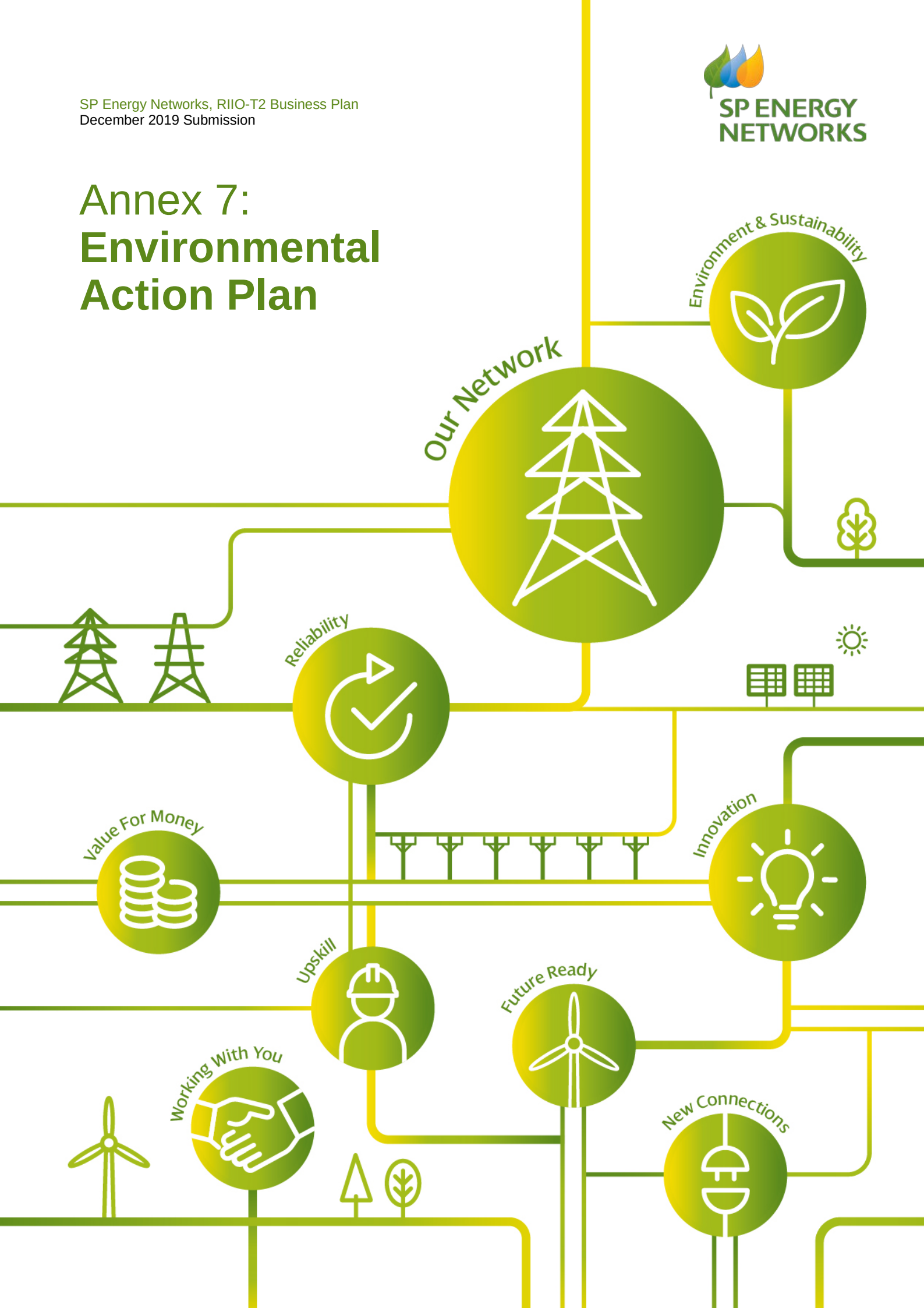
Annex 7: **Environmental Action Plan**



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Appendix A: Environmental aspects and Impacts (A&I) assessment process and SPT A&I REGISTER 1

1. INTRODUCTION

A key aim of the RIIO-2 Framework is that network companies support the transition to a smarter, more flexible, sustainable low-carbon energy system and take the appropriate steps to mitigate their own environmental impact.

Our transmission system transports electricity from large scale generation to the cities, towns and communities of central and southern Scotland. Our network is a critical element of the GB energy system and we therefore play an essential role in the decarbonisation and electrification of the energy sector and of the economy as a whole:

Opening up renewable energy to the rest of the UK

Our location in an area of exceptional renewables resource and our position linking SSEN Transmission to the North and National Grid Electricity Transmission areas to the South, means that we provide a key link between renewable generation sources and demand centres. We import renewable energy from the SSEN Transmission area in the North of Scotland for over 260 days, and export energy to meet demand in England for over 331 days in an average year.

Providing a reliable, adaptive service

Our network provides vital reliability and security of supply, adapting to the accelerating rate of change in energy production and use. In recent years, the capacity of generation directly connected to the SP Transmission network has reduced by 31%, due to the closure of coal fired power stations (Cockenzie -1,200MW and Longannet -2,400MW) being only partially offset by an increase in onshore wind capacity (+1,400MW). In the same period, generation connected to the distribution network in the same territory has risen by 178% (from 900MW in 2010 to 2,500MW in 2017), further underlining the transition from traditional one-way generation-demand flows towards a far more liquid and flexible market, where demand and generation offset one another at a much more local level than before, and visibility of true power flows becomes more challenging.

Supporting long term decarbonisation goals

Driven by more efficient technologies, processes and increased domestic and on-site generation, domestic demand has decreased by 6.4% and industrial and commercial demand by 16.6% since 2010 in Central and Southern Scotland. As focus on decarbonisation of transport and heat intensifies, reliance on electricity is likely to increase. Irrespective of overall demand profiles, more individuals and businesses will use electricity exclusively for all of their heat and transport needs. We engage with a wide range of stakeholders and work together with our network peers to understand the demands that these changes place on UK networks, and invest wisely to improve performance, ensure security of energy supply and facilitate the connection of low carbon technology.

Managing the network and its impacts

Whilst providing the capacity, flexibility and security of supply to realise this fast-evolving energy future, we work with our supply chain to efficiently manage existing and new network assets in ways that achieve neutral or positive environmental and social impacts. We operate and maintain linear infrastructure which may be routed through, or adjacent to, a wide range of culturally or environmentally sensitive landscapes and structures, ranging from pristine to degraded habitats. While we provide the network connections and services that customers require, we recognise the need to minimise any negative effects these activities could have on the environment and communities. Throughout the life of our assets, we not only meet the requirements of government policies and legislation but strive to better them by balancing fair and responsible environmental practices with socio-economic considerations.

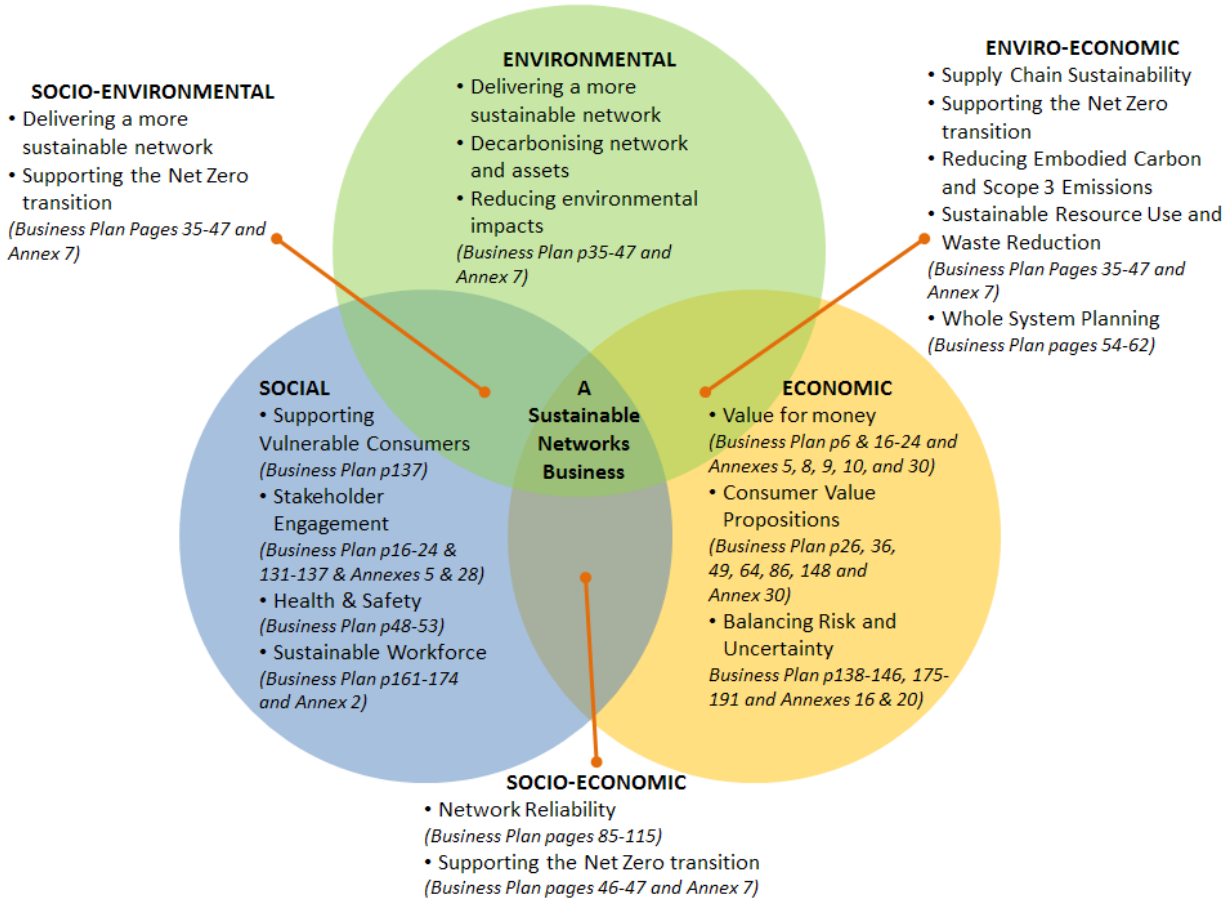


Figure 1: Sustainable Network Model

1.1. Risks from climate change

The changing climate presents a wide range of threats and challenges to the environment, infrastructure, economy and people of Scotland. The 'UK Climate Change Risk Assessment 2017 "Evidence Report – Summary for Scotland' highlighted the following issues:

- **Natural environment and natural assets** – Climate change poses risks to Scotland's soils, natural carbon stores, agriculture, wildlife and coastal habitats and seas.
- **Infrastructure** - Flooding poses the greatest long-term risk to infrastructure performance from climate change, but the growing risks from heat, water scarcity and slope instability caused by severe weather could be significant.
- **People and the built environment** - There are potential health benefits from warmer winters in Scotland, but more action is needed to manage current risks to people from cold temperatures through addressing fuel poverty.
- **Business and industry** - Flooding and extreme weather events which damage assets and disrupt business operations pose the greatest risk to Scottish businesses now and in the future. This could be compounded by a lack of adaptive capacity.
- **International dimensions** - Climate change will impact upon water security, agricultural production and economic resources around the world. The main risks arising for the UK from climate change overseas are through impacts on the food system, economic interests abroad, and increased demand for humanitarian aid.

Climate Change (Emission Reduction targets) (Scotland) Bill 2018

A new Climate Change Bill was introduced to the Scottish Parliament in May 2018 which intended to put into law the Scottish Government's intent to deliver Scotland's fair share of the global emissions reduction necessary to limit temperature rises to 1.5˚C, in line with the Paris Agreement.

'Net zero, the UK's contribution to stopping global warming'

The Committee on Climate Change (CCC) 2019 Report recommended that the UK should legislate as soon as possible to reach net-zero GHG by 2050[1]. The report identified Scotland as having proportionately greater potential for emissions removal than the UK overall, and recommended that Scotland can credibly adopt a more ambitious target of net-zero GHG by 2045. The Scottish Government subsequently confirmed the Climate Change Bill will be amended in accordance with these recommendations[2].

Figure 2 summarises the key technologies and behaviours identified by the CCC that would best meet the challenges of reaching Net Zero GHG emissions, with the most relevant outlined below:

- **Resource and energy efficiency**, reducing demand for energy across the economy.
- **Extensive electrification**, particularly of transport and heating, supported by a major expansion of renewable and other low-carbon power generation.
- **Development of a hydrogen economy** to service demands for some industrial processes and for electricity and heating in peak periods. By 2050, a new low-carbon industry is needed with UK hydrogen production capacity of comparable size to the UK's current fleet of gas-fired power stations.
- **Carbon capture and storage** (CCS) in industry, with bioenergy, and very likely for hydrogen and electricity production.

Our role in delivering these targets extends beyond managing our own emissions; our network must be ready to accommodate the decentralised, non-synchronous, low carbon generation that is essential to achieving these climate change targets.

Protecting our network from the risks of extreme weather is key to continuing to provide a reliable electricity supply to consumers that is fit for the future. The risks from extreme weather include increasing occurrences of extreme heat, storms, flooding and drought. The adoption of net-zero targets does not reduce the need for adaptation since the effects of the global temperature rises will continue to increase for many years to come. Global average temperature is currently around 1°C above pre-industrial levels, and rising. The CCC has advised that long range adaptation strategies should consider a range of temperature scenarios to prepare for climate change.

[1] Committee on Climate Change (2019) Net Zero - The UK's contribution to stopping global warming
[2] https://news.gov.scot/news/climate-change-action-1

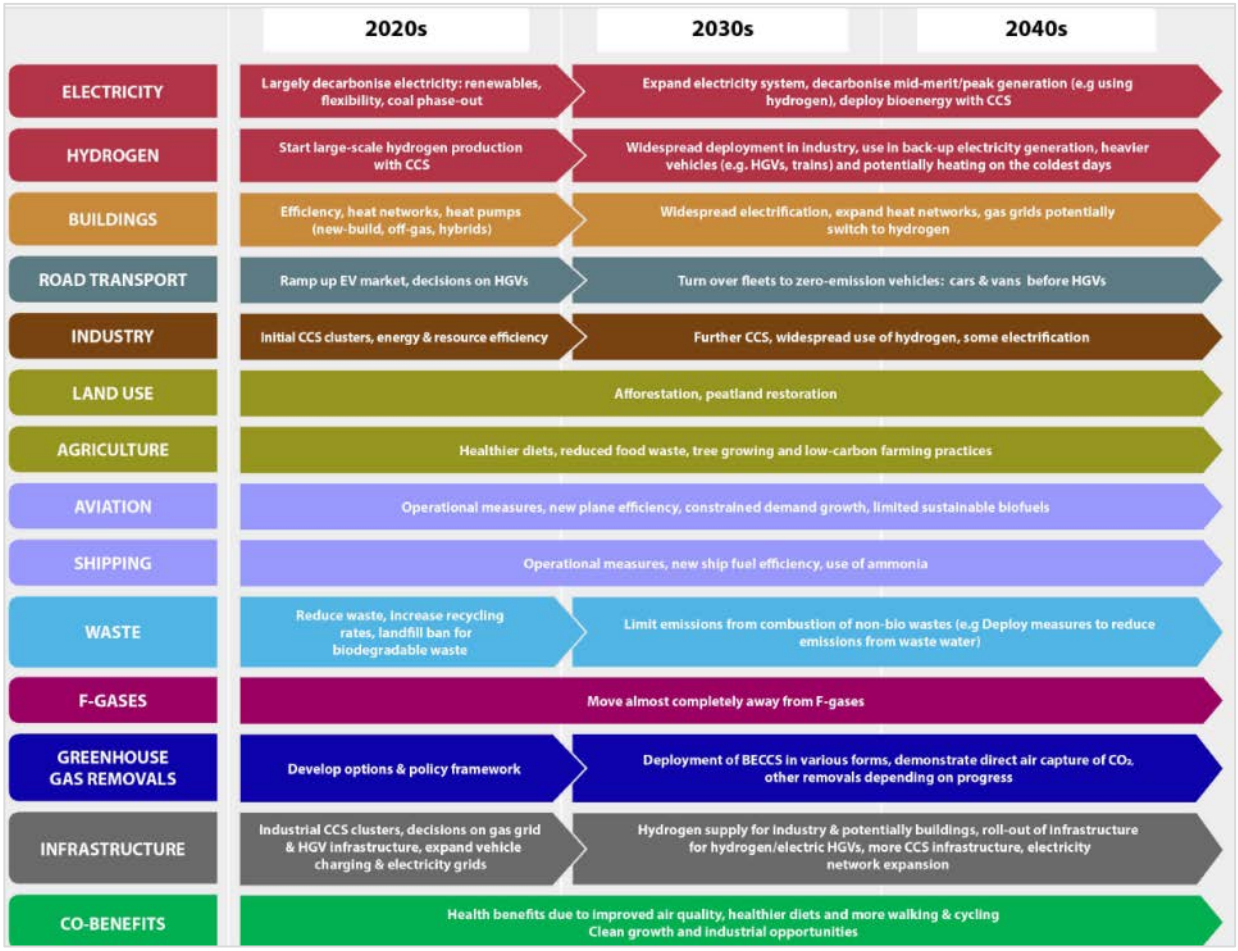


Figure 2: UK net-zero GHG scenario

Source: Committee on Climate Change (2019) Net Zero - The UK's contribution to stopping global warming

The table below highlights the contribution the electricity sector needs to make and the high level timescales that frame the evolution of the energy system transition. Our RIIO-T2 business plan is aligned to this transition.

