that the NAP interacts with a number of policy areas, in particular our proposed approach to whole systems as described in Chapter 4 of the core consultation document.

5.27 As highlighted above, we note that proposals for an additional incentive mechanism (beyond the NAP obligations) designed to encourage better ESO/ TO collaboration were tabled at our working group. Further details are available on our website.⁵⁰ We welcome views from stakeholders on this proposal and those we set out in Chapter 5 of the Core Document.

ETQ56. We welcome views on these proposals, and on any potential interactions and/ or duplications between these proposals, the NAP and the STC.

Considerations for network companies’ stakeholder engagement and Business Plans

5.28 We recognise that the TOs have an existing NAP in place that was approved by Ofgem. We also recognise that NGET’s NAP is currently being updated and is with Ofgem for approval.

5.29 For RIIO-ET2 we propose the TOs submit their view on how to incorporate any potential changes to the NAP arising from the decisions that will take place following this consultation. For example, if we decide that third party engagement should be captured through the NAP and/or that there should be a single consolidated NAP, the business plans should capture the TOs’ approaches to how they will interact with relevant parties to draft and agree the NAP. TOs should also highlight in their business plan how they will make sure the NAP is updated to reflect related STC procedure updates.

5.30 Finally, we expect the TOs to provide suggestions to help improve reporting and monitoring of impacts and benefits, with the aim of increasing transparency around activities relating to the NAP and the benefits achieved for consumers.

Successful delivery of large capital investment projects

Purpose	To ensure the successful delivery of large capital investment projects
Proposed approach	Introduce PCDs with clear consequences for failure to deliver outputs

⁵⁰ Please see ‘NGET proposals for a whole system incentive’ here: <https://www.ofgem.gov.uk/publications-and-updates/riio-et2-working-groups>

Background

- 5.31 Large transmission capital investment projects strengthen and extend the electricity network, enable the connection of new generation, improve efficiency and ensure that the network complies with SQSS.
- 5.32 When these projects are delayed or not successfully delivered to the required level of quality, it can be detrimental to consumers and result in an increase in system constraint costs or security of supply implications.

Proposed approach for RIIO-ET2

- 5.33 For RIIO-ET2, we want to simplify and clarify the price controls. Given the potential volume of upcoming projects, it is important that we have effective regulatory tools available to ensure the successful and timely delivery of these projects. In identifying options for RIIO-ET2, we have considered our experience with the RIIO-ET1 Mid-Period Review (MPR) and MPR Parallel Work^{51 52}.
- 5.34 As highlighted in Chapter 8 of the Core Document, one of our core principles is that companies should not benefit from delay in delivery or failure to deliver a Price Control Deliverable (PCD). We are therefore seeking views on potential options for dealing with large capital projects that are not successfully delivered on time and/or to an expected standard. Firstly, we want to ensure that there is no benefit to the TOs from delayed delivery. Secondly, we are considering how we can reduce the detriment to consumers resulting from delayed or unsuccessful and/or poor quality delivery.
- 5.35 Large capital investment projects are, by nature, bespoke. The range of options and tools for ensuring the successful delivery of these projects should be reflective of this. For RIIO-ET2 we propose to assess projects on a case-by-case basis and look to apply the most effective options and regulatory tools. We also recognise the need to achieve the right balance between ensuring our regulatory framework protects consumers and continuing to ensure TOs deliver these types of projects in an economic and efficient manner.

Ensuring that there is no benefit to companies from delay and/ or poor quality delivery

Re-profiling allowances

- 5.36 We are of the view that companies should not benefit financially from delays and/or poor quality delivery. We propose to introduce a mechanism whereby allowances are automatically re-profiled to reflect any delays and match actual spend. This removes all timing gains but preserves changes in overall costs. We consider this an effective means of ensuring that TOs do not benefit from delayed delivery.
- 5.37 We note that these proposals for re-profiling allowances are in line with the approach we signalled in our RIIO-T1 mid-period review Parallel Decision. Within the context of the mid-period review Parallel Decision, some stakeholders identified the need for a reward where outputs and outcomes were delivered early.
- 5.38 The benefits case for large capital investment projects depends to a significant extent on the level of future generation and/or demand. The potential impacts of

⁵¹ For further information on the MPR work decision please see <https://www.ofgem.gov.uk/network-regulation-riio-model/current-network-price-controls-riio-1/riio-mid-period-review-riio-t1-and-gd1>

⁵² For further information on the MPR parallel work decision please see <https://www.ofgem.gov.uk/publications-and-updates/mpr-parallel-work-decision>

this uncertainty on consumers could be significant given the scale of the investment involved. If the project is delivered before the scheduled delivery date, there is not necessarily any added value to the consumer. Further, investment that is realised too early could lead to higher costs for consumers due to unnecessary infrastructure financing costs or increase the risk of assets being built that turn out not to be fully utilised. For these reasons we are not considering a reward for early delivery.

Introducing a milestone-based approach

5.39 An alternative option would involve introducing a milestone-based approach to the recovery of allowances. Under this approach, the existing arrangement for assessing and agreeing the total project cost allowances (for example at the start of every price control) would still apply. The new milestone-based approach would then enable the allocation of these allowances against project milestones, whereby recovery would not be permitted until the TO has demonstrated successful delivery against the criteria for that project milestone. This would also allow TOs flexibility to set appropriate, effective and meaningful milestones and would incentivise efficient delivery.

ETQ57. Do you agree with our proposed approach for ensuring TOs do not benefit financially from delays in delivering large capital investment projects?

ETQ58. We invite views on the suitability of the milestone approach, the types of milestones or delivery criteria we should be considering and any potential challenges associated with implementing such an arrangement.

ETQ59. Are there any alternatives which we should also consider?

Minimising consumer detriment

5.40 In addition to ensuring companies do not benefit from delays, we are considering ways in which consumer detriment could be minimised and/or shared with network operators, as a result of unsuccessful, delayed or poor quality delivery. We are seeking views on the potential introduction of clear consequences and/or penalties through individual licence obligations, in particular where companies have not acted efficiently and in the interest of consumers. We have identified two options for setting penalties and/ or consequences as follows.

- **Option 1:** we are considering the introduction of a penalty which could be reflective either of (i) the forecast reduction in constraint costs not realised as a result of delayed project delivery or (ii) the actual constraint costs incurred by consumers as a result of late project delivery.
- **Option 2:** agreeing an up-front pre-defined 'day rate' type payment to be made by TOs to consumers in the event of a delay and/or poor quality delivery.

ETQ60. We invite views on the circumstances we should consider options for minimising consumer detriment and/ or sharing consumer detriment with consumers.

ETQ61. We are seeking views on these two options, including ways in which we could measure and reflect consumer detriment.

ETQ62. Are there any alternatives not identified here which you think we should be considering?

6. RIIO-ET2 cost assessment

We provide context to and initial thinking on our proposed cost assessment approach for RIIO-ET2. The aim is to update stakeholders and invite their early views. We outline the approach we used in RIIO-ET1 and some of the methodology options currently under consideration for RIIO-ET2. We conclude by setting proposed expectations for RIIO-ET2 Business Plans and outlining next steps.

Chapter 6 questions

ETQ63. Do you agree with our intention to evolve the RIIO-ET1 approach for RIIO-ET2?

ETQ64. Do you have any comments on appropriate cost categories, cost drivers or approaches to cost assessment?

All questions are set out in Appendix 3.

Introduction

- 6.1 As in RIIO-ET1, RIIO-ET2 sets allowances for the efficient level of costs that will enable the TOs to carry out their activities and deliver an appropriate level of service. This chapter provides some context to, and initial thinking on, our approach to assessing the efficient level of costs and invites early views from stakeholders. Once developed, the approach will inform our assessment of the cost efficiency of RIIO-ET2 business plans, the robustness of the supporting cost justifications and Ofgem's proposed cost allowances.
- 6.2 We have established a cost working group comprising the TOs and other stakeholders. This working group has to date been the main forum at which we have discussed our potential approach to cost assessment. We will continue to hold these groups in the coming months to facilitate transparency and the development of our approach, and to complement this consultation process. Full details of the working group, including minutes and slide packs, can be found on our website.⁵³
- 6.3 In the remainder of this chapter we:
 - briefly summarise our approach to assessing costs in RIIO-ET1
 - discuss some of our early thinking on the cost assessment approach for RIIO-ET2
 - outline some of our proposals regarding TO business plans
 - set out next steps.

