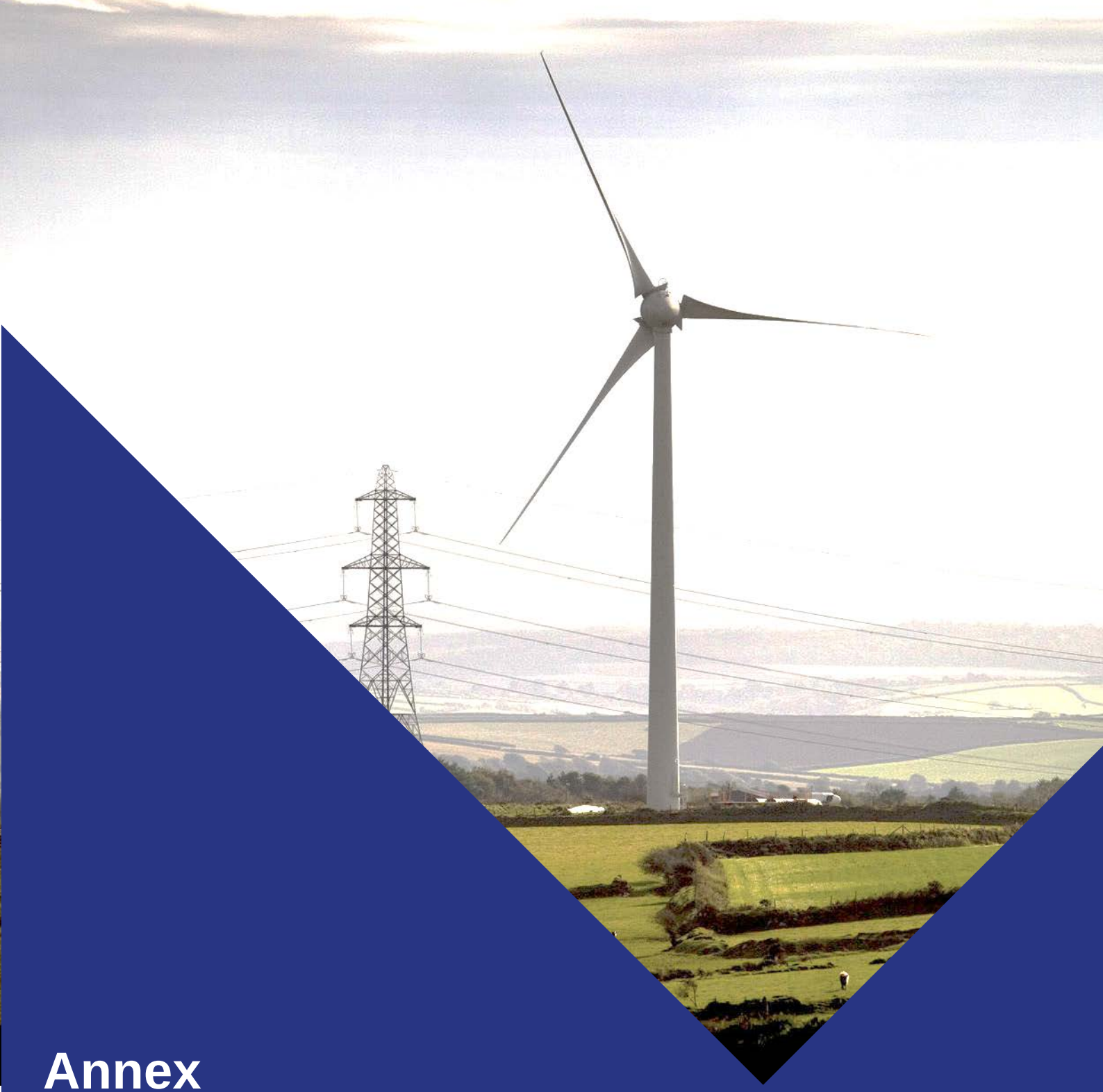

Annex

NGET_ET.08_Outputs

December 2019

As a part of the NGET Business Plan Submission

nationalgrid

RIIO-T2

nationalgrid
Electricity Transmission

NGET_ET.08_Outputs

Cross Cutting
(December 2019)

Submission annex 2019

This is National Grid Electricity Transmission (NGET)'s annex ET.08 on the outputs in our final RIIO-ET2 business plan. This annex accompanies our 9 December 2019 final business plan that we are submitting to our regulator, Ofgem.

In this annex we introduce define outputs and explain the bespoke outputs we are proposing and how they benefit consumers.

This annex is supported by annex ET.08A, which is Ofgem's snapshot table on outputs.

Contents

1. Introduction and definitions

What are outputs?
Outputs are the services that end-consumers and our customers value such as customer satisfaction, energy supplied and reducing carbon emissions. Outputs are the observable and measurable achievements that a company needs to deliver. They represent what customers and society really value.

> Outputs are one of the cornerstones of the RIIO framework: **RIIO** = "setting **R**evenue using **I**ncentives to deliver **I**nnovation and **O**utputs", page 4, Ofgem RIIO-2 framework decision, July 2018.

An output focus is better for consumers and the environment than an input focus, because it focuses network companies on what matters for consumers and the environment and allows them to innovate to deliver it.

Ofgem has grouped all network companies' outputs into **three categories for RIIO-2:**

1. Meet the needs of consumers and network users.
2. Maintain a safe and resilient network.
3. Deliver an environmentally-sustainable network.

Ofgem's three types of outputs

Ofgem has established a framework for RIIO-2 with three ways in which companies are held to account for delivering outputs. The table below sets out the definitions in Ofgem's 24 May 2019 RIIO-2 sector-specific methodology decision – core document:

Table 1.1 – Ofgem's definitions of three types of outputs

Type of output	Definition
Licence obligations	"We will use Licence Obligations to set minimum standards which network companies must achieve through their baseline funding, with clear consequences where these are not met through the use of penalties and/or enforcement action". (paragraph 4.21, sector-specific methodology decision)
Price control deliverables (PCDs)	"we will use PCDs to capture those outputs that are directly funded through the price control and where the funding provided is not transferrable to a different output or project. The purpose of a PCD will be to ensure the

	conditions attached to the funding are clear up-front." (paragraph 4.23, sector-specific methodology decision) “PCDs could include for example: • Large one-off capital projects – to be delivered to a stated specification, budget or timing • Commitments or assumptions associated with a baseline level of funding – e.g. MW of connected generation, or kilometres of pipe replacement • Other input activities to be delivered to a stated standard – e.g. activities related to changes in government policy. These will be determined by us on a case-by-case basis.” (paragraph 4.25, sector-specific methodology decision)
Output delivery incentives (ODIs)	"We will apply ODIs to reflect the fact that the baseline level of allowances we provide is associated with a baseline level of service delivery when measured across all a network’s customers." (paragraph 4.33, sector-specific methodology decision)

There is overlap between the three categories. An output could have a licence obligation, a PCD and/or an ODI attached to it.