Table 1: SP Transmission T2 contribution to UK net zero GHG scenario

	CCC net-zero GHG scenario (2020s contribution)	Our actions in T2 to deliver our own contribution
Electricity	Largely decarbonise electricity: renewables, flexibility, coal phase-out	Renewable energy tariff for Depots/offices Solar panels on substations Community renewables on non-operational land
Hydrogen	Start large-scale hydrogen production with CCS	Decarbonisation of operational fleet – investigation of options for HGVs
Buildings	Efficiency, heat networks, heat pumps (new-build, off-gas, hybrids)	Energy efficiency and renewable energy measures at substations BREEAM Excellent rated HQ Refurbishment of main SPT Depot

	CCC net-zero GHG scenario (2020s contribution)	Our actions in T2 to deliver our own contribution
Road transport	Ramp-up of EV market, decisions on HGVs	Accelerated electrification of operational fleet (except HGVs) by 2026 ahead of EV100 2030 commitment Improved video conferencing and laptop based communication options to avoid travel Measures to encourage less travel, car sharing and move from air and car to rail Business travel reductions via staff awareness raising re: carbon impacts
Industry	Initial CCS clusters, energy and resource efficiency	Embodied carbon measurement and reduction Embedding of circular economy principles (BS8001), establish baseline and set targets. Waste recycling and reduction targets Activities with our supply chain to reduce 'embodied carbon' and other environmental impacts associated with the design, manufacture, transport and construction of our network assets. Energy efficiency and renewable energy measures at substations during refurbishment.
Land use	Afforestation, peatland restoration	Targeting Biodiversity Net Gain and Natural Capital Value increase SF6 leakage offset for assets pending replacement (tree planting)
Aviation	Operational measures, new plane efficiency, constrained demand growth, limited sustainable biofuels	Encouragement of move from air to rail for staff domestic flights
Waste	Reduce waste, increase recycling rates, landfill ban for biodegradable wastes	Measures to achieve targeted 95% landfill avoidance by 2023 Embedding of circular economy principles, establishing baseline and setting targets
F-Gases	Move away from F-Gases	Driving development and implementation of SF6 alternatives Minimising SF6 inventory and leakage rates Prompt repair of leaks

	CCC net-zero GHG scenario (2020s contribution)	Our actions in T2 to deliver our own contribution
Infrastructure	Industrial CCS clusters, decisions on gas grid and HGV infrastructure, expand vehicle charging and electricity grids	Implementation of Network Losses Reduction Strategy Provision of electric vehicle charging infrastructure at our sites, for operational fleet, staff and visitors
Co-benefits	Health benefits due to improved air quality, healthier diets and more walking and cycling. Clean growth and industrial opportunities	Use of operational EVs in urban areas Staff initiatives to encourage walking and cycling, business travel reduction, flexible working, sustainable catering, etc.

1.2. Summary of our Environmental Action Plan

We play a critical role in meeting the UK's ambitious climate change targets and in enabling the transition to a sustainable, Net Zero future.

While we do this, we must reduce our environmental impacts, increase efficiency through constant innovation and adapt our world-class, resilient network to withstand the effects of climate change to deliver sustainable value for current and future customers. Our Sustainable Business Strategy outlines our stakeholder-led vision, drivers, goals and objectives for environmental and sustainability improvement to 2050, underpinning all of our RIIO-T2 commitments.

The actions and costs to deliver baseline environmental compliance are embedded throughout our Business Plan. This annex therefore predominantly focuses on the beyond-compliance commitments we will deliver during RIIO-T2 to continue to drive more environmentally and socially sustainable performance.

RIIO-T2 Aims

Our ambitious plan for environmental sustainability in RIIO-T2 represents a significant step-change from RIIO-T1. This is driven by the accelerating global environmental agenda, UK and Scottish Government Net Zero targets (by 2050 and 2045 respectively), and significant stakeholder support. We welcome the enhanced regulatory regime for this area and our RIIO-T2 plans will enable us to build on our RIIO-T1 performance and quickly eliminate, reverse, reduce or manage a wider range of environmental impacts than ever before, within the context of our long-term Sustainable Business Strategy.

Current maturity level

Our RIIO-T2 plan and commitments are designed to quickly build on our current performance, using our established process for achieving maturity which starts with identifying and collecting initial data, progresses to identifying metrics and baselines then culminates in setting and delivering targets and ongoing tracking.

Our current maturity levels (See Figure 3) clearly show the areas (above and beyond compliance) which have been a focus under the RIIO-T1 framework, and those which have increased in priority more recently.

	Increasing maturity →				
Maturity Level	1	2	3	4	5
Impact Area	Identify and collect initial data	Identify metrics and establish baseline for chosen metrics	Analyse data and identify priorities	Set targets and deadlines Identify actions to eliminate / reduce / mitigate	Deliver actions Track metrics and report progress
	Verify			Review	
Supply Chain Sustainability	1				
Reducing Embodied Carbon and Scope 3 Emissions	1	2			
Business Carbon Footprint – Sulphur Hexafluoride (SF6)				4	5
Business Carbon Footprint - Other				4	5
Losses Carbon Footprint				4	5
Climate Change Adaptation				4	5
Preventing Pollution					5
Land and Biodiversity	1				
Enhancing Visual Amenity					5
Sustainable Resource Use	1				
Waste Reduction			3	4	5

Figure 3: Current understanding and mitigation maturity levels

In RIIO-T1:

- We have updated our standard contract terms, pre-qualification questionnaires and specifications, obligating suppliers and contractors to meet high environmental management standards and report data on impacts and progress monthly. We do not currently use a carbon metric or set specific targets for environmental impact reductions from our Supply Chain.
- Business Carbon Footprint, Climate Change Adaptation, Preventing Pollution and Enhancing Visual Amenity are all at full maturity and therefore subject to the continuous improvement loop at levels 4 and 5 in Figure 3.
- We do not have robust data on biodiversity and natural capital across our portfolio which precludes the setting of biodiversity or natural capital net gain targets ahead of RIIO-T2. Our aim in RIIO-T2 is therefore to create a baseline dataset and develop, embed and trial a robust net gain methodology. This will enable us to set realistic, cost efficient targets for net gain whilst retaining the flexibility required to align our targets with Scottish legislation as it is developed.
- Elements of waste reduction are at full maturity (waste management and landfill diversion), however we are continuing to analyse data and identify priorities to move up the waste hierarchy (Figure 40, p105) and deliver more waste reduction.
- We have started to embed the principles of a circular economy to enable more sustainable resource use and will follow an appropriate, recognised standard, such as the BS8001 circular economy implementation framework during RIIO-T2.

Maturity level by 2023

	Increasing maturity →				
Maturity Level	1	2	3	4	5
Impact Area	Identify and collect initial data	Identify metrics and establish baseline for chosen metrics	Analyse data and identify priorities	Set targets and deadlines / Identify actions to eliminate / reduce / mitigate	Deliver actions / Track metrics and report progress
	Verify			Review	
Supply Chain Sustainability		2	3	4	
Reducing Embodied Carbon and Scope 3 Emissions			3	4	
Business Carbon Footprint – Sulphur Hexafluoride (SF6)				4	5
Business Carbon Footprint - Other				4	5
Losses Carbon Footprint				4	5
Climate Change Adaptation				4	5
Preventing Pollution					5
Land and Biodiversity		2	3	4	
Enhancing Visual Amenity					5
Sustainable Resource Use		2	3		
Waste Reduction			3	4	5

Figure 4: Understanding and mitigation maturity levels by RIIO-T2 mid-point

By the mid-point of RIIO-T2 (and in preparation for T3) we will have:

- Introduced consideration of environmental sustainability in our procurement processes in line with ISO20400 Sustainable Procurement Standard, including a carbon metric as a minimum.
- Further enhanced environmental management standards and KPIs within contract specifications and supplier codes of conduct (including requirements for public disclosure of metrics) and cascaded to all relevant suppliers. Started to report on the actual percentage of suppliers (by value) meeting these standards.
- Become a Supply Chain Sustainability School Partner, requiring contractors and suppliers for all new contracts to become members and undertake relevant sustainability and environmental training.
- Started to engage with suppliers early in the development of projects to enable them to propose environmental improvements at concept and design stages.
- Introduced a measurement tool for embodied carbon in new projects, in order to establish a baseline and set a reduction target.
- Adopted a science based target for scope 3* carbon reduction. Identified, and subsequently started to monitor and report, metrics to track progress towards our Scope 3 science-based carbon reduction target.
- Developed and piloted a common approach and robust methodologies for delivering Biodiversity Net Gain alongside Natural Capital assessment and enhancement.
- Embedded these biodiversity and natural capital assessment methodologies and associated tools in our business decision making processes for projects and the management of existing sites.

Maturity level by end of RIIO-T2

	Increasing maturity →				
Maturity Level	1	2	3	4	5
Impact Area	Identify and collect initial data	Identify metrics and establish baseline for chosen metrics	Analyse data and identify priorities	Set targets and deadlines / Identify actions to eliminate / reduce / mitigate	Deliver actions / Track metrics and report progress
	Verify			Review	
Supply Chain Sustainability				4	5
Reducing Embodied Carbon and Scope 3 Emissions				4	5
Business Carbon Footprint – Sulphur Hexafluoride (SF6)				4	5
Business Carbon Footprint - Other				4	5
Losses Carbon Footprint				4	5
Climate Change Adaptation				4	5
Preventing Pollution					5
Land and Biodiversity			3	4	5
Enhancing Visual Amenity					5
Sustainable Resource Use				4	5
Waste Reduction			3	4	5

Figure 5: Understanding and mitigation maturity levels by end of RIIO-T2

By the end of RIIO-T2, we will have:

- Targeted more than 80% of RIIO-T2 suppliers (by value) meeting enhanced environmental standards.
- Involved our supply chain in our design, planning and construction processes, utilising their expertise to drive down environmental impacts associated with the life cycle impacts of our network, particularly ‘embodied carbon’ and will have set targets for ongoing reductions into T3.
- Achieved our 2023 Business Carbon Footprint reduction target of 15% and be on course to deliver our Science-Based Target for Scopes 1 and 2 carbon emissions.
- Maximised the avoidance of new SF6 assets on our network, having driven the development of alternatives at all Voltages and implemented these when market ready. Minimised leakage from existing SF6 assets by employing all available leakage repair methodologies and programming replacement of assets where repairs provided unsuccessful.
- Worked with our local communities, landowners, Transmission Operator colleagues and other stakeholders to deliver Biodiversity Net Gain across our site and project portfolio and a net positive impact in natural capital across our existing sites. Set a target for BNG for T3.
- Delivered our 2023 avoidance of landfill target of 95% and be on target for 100% by 2030. Embedded circular economy principles in our processes to deliver reductions in quantities of waste produced, and set targets for such reductions for T3 and beyond. Set targets for recycled/reused materials as a % of total input materials to be achieved by end RIIO-T2, 2030 and 2050.

Our Costs

The figure below summarises the costs embedded in our RIIO-T2 Business Plan that deliver environmental sustainability improvements. We provide a breakdown of costs throughout this Plan.

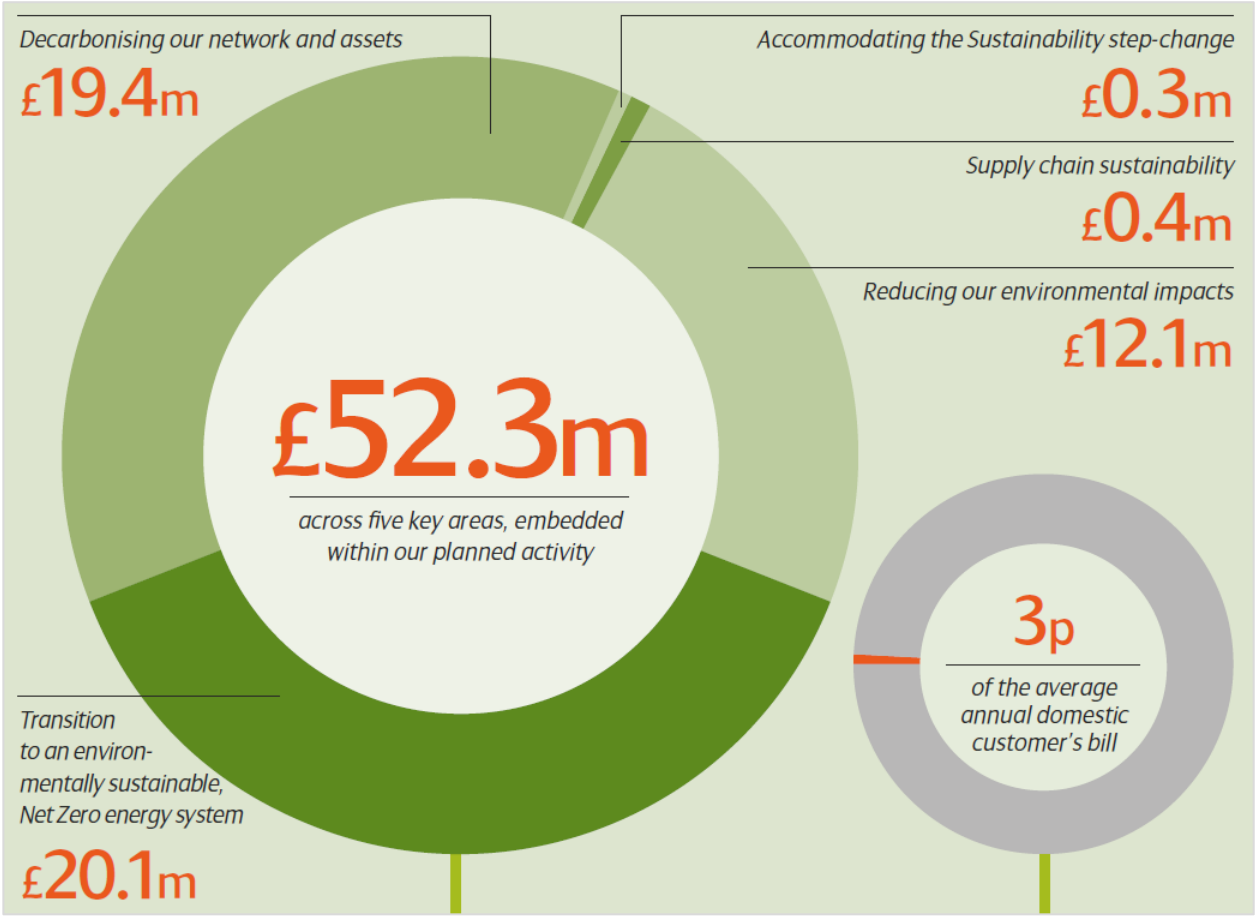


Figure 6: Environmental Sustainability RIIO-T2 Costs (£m)

Costs are outlined in this annex only to provide transparency of the total cost of our RIIO-T2 Environmental Sustainability package. All of these costs are included within the 'Proposed Expenditure and Outputs' section of our Business Plan and related annexes.

Our Commitments

Speed of delivery is key to the effectiveness of our plan. Commitments are prioritised as follows:

- **By 2021**– Activities carried out in readiness for the start of RIIO-T2.
- **Throughout RIIO-T2** – Activities starting before or at the beginning of RIIO-T2 and continuing through and potentially beyond the RIIO-T2 period.
- **By 2023/25** – Activities representing considerable business change, reliant on asset replacement/upgrade programmes, or which follow the completion of other RIIO-T2 commitments, and which will be in place in time to influence the RIIO-T3 development process.
- **By 2026** – Activities or programmes of work which may start from the beginning of RIIO-T2, but will not complete until 2026.

The following table provides a summary of our commitments for RIIO-T2 in delivering an environmentally sustainable network.