RIIO-ET1 cost assessment

- 6.4 The cost assessment process for RIIO-ET1 used a variety of approaches to determine a view of the appropriateness of submitted costs. These included:
 - total expenditure (totex) benchmarking

53 <https://www.ofgem.gov.uk/publications-and-updates/riio-et2-working-groups>

- disaggregated benchmarking
 - historical trend analysis
 - unit quantity analysis
 - asset unit cost analysis
 - output unit cost analysis
 - expert review
 - project by project review.
- 6.5 These techniques were applied to historical performance data and TOs' forward cost projections, including their views of ongoing productivity/efficiency improvements and expected changes in input prices relative to the retail price index.
- 6.6 Analysis was conducted both on a Totex basis (top down benchmarking) and the more disaggregated basis of direct/indirect operating expenditure, load related and non-load related capital expenditure (bottom-up benchmarking).
- 6.7 Where there was significant uncertainty in respect of either the cost or volumes of work across the price control period, we introduced uncertainty mechanisms and our cost assessment supported the design of those mechanisms through identifying the relevant drivers and parameter values.
- 6.8 We based our final allowances on the outcome of these approaches and the application of the IQI incentive.

Approach to assessing costs for RIIO-ET2

- 6.9 We have reviewed the cost assessment approach adopted for RIIO-ET1 as well as the actual costs and performance submissions from RIIO-ET1 to date. Our view is that the RIIO-ET1 cost assessment approach is largely appropriate for RIIO-ET2 and so we will look to adapt that, as appropriate, for RIIO-ET2, rather than establish a whole new approach.
- 6.10 Informed by discussions in the working groups, we set out some of our current thinking on areas of the RIIO-ET1 approach that may evolve for RIIO-ET2. These include:
- cost categories and the levels at which we choose to assess costs
 - use of appropriate cost drivers
 - treatment of Real Price Effects (RPEs)
 - our assessment toolkit and the data we use
 - the method by which we combine our analysis to determine a final cost allowance.
- 6.11 There are a number of wider policies under development that are likely to impact our views of efficient costs once they have been decided upon: transmission access reform, whole systems approaches, competition in transmission and the transmission charging review. We will keep developments in these areas under review during the course of our business plan assessment process and consider how to reflect these appropriately in cost assessment.

Cost categories

- 6.12 In RIIO-ET1 costs were grouped at the level of load related capex, non-load related capex, direct and indirect operating expenditure.
- 6.13 In RIIO-ET2 we propose to move to a simplified structure to align our categorisation with the Totex approach. We expect this approach to improve our ability to reconcile outputs and allowances, improve ongoing performance monitoring and avoid cost re-categorisation. We propose the following three cost categories:
- load related expenditure
 - non load related expenditure
 - indirect and non-operational expenditure.
- 6.14 We expect to request additional granularity on some cost categories to improve our cost assessment capability. We will progress this through the working groups and consult when these are sufficiently developed.

ETQ65. We invite views on the appropriateness of our proposed cost categories for RIIO-ET2.

Cost drivers

- 6.15 Our models of cost assessment need to take account of the key cost drivers of the TOs. There are several principles that we propose should guide our development of appropriate cost drivers. A good cost driver should:
- make economic and/or engineering sense
 - be accurately and consistently measurable and quantifiable
 - have a relatively stable relationship with costs over time
 - be beyond the control of the network company
 - promote long term efficiency (rather than, for example, current network condition).
- 6.16 We are working with stakeholders to evaluate cost drivers from RIIO-ET1 and will consider potential changes to cost drivers for RIIO-ET2 against the principles set out above. In doing so we note that the choice of cost driver may involve trade-offs between these principles, ie not all cost drivers will necessarily perform well against all these principles.
- 6.17 Other developments may change how the cost drivers relate to network companies' costs. For example, whole-system implications could change how costs may be distributed across different players in the energy system. Also, change in the access arrangements could lead to a different relationship between certain cost drivers and actual network expenditure.
- 6.18 TOs may provide their own views of cost drivers as part of their business plans. We will review the evidence underpinning their views before deciding whether to incorporate them into our analysis. In ET we are likely to rely on bottom-up benchmarking (supplemented by engineering and other expert knowledge) more

heavily than in the distribution sectors due to there being fewer comparators and the specific nature of the projects, eg investing for local boundary capacity.

ETQ66. We invite views on the principles of a good cost driver and our approach to identifying suitable RIIO-ET2 cost drivers is appropriate.

Real Price Effects (RPEs)

6.19 In our RIIO-2 Framework decision we confirmed that, where possible, we will index RPEs in RIIO-2 to protect consumers from forecasting risk. The Core Document sets out our proposed approach to the indexation of assessed costs for RPEs, where they are needed. Although it is for us to decide on the appropriate input price indices, we expect companies to provide evidence justifying the need for RPEs, as well as proposing and justifying input price indices as part of their business plans. We welcome evidence justifying the need for RPEs and any initial views on appropriate indices.

Cost assessment toolkit

- 6.20 Our cost assessment toolkit for RIIO-ET1 comprised a range of techniques as set out in Paragraph 1.4 above. Major investment projects were also subject to individual cost assessment. We intend to use a similar toolkit for RIIO-ET2.
- 6.21 We expect to use historical incurred costs during RIIO-ET1 as an important part of our evidence base for RIIO-ET2 cost assessment. Where possible, we will supplement this with robust data from outside of the RIIO-ET1 regulatory returns.⁵⁴ Our assessment of historical expenditure will aim to establish the efficiently incurred levels of cost and also identify what this has delivered in terms of outputs. The review of the TOs' performance in the historical period will also help us identify and understand issues that may impact on forecast expenditure.
- 6.22 Where an activity is applicable across multiple companies, sectors or industries, we will seek to leverage this wider data set to enable us to perform a more robust assessment of costs. For example, business support costs may be comparable at a cross sectoral level.
- 6.23 For specific investment projects outlined in the business plan we may carry out individual cost assessment using techniques appropriate for that project type and at a proportionate level of scrutiny. This could be done on the basis of a materiality threshold or a spot check based on random sampling. For such projects we may require additional levels of granularity in reporting to fully assess efficient costs. This may include labor, plant, materials, risk and project management costs.
- 6.24 Some projects may contain uncertainty around the needs case or timing but have reasonably firm cost information. Subject to the circumstances, we will consider the merits of either leaving cost assessment until the needs case is more certain during RIIO-ET2 or conducting an assessment of the efficient costs and incorporating the result in a relevant uncertainty mechanism.
- 6.25 In situations where activities are unique to the network, and either we have insufficient information to assess efficient costs or we require further external

⁵⁴ For example, some of the Distribution Network Operators' data on 132kV installations might be relevant for certain elements of the Scottish Transmission networks. In addition, all of the GB onshore TOs are participating in an European cost benchmarking exercise, which may provide further comparative data for consideration.

- input to adequately assess costs, we may also request bespoke engineering assessment by subject matter experts. Using such experts with access to additional knowledge and data will improve our ability to assess efficient costs.
- 6.26 Over the coming months, we will assess different model options, considering the alternative cost categories and cost drivers, as set out above. This will be discussed further with stakeholders during our working groups and subsequently will be subject to consultation.
- 6.27 When assessing the cost efficiency of activities with a relatively high degree of uncertainty, qualitative techniques may supplement technical measures to enable a more robust determination of costs. This may involve stakeholder collaboration, bilateral discussions with policy makers or any other means of revealing insightful actionable information.
- 6.28 Employing a wide range of techniques has the potential to strengthen our view on efficient costs. However, the application of different techniques requires decisions on corresponding underlying assumptions (eg choice of inputs and outputs, functional form of the production or cost function, etc). Each technique has advantages and disadvantages in the specific context of the ET sector. For example, the constraints of limited data, with only three TOs and all of which are on a differing scale, may limit the effectiveness of the top-down benchmarking. In dealing with different, potentially contrasting results, we will bear these in mind and make appropriate use of all information and techniques available.
- 6.29 We note the links between the specific nature of ET investment and the current policy proposals regarding totex sharing factors being reduced for instances where costs are less predictable, as discussed in the Core Document. We will work with TOs to clarify how these factors interact and the implications for overall incentive rates during the RIIO-ET2 control period.