We have a separate annex on output delivery incentives (ET.06) so this annex focuses on licence obligations and PCDs.

Stakeholder engagement on outputs

In its RIIO-2 sector-specific methodology core document Ofgem emphasised that it wants network companies to engage with their stakeholders to set the outputs for their business plans:

> “we wish to ensure that the services delivered by network companies appropriately reflect the local priorities of consumers in the regions that they serve. Our enhanced engagement framework – together with the opportunity for network companies to propose bespoke outputs informed by this engagement - is designed to achieve this.” (paragraph 1.20, page 7)
>
> “We are seeking to achieve our objective for RIIO-2 by:
> - Giving consumers a stronger voice in setting outputs and in shaping and assessing Business Plans;” (paragraph 2.6, page 9)

We describe the stakeholder support for each output briefly in this annex. We explain our overall approach to stakeholder engagement in chapter 6 of our business plan and our engagement on each stakeholder priority in the relevant chapter of our plan.

Ofgem’s areas to justify for bespoke outputs

In its 31 October 2019 RIIO-2 Business plan guidance Ofgem sets out the following areas network companies should address to justify any proposals for bespoke outputs (see paragraph 2.17, page 14):

Table 1.2 – Ofgem's areas network companies should address to justify any proposals for bespoke outputs

Number	Area network company should address
1	whether the activity in question is best dealt with through the price control, rather than through a government body responsible for the public interest in that area (eg Highways Authorities for matters relating to the occupation of the highway)
2	whether proposals are backed by robust evidence and justification (such as cost benefit analyses) and demonstrate value for money for existing and future consumers
3	the value that consumers will receive from a proposed new service level and, by extension, the potential associated reward and/or penalty, and the extent to which these are symmetrical, in terms of value and likelihood of outcome
4	the extent to which an independent measure of the existing level of service that consumers receive is available and the degree to which the target level being proposed represents an improvement on this
5	the level of service provided by other companies/comparators (where available)
6	the activities (and indicative cost) associated with achieving the targeted level of service
7	proposals for licence conditions and/or penalties if performance falls below existing service levels

2. An overview of our bespoke outputs

The table below provides an overview of our bespoke outputs. It links with annex ET.08A, which is Ofgem's snapshot table on outputs. The outputs are numbered by the chapter of our business plan they refer to, to help with navigation.

This annex only covers licence obligations and PCDs. We cover our ODIs in annex "ET.06 –output delivery incentives".

Table 2.1 – our proposed outputs

Number	Name	In this annex?
7-1	Network reinforcements	✓
7-2	Maintaining security of supply as the energy system changes	✓
7-3	Facilitating the closure of conventional generation	✓
7-4	Facilitating competition	✓
7-5	Optimising with the ESO	✓
7-6	Optimising with the DNOs	✓
8-1	Connecting generation customers	✓
8-2	Connecting demand customers	✓
8-3	Customer experience strategy	No, ODI annex
8-4	Improving the system access experience	No, ODI annex
9-1	Reducing energy not supplied	No, ODI annex
9-2	Maintaining network risk	✓
9-3	Substation equipment	✓
9-4	Protection and control	✓
9-5	Overhead line steelwork replacement	✓
9-6	Overhead line steelwork refurbishment	✓
10-1	Protection from extreme weather	✓
10-2	Physical Security	✓
10-3	Cyber resilience	✓
10-4	A resilient operational telecommunication infrastructure	✓
10-5	Black Start capability	✓
11-1	Reducing our SF_6 emissions	No, ODI annex
11-2	Reducing carbon emissions from operational transport	✓
11-3	Net-zero capital carbon	✓
11-4	Natural capital	No, ODI annex
11-5	Net environmental gain at construction projects	No, ODI annex
11-6	Water use	No, ODI annex
11-7	Recycling operational and office waste	No, ODI annex
11-8	Visual impact	✓

3. An explanation of each of our bespoke outputs

This section provides an explanation of each of our bespoke outputs and how they address Ofgem's areas for justifying our bespoke outputs.

Chapter 7 - We will enable the ongoing transition to the energy system of the future