Table 2: Environmental Sustainability Commitments

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
Accommodating the Sustainability step-change **Page 62**  Sustainable Society  Carbon and Energy Reduction  Climate Change Resilience  Water Efficiency and Protection  Land and Biodiversity Improvement  Sustainable Resource Use	We will maintain and continually improve our ISO14001 certified Environmental Management System to achieve 'beyond compliance' environmental performance.	Continuing business as usual	Throughout RIIO-T2
	We will collaborate with SEPA on a Sustainability Growth Agreement.	External Stakeholder - Environmental Regulators	By 2021
	We will embed a process for Initial Environmental and Sustainability Reviews (IESRs) for all relevant projects, to identify potential environmental issues and opportunities at the earliest stage.	Ofgem	By 2021
	We will improve the quality of environmental data collected and analysed at all stages of the asset lifecycle, investing in enhanced geospatial systems and formalising data sharing collaborations with key stakeholders.	External Stakeholder - Environmental Regulators, Sustainability Working Group, User Group, Expert Reviewers	By 2023
	We will continue to ensure that our staff, contractors and supply chain have the skills and knowledge to move beyond compliance and achieve our Sustainability Goals.	External Stakeholder - Supply Chain	By 2023
	We will continue to drive industry-wide collaboration in RIIO-T2 for the benefit of all customers.	External Stakeholder - Supply Chain, Ofgem, Operators	Throughout RIIO-T2
	We will continue to engage our key environmental stakeholders via our Sustainable Stakeholder Working Group, ensuring progress via collaboration activities arising from this engagement.	External Stakeholder - Sustainability Working Group, Environmental Regulators, Expert Reviewers	Throughout RIIO-T2
	We will continue to provide transparent reporting of our environmental and sustainability performance publishing an annual report of our progress against all environmental and sustainability commitments (as detailed in our Environmental Action Plan in Annex 7) in line with metrics and a format developed in collaboration with the other TOs.	Ofgem, External Stakeholder - Sustainability Working Group, Operators	Throughout RIIO-T2
Supply Chain Sustainability **Page 64**	We will introduce consideration of environmental sustainability in our procurement processes in line with ISO20400 Sustainable Procurement Standard, including a carbon metric as a minimum.	External Stakeholder - Environmental Regulators, Supply Chain, User Group, Operators	By 2023

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
	We will work in collaboration with our suppliers and industry peers to develop a suite of targets and impact metrics designed to drive environmental improvements throughout our value chain.	External Stakeholder - Supply Chain, Environmental Regulators, Operators	Throughout RIIO-T2
	We will further enhance environmental management standards and KPIs within contract specifications and supplier codes of conduct (including requirements for public disclosure of metrics) and cascade to all relevant suppliers.	External Stakeholder - Ofgem, Supply Chain, Environmental Regulators, Operators	By 2021
	We will target more than 80% of RIIO-T2 suppliers (by value) meeting these enhanced environmental standards.	External Stakeholder - Ofgem, Operators	By 2026
	We will report on the actual percentage of suppliers (by value) meeting these standards.	External Stakeholder - Ofgem, Operators	By 2023
	We will engage with suppliers throughout the duration of their contracts to continue to reduce impacts and optimise benefits	External Stakeholder - Supply Chain, Operators, Expert Reviewers	Throughout RIIO-T2
	We will increase our internal supply chain management resources to enable the collection and analysis of enhanced data and a greater level of collaborative working.	External Stakeholders - Supply Chain, Ofgem	By 2021
	We will become a Supply Chain Sustainability School Partner, requiring contractors and suppliers for all new contracts to become members and undertake relevant sustainability and environmental training.	External Stakeholders - Supply Chain, Operators	By 2023
	We will engage with suppliers early in the development of projects to enable them to propose environmental improvements at concept and design stages	External Stakeholder - Supply Chain, Operators, Expert Reviewers	By 2026
Decarbonising our network and assets – Strategic commitments **Page 69** 	We will implement processes for carbon management in relevant business activities, aligned with PAS 2080 Carbon Management in Infrastructure.	External Stakeholders - Supply Chain, Operators	By 2023
	We will adopt a science based target for scope 1* & 2* carbon reduction.	External Stakeholder - Ofgem, Operators	By 2021

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
 	We will adopt a science based target for scope 3* carbon reduction.	External Stakeholder - Ofgem, Operators	By 2023
	We will identify, and subsequently monitor, metrics to track progress towards our science-based carbon reduction targets.	External Stakeholder - Ofgem, Operators	By 2021
Reducing Embodied Carbon **Page 69**   	We will work collaboratively with our stakeholders, including the other Transmission Operators, throughout RIIO-T2 with the aim of assessing and managing capital carbon on our projects, driving efficiencies throughout our supply chain, and sharing best practice.	External Stakeholder - Ofgem, Operators	Throughout RIIO-T2
	We will, in collaboration with the other Transmission Operators, introduce a measurement tool for embodied carbon in new projects, in order to establish a baseline and set a reduction target.	External Stakeholder - Ofgem, Operators	By 2023
	We will identify, and subsequently monitor and report, metrics to track progress towards our Scope 3 science-based carbon reduction target.	External Stakeholder - Ofgem, Operators	By 2023
	We will collaborate with our supply chain and other Transmission Operators to drive scope 3 and embodied carbon footprint reductions.	External Stakeholder - Ofgem, Operators, Environmental Regulators, Supply Chain	Throughout RIIO-T2
	We will collaborate with our supply chain to implement sustainable project sites to reduce carbon and other impacts, for example energy efficiency, diesel use, re-use of materials and reducing impact of transportation.	External stakeholder - Supply Chain	By 2023
Business Carbon Footprint – Sulphur Hexafluoride (SF6) **Page 74**	We will continue to require manufacturers to provide equipment with an SF6 leakage rate whichis half that of the internationally recognised standards, where technically viable.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
 Carbon and Energy Reduction  Climate Change Resilience  Sustainable Resource Use	We will continue to carefully monitor and manage our assets to minimise SF6 leakage, repair leaks quickly, and where this is not possible, replace the asset before its anticipated end of life	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
	Where a repair to a leaking asset proves ineffective and the asset requires to be replaced, we will offset the SF6 emissions from that asset until its replacement via a Carbon Offsetting partner.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
	We will use alternatives to SF6 insulating gas for all new circuit-breakers and GIS installations where there are technically feasible market-ready solutions.	External Stakeholder - SF6 Strategy consultation	Throughout RIIO-T2
	We will drive the development and adoption of SF6-free technologies, collaborating with supply chain and industry peers and piloting new technologies where technically viable.	External Stakeholder - Consumer Challenge Group, Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
Business Carbon Footprint – Other **Page 78**  Carbon and Energy Reduction	We will implement energy efficiency measures as part of our RIIO-T2 building refurbishment programme at 48 substations (representing around 1/3 of our sites) with the aim of reducing energy consumption by more than 1000MWh per year.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	By 2026
	We aim to decarbonise our operational fleet by replacing 100% of our 72 cars and vans with electric alternatives by the end of T2.	External Stakeholder - Sustainability Stakeholder Working Group	By 2026

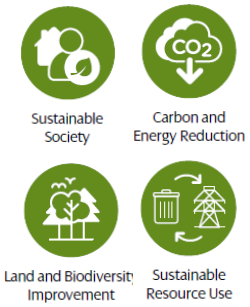
Header, Page number and Drivers	Commitment	External source/ justification	Timeline
 	We will strive to lead the decarbonisation of fleet vehicles, working with suppliers and other fleet operators to pilot technically viable alternatives to drive technical advancements and early adoption.	Continuing business as usual	Throughout RIIO-T2
Losses Carbon Footprint **Page 82** 	We will implement our T2 Losses Reduction Strategy to reduce losses on the network by an estimated 14,500 MWh (circa 3% of 2018/19 losses), thereby limiting losses to a lower level than would otherwise be the case, where this is economic and provides benefit to customers.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
Climate Change Adaptation **Page 89** 	We will undertake detailed Flood Risk Assessments at our remaining 10 high risk sites and implement identified measures to mitigate the risk to the network from flooding.	External Stakeholder - Environmental Regulator	By 2026
	We will publish a report in line with the 3rd Round of Adaptation Reporting under the Climate Change Act, in line with the Energy Networks Association work to produce a sector report.	Continuing business as usual	By 2026
Preventing Pollution **Page 92** 	We will target zero environmental regulatory interventions and notifiable breaches	Continuing business as usual	By 2021
	We will deliver our RIIO-T2 programme of mitigation measures (oil containment) for pollution prevention, developed via a condition-based asset risk assessment process.	External stakeholder - Environmental Regulators	By 2026
	We will implement Pollution Prevention Plans for all future projects for RIIO-T2 and beyond.	External stakeholder - Environmental Regulators	By 2026

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
  	We will implement a programme to identify, risk assess and address high risk legacy land contamination.	External stakeholder - Environmental Regulators	By 2026
	We will eliminate PCBs from our network in compliance with the relevant legislation and in line with the industry approach agreed with the Environmental Regulators.	Continuing business as usual	By end Dec 2025
Enhancing Biodiversity **Page 98**   	We will work collaboratively with our stakeholders, including the other Transmission Operators, throughout RIIO-T2 to develop and pilot a common approach and robust methodologies for delivering Biodiversity Net Gain alongside Natural Capital assessment and enhancement.	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2021
	We will pilot these biodiversity and natural capital assessment methodologies and associated tools on selected RIIO-T2 projects	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2023
	We will embed these biodiversity and natural capital assessment methodologies and associated tools in our business decision making processes for projects and the management of existing sites.	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2023
	We will identify, and subsequently monitor and annually report, metrics to baseline and track the levels of biodiversity and value of natural capital on our sites and the achievement of our targets.	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2021
	We will work with our local communities, landowners and other stakeholders to deliver 'no net loss' in biodiversity and identify options for delivering 'net gain'.	External Stakeholder - Environmental Regulators, User Group, Expert Reviewers	By 2026
	We will work with our local communities, landowners and other stakeholders to deliver a net positive impact in natural capital across our existing sites.	External Stakeholder - Environmental Regulators, Conservation Groups, Sustainability Working Group, Expert Reviewers	By 2026

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
Enhancing Visual Amenity **Page 102**  Sustainable Society  Land and Biodiversity Improvement	Where supported by visual amenity assessment and stakeholder engagement, and when cost effective to do so, we will deliver visual amenity mitigations for those existing assets not identified for upgrade or refurbishment during RIIO-T2.	External Stakeholder - Sustainability Stakeholder Working Group	By 2026
Sustainable Resource Use and Waste Reduction **Page 103**  Sustainable Resource Use  Sustainable Society  Carbon and Energy Reduction	We will embed circular economy principles where relevant throughout our business processes, considering whole life cycle environmental impacts.	External Stakeholder - Sustainability Working Group, Environmental Regulators, Ofgem, Operators	By 2023
	We will divert 95% of our waste from landfill.	External Stakeholder - Sustainability Working Group, Circular Economy Forum	By Dec 2023
	As part of our revision of design processes, we will include considerations of operational and end of life stages with the aim of designing out waste.*	External Stakeholders - Supply Chain, Circular Economy Forum, Operators	By 2023
	We will require project Waste Management Plans for all new projects in RIIO-T2 and beyond.	External Stakeholders - Environmental Regulators, Supply Chain	By 2026
	We will implement metrics to measure the sustainability of our resource use, with the aim of establishing a baseline to enable target setting during RIIO-T2.	External Stakeholder - Sustainability Stakeholder Working Group	By 2023
	We will set targets for recycled/reused materials as a % of total input materials to be achieved by end RIIO-T2, 2030 and 2050.	External Stakeholders - Environmental Regulators, Supply Chain, Ofgem	By 2026

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
	We will continue our work to minimise the environmental impacts of our use of aggregates (soils and stones) via collaboration with other TOs, our supply chain and membership on infrastructure resource optimisation groups** with the aim of identifying and implementing solutions to reduce the use and disposal of aggregates, including increased use of secondary aggregates. ** Via the Scottish Infrastructure Circular Economy Forum and Major Infrastructure Resources Optimisation Group.	Continuing business as usual	Throughout RIIO-T2
	We will continue to collaborate with environmental / waste regulators, other infrastructure companies** and our supply chain to drive sustainable resource use and waste minimisation in order to meet our RIIO-T2 and Sustainability Goals. ** Via the Scottish Infrastructure Circular Economy Forum and Major Infrastructure Resource Optimisation Group.	Continuing business as usual, External Stakeholders - Environmental Regulators, Circular Economy Forum, Sustainability Working Group	Throughout RIIO-T2

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
Introducing our Net Zero Fund **Page 109**  Sustainable Society  Carbon and Energy Reduction  Climate Change Resilience  Water Efficiency and Protection  Land and Biodiversity Improvement  Sustainable Resource Use	For RIIO-T2 we have proposed a £20m 'Net Zero' Fund so that we can use our central and impartial role within the energy system to ensure local communities, including those identified as 'vulnerable', are financially supported to maximise the social, environmental and economic benefits of local energy solutions. The Net Zero fund will focus on facilitating practical, low carbon initiatives with tangible outcomes that benefit local communities and help Britain on the path to Net Zero. This fund builds upon our existing Green Economy Fund which has supported initiatives which have delivered demonstrable benefits for the people of Scotland and support Scotland's ambitious green energy plans and local economic growth (details of our existing Green Economy Fund projects can be found on our website).	External Stakeholder - Scottish Government, Energy Consumer NGOs, Community Energy organisations	Throughout RIIO-T2

Header, Page number and Drivers	Commitment	External source/ justification	Timeline
Maximising environmental benefit from operational land **Page 113** 	We will release unused non-operational land to local community energy projects, allowing them to use sites for free to generate and deliver energy to their local communities.	External Stakeholder - Sustainability Stakeholder Working Group	Throughout RIIO-T2

Our Initiatives

The following table draws together the direct carbon impacts claimed in Investment Decision Pack submissions (for example leakage, losses, EV fleet) and those initiatives across our Business Plan where carbon reduction is the main driver or contributes to a substantial part of the benefits claimed.

Table 3: Summary of Business Plan Data Table A4.4 Table 3 Environmental Initiatives

Initiative identifier	EAP Commitment	Description	Predicted Carbon Savings (tCO2e)
Decarbonising our network and assets - Business Carbon Footprint - Sulphur Hexafluoride (SF6) - SF6 strategy	EAP Commitment: We will use alternatives to SF6 insulating gas for all new circuit-breakers and GIS installations where there are technically feasible market-ready solutions. [Taking this approach during T2 investment planning, at which time only 132kV SF6-free equipment is market ready, we will avoid additional annual emissions of at least ~35kg.]	Includes load and non-load programmes. Doesn't include leakage repairs at existing sites. Figures represent the SF6 strategy and main costs result from the 'preferred option' (SF6 alt) cost over the 'alternate option' (SF6) cost.	823
Decarbonising our network and assets - Business Carbon Footprint - Sulphur Hexafluoride (SF6) - SF6 offset	EAP Commitment: Where a repair to a leaking asset proves ineffective and the asset requires to be replaced, we will offset the SF6 emissions from that asset until its replacement via a Carbon Offsetting partner.	Strategically important asset with history of leakage repair attempts proposed to offset carbon equivalent using contribution to tree planting project in the UK.	9883

Initiative identifier	EAP Commitment	Description	Predicted Carbon Savings (tCO2e)
Decarbonising our network and assets - Business Carbon Footprint - Other - Losses strategy	EAP Commitment: We will implement our T2 Losses Reduction Strategy to reduce losses on the network by an estimated 13,000 MWh (circa 2% of 2018/19 losses), thereby limiting losses to a lower level than would otherwise be the case, where this is economic and provides benefit to customers.	Costs associated with reducing losses are embedded within the project costs. The approach for losses strategy is to reduce losses to a lower level than would otherwise be the case through asset replacement using lower loss equipment. The annual costs in this table are therefore intentionally left blank.	2097
Decarbonising our network and assets - Substation Building Refurbishment (SPNLT20101)	EAP Commitment: We will implement energy efficiency measures as part of our T2 building refurbishment programme at 48 substations (representing around 1/3 of our sites) with the aim of reducing energy consumption by more than 1000MWh per year.	Refurbish the building fabric and building services where they have been identified as being in poor condition. Without intervention these assets will degrade to a point where they cannot be repaired and this will mean the building cannot provide an environment suitable for housing the internally-installed equipment.	328
Decarbonising our network and assets - Building Energy Reduction Measures (SPNLT20142)	EAP Commitment: We will implement energy efficiency measures as part of our T2 building refurbishment programme at 48 substations (representing around 1/3 of our sites) with the aim of reducing energy consumption by more than 1000MWh per year.	As part of our goal to decarbonise our network we are proposing to supplement SPNLT20101, by undertaking a further programme of works to install holistic refurbishment solutions, specifically aimed at creating low energy use substation buildings.	
Decarbonising our network and assets - Fleet electrification	EAP Commitment: We aim to decarbonise our operational fleet by replacing 100% of our 72 cars and vans with electric alternatives by the end of during T2.	Leading prompt action to decarbonise our operational fleet through electrification of vehicles and installation of associated charging points.	319
Decarbonising our network and assets - Climate Change Adaptation - Flood mitigation (Legal and safety- C 2.24)	EAP Commitment: We will undertake detailed Flood Risk Assessments at the remaining 10 high risk sites and implement identified measures to mitigate the risk to the network from flooding.	Ensuring critical network asset protection in order to mitigate against climate change. During studies a number of sites have been identified as at potential risk from flooding which will be addressed through a programme of works to key sites.	n/a

Initiative identifier	EAP Commitment	Description	Predicted Carbon Savings (tCO2e)
Reducing our environmental impacts - Refurbishment of Oil Bunding and Drainage Systems (SPNLT20102)	EAP Commitment: We will fully deliver our T2 programme of mitigation measures (oil containment) for pollution prevention, developed via a condition-based asset risk assessment process.	Condition-based asset risk assessment process identifying a number of sites for measures to undertake works to refurbish and upgrade bunds and drainage systems.	n/a
Reducing our environmental impacts - RIIO-T2 PCB CVT Replacement Programme (SPNLT20141)	EAP Commitment: We will eliminate PCBs from our network in compliance with the relevant legislation and in line with the industry approach agreed with the Environmental Regulators.	Ensuring PCB removal from ageing assets on our network. In line with environmental compliance and agreed with SEPA.	n/a
Reducing our environmental impacts - Land & Biodiversity Management	EAP Commitment: We will work with our local communities, landowners and other stakeholders to deliver 'no net loss' in biodiversity and identify options for delivering 'net gain'.	Potential projects / initiatives to develop methodologies for measuring levels of biodiversity and to conduct such measurement. Cost of mitigation/enhancement measures are separately embedded in projects or covered by uncertainty mechanism.	n/a
Reducing our environmental impacts - Sustainable Resource Use and Waste Reduction	EAP Commitment: We will divert 95% of our waste from landfill.	Potential projects / initiatives to embed the principles of circular economy and efficient use of resources through collaboration to achieve our targeted waste goals.	n/a
Supporting the transition to an environmentally sustainable, low-carbon energy system - Net Zero Fund (SPNLT20120)	EAP Commitment: We propose the introduction of a £20m 'Net-Zero' Fund to ensure that we have an adequate funding mechanism to support local businesses and research projects which focus on low carbon and supporting vulnerable communities.	Proposal to award to potential projects / community initiatives which support the low-carbon transition.	n/a

Initiative identifier	EAP Commitment	Description	Predicted Carbon Savings (tCO2e)
Supporting the transition to an environmentally sustainable, low-carbon energy system - Maximising environmental benefit from operational land	EAP Commitment: We will release unused non-operational land to local community energy projects, allowing them to use sites for free to generate and deliver energy to their local communities.	Proposal to maximise benefits of unused land though community renewable energy projects together with biodiversity improvements.	500

2. STRATEGY

2.1. Our Corporate Approach

Sustainable development is at the heart of our corporate purpose and values.