Combining our analysis

- 6.30 We expect to use a variety of tools and approaches to assess TO cost efficiency in RIIO-ET2. We will only be in a position to decide how best to combine these analyses once they are complete, but given the lack of comparators in the sector, we would expect both bottom-up benchmarking and engineering judgement to be prominent in coming to our final decision. In combining the analyses, we will be mindful of the need to set allowances at a level that will enable an efficient company to deliver its outputs.
- 6.31 We will continue to consult with stakeholders on our approach to cost assessment and the types of analyses to be used, both through our cost assessment working groups and subsequent consultations.
- 6.32 We also expect the TOs to provide their own assessments of what constitute efficient costs as part of their submissions and we will consider the evidence provided when undertaking our own assessment of the submission.

ETQ67. We welcome any early views on how we can combine the analysis in order to ensure ex ante allowances reflect efficient costs.

Proposals for ET Business Plans

- 6.33 Our assessment of the outputs that the TOs are required to deliver and the associated revenue they may recover will be informed by the business plans put forward by the TOs. They will need to set out in their business plans what they intend to deliver for consumers over time and what revenue they need to earn from existing and future consumers to ensure delivery is financeable. The onus is on TOs to justify their views of required expenditure.
- 6.34 We expect a TO to consider a range of options for delivering outputs and explain why its proposal is the best way forward. When making the case for its preferred proposal we would expect it to demonstrate that it had considered the long-term costs and benefits of the most viable options.
- 6.35 We will shortly be publishing an updated cross sector Business Plan guidance. In this section, we set out some of our business plan proposals specific to the TOs. This includes our approach to the RIIO-ET2 Business Plan Data Templates (BPDTs) and associated instructions. Please note that our proposal for a new business plan incentive is discussed in the Core Document.
- 6.36 We expect major investment decisions in RIIO-ET2 to have a needs case which demonstrates the company's decision making process. It should highlight the rationale for the proposed investment, functionally equivalent alternatives that have been considered and the determining factors that led to the final choice. It must be underpinned by a cost benefit analysis (CBA) to demonstrate the value to consumers of making the investment(s). We have outlined the key principles for CBAs in the Business Plan Guidance document and we expect to develop these on a sector specific basis in discussion with the TOs and other stakeholders through our cost assessment working groups.

Business Plan Data Templates

- 6.37 The RIIO-ET1 BPDTs and the Regulatory Instructions and Guidance (RIGs) will form a basis on which to build for RIIO-ET2 and there will be a clear link between the BPDTs and the Regulatory Return Packs (RRP) submitted for annual monitoring. We will also consider the level of standardisation between sectors; for example, between GT and ET in terms of both general language and structure of information and between ED and ET in terms of unit cost definitions.
- 6.38 We have been working with the TOs to develop BPDTs and will continue this over the next few months to develop the RIIO-ET2 BPDTs and associated guidance.
- 6.39 We intend to issue a draft RIIO-ET2 BPDT in March 2019. We expect the TOs to use this draft BPDT when submitting draft business plans on 1 July 2019.
- 6.40 We will further develop the RIIO-ET2 BPDT to account for any sector specific methodology decisions in May 2019. A final BPDT, incorporating these amendments, will be issued in advance of the December 2019 business plan submission.

BPDT content

- 6.41 In large part, we expect to ask for similar data in the RIIO-ET2 BPDTs as we collect annually in RIIO-ET1 RRP and as we collected in RIIO-ET1 BPDTs. However, in some areas we expect to see change, for example:

- where we think the level of uncertainty has changed from RIIIO-ET1 to RIIIO-ET2 meaning we may need to amend our cost assessment approach
- to inform new policy, for example to enable us to assess costs associated with PCDs and ODIs, to determine output targets and to implement indexation for any proven need for RPEs (if this is what we decide)
- to adapt to Network Asset Risk Metrics (NARM) reporting requirements. This will be driven by the development of our approach to assessing NARM in ET2 at both cross-sector and sector specific levels
- to inform how we develop our cost assessment methodology, for example to link outputs to costs and ensure transparency
- where we require a greater level of granularity, for example for specific investment projects
- to reflect a multi period approach to provide greater transparency on investment cycles beyond RIIIO-2 in recognition of the fact that price controls are artificial boundaries.

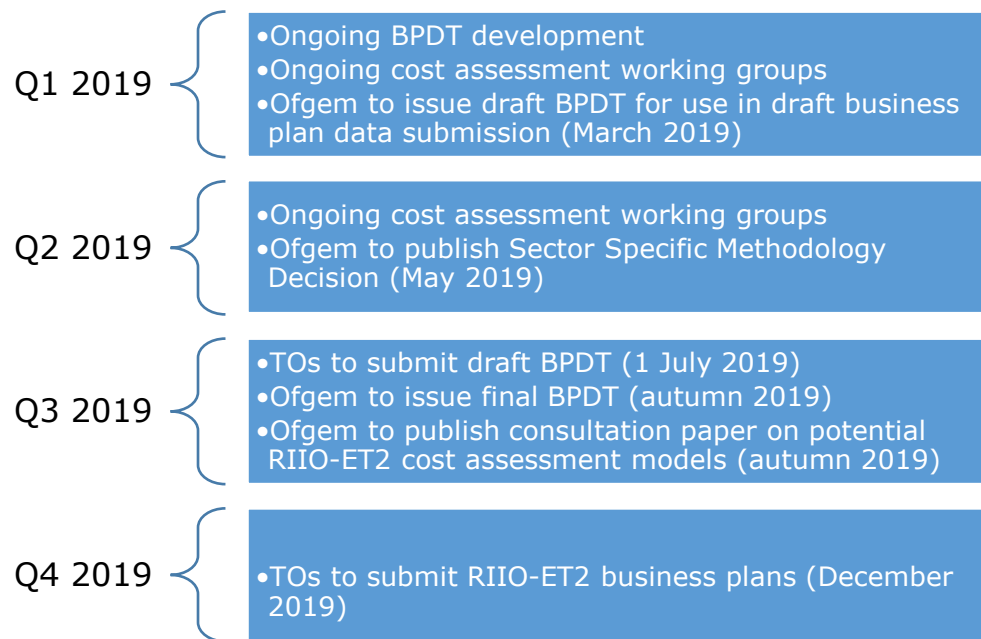
Proposals for Cost Benefit Analysis submission

- 6.42 Cost Benefit Analysis (CBA) is an important decision support tool as part of the justification for investment needs. The Business Plan Guidance has set out our views on the general principles to be followed for all CBAs on a cross-sectoral basis. However, we expect that there will be issues unique to each sector that will need to be further developed.
- 6.43 Using the RIIIO-ED1 process as a starting point we will work with the TOs and other interested parties, through both the working groups and bilateral meetings, to agree the scope for the application of CBAs and to develop detailed guidance and templates for CBA submissions. We expect to publish draft guidance and templates for consultation during March 2019.
- 6.44 TOs have noted that for projects identified by the Network Options Assessment (NOA) process, the System Operator has already conducted a CBA as part of their study to determine the benefit of the work. We will take into account the analysis conducted during the NOA process and consider the extent of further information to be provided by the TOs for these projects on a case by case basis.

Next steps

- 6.45 We intend to continue the cost working groups in 2019. We will use these to develop ET specific BPDTs and develop our approach and methodology to cost assessment.
- 6.46 By autumn 2019, we will publish a document that sets out more of our thinking on our approach to assessing efficient costs for RIIIO-ET2 and ask for views on alternative approaches.
- 6.47 The figure 6.2 summarises these next steps.

Figure 6.2: Next steps timeline



7. Uncertainty mechanisms

Several uncertainty mechanisms are included in RIIO-ET1. We have not yet formulated our views on which (if any) of these will be needed for RIIO-ET2, and we welcome views on this. Companies may also suggest additional mechanisms as part of their business plans.

Chapter 7 questions

ETQ68. We would welcome views on the design and suitability of existing uncertainty mechanisms for RIIO-ET2, and whether any of these should be removed.

ETQ69. Are there any additional mechanisms that we should consider across the sector and if so, how should these be designed?

All questions are set out in Appendix 3.