Name	Output 7-1: Network reinforcements
Description	Innovate and invest in the network reinforcements indicated by the ESO's NOA process, increasing boundary capability by 22.5GW to facilitate a changing energy market and keep costs down.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 7 of 200-page business plan IDP A7.02 Incremental wider works BPDT 4.2a
Ofgem output category	Meeting the needs of consumers and network users.
Risk and uncertainty	We are proposing an uncertainty mechanism UM7-1 on boundary capacity in chapter 7 of our business plan (see section 7).
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider that network reinforcements are a core activity for a transmission company and best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to provide a network that enables the transition to net-zero greenhouse gas emissions by 2050 at lowest cost to consumers. Our output is based on the network reinforcements indicated by the ESO's NOA process. For the evidence justifying our output please see IDP A7.02 Incremental wider works.
3. Value consumers will receive	Our investment of £507m provides increased capacity of 22.5GW on the transmission network. This investment, made in response to the ESO's NOA recommendations, is estimated to save consumers at least £250m/annum in avoided future constraint costs (based on analysis of the latest NOA outputs).
4. Measure of service level	The output is increased capacity of 22.5GW on the transmission network.
5. Level of service provided by others	The ESO's NOA recommendations apply to all the TOs.
6. Cost and activities	**Cost: £507m** In chapter 7 we list our proposed investments for additional boundary capacity in the T2 period.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 7-2: Maintaining security of supply as the energy system changes
Description	Invest in protection and control coordination studies, changes required to maintain security of supply and identify future requirements as renewables increase.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 7 of 200-page business plan IDP A7.03 Protection and control co-ordination BPDT 4.2a
Ofgem output category	Delivering an environmentally sustainable network.
Risk and uncertainty	This output relates to the studies we will carry out in the T2 period. The volume of upgrades we will carry out is subject to the outcome of the studies and effectiveness of setting changes. Given this uncertainty, investments have not been included in our baseline proposals to protect consumers. We propose a targeted within period re-opener (UM7-4: Protection and control) to fund any upgrades identified through the studies, as detailed in Section 7 of chapter 7 and annex ET.12 uncertainty mechanisms for more details.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider protection and control coordination studies are best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to provide a network that enables the transition to net-zero greenhouse gas emission by 2050 at lowest cost to consumers. For the evidence justifying our output please see IDP A7.03 Protection and control co-ordination.
3. Value consumers will receive	By delivering this output we will support the ESO's goal of operating a zero-carbon network by 2025. The System Operability Strategy indicates increasing amounts of renewable generation are leading to declines in system inertia and short-circuit levels that could cause transmission protection not to operate as expected, posing a risk to network safety and reliability. Consumers face the risk of more frequent demand disconnection if this risk is not better understood and appropriately mitigated.
4. Measure of service level	We will invest in modelling, software and the analysis required to undertake coordination studies and make changes to ensure our protection and control systems are robust to changes on the network. This type of detailed analysis is needed in the T2 period due to the levels of renewable generation on the network in all scenarios.
5. Level of service provided by others	We understand the two Scottish TOs have carried out similar studies reflecting the higher proportion of renewables on their networks.
6. Cost and activities	**Cost: £31.1m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 7-3: Facilitating the closure of conventional generation
Description	Invest to facilitate closure of conventional generation and secure easements to maintain access and minimise costs.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 7 of 200-page business plan IDP A7.04 Site Separation IDP A7.05 Easements BPDT 4.2a
Ofgem output category	Delivering an environmentally sustainable network.
Risk and uncertainty	The proposed costs of these outputs are informed by historical expenditure and recent trends. They are sufficiently certain for us not to propose an uncertainty mechanism.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider facilitating closure of conventional generation and securing easements to maintain access and minimise costs are best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to provide a network that enables the transition to net-zero greenhouse gas emissions by 2050 at lowest cost to consumers. For the evidence justifying our output please see IDP A7.04 Site Separation and IDP A7.05 Easements.
3. Value consumers will receive	These activities ensure we can access our assets and continue to operate our sites to deliver our service to consumers. For example, as the electricity system continues to decarbonise many ageing conventional power stations are closing. This work is needed to make sure we can continue to operate our substations at sites where power stations are closing.
4. Measure of service level	Renegotiation of wayleaves was permanent easements with land owners. Site separation work at 9 sites as set out in chapter 7.
5. Level of service provided by others	We face more of an issue with maintaining access to substations at sites where power stations are closing than the other two TOs, because we do not own power stations.
6. Cost and activities	**Cost: £134.7m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 7-4: Facilitating competition
Description	Highlight potentially contestable projects and propose approach to facilitate competition in third party and incumbent delivery.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 7 of 200-page business plan BPDT 4.2a
Ofgem output category	Meeting the needs of consumers and network users.
Risk and uncertainty	We are proposing an uncertainty mechanism, UM 7-2: Facilitate competition (pre-consents), to adjust our allowances for the delivery of planning consents for contestable projects. See section 7 of chapter 7 and annex ET.12 uncertainty mechanisms for more details.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider our investment to facilitate competition is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to facilitate competition and new business models to minimise costs in the transition to the energy system of the future. We provide the evidence for the potentially competitive projects we have identified and the cost of providing consents for them in chapter 7.
3. Value consumers will receive	Highlighting potentially contestable projects and proposing approaches to facilitate competition in third party and incumbent delivery is important to minimise the cost of the transition to a low-carbon energy system for consumers.
4. Measure of service level	This output will deliver consented projects that meet the contestability criteria and which the NOA signals should proceed. Chapter 7 provides more details.
5. Level of service provided by others	All three TOs have to identify potentially-competitive projects in their business plans in line with Ofgem's guidance. To deliver planning consents we have to comply with the planning regime for England and Wales. There is a different planning regime in Scotland that the other two TOs need to comply with.
6. Cost and activities	**Cost: £181.5m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 7-5: Optimising with the ESO
Description	Installing system monitoring equipment across the network is needed to help deal with the system implications of the transition to a low-carbon energy system.
Output type	Licence obligation (LO) Price control deliverable (PCD)
Supporting information	Chapter 7 of 200-page business plan Annex A7.07 System Monitoring Justification Paper. BPDT 4.2a
Ofgem output category	Meeting the needs of consumers and network users.
Risk and uncertainty	The proposed costs of this output are based on recent tender return costs from competent installers and schemes. They are sufficiently certain for us not to propose an uncertainty mechanism.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider installing system monitoring equipment across the network is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to deliver electricity whole-system solutions across network companies. For the evidence justifying this output please see annex A7.07 System Monitoring Justification Paper.
3. Value consumers will receive	Installing system monitoring equipment across the network is needed to help deal with the system implications of the transition to a low-carbon energy system. A national roll-out of system monitoring is required through the SO-TO code procedure STC-P 27-1, which specifies the provision of synchronised data from all grid supply points to the ESO by 31 March 2026. These investments will enhance security of supply and reduce the cost of system operation.
4. Measure of service level	This output delivers: • System monitoring devices on all circuits at all grid supply points (approx. 1,200 services). • Data collection and archiving. • A system visualisation tool. • Analytics to support modelling validation and system dynamics.
5. Level of service provided by others	The other two TOs also have to comply with the SO-TO code procedure STC-P 27-1 requirements for a national roll-out of system monitoring.
6. Cost and activities	**Cost: £48m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 7-6: Optimising with the DNOs
Description	Optimise with DNOs by identifying whole system opportunities, establishing an ongoing process and investing in five reactor units.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 7 of 200-page business plan Annex A7-8.03 Whole Systems Annex A7.08 System operability (voltage) BPDT 4.2a
Ofgem output category	Meeting the needs of consumers and network users.
Risk and uncertainty	We will keep the need for these investments and the most economical solution under review through the whole system process agreed with the DNOs and the ESO. We are proposing a system operability uncertainty mechanism, UM7-3 system operability (voltage), that will automatically adjust allowances when required so consumers only pay for delivery of the most economical solution when it is needed. For more details see section 7 of chapter 7 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider addressing system operability issues related to voltage management is best dealt with through the price review. For the evidence justifying this output please see annex A7.08 System operability (voltage).
2. Backed by robust evidence	Our stakeholders have told us they want us to deliver electricity whole-system solutions across network companies.
3. Value consumers will receive	Reactive power is required for voltage control. As we transition to a decentralised and decarbonised electricity system, the ESO has indicated in its Operability Strategy document that it needs access to new sources of reactive power.
4. Measure of service level	We will deliver 5 reactors across the network in England and Wales. These are detailed in chapter 7.
5. Level of service provided by others	All three TOs follow the ESO's operability strategy document, including its request for new sources of reactive power.
6. Cost and activities	**Cost: £30.7m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Chapter 8 - We will make it easy for you to connect to and use the network