Figure 7: Iberdrola Group Purpose and Values

Our commitment is embedded within our code of ethics, company strategies, governance and decision-making processes, all of which can be found on our website here: https://www.iberdrola.com/sustainability.

Our RIIO-T2 Business Plan, policies and procedures provide the means to deliver the sustainable development agenda at transmission network level. Throughout our approach we consider economic, social and environmental benefits to ensure we deliver best overall value for consumers.

Our decision making process, as detailed within Annex 13: Investment Decision Making Process, balances technical, cost (economical) and environmental factors during the discharge of statutory and licence obligations. Our Draft Business Plan is the result of extensive stakeholder engagement and aims to deliver the objectives of our Sustainable Business Strategy whilst delivering excellent network performance and value for money.

2.2. Our Sustainable Business Strategy

Our Sustainable Business Strategy[3] has been developed through several years of collaboration with our stakeholders, and is regularly updated in response to internal and external policy developments (as described on pages 7 and 8 of the Strategy), in order to ensure that our business continues to manage the transition to a low carbon energy system over short, medium and long-term timelines.

Figure 8: SP Energy Networks Sustainable Business Strategy Vision Statement

To capture the views of our external stakeholders, we formed a Sustainability Stakeholder Working Group (SSWG) which is populated by representatives from organisations with strategic interests in sustainability in the licence areas in which we operate including, for example the Scottish Environment Protection Agency (SEPA) and Scottish Natural Heritage. The

[3] www.spenergynetworks.co.uk/SustBusStrat

SSWG meet quarterly with the main focus for discussions being the actions required to deliver the SPEN Sustainable Business Strategy and associated opportunities to collaborate. Feedback from the group has welcomed the ambitious nature of our reduction targets and our commitment to report transparently on our activities which seek to deliver our sustainability improvements.

This Strategy is built around six Sustainability Drivers (Figure 9), developed with stakeholders to deliver targeted activity where materiality and impact are greatest. Beyond enabling decarbonisation and reducing our environmental impacts, these drivers also deliver activities to enhance social and economic sustainability.

Figure 9: SP Energy Networks Sustainable Business Strategy Sustainability Drivers

Where we hold good quality accurate data, we have identified quantified impact reduction goals for three time frames: 2023, 2030 and 2050 (Figure 10). The 2023 target date is aligned with the end of the RIIO-ED1 price control, 2030 is aligned with Scottish Government interim decarbonisation timelines, and 2050 is aligned with the UK net zero target. Our strategy is to continually improve the breadth and quality of the data we hold, refining our key goals as new data streams become available to us.

Key goals

	Carbon and Energy Reduction	Sustainable Resource Use	Water Efficiency and Protection
2023	*-15% carbon footprint**	*Divert 95% of waste from landfill*	*-10% in water use**
2030	*-80% carbon footprint**	*100% waste recycled or re-used*	*-25% in water use**
2050	*Carbon neutral**	*Zero waste*	*-50% in water use**
Rationale	Essential to meeting global and national CO_2 reduction targets.	Essential to meeting landfill diversion targets particularly in Scotland where the Scottish Government has Zero Waste Strategy target of 5% to landfill by 2025.	Climate change models forecast reduced summer rainfall putting pressure on scarce water resources. Treating water to potable standards and transportation of water is costly and uses energy.

*targets from a 2013/14 baseline (carbon footprint target excluding losses).

Figure 10: SP Energy Networks Environmental Sustainability Goals

We take a systematic approach to manage and reduce our environmental impacts by using a documented Environmental Management System (EMS). With our commitment to compliance with environmental legislation as a foundation, the environmental impacts of our activities are then prioritised for improvement action via a risk assessment process. This process is described in Appendix A along with the resulting Aspects and Impacts Register for SP Transmission. The EMS has been externally certified to ISO14001:2015, the international standard for EMS, for over a decade and is fully embedded throughout our business processes. These identified environmental impacts informed the identification of our Sustainability Drivers, the development of our Sustainable Business Strategy and the identification of our Sustainability Goals and Objectives, and they are reviewed annually and inform the environmental planning process which identifies annual actions and targets.

The level of maturity of our understanding of each of our environmental impacts informs the types of action required to progress, as shown in Figure 11.

	Increasing maturity →				
Maturity Level	1	2	3	4	5
Impact Area	Identify and collect initial data	Identify metrics and establish baseline for chosen metrics	Analyse data and identify priorities	Set targets and deadlines Identify actions to eliminate / reduce / mitigate	Deliver actions Track metrics and report progress
	Verify			Review	
Supply Chain Sustainability	1				
Reducing Embodied Carbon and Scope 3 Emissions	1	2			
Business Carbon Footprint – Sulphur Hexafluoride (SF6)				4	5
Business Carbon Footprint - Other				4	5
Losses Carbon Footprint				4	5
Climate Change Adaptation				4	5
Preventing Pollution					5
Land and Biodiversity	1				
Enhancing Visual Amenity					5
Sustainable Resource Use	1				
Waste Reduction			3	4	5

Figure 11: Stages in maturity of impact understanding and mitigation

Alongside our goals, we deliver on set objectives related to each Sustainability Driver. Each Objective is measured against high level Key Performance Indicators (KPIs) and specific actions detail how we will work to fulfil the Objectives.

We annually review existing environmental and sustainability data in order to:

- Guide the Objectives, KPIs and Actions for the period to 2023;

- Quantify our inputs and outputs in relation to material uses and emissions including waste, electricity, fuel and CO2; and
- Facilitate the setting of business-wide SMART targets for Objectives.

Our current Sustainability Objectives as listed in the Strategy are shown in the next two figures:

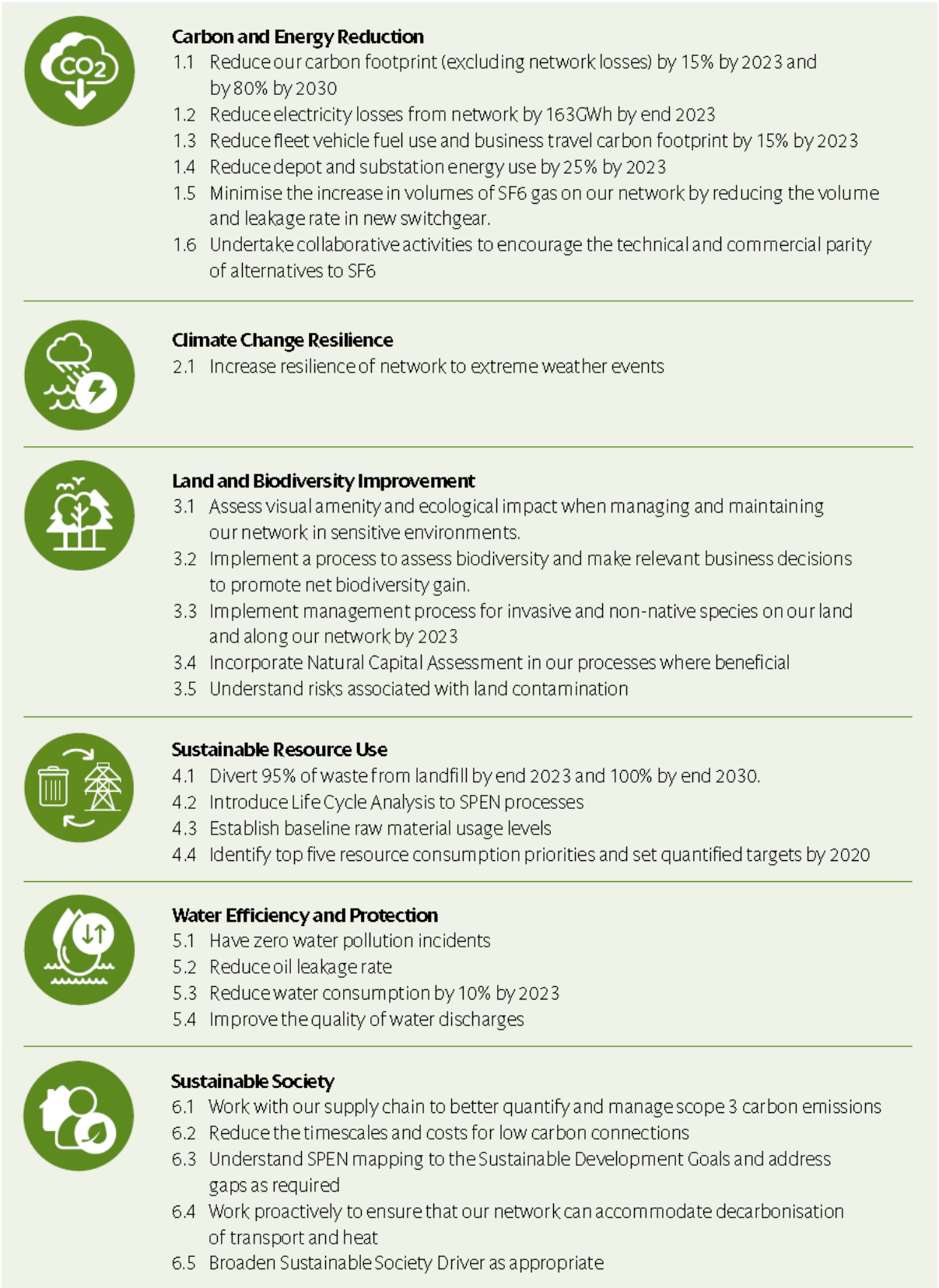


Figure 12: SP Energy Networks Sustainability Objectives 2019

Figure 13: SP Energy Networks Sustainable Process Objectives 2019

We followed this approach to develop our RIIO T2 Environmental Action Plan (see Section 3) and describe the commitments, metrics and actions in the relevant subsequent sections.

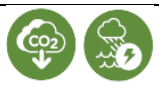
Once finalised, our RIIO-2 Plans will feed into subsequent annual reviews of our Strategy, in particular informing updates to our Goals and Objectives.

2.3. Our commitment to the Sustainable Development Goals (SDG)

The United Nations' Sustainable Development Goals (SDGs) provide a global framework for delivering improvements in all areas of sustainability by 2030. As part of Iberdrola, we support the UN SDGs and have embraced these as part of our business strategy and corporate governance system.

We have identified the SDGs to which we, as SP Transmission, contribute:

Table 4: SP Transmission SDG mapping to Sustainability Drivers

	SDG	Goal Aims and Our Contribution	Sustainability Drivers
Main focus		***'Ensure access to affordable, reliable, sustainable and modern energy for all'*** • Providing excellent network reliability and value for money • Connecting renewables to the network quickly and sustainably	
		***'Take urgent action to combat climate change and its impacts'*** • Enabling decarbonisation of electricity, heat and transport through providing the required network capacity and connections • Reducing our Business Carbon Footprint • Ensuring the electricity network is resilient to the effects of climate change	

Direct Contribution	6	***'Ensure availability and sustainable management of water and sanitation for all'*** • Reducing the risk of water pollution from our operations • Reducing business water consumption	
	9	***'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'*** • Significant investment in innovation • Providing system solutions that enable the most efficient use of the network, reducing the need for costly upgrades	
	15	***'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'*** • Reducing the risk of biodiversity loss or land contamination from our operations • Understanding and protecting the ecological value of the environments in which we operate	
	17	***'Strengthen the means of implementation and revitalize the global partnership for sustainable development'*** • Inclusive, responsive stakeholder engagement, acting on the issues that are most material for stakeholders, and delivering meaningful impact • Working in partnership with stakeholders and organisations to co-create solutions for sustainability	
Indirect Contribution	1	***'End poverty in all its forms everywhere'*** • Providing value for money • Supporting customers in fuel poverty • Supporting vulnerable communities to adopt low carbon technologies	
	3	***'Ensure healthy lives and promote well-being for all at all ages'*** • Enabling air quality improvement through the connection of low carbon technologies • Enabling access to green spaces through landscape and visual mitigation schemes	
	4	***'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'*** • Providing a wide range of training and development opportunities for staff • Providing educational opportunities in the communities in which we operate	
	5	***'Achieve gender equality and empower all women and girls'*** • Driving down the gender pay gap • Empowering women through staff networks and gender neutral recruitment processes	
	8	***'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'*** • Providing network capacity and connections to accelerate growth in green industries	
	10	***'Reduce inequality within and among countries'*** • Targeting investment to where it's needed the most • Working to ensure a just transition into the low carbon transition	
	11	***'Make cities and human settlements inclusive, safe, resilient and sustainable'*** • World class safety performance • Working with communities to enhance resilience	
	12	***'Ensure sustainable consumption and production patterns'*** • Minimising overall resource consumption • Increasing re-use and recycling	
	16	***'Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels'*** • Transparency, inclusivity and accountability in our business processes	

3. DEVELOPING OUR ENVIRONMENTAL ACTION PLAN

As outlined above, building on our commitment to environmental legal compliance, our Sustainable Business Strategy identifies our Sustainability Drivers which represent the key issues associated with our network and business activities and below these Drivers sit our Goals and Objectives. Our process to date for delivering these Objectives has been to produce a detailed annual Sustainability Plan of prioritised actions, metrics and targets. The relatively limited focus of RIIO-T1 on such activities has had an impact on our scope for ambition.

We therefore welcome Ofgem's decision to create a new Environmental Framework for RIIO-2. This has allowed us to follow our planning process and embed the measures required to move 'beyond compliance' towards becoming a Sustainable Networks Business in our T2 Business Plan, thereby ensuring that we will take the necessary steps towards

delivery of our sustainability Goals, our stakeholders' expectations and our fair share of Net Zero carbon targets and the UN SDGs.

We have developed this Environmental Action Plan (EAP) with our stakeholders, focusing on the three areas identified in Ofgem's guidance:

1. Decarbonising the energy network, with a focus on our carbon footprint and embedded carbon in our network
2. Reducing our network's environmental impacts
3. Supporting the transition to an environmentally sustainable low-carbon energy system.

Our EAP aligns these to our Sustainability Drivers and details the commitments, initiatives and actions we will deliver over the five year price control period 2021-2026, towards our longer term strategic goals for 2030 and 2050.

In order to identify the priority environmental impacts to target for improvement during RIIO-T2 we considered a variety of data and information sources, in line with our EMS Management Review process, including our longer term strategic goals, our Environmental Aspects and Impacts Register (introduced above and see Appendix A) and findings from audits and incident investigations. Our 2019 High priority environmental impacts from our Environmental Aspects and Impacts Register are:

- Use of electricity
- Production of wastes
- Fugitive emissions of gases to air
- Fugitive emissions to land and water
- Wildlife and biodiversity impacts
- Staff competence

We then considered the level of maturity of the various impact areas (as shown in Section 2.2, Figure 7: Stages in maturity of impact understanding and mitigation), and applied the 'mitigation hierarchy' (Figure 14 below) to guide identification of the required next steps for each.

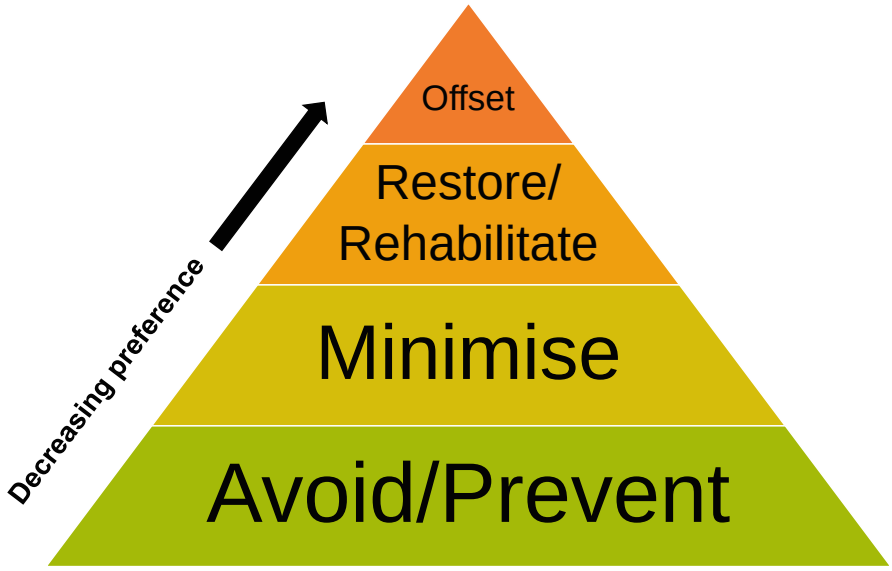


Figure 14: Environmental mitigation hierarchy

Specifically, this EAP:

- Describes the methodology we use to assess our environmental impacts
- Clarifies our objectives and targets for the network's environmental impacts
- Prioritises impacts for reduction during T2
- Identifies actions to deliver improvements with:
  - milestones and indicators to track delivery
  - an assessment of impacts in T2 compared to current levels
  - costs of delivering reductions, including evidence of value for money
  - expected deliverables, outputs and benefits
- Sets out the role that we play in supporting the low carbon energy transition.

3.1. Embedding environmental considerations and costs in our Business Plan

Asset Management and Investment Planning

As described within our main Business Plan Annex 13, our investment decisions are founded upon the ISO55001 a robust asset management lifecycle process that is widely used through industry. We use a series of phase gates in our process to ensure we correctly evaluate, challenge and ultimately deliver the best balanced solution for all our stakeholders. We consider multiple factors when evaluating projects of which environment is one.