Introduction

- 7.1 Forecasting all costs and outputs with confidence for the duration of a price control is challenging. Uncertainty mechanisms allow changes to a network company's allowed revenues to be made in light of what happens during the price control period. We use the term uncertainty mechanisms to cover a range of regulatory approaches.⁵⁵ The use of uncertainty mechanisms, and their design, is important to ensure we don't damage incentives on companies to be efficient and don't expose companies to risks outside of their control.
- 7.2 At the time of setting RIIO-ET1, some of the uncertainties included the degree of entry by renewables into the system and the viability of certain system reinforcements associated with nuclear power projects. Many of the RIIO-ET1 uncertainties would appear to be still relevant for the RIIO-ET2 period.
- 7.3 The uncertainty mechanisms within RIIO-ET1 can be characterised as:
 - volume drivers that automatically adjust allowed revenue as a volume measure varies
 - within period arrangements to determine Strategic Wider Works outputs
 - specific re-openers to recover uncertain costs.
- 7.4 Table 10 below sets out all of the current uncertainty mechanisms within RIIO-ET1. We have not formulated a clear view on whether these should be continued, though it may be that the particular uncertainty still exists and the mechanisms are still appropriate.

ETQ70. We would welcome views from respondents on the continuing relevance of these mechanisms and any changes to the way that they operate if they are to continue.

⁵⁵ Mechanisms include: indexation, volume drivers, specific re-openers, and pass through costs.

Table 10: Summary of the generic uncertainty mechanisms used in RIIO-ET1 and potentially available for RIIO-ET2

Name	Type of mechanism	Comparison to RIIO-ET1
Cross sector		
Ofgem Licence Fee	Pass through	No change proposed from RIIO-ET1
Business Rates	Pass through	No change proposed from RIIO-ET1
Real Price Effects (RPEs) – if required	Indexation	New for RIIO-ET2
Physical Security	If not in base revenue only, then re-opener	Revised RIIO-ET2
Cyber Resilience	If not in base revenue, then re-opener	New for RIIO-ET2
Disapplication	Re-opener	No change proposed from RIIO-ET1
ET2 specific		
Workforce renewal (SPTL only)	Pass through	To be reviewed for RIIO-ET2
Landowner compensation under wayleave (SHETL only)	Pass through	To be reviewed for RIIO-ET2
BT 21st Century Networks (SHETL only)	Pass through	To be reviewed for RIIO-ET2

- 7.5 While the RIIO-ET1 uncertainty mechanisms provided a high degree of flexibility to enable cost allowances to adapt to a wide range of external changes, their effectiveness is varied and we will consider any adjustment or strengthening required. This will involve considering both the appropriateness and the level of the parameters.
- 7.6 Additional uncertainties have arisen for the RIIO-ET2 period and uncertainty mechanisms will help ensure the price control can adapt to these. For example, in the area of decarbonisation through electrification, government decisions on topics such as promotion of electric vehicles could have a significant impact on either of the transmission or distribution systems, or indeed, both. We therefore propose to reflect such additional sources of uncertainty in our setting of cost allowances and output requirements.
- 7.7 Chapter 7 of the Core Document sets out our overall approach to managing uncertainty under RIIO-2. It also includes:
- the principles guiding the use of uncertainty mechanisms and provides details on what stakeholders need to provide in order to suggest additional mechanisms
 - information on the uncertainty mechanisms that we propose to apply in the same way across all of the RIIO-2 price controls is described as ‘Cross sector’ in Table 10.
- 7.8 Network companies will have an opportunity, as part of their business plans, to propose additional uncertainty mechanisms that they would find valuable in managing risk. In doing so, we expect companies to justify why any additional mechanisms would be appropriate and the benefits these would bring for consumers.

ET specific issues

- 7.9 There are a number of issues that may affect our view of the need for transmission investment and/or what constitutes an efficient level of cost. We discuss these below.

Access reform and the Transmission Charging Review

7.10 Our cost assessment will be broadly based on our current understanding of the level of network capacity required for amount of generation connected. If different types of access product become available, that may change that relationship. We will identify clearly the assumptions supporting the cost assessment that may be subject to changes arising from access reform or the transmission charging review to allow any appropriate future adjustments to be made.

Competition in transmission

7.11 Our current assumption is that TOs Business Plans will contain all costs they consider are required to deliver any given project. However, our policy development of competition in transmission may result in some of these projects/elements of their cost submissions being delivered by other parties. Our position will be to identify these costs and any associated cost areas in a transparent manner so that they can be dealt with in the appropriate way should any such policy changes materialize.

Whole system

7.12 We are keen that TOs produce solutions that take a holistic view of the energy system rather than being focused too inwardly on their own networks. For example, where changes on one network affects the operation of an adjacent network, there may be opportunities to reduce costs through combined solutions, eg ET in combination with the electricity distribution networks. Although we take these factors into account as much as possible in the ex ante assessment, some of these types of issues may only become clear in the course of RIIIO-2 period. We would look to revise our assessment of costs once we become aware of any such instances.

Harmonisation of existing mechanisms

7.13 Partly due to the Scottish TOs being fast tracked during the RIIIO-ET1 process, a wide disparity has evolved between their volume drivers and those of National Grid. We will consider whether these differences are still justified, and where not look to harmonise the mechanisms.

Table 11: Summary of SPT and SHET volume drivers⁵⁶

	SPT	SHET
Description	Connection works including local substation, OHL and cable to the existing network	
Baseline description	Sole: 2503MW across the 8-year period. Shared: 1173MVA across the 8-year period.	Sole: 1168MW across the 8-year period. Shared: 1006MVA across the 8-year period.
Baseline output definition	Sole: MW 'using' network (TEC) Shared: MVA (asset rating)	
Pre threshold Unit Cost Allowance (UCA)	Sole: £27.3k/MW (excl RPE) Shared: £104.6k/MVA (excl RPE)	Sole: £85k/MW (excl RPE) Shared: £83k/MVA (excl RPE)
Post threshold UCA	£42k/MW (excl RPE) Asset specific captured in licence condition	£75k/MW (excl RPE) £83k/MVA (excl RPE)
Trigger threshold for High Cost Projects	Not applicable	Sole: >= £150k/MW Shared: >=£166k/MVA
Atypical UCA	Not applicable	Sole: £294k/MW Shared: £182k/MVA

⁵⁶ The price control splits funding for generator connections based on how many generators are connected. There are separate mechanisms to connect one generator at a time (sole-use connections) and another to connect multiple generators (shared-use connections), ie triggers "deeper" reinforcement to the surrounding network to enable this generation to connect.

Table 12: Summary of National Grid’s Uncertainty Mechanisms in RIIO-ET1

	Investment Category				
	Generation Connections	Demand Connections	Wider Works	DNO Mitigation	Undergrounding
Description	Connection works including local substation, overhead line (OHL) and cable to the existing network (excludes sole-user work, turn-ins, and cross-site cables).	Connection works including local substation, OHL and cable to existing network (excludes sole-user work, turn-ins, and cross-site cables).	Wider network reinforcement subject to Network Options Assessment (NOA) decisions (all circuits assumed to be OHL, as undergrounding covered by separate mechanism).	Work on DNO network when required by the DCO planning process, e.g. taking over a 132kV route and rebuilding at 400kV.	Undergrounding of wider works circuits when required by the DCO planning process.
Baseline description	Phased generation connecting to achieve the Gone Green 2012 (GG12) scenario across the 8-year period.	Phased delivery of SGTs required to deliver the GG12 scenario across the 8-year period.	Phased incremental boundary capacity required to deliver the GG12 scenario minus some specific projects.	Zero baseline.	Zero baseline.
Output definition	MW ‘using’ network (TEC) km of OHL/cable 15 cable types (e.g. cores per phase, cross-section, and route length)	Number of SGTs km of OHL/cable 15 cable types (e.g. cores per phase, cross-section, and route length)	MW of boundary capacity provided on 15 specified network boundaries	Number of new DNO bays km of new DNO OHL km of DNO OHL removal km of DNO cable (u/g)	km of cable 15 cable types (e.g. cores per phase, cross-section, and route length)
Basis of unit cost allowance (UCA)	£/MW average based on expected cost and capacity of future contracted connections (March 2012). £/km OHL and cable based on 2012 Institute of Engineering and Technology (IET) report. ⁵⁷ Full project cost included in UCA calculation, i.e. spend in prior price control periods.	£/SGT based on expected cost of future contracted connections. £/km OHL and Cable based on 2012 IET report. Full project cost included in UCA calculation, i.e. spend in prior price control periods.	UCAs for each boundary, tiered according to the level of capacity provided. Each UCA considered the cost and capacity provided by a group of ~2-4 schemes. Construction costs only in UCA; pre-con crudely estimated and then funded by fixed allowance.	Unit costs extracted from Ofgem-published Electricity Distribution cost data.	£/km cable based on 2012 IET report.