Output 8-1: Connecting generation customers

Name	Output 8-1: Connecting generation customers
Description	We will invest in the network to connect 15.3GW of new generation, storage and interconnector for customers under the common energy scenario.
Output type	Licence obligation (LO)
Supporting information	Chapter 8 of 200-page business plan Annex A8.02 Generation connection IDP. BPDT section B - B0.7, B4,2a, B4.2c, B4.4b, B4.5, B4.5a, B4.6, B4.7 and B4.8.
Ofgem output category	Meeting the needs of consumers and network users.
Risk and uncertainty	The volume of generation connecting to our network is likely to vary from the common energy scenario. We are proposing a re-designed generation volume driver, UM8-1 generation connections, to make sure it is line with the recent changes in our customer base and to make the unit cost allowances more cost-reflective. For more details see section 7 in chapter 8 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider connecting generation customers is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us that they want us to make it easy to connect to the network. For the evidence justifying this output please see annex A8.02 Generation connection IDP. As required, we have based this output on the lower values of the common energy scenario.
3. Value consumers will receive	Connecting generation customers to our network is a licence obligation. This output connects 15.3GW of generation, storage, and interconnector projects during the T2 period. We forecast 69% of this will be from renewable sources and technologies that optimise the use of renewable energy (e.g. wind and storage); and from interconnectors that allow renewable energy to be imported from other countries. This will support the UK achieving its net-zero emission goal.
4. Measure of service level	We will invest in the network to connect 15.3GW of new generation, storage and interconnector for customers under the common energy scenario.
5. Level of service provided by others	The requirement for all network companies is to base their outputs on the lower values of the common energy scenario.
6. Cost and activities	**Cost: £245m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Output 8-2: Connecting demand customers

Name	Output 8-2: Connecting demand customers
Description	We will invest in the network to connect demand customers when they request connections by installing [redacted] super grid transformers (SGTs) under the common energy scenario.
Output type	Licence obligation (LO)
Supporting information	Chapter 8 of 200-page business plan Annex A7-8.03 Whole Systems Annex A8.03 Demand investment decision pack BPDT section B - B0.7, B4,2a, B4.2c, B4.4b, B4.5, B4.5a, B4.6, B4.7 and B4.8
Ofgem output category	Meeting the needs of consumers and network users.
Risk and uncertainty	The volume of demand connecting to our network is likely to vary from the common energy scenario. We are proposing a re-designed demand volume driver, UM8-2 demand connection, to make sure it is line with the recent changes in our customer base and to make the unit cost allowances more cost-reflective. For more details see section 7 of chapter 8 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider connecting demand customers is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to make it easy to connect to the network. For the evidence justifying this output please see annex A8.03 Demand investment decision pack. As required, we have based this output on the lower values of the common energy scenario.
3. Value consumers will receive	Connecting demand customers to our network is a licence obligation. Connecting demand customers to our network gives them access to an increasingly low-carbon energy system and help support the decarbonisation of the economy e.g. electric trains.
4. Measure of service level	We will invest in the network to connect demand customers when they request connections by installing [redacted] super grid transformers (SGTs) under the common energy scenario.
5. Level of service provided by others	The requirement for all network companies is to base their outputs on the lower values of the common energy scenario.
6. Cost and activities	**Cost: £142m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 8-3: Customer experience strategy
Name	Output 8-4: Improving the system access experience
These two outputs are covered by Ofgem's common ODI on the quality of connections and therefore we are not providing further details on these outputs in this annex. Output 8-4 is also covered by our proposed bespoke ODI on outage management. Please see annex ET.06 Output delivery incentives (ODIs) instead for information on the quality of connections ODI and our proposed bespoke ODI on outage management.	

Chapter 9 - We will provide a safe and reliable network

Name	Output 9-1: Reducing energy not supplied
This output is covered by Ofgem's common ODI on energy not supplied and therefore we are not providing further details on this output in this annex. Please see annex ET.06 Output delivery incentives (ODIs) and annex A9.10 Energy not supplied.	

Name	Output 9-2: Maintaining network risk
Description	We will maintain our network risk position through condition monitoring, maintenance, repair, refurbishment and replacement of our lead assets (OHLs, SGTs, reactors, cables, switchgear). We will deliver this work at lowest cost (on average per unit) by embedding innovation. This output is covered by Ofgem's NARM approach (Network Asset Risk Metric)
Output type	Price control deliverable (PCD)
Supporting information	Chapter 9 of 200-page business plan BPDT C2.2a
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	Under the NARM methodology, risk trading allows risk to be moved between asset categories where this delivers a better plan. Ofgem have set out definitions for justified and unjustified over and under delivery of this target.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider maintaining network risk is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to maintain levels of reliability at an affordable cost. This can be seen in the Reliability Engagement Log NGET_A9.01 and summarised in section 3 of the Safe and Reliable Chapter
3. Value consumers will receive	This output measures the aggregate network risk across all our "lead assets". The output enables us to target a level of risk by replacing or refurbishing our assets at the optimum time, to prevent network outages associated with end of life failures and avoid uneconomic early intervention.
4. Measure of service level	Under the NARM approach Ofgem's current thinking is an output based on a long-term "risk delta" or a reduction in the overall level of network risk we will deliver. For the T2 plan the long-term risk delta is a reduction of LR£1,267m.
5. Level of service provided by others	The NARM methodology has been tested and validated across transmission networks. The change to 'total risk' from EOL risk has not been tested and validated enough across networks to provide an accurate comparison.
6. Cost and activities	**Cost: £2,251m** For activities, see row 4 above.
7. Penalties for poor performance	The NARM methodology includes a reduction of allowances and penalties for poor performance.