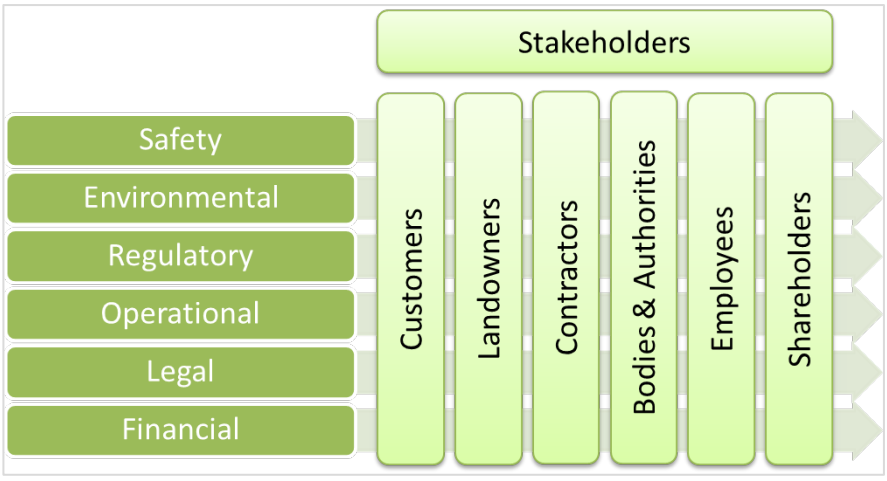


Figure 15: Investment Decision-making factors for consideration

Development of our planned investments, including our RIIO-T2 Business Plan, starts with the identification of a network need. A Concept Approval Paper (IP1) is prepared to describe the need and outline a proposed scope of options. Environmental impacts are considered at this early stage and we seek to provide a solution that achieves an equitable balance between environmental, technical and economic matters (see Annex 13). Technical options are then identified for review by a cross-functional team who aim to challenge the design proposals and identify those for further evaluation via Cost Benefit Analysis (see Annex 13).

Assessing the Environmental Impact of our Investment Decisions

For RIIO-T2, Initial Environmental and Sustainability Reviews (IESRs) were prepared, where appropriate, to support this Investment Planning process, the objectives of which include:

- To establish the availability of baseline environmental data
- Identification of potential survey requirements at key stages

- Identification, where possible, of planning requirements and if an Environmental Impact Assessment (EIA) is required
- Identify opportunities to reduce carbon in design, aligned with the principles of PAS 2080
- Identify the range of likely impacts on the environment
- Identify the extent to which these impacts need to be investigated
- Identify broad mitigation measures
- To function as a 'course screen', ensuring with unacceptable or unmitigatable impacts are not taken forward

Each IESR is support by an Environmental Sensitivity Map generated by integrating numerous environmental and network infrastructure datasets into a single composite layer in a Geographical Information System (GIS). This approach allowed the rapid identification of environmental and cultural features which may be sensitive to a development. Environmental and cultural datasets used include, but are not limited to:

- Listed buildings
- Conservations areas
- Ecologically designated areas of international and national importance
- Ancient woodland
- National Parks and National Science Areas (NSA)
- World Heritage Sites and Scheduled Ancient Monuments

Cost Benefit Analysis

Design options were assessed through the RIIO-T2 cost benefit analysis (CBA) model, where applicable. This provides additional information on the costs and benefits for each option to allow for an informed decision on the most appropriate solution. We incorporate environmental and social factors into this thereby ensuring these factors are taken into consideration in our long-term business planning.

Further information on the cost benefit analysis model can be found in the Annex 8 - Cost Benefit Analysis Process.

The table below provides examples of environmental actions we have embedded in our T2 Business Plan by following the process described above:

Table 5: Environmental impact minimisation – example actions

Impact Area	Example action	Example project
Climate change mitigation	Where appropriate, we applied the carbon emission reduction (PAS 2080), in the decision making process of our investment plan to identifying potential opportunities to reduce carbon	In RIIO-T1, we delivered a project through the network innovation allowance (NIA) investigating methods to extend the lifespan of existing concrete structure. Using this experience, we tested concrete structures to establish their condition and suitability for re-use. By taking this approach in, for example our Devol Moor project (Scheme reference SPNLT 2038), we will avoid generating 500m3 of concrete waste reduce consumption of fresh concrete – a material with a high carbon footprint (Section 6.10 Climate Change Adaptation)

Impact Area	Example action	Example project
GHG emissions management	We use SF_6 –alternative insulating gases where technically and economically feasible. By taking this approach for T2, we have avoided adding an estimated 9700kg of SF_6 to our inventory, avoiding additional annual emissions of approx. 51.8kg (1,200tCO2e). Refer to our SF_6 strategy (section 6.7)	Example circuit breaker projects: • Hunterson • Windyhill • Green House Gas Reduction Programme For more information, please refer to 'our strategy for circuit breakers' section within the main Business Plan
Climate change adaptation	A desktop exercise using the latest SEPA modelling information for pluvial, fluvial and coastal flooding was undertaken to review the impact of flooding across the network.	We have identified a need to undertake detailed Flood Risk Assessments (FRA) and flood mitigation works at the remaining 10 high risk sites (Section 6.10 Climate Change Adaptation)
Pollution to the local environment	We have reviewed all assets across our network and identified mitigation measures to prevent pollution to the local environment – land, air and water.	Our investment plan includes a programme of refurbishment works which prioritises sites according to health index and environmental risk. Refer to Section 7.1 preventing pollution to the local environment
Resource use efficiency	We considered a resource efficiency hierarchy – reuse, refurbish, replace – when assessing options during the development of our T2 investment plan.	RIIO T2 Transformer Refurbishment Programme (SPNTL2068 - 2074, SPNTL2094, SPNTL2096). We prioritised refurbish over replacement where this option was supported by CBA.

3.2. Incentives and Uncertainty Mechanisms

Incentives

We welcome Ofgem's decision to leave open the option for TOs to develop bespoke ODIs with stakeholders for delivering an additional contribution to the low carbon transition and environmental improvements. This allows consideration of the different priorities of each TO given our individual situations and the differing levels of maturity of our action to address different environmental impacts.

Please see Category 3 within the Output Incentive Proposals section of our T2 Business Plan, and the associated Annex 12, for details of our proposals for incentives to:

- Minimise electricity losses
- Reduce carbon impact from Insulation and Interruption Gases (such as SF6)
- Maximise benefit from non-operational land
- Maximise supply chain sustainability and reduce embodied carbon
- Deliver Biodiversity Net Gain

Uncertainty Mechanisms

Where appropriate and justified, some environmental improvement activities may fall within the scope of our proposed uncertainty mechanisms for 'Legislative, Policy and Standards Uncertainty: Legislative changes for the environment and

climate change, Planning Requirements, Flood resilience and/or Environmental enhancements'. For more details please see the Managing Uncertainty section and associated Annex 20 in our T2 Business Plan.

4. STAKEHOLDER ENGAGEMENT

We engage proactively with our stakeholders to anticipate their needs and deliver an environmentally, socially and economically sustainable energy service for current and future consumers. Our approach is founded on our comprehensive Stakeholder Engagement Strategy, which enables us to engage in a credible, tailored way on an ongoing basis to continually improve our services. This section lays out our strategy for sustainability-focused engagement and provides details of business-as-usual engagement then goes on to describe the specific engagement carried out in the development of this plan, and finally outlines our plans for ongoing engagement during RIIO-T2.

4.1. Engagement Strategy and Planning

Engagement Strategy

Mission statement and principles

Developed in 2013 and updated annually since then, the SPEN Stakeholder Engagement Strategy provides Principles, Approach and Supporting Tools and Processes to deliver against the following compelling Mission Statement:

'Our engagement places our customers at the centre of what we do. With a tailored and locally focused approach, we will prioritise the wants and needs of all in a consistent manner across our business. We will deliver safe, reliable services, sustainable value, and a better future, quicker.'

Our strategy embeds, at its core, the four principles of the AA1000 stakeholder engagement standard – Inclusivity, Materiality, Responsiveness and Impact. These ensure we engage at all levels, with a specific focus on those who are hard to reach; determine the most relevant and significant issues for us and our stakeholders; act on the outcomes of our engagement, making the necessary changes to our business; and then measure the results. Embedding these principles is important to our business because good engagement with stakeholders helps us to improve impact, reduce inefficiencies, create greater socio-economic value and reduce risk. Most importantly, effective engagement leads to tangible action in our business and benefits for customers and stakeholders.

Recognising the interconnectedness of transmission and distribution issues and the prevalence of common stakeholders across both distribution and transmission, this holistic Strategy provides a framework for effective and consistent engagement at a whole system level, regardless of voltage or licence.

The strategy lays out five underpinning principles:

- **Inclusive** – We engage all customers and stakeholders impacted through our work, with a specific focus to ensure those who may be hard to reach are given a voice.
- **Authentic** – Our engagement works to understand significant issues affecting our customers and stakeholders, before acting on them in a meaningful way.
- **Tailored** – The approach we take to engagement ensures that each initiative is planned and delivered in the most appropriate way for the specific purpose and stakeholders in question.
- **Value-for-money** – An inherent focus, we prioritise efficient spending on engagement activities, aiming to maximise the overall customer benefit.
- **Innovative** – We aim to better our approach each year, continually looking for new methods to improve how we engage and deliver against wants and needs.

Process

Through a nine-step process, the strategy enables us to identify the purpose and specific stakeholders for each engagement, provide tailored engagement, then capture and act upon the feedback we receive, closing the feedback loop by confirming stakeholder satisfaction with the quality of engagement.

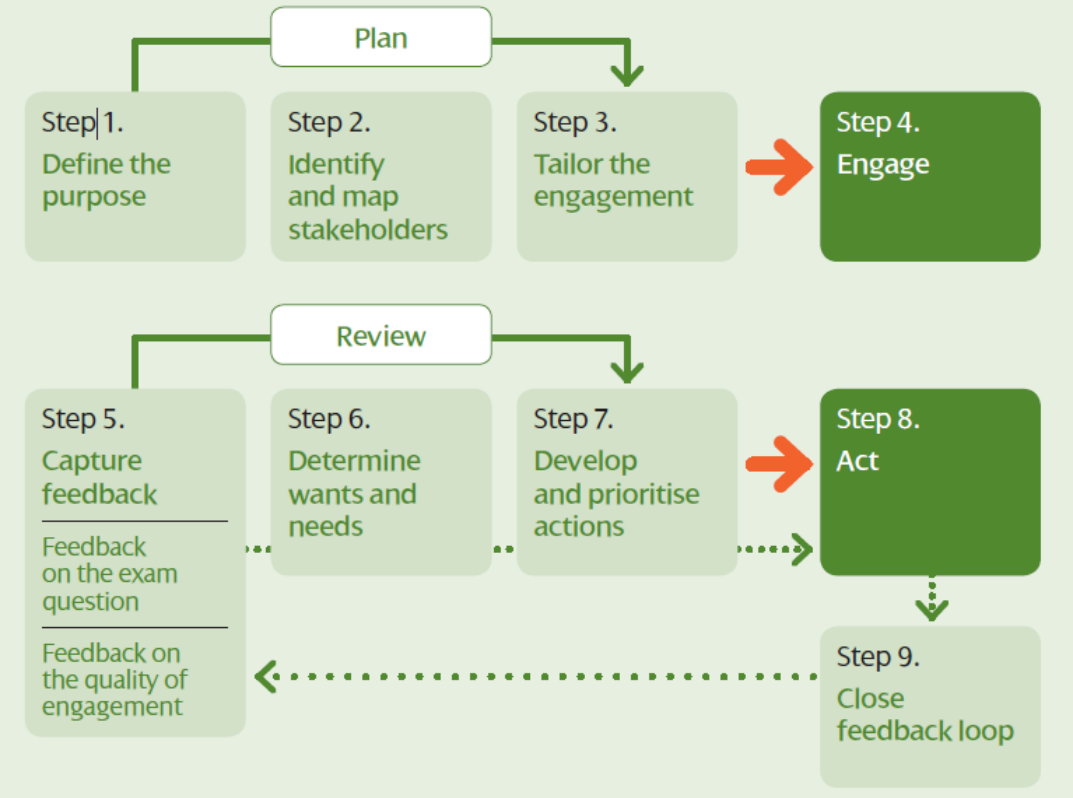


Figure 16: SPEN Engagement Process

Please see SPEN Stakeholder Engagement Strategy 2019 page 4.

We continually improve this process, resulting in recent changes including:

- Improving the feedback we collect via our online stakeholder engagement tracker (Tractivity) and the ease which with it can be recorded.
- Improving our monthly reporting process to enhance the visibility of engagement that has taken place and highlight its importance within the business.

Key engagement topics

Of the 11 specific topic categories laid out by the strategy, six are directly linked with sustainability and the decarbonisation of the network and society:

- Sustainability
- Connections
- Future Smart Network
- Smart Communities
- Electric Vehicles
- Heat

And five relate to the ways in which we optimise our positive impact while we carry out decarbonisation activities.

- Customer Service & Social Obligations
- Resilience
- Visual Mitigation
- Safety
- Recruitment

The engagement strategy mandates SP Transmission-specific engagement on all of these topic categories, whilst enabling engagement to sit within a centrally orchestrated framework that encourages resource efficiency and best practice sharing between SP Transmission and SP Energy Networks' other licences and central functions.

Stakeholder Engagement Plans

The Stakeholder Engagement Process described above is used to create annual Stakeholder Engagement Plans for all key topic areas, enabling us to define the purpose of our engagement, identify and prioritise stakeholders and tailor engagement to meet their needs. These plans are held within our online stakeholder management system, and continue to evolve as each year progresses. For the purposes of this document, the following text focusses on Sustainability engagement planning carried out in the last two years.

Defining the purpose

All engagement is carried out with a clearly defined purpose in mind, related to the overall aims of our business.

At the start of 2018, we conducted in-depth research with customers to refresh our understanding of what our customers wanted from a network operator and the key values they expect us to hold. We held six discussion groups – 1 with women, 1 with men, 1 with non-adopters of new technology, 1 with early adopters of new technology, 1 with participants with children and 1 with participants aged 60+. We looked for key themes/points arising, asked why these were important and enquired what those mean for them, their local area and their families. We tested a series of messages with innovative, 'dial testing', to capture real-time reactions and sentiments, to see what themes received a positive reaction from participants.

The results were revealing – customers wanted a better future, quicker:

- **Better** – Clean growth, better public services
- **Future** – A stronger, independent economy, a richer, fairer future
- **Quicker** – Personal freedom

We took the results from this research and structured our engagement approach in transmission around these three themes:

- **Better** – A sustainable network (Our sustainability strategy and building key partnerships for global impact, The Green Economy Fund, Community Initiatives).
- **Future** – A resilient network (Leading the way with new technology, outage flexibility, system restoration).
- **Quicker** – An innovative network (Digital Substations, Connecting to the network quicker, Future energy scenarios).

We identified the key challenges, opportunities and enablers for our business to deliver against these three themes, including:

Challenges and opportunities

- **Climate and biodiversity changes** – increases in extreme weather events and acceleration in decline of biodiversity and increase in species extinctions.
- **Recent legislative, regulatory and governmental changes** – Government Environmental Plans, Industrial Strategy, Clean Growth Strategy, Ofgem RIIO-2 Price Control consultations.
- **Climate change and Sustainable Development** – Intergovernmental Panel on Climate Change Special Report 15, Scottish Government Climate Change Plan, UK Government National Adaptation Programme, United Nations 2030 Agenda for Sustainable Development.
- **Decarbonisation of Energy** – Climate Change Committee Progress Report to Parliament 2018, UK Government Clean Growth Strategy, Scottish Government Energy Strategy, Welsh Government Consultation on Decarbonisation.
- **Decarbonisation of Transport and Heat** – UK Government Road to Zero Strategy, Scottish Government Energy Strategy, BEIS/Ofgem call for evidence on decarbonisation of heat.
- **Decentralisation, Digitalisation and Democratisation** – Ofgem/BEIS Upgrading our Energy System – Smart Systems and Flexibility Plan: Progress Update, Open Networks Project.
- **Customer and shareholder value** – Scottish Government introduction of The Just Transition Commission.

- **Network and whole system trends** – ESO Future Energy Scenarios (FES), Industry Best View Scenario, ESO Electricity Ten Year Statement (ETYS), ESO Network Options Assessment (NOA).

Enablers

- **Stakeholder engagement** – effective and timely engagement with relevant stakeholders is essential in enabling us to act decisively to reduce environmental impact whilst driving the rapid decarbonisation, decentralisation, digitalisation and democratisation of the energy sector.
- **A common language** – The United Nations Sustainable Development Goals provide a common platform and vocabulary for countries and organisations with appropriate ambition and focus to align and target their sustainability activities for maximum positive impact. Our understanding of, and our alignment with, both the goals and the aspirations of our key stakeholders is central to the direction and prioritisation of our activities.
- **Data and target setting** – Effective target setting and data management is an essential enabler on the journey to becoming a sustainable networks business.
- **RIIO Price Controls** – Our ability to deliver the sustainable networks business of the future relies upon the capacity of the RIIO-2 framework to support investment and decision making that will result in long-term socio-economic and environmental benefits for all customers and stakeholders.
- **Innovation Strategy** – Sustainability cannot be achieved without innovation, and innovation must aim for sustainable solutions. Our need to move towards more sustainable practices stimulates innovation by setting a high premium on fresh ideas, stimulating creativity in our business, and encouraging us to appreciate our whole value chain in decision making.
- **Open Networks Project** – Outcomes from this project will heavily influence our ability to enable the exponential uptake of low carbon technologies and manage our network assets better in real time, potentially reducing impacts across all of our Sustainability Drivers.
- **Seed funding** – Funding is needed to support communities in moving towards a green economy, the low carbon network transition and environmental benefit.