⁵⁷ <https://www.theiet.org/factfiles/transmission.cfm?>

Appendices

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Appendix 1 – Further background on RIIO-ET1 performance and outputs

In this appendix, we provide additional background and information on RIIO-ET1 outputs and company performance against these.

Stakeholder Satisfaction Output

Stakeholder Engagement Incentive

Table 13: TO performance under the SEI

	2013-14		2014-15		2015-16		2016-17		2017-18	
	Score	Reward (£m)	Score	Reward (£m)	Score	Reward (£m)	Score	Reward (£m)	Score	Reward (£m)
SPT	4.90	£0.26	5.50	£0.48	6.25	£0.75	6.25	£0.68	6.40	£0.78
NGET	5.75	£2.76	6.00	£3.50	6.25	£3.81	7.00	£5.05	5.10	£1.78
SHETL	5.40	£0.25	6.00	£0.44	6.00	£0.68	5.40	£0.48	3.25	£0.00

Survey, KPI and external assurance components of the SSO

Table 14 below summarises the key characteristics of the survey, KPI and external assurance components of the SSO.

Table 14: Key components of the SSO

Component	NGET	SP Transmission	SHE Transmission
Values apply for years 4-8 of the price control			
Baseline Stakeholder Satisfaction Survey	7.4	7.4	7.4
Cap and Collar Stakeholder Satisfaction Survey	+/-1.6	+/-1.6	+/-1.6
Baseline KPI	N/A	69	89
Cap and collar KPI	N/A	+/-16	+/-11
Weightings Years 4-8:			
NGET; Customer Satisfaction Survey: Stakeholder Satisfaction Survey	70:30	60:30:10	60:30:10
Scottish TOs; Stakeholder Satisfaction Survey: KPIs: External Assurance			

Component 1: Stakeholder Satisfaction Surveys

The Stakeholder Satisfaction Survey component of the SSO applies to all three TOs and is weighted at 60% for the Scottish TOs and 30% for NGET of the incentive's overall value. The TOs are expected to carry out this survey at least once a year.

In RIIO-ET1 TOs are allowed to set their own questions for their surveys as they see appropriate, subject to the inclusion of one key question. This question asks for overall stakeholder satisfaction to be rated on a scale of one to ten, with one representing low satisfaction and ten representing high satisfaction. This is the only one that TOs report to Ofgem and is used to generate their satisfaction score. The remaining questions offer opportunities for the TOs to understand and reflect on their stakeholders' priorities.

In RIIO-ET1 we did not prescribe which stakeholder groups should be included in the survey sample. However, in our RIIO-ET1 decision document⁵⁸ we did provide guidance on the broad stakeholder audience that was expected to be captured which included;

⁵⁸ Guidance on potential Stakeholder groups to be covered can be found here (figure 5.1): https://www.ofgem.gov.uk/sites/default/files/docs/2011/03/t1decisionoutput_0.pdf

connections stakeholders, local government, universities, construction companies, charities etc.

As explained above, we 'switched off' the incentive for a number of years at the start of RIIO-ET1 in order to determine the baseline for the satisfaction survey. We determined the mean of the performance scores in the switched off period, which was 7.2. We subsequently applied an adjustment in order to ensure we set a baseline that encourages genuine improvement in stakeholder satisfaction and set a survey baseline value of 7.4.

In RIIO-ET1 it was proposed that a cap and collar would be set for the Stakeholder Satisfaction Survey that was in line with the symmetric cap and collar user for NGET's Customer Satisfaction Survey. The rationale behind +/-1.6 was to enable the full revenue impact (positive or negative) to be recovered/incurred without needing to score at the extremes of the survey scores. Therefore, the Stakeholder Satisfaction Survey had a cap and collar of +/-1.6 around the baseline of 7.4 out of 10 (9 and 5.8 respectively).

Component 2: Key Performance Indicators (KPIs)

The KPIs apply to the Scottish TOs and are weighted at 30% of the incentive's overall value. The policy intent of the KPIs was to reflect the priorities of the stakeholders in specific metrics that the TOs have to achieve during the price control.

The baseline for the KPIs was also determined based on the average of the performance during the three 'switched off' years of the incentive. We decided to set the baselines at 69 for SPT and 89 for SHE-T, as it was found that their KPIs were materially different. The relevant licence condition does not prescribe specific periods within the price control where the KPIs' content or targets can be modified.

In RIIO-ET1, the cap and collar for the KPIs were set at +/-16, in line with the Stakeholder Satisfaction Survey. However, as SHE-T's KPI baseline is higher than SPT's, the cap and collars were modified as follows:

- SHE Transmission's KPI cap and collar at +/- 11 around its baseline (100 and 78 respectively)
- SP Transmission's KPI cap and collar at +/- 16 around its baseline (85 and 53 respectively).

Component 3: External Assurance

The external assurance component applies to the Scottish TOs and has a weighting set at 10% of the incentive's overall value. This component requires transmission operators to have in place stakeholder strategies which are then assessed by an external assurer. The purpose of the external assurance component is to ensure that the TOs are developing and maintaining high quality stakeholder strategies.

Performance over RIIO-ET1

Table 15 below summarises performance to date in RIIO-ET1 (for the 'switched on' years only) against the three components.

Table 15: Performance Scores for the 'switched on' years of the SSO

Survey Scores	16/17	17/18	Survey Baseline
SPT	7.9	8.3	7.4
SHE-T	8.7	8.0	7.4
NGET	7.7	7.88	7.4
KPI Scores	16/17	17/18	KPIs Baseline
SPT	77	78	69

SHE-T	69	76	89
External Assurance	16/17	17/18	
SPT	Exceeding	Exceeding	N/A
SHE-T	Compliant	Compliant	N/A

Energy Not Supplied

Background

Table 16 below highlights the key characteristics of the RIIO-ET1 ENS incentive.

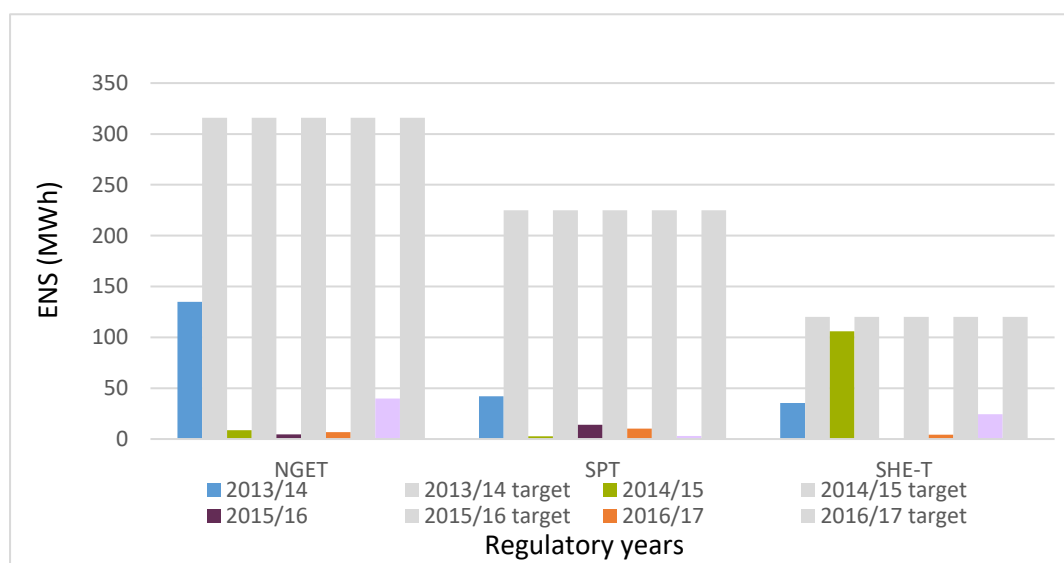
Table 16: Key RIIO-ET1 ENS characteristics

Baseline targets	
NGET	316 MWh
SPT	225MWh
SHE-T	120MWh
Incentive value	
All TOs	£16,000/MWh (multiplied by the efficiency incentive rate)
Financial collar	
All TOs	3%

Performance over RIIO-ET1

Figure 7.1 below shows RIIO-ET1 performance under the ENS incentive to date.