Name	Output 9-3: Substation equipment
Description	We will maintain our network risk position for substation equipment through condition monitoring, maintenance, repair, refurbishment and replacement of instrument transformers, through-wall bushings and bay equipment. We will deliver this work at lowest cost (on average per unit) by embedding innovation. We are proposing to extend NARM in T2 to cover these asset types.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 9 of 200-page business plan BPDT C2.2a
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We propose that this output can be adjusted for justified under or over-delivery.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in substation equipment is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to maintain levels of reliability at an affordable cost. Our stakeholders support an outputs-based approach to non-lead reliability assets. This can be seen in the Reliability Engagement Log NGET_A9.01 and summarised in section 3 of the Safe and Reliable Chapter.
3. Value consumers will receive	These assets are crucial to the reliability of the network.
4. Measure of service level	We are proposing to adjust the T2 NARM target to incorporate these additional asset types.
5. Level of service provided by others	The NARM methodology has been tested and validated across transmission networks. The change to 'total risk' from EOL risk has not been tested and validated enough across networks to provide an accurate comparison.
6. Cost and activities	**Cost: £327m** For activities, see row 4 above.
7. Penalties for poor performance	The NARM methodology includes a reduction of allowances and penalties for poor performance.

Name	Output 9-4: Substation protection and control
Description	We will maintain our network risk position for substation protection and control through condition monitoring, maintenance, repair, refurbishment and replacement of protection and control equipment. We will deliver this work at lowest cost (on average per unit) by embedding innovation. We are proposing to extend NARM in T2 to cover these asset types.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 9 of 200-page business plan BPDT C2.2a
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We propose that this output can be adjusted for justified under or over-delivery.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in substation protection and control is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to maintain levels of reliability at an affordable cost. Our stakeholders support an outputs-based approach to non-lead reliability assets. This can be seen in the Reliability Engagement Log NGET_A9.01 and summarised in section 3 of the Safe and Reliable Chapter.
3. Value consumers will receive	These assets are crucial to the reliability of the network.
4. Measure of service level	We are proposing to adjust the T2 NARM target to incorporate these additional asset types.
5. Level of service provided by others	The NARM methodology has been tested and validated across transmission networks. The change to 'total risk' from EOL risk has not been tested and validated enough across networks to provide an accurate comparison.
6. Cost and activities	**Cost: £489m** For activities, see row 4 above.
7. Penalties for poor performance	The NARM methodology includes a reduction of allowances and penalties for poor performance.

Name	Output 9-5: OHL steelwork replacement
Description	We will deliver an equivalent tonnage of steelwork replacement in the T2 period.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 9 of 200-page business plan BPDT C2.2a
Ofgem output category	Maintaining a safe and resilient network. We do not think the level of service provided by the other TOs is a relevant comparator given our different size and network to them.
Risk and uncertainty	We propose that this output can be adjusted for justified under or over-delivery.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in over-head line (OHL) steelwork replacement is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to maintain levels of reliability at an affordable cost. Our stakeholders support an outputs-based approach to non-lead reliability assets. This can be seen in the Reliability Engagement Log NGET_A9.01 and summarised in section 3 of the Safe and Reliable Chapter.
3. Value consumers will receive	Ensuring our 22,000 towers are maintained in a safe and reliable condition is essential to the overall reliability of the network.
4. Measure of service level	An equivalent of [redacted] tonnes of steelwork. Using an equivalent output rather than a volume drives innovation in this area to find alternative solutions that will benefit consumers in the long-term.
5. Level of service provided by others	We do not believe that there are comparable outputs with other TOs for this category.
6. Cost and activities	**Cost: £53m** For activities, see row 4 above.
7. Penalties for poor performance	We are proposing the same performance penalties are applied to this output as per NARM for justified/un-justified over/under-delivery.

Name	Output 9-6: OHL steelwork refurbishment
Description	We will deliver an equivalent volume of steelwork refurbishment in the T2 period.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 9 of 200-page business plan BPDT C2.2a
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We propose that this output can be adjusted for justified under or over-delivery.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in over-head line (OHL) steelwork refurbishment is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to maintain levels of reliability at an affordable cost. Our stakeholders support an outputs-based approach to non-lead reliability assets. This can be seen in the Reliability Engagement Log NGET_A9.01 and summarised in section 3 of the Safe and Reliable Chapter.
3. Value consumers will receive	Ensuring our 22,000 towers are maintained in a safe and reliable condition is essential to the overall reliability of the network.
4. Measure of service level	An equivalent of [redacted] km^2 tonnes of steelwork. Using an equivalent output rather than a volume drives innovation in this area to find alternative solutions which will benefit consumers in the long-term.
5. Level of service provided by others	We do not believe that there are comparable outputs with other TOs for this category.
6. Cost and activities	**Cost: £92m** For activities, see row 4 above.
7. Penalties for poor performance	We are proposing the same performance penalties are applied to this output as per NARM for justified/un-justified over/under-delivery.

Chapter 10 - We will protect the network from external threats

We have five outputs in chapter 10.