Identifying and prioritising stakeholders

With a clear purpose defined, we then identified the key stakeholders best placed to provide the insight required and help us achieve our objectives. To do this, we formed an understanding of the existing knowledge levels of our stakeholders on our proposed topics of engagement.

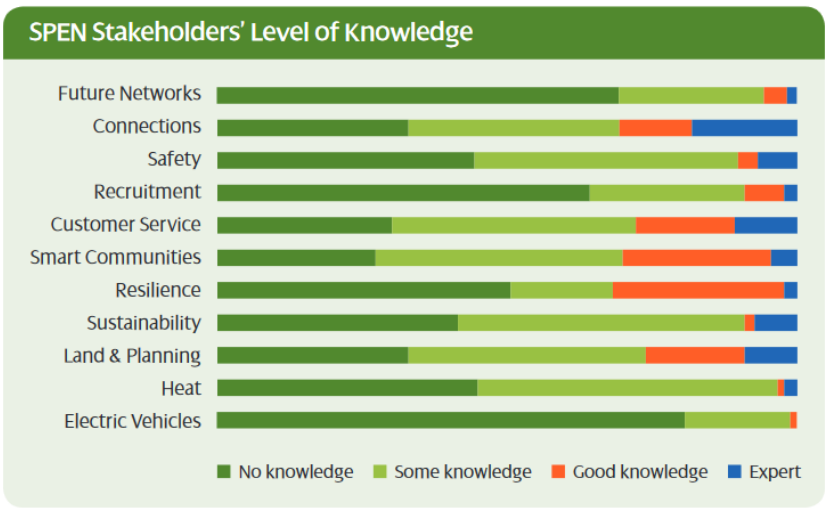


Figure 17: SPEN Stakeholders' Level of Knowledge

We identified and prioritised the specific stakeholders to engage with:

Table 6: Sustainability Stakeholders Identified

Key Stakeholders		
Scottish Environment Protection Agency (SEPA)	2050 Climate Group	Members of the Scottish Infrastructure Circular Economy Forum
Scottish Government	Sustainable Scotland Network	Members of the Major Infrastructure Resource Efficiency Group
Scottish Natural Heritage	National Grid Electricity Transmission	ScottishPower Corporate
Scottish Wildlife Trust	SSEN Transmission	Planet First
WWF Scotland	SP Distribution	
Keep Scotland Beautiful	Ofgem	
Informed Stakeholders		
Independent Transmission User Group	Young Sustainability-focussed Stakeholders	Connections Customers
Supply Chain	SP Transmission Strategic Stakeholder Panel Members	
Broad Interest Stakeholders		
Consumer Groups	Consumers	SPEN Stakeholder Conference Delegates

Tailoring the engagement

We then tailored our plans for engagement to ensure that it delivered maximum value. This involved tailoring content and before, during and after each engagement to enable full inclusivity and accessibility and pitch the information presented and the questions asked at the most appropriate level for the particular stakeholders. It also involved tailoring our engagement methods to reach a wide and varied stakeholder base using the most appropriate engagement vehicle:

Figure 18: Example methods of engagement

Methods used for Sustainability Engagement include:

- Working Groups
- Workshops

- Conferences / Summits
- Online Stakeholder Community
- Project or activity specific engagement
- Forums
- Surveys
- Consultations
- Newsletters
- Reports and action plans

4.2. RIIO-T1 Business-as-usual Sustainability Engagement

Business-as-usual Sustainability Engagement is carried out in line with the Strategy and Plans described above.

Our Sustainability Governance Structure (excerpt shown below), describes the business-as-usual role that external engagement plays in the development and delivery of our Sustainable Business Strategy and shows how the external engagement and internal governance processes interact.

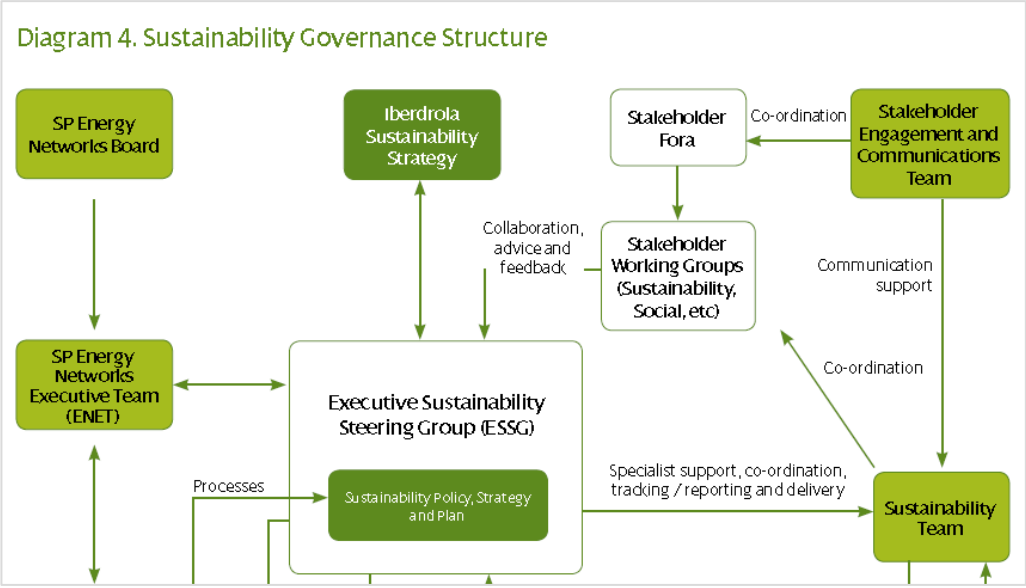


Figure 19: Excerpt from SPEN Sustainability Governance Structure

Showing engagement and governance interactions. Please see SPEN Sustainable Business Strategy 2019 page 19, Diagram 4 Sustainability Governance Structure for the full diagram (excerpt is from top right hand corner).

Sustainable Business Strategy Development

External engagement on the Sustainable Business Strategy is primarily facilitated through the Sustainability Stakeholder Working Group, populated by representatives from organisations with strategic interests in sustainability in the licence areas in which we operate. The organisations represented have a largely National or UK-wide reach, but may include regional bodies. Membership of the group will evolve as the Strategy continues to develop, and currently includes:

- Scottish Environment Protection Agency (SEPA)
- Scottish Government
- Scottish Natural Heritage
- Scottish Wildlife Trust

- WWF Scotland
- Keep Scotland Beautiful
- 2050 Climate Group
- Sustainable Scotland Network
- ScottishPower Corporate representatives

We engaged extensively with the SSWG during 2018-19, reviewing our Sustainable Business Strategy to ensure that we had accurately identified the key environmental issues associated with our business activities. For details of the ways in which stakeholder engagement supports the continual development of the Strategy and information about the most recent stakeholder-led changes to our Sustainable Business Strategy, please see SPEN Sustainable Business Strategy 2019 pages 20, 25, 32 and 35.

Annual Sustainability Plan and Statement

Annual Sustainability Plan

Information collected from regular engagement with specialist stakeholders is reported to internal and external stakeholders and influences Sustainable Business Strategy objectives and Annual Sustainability Plan actions.

- A collaborative workshop with the Scottish Environment Protection Agency identified 16 key shared Carbon and Energy reduction opportunities and challenges. These were documented in a detailed workshop report, communicated to relevant SP Transmission and SEPA stakeholders, and immediate actions were included in the 2019 Sustainability Plan.
- A collaborative workshop with Scottish Natural Heritage identified 13 key shared Carbon and Energy reduction opportunities and challenges. These were documented in a detailed workshop report and communicated to relevant SP Transmission and SNH stakeholders.
- A collaborative workshop with Planet First and Scottish Power Group stakeholders identified a large number of Carbon and Energy reduction opportunities and challenges. These were documented in a detailed workshop report and communicated to relevant SP Transmission, Planet First and Scottish Power Group stakeholders.

Annual Sustainability Statement

Each year, we provide a draft of this statement to a wide range of stakeholders for their comment before we finalise it. This year, stakeholder feedback has been overwhelmingly positive, with stakeholders commenting that they appreciate the inclusion of more data in easy to read graphs, that the document covers all the main areas expected, that target timelines are appropriately aligned with external strategy, and that they find the document easy to read and understand.

Other Business-as-usual Sustainability Engagement

Examples of other business-as-usual Sustainability Engagement include:

- **Annual Transmission Connections Summit** – engaging customers, developers, and interested parties on SP Transmission's activities as a Transmission Owner and how we see the landscape evolving. The engagement informs how SP Transmission innovates to remove barriers to low carbon transition.
- **Innovation project engagement** – Overviews of projects, presentations project partners and development-focussed breakout sessions.
- **Developer forums** – Forums for low carbon and demand developers in locations undergoing significant development, covering project delivery and innovative approaches.
- **Green Economy Fund** – Workshops with interested projects and ongoing project engagement with successful projects
- **Annual supply chain conference** – covering relevant topics such as skills, innovation, and sustainability
- **Supply chain newsletters** – covering project progress and successes, SP Transmission activities, Health and Safety and environmental issues
- **Site newsletters** – covering project-specific Health, Safety, Environmental and Quality (HSEQ) issues.
- **Contractor Health, Safety, Environment and Quality Forum**
- **Online Stakeholder Community** – blogs, Q&A and conversations with interested stakeholders

4.3. Engagement for the development of our Environmental Action Plan

Our RIIO-T2 plan must be sustainable in terms of strategic direction, prioritisation of environmental, economic and social impacts, timelines for delivery and acceptable levels of financial investment. To achieve this, we engaged with a wide range of stakeholders to guide our decision making and develop a well-balanced, fully justified plan that facilitates Net Zero and delivers the objectives outlined above while meeting the needs of network users and consumers.

Working closely with our stakeholders is a vital part of mitigating our environmental impact and ensuring the sustainability of all our investment decisions. This is especially important because of the increasing pace of change in the sustainability agenda, which requires us to be open to new information and ideas and make balanced decisions in response. The delivery of sustainability benefits requires the adoption of new approaches and tools, and sustainability initiatives are both a product of, and reliant upon, location-specific knowledge that stakeholders can provide.

Engagement Plan

We focused our engagement on those stakeholders who are knowledgeable about the environmental and sustainability impacts of our work, or are potentially affected by our plans in this area, as identified above.

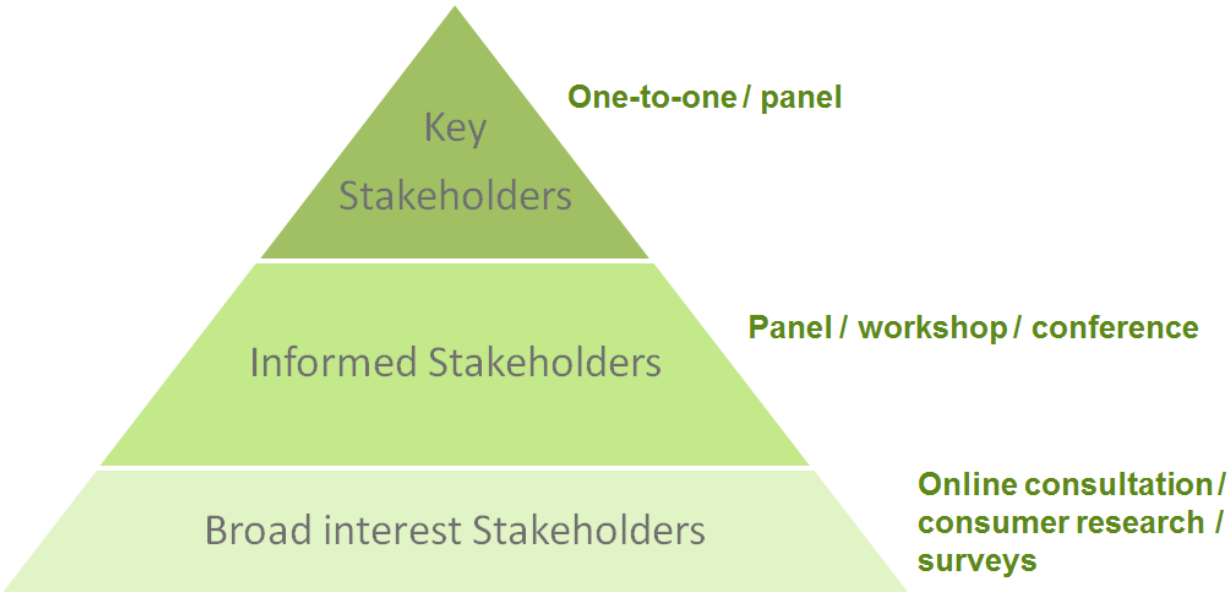


Figure 20: RIIO-T2 Development Sustainability Engagement Hierarchy

Engagement to develop the EAP started with the Sustainability Strategy development activity described above and took place in several iterations:

- **Stage 1 – Identifying stakeholder priorities (Q3 2018-Q2 2019)** – Assessing past, current and future performance, identifying stakeholder needs and desired outcomes, identification and prioritisation of material issues, industry benchmarking, engagement with environmental and energy regulators.
- **Stage 2 – Educating stakeholders and understanding values (Q2-Q3 2019)** – Understanding the value of our activities and services, public consultation on incentive proposals, roundtable discussions with SSWG, environmental regulators and informed stakeholders, joint Transmission Operator consumer willingness to pay research, SP Transmission-specific willingness to pay research, coordination with other network operators to share best practice, cross-vector engagement with government and major infrastructure organisations.
- **Stage 3 – Co-creating our business plan (Q3-Q4 2019)** – Developing, testing and refining business plan and agreeing performance levels, benchmarking of draft business plans with other operators, incorporation of Transmission User Group feedback, incorporation of Consumer Challenge Group feedback, detailed topic-specific engagement with Key and Informed Stakeholders, incorporation of feedback from external experts.

- **Stage 4 – Business Plan acceptability (Q4 2019)** – engagement with SSWG, Key and Informed stakeholder to finalise commitments and costs, engagement to confirm Broad Interest stakeholder acceptance of commitments and costs, incorporating final feedback from independent Transmission User Group and Consumer Challenge Group, initial engagement on next steps for commitment delivery.

Engagements and Outputs

We worked with our long established Sustainability Stakeholder Working Group (SSWG) and the Transmission User Group, who have expertise and a broad understanding of our RIIO-T2 plans. Engagement with the SSWG helped us define high level strategy and materiality and identify relevant stakeholders.

Workshops with environmental regulators, supply chain and our Young Energy Force stakeholder groups further defined the materiality and prioritisation of our environmental and sustainability plans.

We engaged with network users and consumers through our Willingness to Pay and Willingness to Accept surveys – these identified and prioritised key environmental areas that users and consumers would like us to focus on and the related values they attributed to these activities.

Our online consultation defined stakeholder expectations on carbon reduction, visual amenity and embedding environmental considerations within our plan.

We held targeted one-to-one engagement with key environmental stakeholders SEPA and SNH to ensure our plans are informed by priority areas (SF6, pollution prevention, biodiversity, natural capital, carbon and sustainable resource use). We also engaged with the Scottish Infrastructure Circular Economy Forum and supply chain members to align our proposals on sustainable resource use, embodied carbon and supply chain sustainability.

We proactively engaged with SP Distribution as our related DNO and with National Grid Transmission and SSEN Transmission as our TO peers, at all key stages of plan development.

The independent User Group provided welcome feedback on our environmental proposals for RIIO-T2 and is supportive of Ofgem's Environmental Action Plan.

Table 7: RIIO-T2 Sustainability – Key External Engagement and Outputs

Engagement	Purpose	Outputs
Stage 1 – Identifying stakeholder priorities (Q3 2018-Q2 2019)		
Sustainability Stakeholder Working Group	Guiding SP Transmission's strategy to become a leading sustainable networks business and to support the low carbon transition. A platform for discussion on a range of sustainability issues, considering appropriate measures to address these issues and how potential objectives and actions are to be reflected in the SPEN Sustainability Policy, Strategy and Plan.	• Mapping of high level shared priorities against the Sustainable Development Goals • Updated Sustainable Business Strategy for 2019, recognising new challenges and opportunities, identifying enablers and updating Sustainability Drivers and Objectives • Guidance on the most effective engagement methods and timeline for Environmental Action Plan development.