Figure 7.1: Volume of ENS - TO Baseline Targets vs. Performance



Business Carbon Footprint (BCF)

A company's business carbon footprint (BCF) comprises GHG emissions that result from the company's day-to-day operations and activities. This includes direct emissions (Scope 1 emissions) from the burning of fossil fuels for energy used in company offices or sites and transportation (e.g. car and plane), and fugitive greenhouse gas emissions such as SF₆ from assets operated by a company. It also includes indirect emissions (Scope 2 emissions) arising from the consumption of electricity and electrical losses on the network.

In RIIO-ET1 the TOs are required to report annually on their Scope 1 and Scope 2 emissions, measured as tonnes of CO₂ equivalent emissions (t/CO₂e) as part of their Regulatory Reporting Pack (RRP). This measure also includes t/CO₂e from fugitive SF₆ emissions (leakage) as well as from electricity losses through transporting power on its network. The BCF incentive is reputational only with no financial rewards or penalties attached.

The RIIO-ET1 BCF incentive is designed to increase the transparency of network owners' GHG emissions and to encourage network owners to monitor and reduce their GHG emissions at a business level throughout the RIIO-ET1 price control. The measure was introduced to ensure the TOs play their part in meeting the UK government's climate change target to reduce carbon emissions by 80% by 2050, based on 1990 levels.⁵⁹

The BCF incentive is the only environmental output measure that is rolled out across all of the network sectors i.e. electricity transmission, gas transmission, gas distribution and electricity distribution.

As shown in Table 17, the vast majority of the TOs' total BCF in RIIO-ET1 arises from electricity losses on their transmission networks.

Table 17: Composition of TOs' average annual business carbon footprint

	Average annual emissions in RIIO-ET1 (tCO ₂ e), 2013-2018	Proportion of emissions
Losses	2,358,296	89%
SF ₆	251,410	9%
Other business carbon	56,107	2%
Total	2,358,296	

Since the start of RIIO-ET1, the total BCF of the TOs has fallen by 18%. However, a closer look at the three main components of BCF shows that TO performance has been mixed. Table 18 shows that most of the decrease has come from a 20% fall in emissions associated with electricity losses which are primarily due to the increase in renewable generation and the closure of several coal power stations since 2013-14. A 12% reduction in SF₆ leakage has also contributed to a lower BCF. However, CO₂ equivalent emissions from the TOs' other business related activities have increased by 22%.

Table 18: Changes in TO's business carbon footprint over RIIO-ET1

	Emissions 2013-2014 (tCO ₂ e)	Emissions 2017-2018 (tCO ₂ e)	Percentage change
Losses	2,366,898	1,901,440	-20%
SF ₆	268,856	237,157	-12%
Other business carbon	48,395	59,103	22%
Total	2,684,149	2,197,699	-18%

⁵⁹ <http://www.legislation.gov.uk/ukpga/2008/27/part/1/crossheading/the-target-for-2050>

Appendix 2 – Summary of policy working group feedback

In this appendix, we provide additional detail on feedback from our policy working group in key areas. Detailed materials and minutes are available on our website, as outlined in the context chapter.

SSO

There was general agreement from the participants of the policy working group that the stakeholder incentives have driven a step change in communicating with and addressing stakeholder's priorities. Policy working group participants felt that the SSO complimented the SEI well as a quantitative measure of stakeholder satisfaction.

In relation to the survey component, there was agreement that flexibility should be retained in terms of setting the questions, to ensure TO specificities could be captured. Policy working group participants were also in favour of introducing a more connections-focused survey.

Most participants were in favour of maintaining the KPI component, as they were viewed as useful metrics in informing stakeholders of TO performance. However, there were various views on whether this should be financially incentivised, particularly when there could be overlap with other outputs.

Finally, all stakeholders were in agreement that the External Assurance component is best practice however, most participants were in favour of removing the financial weighting against this and moving this component to a licence obligation in RIIO-ET2.

There was also some discussion around the potential introduction of a relative incentive, with some stakeholders raising concerns about this approach and the lack of comparability.

ENS

During the working group, some participants expressed the view that the incentive has allowed the TOs to be better asset managers by encouraging them to be proactive in managing risks relating to reliability, and embedding changes in their business processes. One of the key issues raised during the discussions was the reward component of the incentive. As TOs have been performing extremely well in terms of reducing ENS levels, some participants questioned the extent to which we should consider introducing a penalty-only mechanism for RIIO-ET2. The argument given was that these new high levels of reliability should become business as usual, and TOs should not be receiving rewards for business as usual mitigation strategies.

Other participants noted that by removing the reward, behaviours may change and move to compliance only, as TOs may divest focus on efficiently managing risks to ENS. Participants considered that mitigation activities can be costly, and the removal of the reward may affect resources spent on risk mitigating considerations for reliability. It's our initial view that we agree with the theoretical concept that the marginal impact of the incentive on TOs would be the same, regardless if the incentive retains a positive reward, or penalty only, if the baseline target is set at zero. This suggests that TOs are rewarded/penalised equally for every MWhs supplied/lost.

Environmental framework for RIIO-ET2 - business plans and annual monitoring

On BCF, the working group expressed concern that its current form gives limited transparency and comparability of company activities and performance, particularly for electricity transmission. It considers that comparability and transparency should be

strengthened in RIIO-ET2 to sharpen the reputational incentive. It was also suggested that elements such as electricity losses should be reported separately to the BCF to give a clearer picture of performance in the areas that are within direct company control.

The working group considered that the status quo option for environmental impacts was not fit-for-purpose for RIIO-ET2. It also indicated concerns more generally that across all sectors, the existing environmental incentives are disparate, process-oriented and not pushing all of the network owners enough.

The working group suggested that the environmental output measures should better distinguish between the areas over which TOs have direct control, areas they can influence/enable and areas over which they have limited influence/control.

The working group said that an environmental package should be introduced that drives efficiency and transparency in achieving carbon reduction and environmentally responsible practices. It should be more holistic, cohesive and also increase consistency across sectors, looking at better ways to integrate environmental and sustainability metrics into the business plan.

Most working group participants agreed that consumers expect the network owners to deliver environmentally sustainable networks and should be efficiently funded for doing so, particularly where company business plans are aligned with wider policy (ie government targets, etc.)

Some working group participants said it was important to consider how to achieve a degree of flexibility in setting price control deliverables so that companies can incorporate new options during the price control period if these are more efficient in minimising environmental impacts.

As part of discussions at the working group, further consideration was given to Sustainability First's proposal for a low carbon incentive for all of the network sectors.

Review of the EDR and potential for bespoke ODIs around low carbon transition and

The working group told us that the EDR has helped to raise the profile of sustainability initiatives, environmental impact and the low carbon transition within companies.

However, the working group also highlighted some concerns. A key issue is that the EDR was developed relatively late in the RIIO-ET1 price control review, which meant there was limited integration with the business planning process. The working group also thought that the EDR has had limited success in terms of promoting transparency on environmental performance. Another issue is that it is primarily backward looking and is only applied in electricity transmission. Some working group participants also had concerns that the format of the EDR scheme is potentially susceptible to a company cherry-picking projects to provide evidence that the criteria have been met. Lastly, it was noted that it is a cumbersome and resource intensive process to make an EDR submission.

Some working group participants consider that the current package of incentives in RIIO-ET1, including the EDR, are not comprehensive enough or do not send a sufficiently strong signal to the TOs on their role in the energy sector decarbonisation. It was also felt that the networks need to be more accountable for their contribution ie that there should be more forward commitment.

The working group also thought there should continue to be incentives in RIIO-ET2 to drive behavioural change. It also suggested that we need to consider the right balance

between driving competition and encouraging collaboration, particularly if we are aiming to increase whole systems thinking across all the network sectors. It was also noted that opportunities might arise within the period for the TOs to make an additional contribution to the low carbon transition. Accordingly, the working supported looking at a new output measure in this area for RIIO-ET2.