Name	Output 10-1: Protection from extreme weather
Description	We will protect our sites from surface level flooding and better understand how we protect from weather-related threats in the long term.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 10 of 200-page business plan Annex A10.05 Extreme Weather BPDT C2.24
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We are proposing a reopener, UM10-1 extreme weather, for potential changes to requirements outlined in ETR138 (guidance on flood protection) due to changes in flood risk or extreme weather threat. For more details see chapter 10 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in protection from extreme weather is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to protect the network from external threats. We have received specific direction from BEIS to implement the guidance within Engineering Technical Report 138 on flood resilience (see annex A10.10 Extreme weather assurance letter). For the evidence justifying this output please see annex A10.05 Extreme Weather.
3. Value consumers will receive	This output helps to protect consumers from loss of electricity supply due to an extreme weather event.
4. Measure of service level	This output includes: • Site-specific solutions to mitigate 100 sites from surface level flooding. • Develop a strategy on tower foundation repair and complete interventions on foundations impacted by erosion at [redacted] sites. • Research and strategy development on climate change.
5. Level of service provided by others	This output is based on meeting government requirements, which also apply to the other TOs.
6. Cost and activities	**Cost: £59.81m** For activities, see row 4 above.
7. Penalties for poor performance	This is a government requirement. See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 10-2: Physical Security
Description	We will continue to meet our Physical Security Upgrade Programme (PSUP) requirements at all designated sites.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 10 of 200-page business plan Annex A10.06 Physical Security (Confidential) BPDT D4.4a, D4.4b
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We are proposing a reopener, UM10-2 Physical security, for potential changes to the Physical Security Upgrade Programme (PSUP) requirements or site-specific requirements. This may result in more or fewer sites requiring site security enhancements. For more details see chapter 10 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in physical security is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to protect the network from external threats. We have a requirement under the government-mandated PSUP to implement agreed levels of security on sites. For the evidence justifying this output please see annex A10.06 Physical Security (Confidential).
3. Value consumers will receive	This output helps to protect consumers from loss of electricity supply due to a physical security incident.
4. Measure of service level	This output includes: • Site-specific physical security mitigations on designated PSUP sites at [redacted] new sites. • Maintenance and asset replacement of PSUP assets and Infrastructure at [redacted] sites.
5. Level of service provided by others	This output is based on meeting government requirements, which also apply to the other TOs.
6. Cost and activities	**Cost: £44.63m** For activities, see row 4 above.
7. Penalties for poor performance	This is a government requirement. See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 10-3: Cyber resilience
Description	We will implement enhanced Cyber security and capabilities to our IT and OT networks to a level agreed with the Network and Information Systems (NIS) Competent Authority.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 10 of 200-page business plan Annex A10.04 Business IT Security Plan (Confidential) Annex A10.09 Cyber Resilience Plan (Confidential) BPDT: D4.8
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We are proposing reopeners (UM10-3 cyber security IT and UM10-4 cyber security operational technology (OT)) for changes in threat, advances in technology, new requirements, greater certainty about appropriate solutions and reprioritisation of deliverables required. For more details see chapter 10 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in cyber security is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to protect the network from external threats. The NIS Competent Authority have informed us of their expectations that we meet higher levels of cyber resilience within T2. For the evidence justifying this output please see annex A10.04 Business IT Security Plan (Confidential) and annex A10.09 Cyber Resilience Plan (Confidential).
3. Value consumers will receive	This output helps to protect consumers from loss of electricity supply due to a cyber security incident.
4. Measure of service level	This output involves: • Improved cyber culture and awareness. • Enhanced cyber capabilities of our systems and people. • Interventions to reduce risk of cyber-attack on our network and systems to be agreed with the NIS Competent Authority. The precise details of our proposals are confidential for security reasons.
5. Level of service provided by others	This output is based on meeting government requirements, which also apply to the other TOs.
6. Cost and activities	**Cost: £184.38m** For activities, see row 4 above.
7. Penalties for poor performance	The NIS regulations state that if we are non-compliant, we face "appropriate and proportionate" penalties of up to £17m from the NIS competent authority (Ofgem and BEIS for us). If we do not implement this output, we increase the risk of us incurring penalties under the Energy not supplied common ODI of up to 3% of our annual revenue (around £48m)

Name	Output 10-4: A resilient operational telecommunication infrastructure
Description	We will make sure we have highly resilient and cyber secure operational telecommunication infrastructure, essential for the safe and reliable operation of the system, supporting physical security management and Black Start capabilities.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 10 of 200-page business plan Annex A10.08 OpTel Refresh BPDT C2.25
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	The proposed costs of this output are based on learning and experience from OpTel and associated projects during T1, and efficiently incurred costs for the deployment of the Optical Path Ground Wire (OPGW) during our T1 overhead line refurbishment plan. They are sufficiently certain for us not to propose an uncertainty mechanism.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in a resilient operational telecommunication infrastructure is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to protect the network from external threats. For the evidence justifying this output please see annex A10.08 OpTel Refresh
3. Value consumers will receive	This output means we will continue to be able to carry out communication and operation activities during and following incidents arising from system incidents and external threats.
4. Measure of service level	This output involves: • Replacing end of life OpTel fibre and supporting equipment: 1,850km of fibre. • Replacing telecommunications terminal equipment at 274 sites. • Delivering a high-capacity OpTel overlay to support future growth and resilience.
5. Level of service provided by others	We have engaged widely with relevant stakeholders to consider future requirements of the telecom's networks, engineering alternatives and solutions. Specifically, we engaged with the other TOs to validate the rigorous engineering standards applied to the provision of the telecoms solution. Both SPEN and SSEN have already completed a programme of fibre wrap replacement having replaced all fibre wrap within their networks during the T1 period.
6. Cost and activities	**Cost: £241.02m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	Output 10-5: Black Start capability
Description	We will put in place enhanced system and people capabilities to ensure an efficient and effective response in a Black Start scenario.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 10 of 200-page business plan Annex A10.07 Black Start BPDT C2.12
Ofgem output category	Maintaining a safe and resilient network.
Risk and uncertainty	We are proposing a reopener (UM10-5 Black Start) for potential changes in BEIS requirements for a Black Start. For more details see chapter 10 and annex ET.12 uncertainty mechanisms.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider investment in Black Start capability is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders have told us they want us to protect the network from external threats. For the evidence justifying this output please see annex Annex A10.07 Black Start.
3. Value consumers will receive	This output means we will be able to restore the supply of electricity to end consumers more quickly in the event of a full or partial shutdown of the network.
4. Measure of service level	This output involves: • Installing [redacted] high performance LVAC systems at [redacted] key sites. • Resolving [redacted] technical limitations at key sites.
5. Level of service provided by others	This output is based on meeting government requirements, which also apply to the other TOs.
6. Cost and activities	**Cost: £22.19m** For activities, see row 4 above.
7. Penalties for poor performance	BEIS has not yet finalised its guidance for Black Start. The guidance might include information on penalties for non-compliance. See section 4 of this annex for our proposed consequences for not delivering outputs.