Engagement	Purpose	Outputs
Scottish Environment Protection Agency (SEPA) Collaboration Workshop	Predominantly Transmission-focused event designed to uncover shared environmental challenges and opportunities, then define the collaborative or innovative actions to meet them.	• Detailed list of shared current and future priorities. • Agreed collaborative actions, including agreement to discuss entering into a Sustainable Growth Agreement.
Scottish Natural Heritage (SNH) Collaboration Workshop	Predominantly Transmission-focused event designed to uncover shared environmental challenges and opportunities, then define the collaborative or innovative actions to meet them.	• Detailed list of shared current and future priorities. • Agreed list of collaborative actions, including agreement to closer project-based engagement in future.
Young Energy Force	Discussing what future bill payers believe SP Transmission should prioritise in terms of sustainability and environmental impacts.	• Detailed lists of prompted and unprompted sustainability priorities for young and future stakeholders.
Stage 2 – Educating stakeholders and understanding values (Q2-Q3 2019)		
Transmission Operator Sustainability Best Practice Sharing Group	Group initiated and meetings co-ordinated / driven by SP Transmission, discussing environmental sustainability strategies, identifying shared goals and best practice, and collaborating on projects to achieve common aims.	• Discussion of Sustainability Strategies. • Sharing of Sustainable Development Goal mapping activities. • Agreement of new collaboration areas including: o Circular economy/resource optimisation o Sustainable procurement o Data o Carbon reduction o Biodiversity Net Gain / Natural Capital

Engagement	Purpose	Outputs
Willingness-to-Pay Consumer Research	Collaborative consumer research first proposed by SP Transmission via the Transmission Best Practice Group and carried out with the other TOs, which provided a base estimate for societal valuations to aid non-load business planning decisions. Followed up by SP Transmission-specific Willingness-to-Pay research.	• High priority and willingness to pay on all Sustainability and Environment areas, including: o Supporting the low carbon transition by investing in infrastructure to connect renewable generation and utilising the network more efficiently. o Making sure the most vulnerable in society are not left behind in the Low Carbon transition. o Reducing our business carbon footprint and setting strong expectations for reducing supply chain carbon impact. o Improving the visual impact of existing assets and supporting local communities, especially in areas where we carry out work. o Improving the environment around our assets, including developing opportunities to enhance biodiversity and build stronger links between habitats. o Setting strong expectations for sustainable resource management and waste reduction throughout the whole project life cycle. o Collaboration is seen as a priority, especially in regard to the collection, analysis and sharing of data.
#ChallengeOurPlan Sustainability and Environment Public Consultation	Consultation to gather public views on environmental impact areas to be embedded in our plan, on early proposals for SF6 reduction, continuation of the Green Economy Fund and Visual Amenity	• Defined stakeholder expectations to date on carbon reduction, visual amenity and embedding environmental considerations within our plan. • No significant feedback received via this engagement.
SEPA SF_6 Workshop	Review of SF_6 options considered, engineering justification, market readiness and cost benefit.	• Agreement in principle of draft SF6 reduction and management plans for RIIO-T2, including commitments to install SF6-free alternatives where there are technically feasible market-ready solutions.
Independent Transmission User Group	Providing external challenge and input to our Plan. Created to include traditional and non-traditional stakeholders, such as transmission customers, academics, industry experts and community representatives.	• Encouraged greater ambition in Biodiversity Net Gain and Losses commitments • Highlighted the importance of the supply chain, embodied carbon and procurement • Suggested inclusion of Business Carbon Footprint graph
Stage 3 – Co-creating our business plan (Q3-Q4 2019)		

Engagement	Purpose	Outputs
Supply Chain Engagement Event	Forum for all SP Transmission suppliers, discussing forward looking plans and new ways of working.	• Highlighted the benefits of Supply Chain Sustainability School membership. • Provided a detailed view of current Supply Chain reporting and sustainability capability. • Highlighted the need for Supply Chain members to be able to influence projects at an early enough stage to be able to deliver sustainability benefits • Highlighted the benefits of a procurement process which asks for and supports sustainability-driven proposals • Highlighted the need for sufficient SP Transmission resource to drive Supply Chain Sustainability. • Encouraged greater collaboration across the supply chain and with network operators and infrastructure organisations.
Sustainability Stakeholder Working Group	As above	• Interrogated the process for delivering the new SF6 offsetting commitment. • Recognised the hierarchy approach taken throughout the EAP including the SF6 commitments. • Examined fleet decarbonisation profiles and the related carbon reductions, agreeing with the decision to withhold judgement on HGVs until technologies reach sufficient maturity. • Highlighted the need for clearer wording on Circular Economy to ensure that all readers understand. • Discussed merits of Supply Chain Sustainability School membership.

Engagement	Purpose	Outputs
SEPA Commitments and Sustainable Growth Agreement Workshop	Discussing the ongoing development of the SP Transmission Sustainable Growth Agreement and input on RIIO-T2 Environmental Action Plan proposals	• Discussed the need for the EAP or related uncertainty mechanisms to include the ability to include activities on currently unknown historic land contamination. • Highlighted the need to consider the consequences of under-delivery in T2. • Emphasised the need for SP Transmission to prioritise the big circular economy activities which will bring the greatest long term benefit over smaller ones which only bring short term benefits. • Underlined the benefits of developing a Sustainable Growth Agreement in terms of driving 'bigger thinking' and bringing in external influences and best practice. • Highlighted the need to consider climate change resilience in its broadest sense – not just in terms of flooding. • Recognised that Biodiversity Net Gain is a very substantial area and that tree planting programmes in Scotland will enable some benefits. • Highlighted the move to electricity for heat which will be a significant aspect of T3 plans.

Engagement	Purpose	Outputs
SNH Biodiversity Net Gain Workshop	SNH Biodiversity Net Gain and Natural Capital developments, SP Transmission-proposed RIIO-T2 commitments on Biodiversity Net Gain and Natural Capital	• Provided background as to past discussions on Biodiversity Net Gain for Scotland and SNH's role. • Highlighted the need for a strategic approach which enables grouping of biodiversity enhancements in the locations where they can deliver the greatest value, but which also enables a community and place-based approach and strong ongoing engagement. • Identified that government and agency buy-in is key, and that there is a need for Scotland-wide coordination. • Underlined the need to understand the approaches and resources required to prove the ongoing viability of biodiversity net gain initiatives, which can take a long time to establish. • Highlighted the need to consider the lifecycle costs of green infrastructure in planning – how will communities fund the upkeep? • Discussion of data requirements, national data sharing initiatives and the need for SP Transmission to create a baseline data set for biodiversity. • Identification of biodiversity net gain aspects currently still to be defined in Scotland, including Scottish Government legislation, SNH and CIEEM role in coordinating national discussions, • Confirmation that SNH would expect to see a firm commitment to net gain, but recognition of the challenges in SP Transmission committing to this ahead of developing baseline data and in advance of Scottish Government legislation on Biodiversity Net Gain.
Net Zero Fund Engagement	Engagement with 16 consumer, community energy, vulnerability, green transport and policy-focused organisations including Community Energy Scotland, Citizen's advice and Scottish Government.	• Request from Scottish Government and Citizens Advice that the Fund should include a focus on vulnerability and heating solutions. • Consultation on Fund criteria to ensure that it will directly and indirectly support communities in vulnerable circumstances.
Consumer Challenge Group	Independent group acting as a 'critical friend' to ensure that the RIIO-T2 settlement meets the needs of existing and future consumers.	• Ranked October draft sustainability plans as Amber/Green. • Highlighted need for more effective justification of costs • Highlighted that some targets appeared to be back-end loaded • Highlighted that SF6 reduction places reliance on manufacturers to drive change and suggested that we could do more, for example by piloting new solutions.

Engagement	Purpose	Outputs
Transmission Operator Sustainability Best Practice Sharing Group	As above	• Shared and discussed EAP commitment proposals and approach to completing EAP data tables. • Confirmed wording of shared commitments.
Scottish Infrastructure Circular Economy Forum	Cross-industry infrastructure forum discussing approaches for - and implications of - moving towards a circular economy.	• Discussion of the Environment Link call for a strong circular economy bill for Scotland • Identification and prioritisation of key circular economy impacts for infrastructure in Scotland.
Stage 4 – Business Plan acceptability (Q4 2019)		
Willingness-to-Accept Consumer Research	Independent research to understand the extent to which SP Transmission's RIIO-T2 Business Plan is accepted by consumers and stakeholders.	• 82% of domestic consumers and 80% of business consumers found SP Transmission's Business Plan acceptable. • Among in and out-of-patch domestic consumers, 84% in-patch and 80% of out-of-patch consumers said that they agreed with the aim to drive cost and environmental efficiencies through a focus on innovation

Responding to Feedback

As a result of feedback from our supply chain and independent Transmission User Group, we have created a new Supply Chain Sustainability section within our plan and committed to considering environmental sustainability in our procurement processes in line with ISO20400, becoming a Supply Chain Sustainability School Partner, increasing our supply chain management resources to enable the collection and analysis of enhanced data and a greater level of collaborative working, and engaging with suppliers early in the development of projects to enable them to propose environmental improvements at concept and design stages.

Engagement with independent Transmission User Group, environmental regulators and biodiversity experts highlighted a desire to set specific biodiversity net gain targets ahead of the development of Scottish legislation. Biodiversity data on our landholdings is not yet sufficiently mature to enable us to develop a meaningful and achievable net gain target and indicative Scottish Government timelines suggest that development of legislation will start during RIIO-T2. Therefore, we have committed to identifying, monitoring and reporting metrics to baseline and track the value of natural capital and levels of biodiversity on our sites and working with local communities, landowners and other stakeholders to deliver 'no net loss' in biodiversity and identify options for delivering 'net gain'. We have proposed an uncertainty mechanism to enable us to deliver any cost effective biodiversity enhancements identified as a result.

Our Sustainability Stakeholder Working Group asked us to clarify which circular economy principles we were planning to embed in our processes. We provided clarification that we will follow an appropriate, recognised standard, such as the BS8001 circular economy implementation framework.

The Consumer Challenge Group and independent Transmission User Group challenged our commitments on SF6 reduction, noting that these placed reliance upon manufacturers to drive the change. In response, we have developed a new commitment to drive the development and adoption of SF6-free technologies, collaborating with supply chain and industry peers and piloting new technologies where technically viable.

In face to face engagement, 80% of consumers agreed with our aim to drive cost and environmental efficiencies through innovation and over 80% accepted the cost of our plan.

The following table tracks the changes that we have made to our Environmental Action Plan in response to stakeholder feedback across all stages of our engagement:

Table 8: Changes made to EAP in response to stakeholder feedback

Section	Type of Change	Description	Led by
Title page	Addition	Updated introductory text to highlight step-change in activity from T1, our positive response to the new regulatory framework, the linkage to our existing Sustainable Business Strategy, clarify that the focus of the chapter is on 'beyond compliance' activities and highlight how the chapter supports our four Strategic Objectives.	Complete Strategy feedback
Title page	Addition	In response to feedback that our commitments appeared 'back-end loaded', included a key to the timelines laid out in our submission to show that activity will start ahead of, or early in T2 for all commitments, and to show the rationale for setting particular timelines.	Consumer Challenge Group feedback, Sustainability Stakeholder Working Group feedback, User Group feedback.
Consumer Value Proposition	Update	Included £ values and reformatted CVP to align with the format used elsewhere in the BP. Added CVP for EV fleet benefits and updated SF6 and Losses benefits figures.	Complete Strategy feedback, Internal feedback
Costs Pie Chart	Addition	Included pie chart of costs and customer bill impact	Internal feedback
Stakeholder Engagement	Update	Updated to include recent engagement with supply chain and environmental regulators and to clarify youth engagement.	Complete Strategy feedback, Internal feedback
Stakeholder Engagement	Update / Addition	Updated to provide more specific examples of aspects of our Environmental Sustainability plan which have changed as a direct consequence of stakeholder feedback. Added statement on Customer Willingess to Accept results.	Complete Strategy feedback, Customer Willingness to Accept research
Throughout	Addition	Added costs for each section	Internal feedback
Throughout	Addition	Added more detail on T1 performance	Complete Strategy feedback
Delivering a more sustainable network	Addition	Created a new section with commitments on Supply Chain Sustainability	Supply Chain feedback, Complete Strategy feedback
Decarbonising our network and assets	Addition	Included a business carbon footprint graph to illustrate T1 performance	User Group feedback, Complete Strategy feedback
Decarbonising our network and assets	Update and Addition	Moved Embodied Carbon to sit at the beginning of the section, broadened title to refer to Scope 3 emissions, developed three new commitments, including one committing to collaboration with other Transmission Operators to assess and manage capital carbon and drive efficiencies throughout our shared supply chain.	Supply Chain feedback, Complete Strategy feedback, TO feedback

Section	Type of Change	Description	Led by
Decarbonising our network and assets	Kept the same / minor update	User group feedback asked whether we could make our loss reduction target more specific and include a % reduction target. We are not minded to update the commitment to include a hard target as it is not possible to measure the actual outcome in terms of loss reduction, and because the carbon footprint of losses is dictated by the carbon intensity of energy generation, which is not within our control. Instead, we have added some detail on the likely reduction in losses in MWh/%.	User Group feedback
Decarbonising our network and assets	Update and Addition	Included SF6 text to describe T1 performance. Developed a new commitment to offset carbon impact where a leaky asset cannot be removed during T2 and where all other courses of action have been exhausted. Developed a new commitment to drive the development and adoption of SF6-free technologies, collaborating with supply chain and industry peers and piloting new technologies where technically viable in response to Consumer Group feedback.	Consumer Group feedback, User Group feedback, Internal feedback
Decarbonising our network and assets	Update	Updated our fleet decarbonisation commitment to align with recent Iberdrola EV100 announcement - replacing 100% of our 72 cars and vans with electric alternatives during T2.	Internal feedback
Decarbonising our network and assets	Update and Addition	Moved Losses to sit at the end of the section and included text which explains that losses carbon footprint is largely outside our control as it is dictated by the amount and behaviour of electricity flowing into and across the network, and the carbon intensity of the energy generated.	Internal feedback
Decarbonising our network and assets	Update and Addition	Moved Climate Change Adaptation to sit at the end of the section and added a new commitment on adaptation reporting	Internal feedback
Reducing our environmental impacts	Addition	Added two new pollution prevention commitments to identify, risk assess and address high risk legacy land contamination and to eliminate the risk of PCBs on our network.	Environmental regulator feedback, Internal feedback
Reducing our environmental impacts	Update and Addition	Broadened 'Enhancing Biodiversity' title to 'Land and Biodiversity'. Updated introductory text to clarify which activities are already embedded. Explained why we're not currently in a position to set biodiversity or natural capital net gain targets at this time, as we will not have the baseline data required to enable setting of an accurate target until into T2, and because we feel it is important to be able to align our targets with Scottish legislation as it is developed. Updated commitments to strengthen and clarify.	Environmental regulator feedback, User Group feedback, Internal feedback, TO feedback

Section	Type of Change	Description	Led by
Reducing our environmental impacts	Update and Addition	In response to Sustainability Stakeholder Working Group feedback, we updated Sustainable Resource Use and Waste Reduction to clarify that our approach will align to an appropriate and recognised standard (such as BS8001 circular economy implementation framework). In response to Supply Chain feedback, we highlighted the importance of effective procurement processes and collaboration with supply chain in achieving our commitments. Updated commitments to strengthen and clarify.	Sustainability Stakeholder Working Group feedback, Supply Chain feedback, Internal feedback
Supporting the transition to an environmentally sustainable, low-carbon energy system	Update	Updated section introduction to include Sustainability Drivers as in the other sections.	Internal feedback
Supporting the transition to an environmentally sustainable, low-carbon energy system	Update	Updated Net Zero Fund text to set out our proposal and the related objectives and governance in more detail. Updated to highlight engagement carried out in the development of the fund, provide more detail on proposed benefits and governance and to show stronger links to Scottish Govt policy. Updated to include details of T1 performance, stakeholder support quotes and our definition of communities in vulnerable circumstances.	Consumer group feedback, Scottish Government feedback, Complete Strategy feedback
Supporting the transition to an environmentally sustainable, low-carbon energy system	Addition	Included a section on Maximising environmental benefit from operational land, describing our proposal to release unused operational land to local community energy projects, allowing them to use sites for free to generate and deliver energy to their local communities.	Internal feedback, TO feedback

4.4. RIIO-T2 Engagement

Engagement Strategy

As in RIIO-T1, our Engagement Strategy will be updated on a regular basis and will continue to align to relevant international standards. Business engagement will continue to be validated by a sufficiently qualified independent organisation. Our strategy for engagement to deliver our RIIO-T2 EAP commitments will therefore evolve as the Engagement Strategy evolves.

Throughout RIIO-T2, the insights of the Independent Transmission User Group and our Sustainability Stakeholder Working Group will continue to influence the ongoing development of our **Sustainable** Business Strategy and the delivery of our commitments.

Engagement, Collaboration and Reporting

Commitments

Recognising that timely, tailored and effective engagement is central to delivery across all areas of our Action Plan, we have identified a range of engagement, collaboration and reporting commitments required for delivery throughout RIIO-T2:

Accommodating the Sustainability step-change

- We will collaborate with SEPA on a Sustainability Growth Agreement.
- We will continue to drive industry-wide collaboration in RIIO-T2 for the benefit of all customers.
- We will continue to engage our key environmental stakeholders via our Sustainable Stakeholder Working Group, ensuring progress via collaboration activities arising from this engagement.
- We will continue to provide transparent reporting of our environmental and sustainability performance publishing an annual report of our progress against all environmental and sustainability commitments (as detailed in our Environmental Action Plan in Annex 7) in line with metrics and a format developed in collaboration with the other TOs.

Supply Chain Sustainability

- We will work in collaboration with our suppliers and industry peers to develop a suite of targets and impact metrics designed to drive environmental improvements throughout our value chain.
- We will work in collaboration with our suppliers and industry peers to develop a suite of targets and impact metrics designed to drive environmental improvements throughout our value chain.
- We will engage with suppliers throughout the duration of their contracts to continue to reduce impacts and optimise benefits
- We will increase our internal supply chain management resources to enable the collection and analysis of enhanced data and a greater level of collaborative working.
- We will engage with suppliers early in the development of projects to enable them to propose environmental improvements at concept and design stages

Reducing Embodied Carbon

- We will work collaboratively with our stakeholders, including the other Transmission Operators, throughout RIIO-T2 with the aim of assessing and managing capital carbon on our projects, driving efficiencies throughout our supply chain, and sharing best practice.
- We will, in collaboration with the other Transmission Operators, introduce a measurement tool for embodied carbon in new projects, in order to establish a baseline and set a reduction target.
- We will collaborate with our supply chain and other Transmission Operators to drive scope 3 and embodied carbon footprint reductions.
- We will collaborate with our supply chain to implement sustainable project sites to reduce carbon and other impacts, for example energy efficiency, diesel use, re-use of materials and reducing impact of transportation.

Business Carbon Footprint – Sulphur Hexafluoride (SF6)

- We will drive the development and adoption of SF6-free technologies, collaborating with supply chain and industry peers and piloting new technologies where technically viable.