The working group considered a new cross-sector low-carbon incentive promoted by Sustainability First to simplify and clarify the existing RIIO-ET1 regulatory framework. Some members thought one of the benefits of this approach is that it could provide a clear focus and coherent approach across the different network sectors.

The working group discussed the range of TO activities that could be within the scope of a low-carbon incentive, those that might not be in scope and other areas that warranted consideration. The working group noted the importance of ensuring that some aspects of network environmental impacts might be omitted if an overarching low-carbon incentive is developed.

The working group also discussed some of the practical difficulties of the single low-carbon incentive. It felt that these include establishing a baseline and identifying performance metrics accurately to measure a TO's contribution. In addition, it thought there might be potential issues with a low-carbon incentive. It had concerns about whether this would provide good value to consumers, noting that future investment in low carbon generation, electric vehicles and energy efficiency measures will depend on many factors outside of the networks control eg government policies and subsidies. It also thought an overarching incentive might duplicate incentives on other outputs such as connections and customer satisfaction. This might ultimately lead to rewarding companies for market activity they had little impact on and/or doubly reward companies for the delivery of other outputs.

It was noted that some of these issues could be overcome by implementing the incentive through a qualitative assessment underpinned by metrics. This option could involve a panel assessment, with the addition of quantitative metrics to underpin the reporting. In addition, we could set a minimum qualitative standard that must be met and only above this would a financial incentive apply.

The working group had concerns that the qualitative proposal appears similar to the EDR scheme. Alternative options for assessment (instead of panels) were discussed such as the role of the network's User Groups if these have an ongoing role.

Another option the working group considered is providing the opportunity for the companies to develop, with their stakeholders, bespoke output delivery incentives (ODI) for additional contributions to the low carbon transition during RIIO-ET2.

Some thought that a bespoke ODI will better challenge the companies to identify activities they could do to support the low carbon transition that would otherwise not happen within price control framework.

Sulphur hexafluoride (SF₆) and other IIG leakage

Some working group participants thought that the existing incentive should be strengthened. They considered that this could be achieved by making the target more ambitious, which would encourage the transition away from the use of SF₆ on the network over the long term and the development of alternative IIGs which have a lower environmental impact.

The working group suggested that the incentive should be changed to focus on CO₂e emissions from IIG (rather than just from SF₆) to ensure that any alternatives are

captured by the incentive. There was some concern that the incentive might perversely encourage the adoption of alternative IIG on the electricity system that are only slightly better than SF₆ (ie IIG that still have a high greenhouse warming potential).

It was highlighted that there is not an established supply chain for very high voltage alternatives for SF₆ and that there is currently no off-the-shelf alternative for HV assets (greater than 145kV). However, it was noted that there are some examples that are currently being developed and trialled at higher voltages. It was also noted that RIIO-ET2 will start in just over three years and that this time can be used constructively to drive a step-change in developing and demonstrating viable high voltage alternatives.

It was suggested that the network owners should be working more collaboratively to engage with the supply chain to encourage it to make market ready alternative gases to SF₆ for insulation and interruption. It was also noted that setting a stretching target in RIIO-ET2 would also help provide institutional support for the supply chain to invest in research, development and demonstration of new viable alternatives.

Visual amenity impacts of transmission infrastructure

Working Group participants considered that the RIIO-ET1 policies are broadly appropriate. Participants said that the arrangements for new transmission projects should be retained as these enable the TOs to balance visual amenity considerations against their duty to be economic and efficient.

Some participants asked whether there is scope in RIIO-ET2 to drive an improvement in the TOs' existing practices to gain the trust and participation of stakeholders in a meaningful way on the development of new project proposals.

The working group generally welcomed retaining an expenditure allowance in RIIO-ET2 for TOs to mitigate the impact of existing infrastructure in designated areas, subject to evidence of sufficient consumer willingness to pay. There was some discussion about whether the provision could be extended to cover other areas such as world heritage sites or non-designated areas. Some participants noted that in RIIO-ET2 there will not be any feasible mitigation projects in the national scenic areas or national parks of one of the Scottish transmission areas.

Another discussion point was whether there could be some process changes to the operation of the scheme. It was suggested that the TOs set out the mitigation projects they are proposing to deliver in RIIO-ET2 in their business plans rather than submit funding requests for Ofgem decision over the course of the price control.

NAP

In our policy working groups we discussed whether the NAP should be retained in RIIO-ET2, and if so, whether any amendments may be necessary. Feedback from some participants highlighted improvements in outage management and TO/ ESO interactions more generally driven by the NAP.

Participants also discussed the potential to introduce a single, consolidated NAP for the Scottish TOs and NGET. There were mixed views: some stated a preference for a single coherent NAP for all TOs while highlighting that a single NAP would allow for greater alignment, including of reporting obligations. Others highlighted that the NAP should reflect individual TO priorities and therefore considered that two separate NAP should continue to exist.

The working group also discussed whether the NAP should be extended to cover third parties such as DNOs and generators, who are playing an active role in the discussions

around outages. Some participants noted a need to define and clarify the current process related to communication with third parties. Under this process, the ESO is the only formal point of contact for third parties, but a lot of the informal communication actually takes place between TOs and third parties (DNOs and generators). Other participants suggested that there is no need to formalise third party engagement, as this could complicate the process without bringing real benefits. They also suggested that some arrangements are already formalised in existing codes, such as the Connection and Use of System Code (CUSC).

In terms of reporting, most participants agreed that there may be scope for more detailed reporting on reductions in constraint costs achieved as a result of increased ESO-TO cooperation through the NAP. Such savings are however not easily identifiable as constraint costs are a result of multiple factors at a certain point of time (demand, weather impacting generation, etc.). Participants considered that the monitoring of activities undertaken by the TOs in implementing the NAP could assist Ofgem in assessing benefits associated with the NAP. For example, this could include measures such as:

- the level of planned maintenance for the year which is completed within the same year (actual vs planned delivery date of maintenance program)
- the number of coordinated meetings with ESO and/or third parties (DNOs, Generators)
- the number of outages which are introduced post week 49 which could have been planned ahead.

Appendix 3 - Consultation Questions

Chapter 3 questions – Meet the needs of consumers and network users

General output questions

ETQ1. What are your views on the overall outputs package considered for this output category?

ETQ2. For each potential output considered (where relevant):

- a) Is it of benefit to consumers, and why?
- b) How, and at what level should we set targets? (eg should these be relative/absolute)
- c) What are your views on the design of the incentive? (eg reward/penalty/size of allowance)
- d) Where we set out options, what are your views on them and please explain whether there are further options we should consider?

ETQ3. What other outputs should we be considering, if any?

ETQ4. What are your views on the RIIO-ET1 outputs that we propose to remove?

In addition to the above questions, where relevant, please see the supplementary output specific questions below.

Supplementary output specific questions

Stakeholder Satisfaction Output: Stakeholder Engagement Incentive

ETQ5. We welcome views on whether a specific incentive for stakeholder engagement is appropriate in RIIO-ET2, and if so, whether this should be reputational or financial.

ETQ6. Do you think individual components of the SSO should be combined into a single incentive mechanism in RIIO-ET2, should the SEI and components of the SSO be retained?

ETQ7. We invite views on types of business plan commitments that would be appropriate for stakeholder engagement.

ETQ8. We welcome views on the potential approaches to setting a financial incentive for the SSO in RIIO-ET2, if retained. Are there any other considerations we should take into account if we move to a fixed reward pot that network companies compete for?

Stakeholder Satisfaction Output: Satisfaction Survey, KPIs, and External Assurance components

ETQ9. Do you have any views on whether we should retain a TO User Survey, targeted at a number of key areas as identified in this document? Are there any alternative mechanisms to address potential issues in these areas we should be considering?

ETQ10. Are there any other areas, beyond those identified in this consultation document, which we should consider targeting through a potential survey?

ETQ11. Do you have any views on our proposal to retain one question on overall satisfaction from which the scores will be collated?

ETQ12. Do you agree that we should use RIIO-ET1 performance as a starting point for setting a RIIO-ET2 baseline? What alternative approach(es) should we consider?

ETQ13. Do you agree that the User Groups could provide guidance on the stakeholders that should be included in the survey sample? Are there any specific stakeholders that you think must be surveyed to improve the validity of the scores?