Chapter 11 - We will care for the environment and communities

We have eight outputs in chapter 11.

Name	Output 11-1: Reducing our SF_6 emissions
This output is covered by the Ofgem common ODI on SF_6 and other insulation and interruption gases (IIG) leakage and therefore we are not providing further details on these outputs in this annex. For more details please see annex ET.06 output delivery incentives. We are proposing UM11-1 for an SF_6 replacement programme. For more details see annex ET.12 uncertainty mechanisms.	

Name	Output 11-2: Reducing carbon emissions from operational transport
Description	PCD: We will purchase and maintain 60% of our fleet as low-carbon vehicles, including installing and maintaining substation charging for them. ODI: Our bespoke environment scorecard ODI encourages us to achieve more than 60% of our fleet being low-carbon vehicles.
Output type	Price control deliverable (PCD) and bespoke output delivery incentive (ODI)
Supporting information	Chapter 11 of 200-page business plan Annex 11.10 – EV fleet justification report BPDT D4.3a - fleet purchase and charging infrastructure capex D4.5 CAI - opex for vehicle maintenance and infrastructure maintenance
Ofgem output category	Delivering an environmentally sustainable network.
Risk and uncertainty	The proposed costs of this output are based on quotations provided directly by vehicle manufacturers and quotations for charging infrastructure at a sub-set of pilot substations. They are sufficiently certain for us not to propose an uncertainty mechanism.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider reducing carbon emissions from our own operational transport is best dealt with through the price review.
2. Backed by robust evidence	Our stakeholders want us to take ambitious action to address climate change. For the evidence justifying this output please see annex 11.10 – EV fleet justification report.
3. Value consumers will receive	Carbon emissions from our vehicle fleet makes up 1.6% of our scope 1 emissions and around 4,500 tonnes of CO_2 equivalent per year. We need to reduce the carbon emissions from our fleet to achieve the science-based targets for reducing our greenhouse gas emissions.
4. Measure of service level	This output involves: • Replacing 60% of our operational fleet with low-carbon alternative vehicles. We have 836 commercial vehicles in our fleet, made up of panel vans, 4x4s and HGVs. • Installing vehicle charging points at 234 of our 273 sites.

5. Level of service provided by others	In our justification report (annex 11.10) we explain that we want to set an example for other companies and wider UK society around the need to transition to low-carbon vehicles to support achieving the UK's net-zero greenhouse gas emissions by 2050 target. Other companies are making this move, including energy industry companies such as SSE, EDF and Centrica.
6. Cost and activities	**Cost: £47.49m**, made up of: £36.05m - vehicles £11.44m - charging infrastructure For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

Name	**Output 11-3: Net-zero capital carbon**
Description	We will achieve net-zero carbon construction by 2025/26, using offsetting for any remaining emissions that cannot be eliminated cost effectively or technically.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 11 of 200-page business plan BPDT D4.5 CAI opex
Ofgem output category	Delivering an environmentally sustainable network.
Risk and uncertainty	The proposed cost of this output is based on quotes from two expert carbon-offsetting organisations. They are sufficiently certain for us not to propose an uncertainty mechanism.
Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	We consider achieving net-zero capital carbon is best dealt with through the price review as part of our approach to reducing our own carbon emissions.
2. Backed by robust evidence	Our stakeholders want us to take ambitious action to address climate change. For the evidence justifying this output please see chapter 11, section 5.
3. Value consumers will receive	There are greenhouse gas emissions associated with our construction projects. These 'capital carbon' emissions are from the extraction of raw materials to make equipment, transport, manufacture and finally installation of this equipment on our sites. These are not included in our business carbon footprint (BCF) calculations, but at around 31,000 tCO_2e are currently equivalent to around 9% of our BCF (excluding losses). Achieving net-zero capital carbon can eliminate these emissions and provide environmental leadership to the energy sector.
4. Measure of service level	This output involves: • We will continue to reduce our capital carbon from construction through lean design techniques and low-carbon materials primarily by using sustainability and carbon weighting in our tenders. • We will seek to offset any remaining emissions that cannot be eliminated cost effectively or technically. There are several options available to us options including afforestation, reducing deforestation, supporting woodland management, energy efficiency projects and supporting community renewables.

5. Level of service provided by others	Annex "A11.03 – Environmental benchmarking" explains that our net-zero capital carbon proposal is a leading environmental commitment for the energy and all sectors.
6. Cost and activities	**Cost: £2.5m** This is our forecast cost of off-setting. We have included this in our baseline because the carbon emissions from our projects are dependent on a range of factors, including project type and workload. There is a risk in the supply chain that as sustainability and carbon reduction become more mainstream, demand for low-carbon materials and practices will increase, leading to shortages in supply or increased costs. To account for the offsetting risk, we have included £2.5m of off-setting cost in our baseline based on quotes from two expert carbon-offsetting organisations.
7. Penalties for poor performance	If we do not need to use the full £2.5m of carbon offsetting we will return any unspent funds to consumers.

Name	**Output 11-4: Natural capital**
Name	**Output 11-5: Net environmental gain at construction projects**
Name	**Output 11-6: Water use**
Name	**Output 11-7: Recycling operational and office waste**
These four outputs are covered by our bespoke environmental scorecard ODI and therefore we are not providing further details on these outputs in this annex. For more details please see annex ET.06 output delivery incentives.	

Name	**Output 11-8: Visual impact**
Description	We will deliver the stakeholder-supported and Ofgem approved T1 visual impact provision (VIP) schemes.
Output type	Price control deliverable (PCD)
Supporting information	Chapter 11 of 200-page business plan BPDT C2.26 - visual amenity
Ofgem output category	Delivering an environmentally sustainable network.
Risk and uncertainty	The forecast cost in our baseline is associated with projects that have (or we expect will have) been separately approved by Ofgem during the T1 period. It represents our current estimate of the T2 cost to complete these T1-identified projects. When we make T1 funding submissions to Ofgem for the remaining T1 projects, we will have tendered costs, high-cost certainty and deliverability certainty. Ofgem will assess our submissions by project when we submit them. If a project is allowed to proceed, the T1 Licence will be modified accordingly and the T2 Licence will also need to reflect the outcome in terms of T2 costs and outputs. We are proposing an uncertainty mechanism "UM11-2 visual impact provision" that covers funding for projects identified in the T2 period associated with the T2 funding pot. Our UM does not cover T1 projects that are continuing into the T2 period.

Ofgem's areas we need to address to justify our bespoke outputs	
1. Best dealt with through price review	Ofgem has decided that visual impact projects should be dealt with through the price review.
2. Backed by robust evidence	We have received feedback from consumers in several large studies (willingness to pay/acceptability testing) that demonstrate people support the undergrounding of our existing pylons to improve our landscapes. This is especially important in National Parks and Areas of Outstanding Natural Beauty, where our pylons can be considered an eyesore. For the evidence justifying this output please see section 5, chapter 11 of 200-page business plan. This includes a table of our VIP expenditure forecasts for our T1-projects during the T2 period. Each VIP scheme will be fully assessed by Ofgem, before it releases funding for a scheme.
3. Value consumers will receive	This output is about completing the RIIO-T1 visual impact projects that Ofgem has approved, or we expect to approve, as part of the visual amenity funding process (a re-opener).
4. Measure of service level	The output will deliver the completion of visual impact projects as agreed by the Ofgem funding process. Ofgem has only approved the Dorset visual impact scheme to date.
5. Level of service provided by others	We have chosen our VIP schemes through extensive stakeholder engagement. We have worked with the Stakeholder Advisory Group, which is an independent group of stakeholder organisations working with us to guide decision-making on the Visual Impact provision project.
6. Cost and activities	**Cost: £202.36m** For activities, see row 4 above.
7. Penalties for poor performance	See section 4 of this annex for our proposed consequences for not delivering outputs.

4. The consequences for not delivering outputs

Ofgem has asked network companies to identify "the potential consequences of any delay or failure to deliver PCDs. This should include considerations of any potential detriment to consumers" (paragraph 5.21 of the 24 May 2019 RIIO-2 sector-specific methodology decision)

Ofgem has also said "we will capture outputs directly associated with baseline funding through Price Control Deliverables (PCDs). We will clarify consequences for non-delivery or delivery to a lower than expected standard as appropriate, including for example the use of uncertainty mechanisms" (paragraph 2.11 of its 9 September 2019 RIIO-2 business plan guidance).

Therefore, we are proposing an approach to the consequences for not delivering outputs, but we expect Ofgem to clarify its views at some point in the future.

Taking account of uncertainty mechanisms
For clarity, in this annex when we talk about not delivering outputs (or under-delivering outputs) we are referring to outputs after they have been adjusted by uncertainty mechanisms. Our uncertainty mechanisms benefit consumers by adjusting what we deliver for them and our allowances to their changing needs. In some cases, an uncertainty mechanism might reduce the amount of an output we deliver, and our associated allowances, due to a change in need. If we deliver this new lower output, we have not under-delivered, it is just that the original higher output has been reduced by the uncertainty mechanism as intended.

Our views on the consequences for the non-delivery of outputs
As we explain in chapter 7 of our business plan, we propose that the consequences of non-delivery of outputs are:

- A mechanism to recover the time value of money benefit to network companies from any delay or non-delivery.
- Contractual payments for damages we receive from suppliers to be used to offset the consumer detriment from any delay or non-delivery.

The reasoning for our view is:
1) We agree that TOs should not benefit financially from delays or non-delivery of their outputs. However, there can sometimes be reasons why a project delay or non-delivery is the right thing for consumers. These include that it leads to lower costs being passed onto consumers, that it allows TOs to improve the service quality during delivery (e.g. increase the amount of community engagement) or it allows a TO to deliver a different output that is better for consumers.

2) We agree that our allowances should be automatically reprofiled to reflect any delays in delivery (or non-delivery) to match the actual spend profile. We propose that any re-profiling of TOs' allowances should be carried out month-by-month to avoid perverse incentives. These include:

- as an annual deadline approached we would be incentivised to incur high costs to avoid triggering a whole year's deferral of allowance – this behaviour might not be in the best interests of consumers.
- if you postponed our allowance for a whole year then we would have a limited financial incentive to complete the project before the end of the following year.

3) We agree there is a case for some form of consumer detriment sharing for late delivery in addition to removing any benefits of late delivery.

You need to be careful to strike a balance between, on the one hand, the size of the incentive to deliver on time and, on the other hand, the potential benefits of delay to consumers in some cases and the risk of creating perverse effects when penalties are too high.

You could allow for there sometimes being benefits to consumers from delay. A TO could present evidence about why consumer detriment sharing for delay was not appropriate because it was in consumers' best interests. A TO would have to show that the delay led to lower costs being passed onto consumers and/or that it allowed TOs to improve the service quality during delivery (e.g. increase the amount of community engagement).

When setting the level of consumer detriment sharing you need to take account of the possible perverse effects, which could be detrimental to consumers, of a sharing factor for TOs which is too high. Requiring TOs to pay too high a level of consumer detriment sharing could:

- discourage TOs from taking innovative approaches that are lower cost or deliver better service quality because they are new and subject to a greater risk of delay;
- result in contractors increasing their prices to reflect TOs seeking liquidated damages in the event of delays;
- encourage TOs to reduce risk and keep down insurance costs by using conservative delivery timescales;
- increase the cost of capital as the sector is perceived by investors to have become riskier; and
- encourage TOs to spend inefficiently to achieve the deadline with consumers picking up a share of these costs through the TIM sharing factor (especially if the TIM sharing factor for consumers is higher in the T2 period).

Any consumer detriment sharing should apply day-by-day or month-by-month, not annually, to avoid perverse incentives. For example, once a TO has incurred an annual consumer detriment payment it has no financial incentive to deliver for a whole year because that is when the TO will next incur an additional payment.

We suggest that any contractual payments for damages we receive from suppliers should be the amount used to offset any consumer detriment from any delay or non-delivery.