ETQ14. Do you agree with our proposals to remove the financial incentive associated with the KPI and EA components? Should the EA component be retained as a minimum requirement/ licence obligation?

Timely Connections Output

ETQ15. Do you have any views on whether we should retain the RIIO-ET1 Timely Connections Output (which applies to the connection offer stage) for RIIO-ET2, including the penalty rate, and extend it to NGET?

ETQ16. Do you have any views on options for capturing the quality of the overall connections process through our stakeholder engagement proposals, for example through the use of a survey?

ETQ17. Are there any alternative options for capturing the quality of the overall connection process, not identified in this consultation document, which we should be considering?

ETQ18. How do you think we can ensure that transmission operators are not rewarded and/or penalised for actions actually undertaken by the System Operator?

Energy Not Supplied

ETQ19. Do you have any views on whether we should retain the ENS incentive, and whether we should retain it as a positive reward mechanism, or move towards a penalty-only scheme? What impact could the move to a penalty-only mechanism have on TO decision-making and behaviours? Please evidence.

ETQ20. Do you have any views on how Ofgem should take into account issues other than past performance when determining baseline targets? For example, processes adopted as BAU, increased TO experience and expertise on fault mitigation and management, future modernisation projects, etc. What adjustment mechanisms are appropriate?

ETQ21. Is the introduction of an improvement factor appropriate within the context of the electricity transmission system? What other mechanisms are appropriate?

ETQ22. We welcome views on additional considerations we should take into account when setting baseline targets?

ETQ23. Do you agree with our proposals to base the ENS incentive rate in RIIO-ET2 on an updated, agreed VoLL?

ETQ24. Do you agree with our proposals to retain the financial collar for the ENS incentive in RIIO-ET2?

ETQ25. We welcome views on approaches to estimating embedded generation at GSP points.

ETQ26. What measures need to be in place to facilitate the collection of data on embedded generations and other real time information? How do you propose to approximate embedded generation data?

ETQ27. We invite views on changing the metrics used to measure reliability on the transmission system from MWh lost to CI/CML? What measures and processes (e.g. data sharing frameworks) need to be in place to facilitate the collection of CI/CML data?

ETQ28. Do you have any views on whether all loss of supply events should be incentivised? Do you have any views on amending the scope of the definition of events excluded as 'loss of supply events' and/or 'exceptional events'?

Chapter 4 questions – Deliver an environmentally sustainable network

General output questions

ETQ29. What are your views on the overall outputs package considered for this output category?

ETQ30. For each potential output considered (where relevant):

- a) Is it of benefit to consumers, and why?
- b) How, and at what level should we set targets? (eg should these be relative/absolute)
- c) What are your views on the design of the incentive? (eg reward/penalty/size of allowance)
- d) Where we set out options, what are your views on them and please explain whether there are further options we should consider?

ETQ31. What other outputs should we be considering, if any?

ETQ32. What are your views on the RIIO-ET1 outputs that we propose to remove?

In addition to the above questions, where relevant, please see the supplementary output specific questions below.

Supplementary output specific questions

Environmental framework - Business Plans and annual monitoring

ETQ33. Do you have any views on the extent to which company activities relating to environmental impacts should be embedded in Business Plans?

ETQ34. We invite views on whether the proposed environmental impact categories are appropriate areas to focus on. Are there any areas that should be excluded and/ or other areas that should be covered? We also invite views on the potential indicators and/ or metrics that are appropriate for each environmental impact category.

ETQ35. We welcome views on the option of an annual reporting framework to increase transparency of the transmission networks' impact on the environment.

Potential for bespoke ODIs around the low carbon transition

ETQ36. We welcome views on whether we should introduce an option for the TOs to develop bespoke ODIs with stakeholders for delivering an additional contribution to the low carbon transition.

ETQ37. We invite views on the kind of activities, not captured elsewhere, that could be captured through such ODIs.

ETQ38. We invite views on how such an ODI might operate, and any other factors we should take into account in considering bespoke ODI for the low carbon transition.

SF₆ and other insulation and interruption gases (IIG) leakage

ETQ39. We welcome views on whether we should retain a financial reward and penalty incentive for the leakage of SF₆ in RIIO-ET2, or move to a penalty only or reputational incentive.

ETQ40. We welcome views on the potential impact of a move away from a financial incentive (or move to penalty-only) on TO behaviours.

ETQ41. We invite views on whether leakage from other IIGs should also be captured in the incentive measure.

ETQ42. We welcome views on whether some leakage events should continue to be excluded from the incentive.

Electricity losses from the transmission network

ETQ43. Do you have any views on the proposed approach for integrating any losses reporting requirements into the proposed business plan and annual public reporting framework?

ETQ44. Do you have any views on the introduction of a target or measure for improving metering at and the energy efficiency of substations? How could this work in practice?

Visual amenity impacts of transmission infrastructure

ETQ45. We welcome views on incentivising the TOs' engagement with stakeholders on the development of new transmission projects through our stakeholder engagement proposals, for example through the use of a survey.

ETQ46. Do you have views on the retaining the existing scheme to mitigate the visual impact of pre-existing transmission infrastructure in designated areas? Do you agree that any decision to implement new funding arrangements should be subject to updated analysis around willingness to pay?

ETQ47. Do you agree with our proposals to modify the implementation process by which funding requests for mitigation projects are submitted and approved?

ETQ48. We welcome stakeholders' views on any other considerations they think are relevant to policy development for visual amenity issues in RIIO-ET2.

Chapter 5 questions – Maintain a safe and resilient network

General output questions

ETQ49. What are your views on the overall outputs package considered for this output category?

ETQ50. For each potential output considered (where relevant):

- a) Is it of benefit to consumers, and why?
- b) How, and at what level should we set targets? (eg should these be relative/absolute)

- c) What are your views on the design of the incentive? (eg reward/penalty/size of allowance)
- d) Where we set out options, what are your views on them and please explain whether there are further options we should consider?

ETQ51. What other outputs should we be considering, if any?

ETQ52. What are your views on the RIIO-ET1 outputs that we propose to remove?

In addition to the above questions, where relevant, please see the supplementary output specific questions below.

Supplementary output specific questions

Network Access Policy (NAP)

ETQ53. Do you agree with our proposed approach to safety?

ETQ54. Do you agree with our proposal to retain the NAP as a licence obligation?

ETQ55. Do you have any views on the potential risks and benefits of introducing a single, consolidated NAP, and of expanding the NAP to cover interactions with third parties?

ETQ56. We welcome views on these proposals, and on any potential interactions and/ or duplications between these proposals, the NAP and the STC.

Successful delivery of large capital investment projects

ETQ57. Do you agree with our proposed approach for ensuring TOs do not benefit financially from delays in delivering large capital investment projects?

ETQ58. We invite views on the suitability of the milestone approach, the types of milestones or delivery criteria we should be considering and any potential challenges associated with implementing such an arrangement.

ETQ59. Are there any alternatives which we should also consider?

ETQ60. We invite views on the circumstances we should consider options for minimising consumer detriment and/ or sharing consumer detriment with consumers.

ETQ61. We are seeking views on these two options, including ways in which we could measure and reflect consumer detriment.

ETQ62. Are there any alternatives not identified here which you think we should be considering?

Chapter 6 questions – Cost assessment

ETQ63. Do you agree with our intention to evolve the RIIO-ET1 approach for RIIO-ET2?

ETQ64. Do you have any comments on appropriate cost categories, cost drivers or approaches to cost assessment?

ETQ65. We invite views on the appropriateness of our proposed cost categories for RIIO-ET2.

ETQ66. We invite views on the principles of a good cost driver and our approach to identifying suitable RIIO-ET2 cost drivers is appropriate.

ETQ67. We welcome any early views on how we can combine the analysis in order to ensure ex ante allowances reflect efficient costs.

Chapter 7 questions – Uncertainty mechanisms

General uncertainty mechanism questions

- ETQ68. We would welcome views on the design and suitability of existing uncertainty mechanisms for RIIO-ET2, and whether any of these should be removed.
- ETQ69. Are there any additional mechanisms that we should consider across the sector and if so, how should these be designed?
- ETQ70. We would welcome views from respondents on the continuing relevance of these mechanisms and any changes to the way that they operate if they are to continue.