Business Carbon Footprint - Other

- We will strive to lead the decarbonisation of fleet vehicles, working with suppliers and other fleet operators to pilot technically viable alternatives to drive technical advancements and early adoption.

Climate Change Adaptation

- We will publish a report in line with the 3rd Round of Adaptation Reporting under the Climate Change Act, in line with the Energy Networks Association work to produce a sector report.

Land and Biodiversity

- We will work collaboratively with our stakeholders, including the other Transmission Operators, throughout RIIO-T2 to develop and pilot a common approach and robust methodologies for delivering Biodiversity Net Gain alongside Natural Capital assessment and enhancement.
- We will identify, and subsequently monitor and annually report, metrics to baseline and track the levels of biodiversity and value of natural capital on our sites and the achievement of our targets.
- We will work with our local communities, landowners and other stakeholders to deliver 'no net loss' in biodiversity and identify options for delivering 'net gain'.

Enhancing Visual Amenity

- Where supported by visual amenity assessment and stakeholder engagement, and when cost effective to do so, we will deliver visual amenity mitigations for those existing assets not identified for upgrade or refurbishment during RIIO-T2.

Sustainable Resource Use and Waste Reduction

- We will continue our work to minimise the environmental impacts of our use of aggregates (soils and stones) via collaboration with other TOs, our supply chain and membership on infrastructure resource optimisation groups with the aim of identifying and implementing solutions to reduce the use and disposal of aggregates, including increased use of secondary aggregates.
- We will continue to collaborate with environmental / waste regulators, other infrastructure companies and our supply chain to drive sustainable resource use and waste minimisation in order to meet our RIIO-T2 and Sustainability Goals.

Net Zero Fund

The significant engagement carried out in the development of our Net Zero fund focus and criteria will continue as we develop the Fund leading into RIIO-T2. During RIIO-T2, engagement will focus on workshops with interested projects and ongoing project engagement with successful projects.

Reporting

We welcome Ofgem's decision to introduce an obligation for a public environmental report through a new licence obligation. Whilst we already publish our Business Carbon Footprint data and other qualitative information in our Transmission Annual Sustainability Statement, we recognise that this does not cover the full extent of our impacts. We will work collaboratively with Transmission Operators and other stakeholders to develop a consistent and appropriate approach in the lead up to RIIO-T2. The metrics we propose to use to track our performance are identified in the following sections in this Environmental Action Plan.

In addition to this environmental content, we will report our wider sustainability performance annually, demonstrating our contribution to the sustainable development agenda.

5. DELIVERING A MORE SUSTAINABLE NETWORK

5.1. Our Vision

Our Vision is to be a sustainable networks business:

- Efficiently managing and developing our network in support of the low carbon transition; and
- Achieving neutral or positive environmental and social impacts.

We will be a leader in this area. Our actions to become a sustainable network operator will drive our supply chain and support our customers and communities to become more sustainable.

We will work in collaboration with national and local stakeholders to understand their needs and to maximize the positive social and economic impacts of our operations on communities, including education, skills and employment.

Our 'sustainable business' model will be characterised by:

- Consideration of environmental, social and economic costs and benefits in decision making;
- Collaboration with stakeholders; and
- Transparency in decision-making processes and reporting of performance.

5.2. Our Objectives

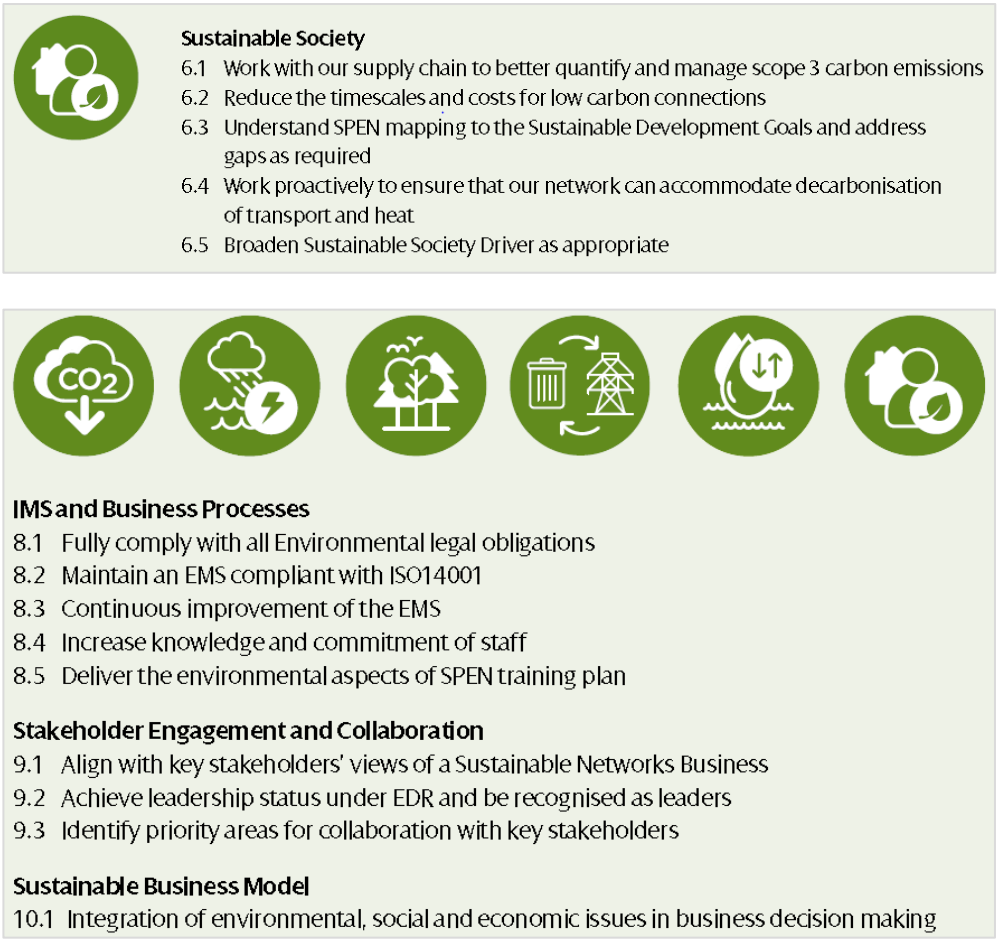


Figure 21: SP Energy Networks Sustainable Business Strategy – Sustainable Society and Process Objectives

5.3. RIIO-T1 Performance: Accommodating the sustainability step change

Environmental Management System

Our Environmental Management System (EMS) has been certified to the relevant International Standard, ISO14001, for over a decade and environmental controls are therefore embedded in our business processes. The Plan Do Check Act cycle upon which the Standard is based ensures that we continuously review our environmental impacts, ensuring compliance with environmental legislation and prioritising the most significant impacts for action to reduce (please see Appendix A for details of our current SP Transmission Network Environmental Aspects and Impacts Register and a description of the process by which it is produced). External certification gives us confidence that our internal systems are to the required standard and that we continue to meet the Standard's requirements for legal compliance and continual improvement.

Data and Reporting

Throughout T1 we have been working to improve the quality and completeness of our environmental data. Some of these improvements can be tracked through the Commentary provided with our annual RRP returns. We achieved the Planet Mark verification for our 2016/17 carbon footprint and successfully retained this Standard for the two years since.

As well as the Business Carbon Footprint data that we report annually to OFGEM, we also collect data on other environmental impacts, including waste disposal (from our Depots and disposed of by contractors on our behalf) and

environmental incidents. We report all our environmental data to our parent company for inclusion in the annual Iberdrola Sustainability Report.

We successfully influenced OFGEM to change the publication timetable for the annual report required for the T1 Environmental Discretionary Reward to allow us to include yearend data, as requested by our stakeholders. This allowed us to publish data on carbon and waste for the first time in 2018/19. Please see our 2018/19 Transmission Annual Sustainability Statement on our website.

Training and Awareness

We are part way through a very substantial environmental training programme to ensure that all staff have the relevant knowledge to be able to competently manage environmental issues that they encounter in their daily work. This programme includes several e-learning courses as well as classroom courses on managing environmental risk and environmental leadership. The primary aim of this programme is to ensure adequate levels of knowledge to ensure environmental compliance and we expect our environmental incident rate to drop, as well as other improvements relating to environmental impact reductions.

Definition of Strategy and Goals

Our Sustainable Business Strategy took a year and a half to develop, involving extensive stakeholder input, and was published in early 2018. This Strategy is very ambitious in its Goals, as we believe this is required in order to deliver decarbonisation and avoid catastrophic impacts on our eco-systems. Our stakeholders agreed, and subsequent events such as the increased public awareness campaigns and the publication of the Committee on Climate Change Net Zero report serve to support our ambition.

Stakeholder Engagement and Collaboration

In order to develop our Strategy we established our Sustainability Stakeholder Working Group (SSWG) which meets quarterly and brings together our key environmental sustainability stakeholders including the Scottish Environment Protection Agency, Scottish Natural Heritage, the Scottish Government, the Scottish Wildlife Trust, Keep Scotland Beautiful, the Sustainable Scotland Network and the 2050 Climate Group. The Group's initial aim was to draft SPEN's Sustainable Business Strategy. Following its publication, the SSWG's purpose is to allow the identification and implementation of opportunities for members to collaborate on common sustainability goals. This Group provided considerable input to our T2 Business Planning process.

In order to deliver the ambitious vision described in our Sustainable Business Strategy, we were instrumental in establishing the TO 'Sustainability Best Practice' group. Collaboration will be necessary to achieve decarbonisation, sustainable resource use and biodiversity protection with the urgency required at efficient cost. The aim of this group is to share best practice and experiences and to work together to drive reductions in common environmental impacts, avoiding duplication of effort and cost.

5.4. RIIO-T2 Commitments: Accommodating the sustainability step change

Environmental Management System

Our EMS forms the basis of our management of our environmental impacts and we will continue to prioritise its continuous improvement and ongoing certification to ISO14001:2015 as the foundation for environmental compliance and moving 'beyond compliance' to deliver our strategic goals.

Data and Reporting

We will continue our work to improve the quality and completeness of our environmental data, shifting the focus upstream from operational impacts to those occurring in our supply chain and during the design and construction of our assets. We will also work to ensure that this data is available to those who need it to make sustainable decisions. This includes enhancements to our Geographical Information Systems to make environmental data visible to those planning or delivering works on the network. There is a significant amount of data available externally that would be beneficial to our decision making and/or could cut our costs, some of which we have identified via our Sustainability Stakeholder Working Group, and we will be progressing data sharing arrangements with relevant organisations.

We have laid out in this EAP the metrics that we propose to use to track delivery of our actions and achievement of our targets and goals. We will work with the other TOs to agree a common reporting methodology and set of metrics for use in the annual Environmental Report that OFGEM are proposing to introduce for T2.

Training and Awareness

We will continue to improve our environmental training provision for staff and will ensure that training is provided in the new processes and systems introduced to deliver compliance with our T2 commitments. This training will be extended, where relevant, to our supply chain.

Stakeholder Engagement and Collaboration

Our Sustainability Stakeholder Working Group (SSWG) will continue to form the basis of our engagement with our key environmental sustainability stakeholders. Now that the T2 Business Plan has been submitted, the aim is to move the focus to the delivery of collaboration projects that will be instrumental in delivering our goals and those of our stakeholders.

Our planned Sustainable Growth Agreement with SEPA will be one such collaboration project and will lay out the actions for both parties to facilitate us to move 'beyond compliance' and deliver our strategic and T2 environmental sustainability goals.

With our TO colleagues, we have made several common commitments to collaborate on key aspects of our T2 plans including decarbonisation, sustainable resource use and biodiversity protection and enhancement, particularly in relation to our common supply chain. This work will start immediately in preparation for T2.

We will continue to participate in collaboration groups with other networks and infrastructure companies, with the aim of identifying and sharing best practice and working together to find practical and optimal solutions, including:

- Major Infrastructure Resource Optimisation Group (MI-ROG)
- Scottish Infrastructure Circular Economy Forum (SICEF)
- Energy Networks Association Environment Committee
- Supply Chain Sustainability School

Table 9: RIIO T2 Commitments: Accommodating the sustainability step change

Commitment	External source/ justification	Timeline
We will maintain and continually improve our ISO14001 certified Environmental Management System to achieve 'beyond compliance' environmental performance.	Continuing business as usual	Throughout RIIO-T2
We will collaborate with SEPA on a Sustainability Growth Agreement.	External Stakeholder - Environmental Regulators	By 2021
We will embed a process for Initial Environmental and Sustainability Reviews (IESRs) for all relevant projects, to identify potential environmental issues and opportunities at the earliest stage.	Ofgem	By 2021
We will improve the quality of environmental data collected and analysed at all stages of the asset lifecycle, investing in enhanced geospatial systems and formalising data sharing collaborations with key stakeholders.	External Stakeholder - Environmental Regulators, Sustainability Working Group, User Group, Expert Reviewers	By 2023
We will continue to ensure that our staff, contractors and supply chain have the skills and knowledge to move beyond compliance and achieve our Sustainability Goals.	External Stakeholder - Supply Chain	By 2023

Commitment	External source/ justification	Timeline
We will continue to drive industry-wide collaboration in RIIO-T2 for the benefit of all customers.	External Stakeholder - Supply Chain, Ofgem, Operators	Throughout RIIO-T2
We will continue to engage our key environmental stakeholders via our Sustainable Stakeholder Working Group, ensuring progress via collaboration activities arising from this engagement.	External Stakeholder - Sustainability Working Group, Environmental Regulators, Expert Reviewers	Throughout RIIO-T2
We will continue to provide transparent reporting of our environmental and sustainability performance publishing an annual report of our progress against all environmental and sustainability commitments (as detailed in our Environmental Action Plan in Annex 7) in line with metrics and a format developed in collaboration with the other TOs.	Ofgem, External Stakeholder - Sustainability Working Group, Operators	Throughout RIIO-T2

Metrics

Table 10: RIIO T2 Metrics: Accommodating the sustainability step change

Metric	Unit	Normalisation Factor
ISO14001:2015 certification	Certification	n/a
Training Plan delivery	% of Training Plan target	n/a
Stakeholder Engagement Plan delivery	% of Engagement Plan target	n/a

RIIO-T2 Cost

£0.3m

5.5. Supply Chain Sustainability

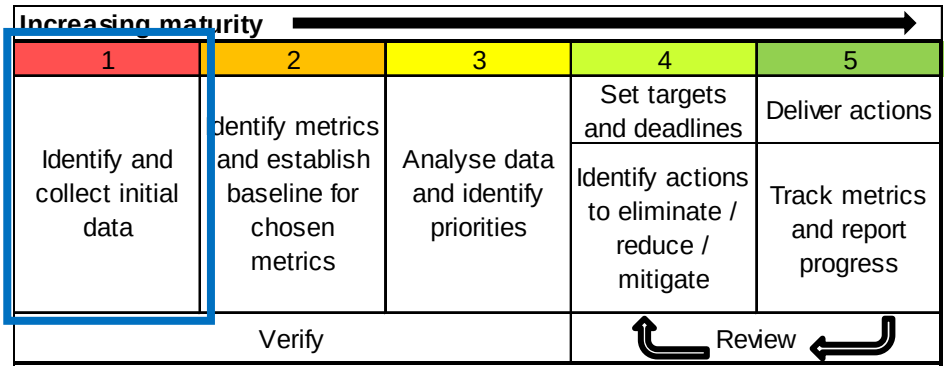
Our strong relationship with our supply chain is critical to the successful and sustainable delivery of our plans. Our diverse suppliers provide a wide range of services throughout the whole lifecycle of assets, including design, manufacture and installation. Beyond safe, efficient and compliant works, we must collaborate to minimise environmental impacts, set enhanced environmental standards and drive industry-wide environmental improvements, drawing on the huge breadth and depth of expertise and services within our supply chain.

RIIO-T1 Performance

During RIIO-T1, we updated our standard contract terms, pre-qualification questionnaires and specifications, obligating suppliers and contractors to meet high environmental management standards and report their progress monthly. Suppliers and contractors have helped us to reduce the environmental impact of many of our projects, from enabling the re-use of thousands of tonnes of materials to greater use of recycled materials.

We conducted a pilot Life Cycle Assessment of one of our T1 windfarm connection projects, which identified that around 70% of the environmental impacts associated with our network are in our supply chain, findings backed up by our stakeholders and with similar figures quoted by other organisations. This pilot provided data we can use to prioritise impact reduction actions and has informed our T2 plans to a significant degree.

Level of maturity:



RIIO-T2 Commitments and Metrics

As a result of our level of maturity with respect to supply chain sustainability identified above, and as outlined in the Table below, we will be embedding sustainability considerations in our supply chain by taking action in several key areas. We recognise that our ability to influence these environmental impacts is greatest at the point at which we specify contracts and designs, so that is why we are updating our specification, design, procurement and contract management processes to maximise the positive benefit delivered through our supply chain. We will:

- Adapt our business processes to include sustainability considerations throughout the value chain. We plan to use PAS2080: Carbon Management in Infrastructure and ISO20400: Sustainable Procurement to guide us.
- Revise our procurement approach by including a carbon metric in our tender assessment process to ensure that the carbon costs as well as the financial costs are factored into our decision making.
- Embed requirements for environmental legal compliance, impact reduction and data reporting in our contractual processes and documents. We will introduce, in collaboration with our supply chain, a supplier standard or code of conduct defining expectations for supplier environmental performance which will form part of our contracts. Again in collaboration with our suppliers we will agree a suite of environmental contract metrics to allow us to measure performance and improvements. We propose to work with the Supply Chain Sustainability School to support all members of our supply chain to achieve these new standards and to gain the necessary knowledge to realise the benefits of reducing their own impacts and thereby support us to reduce ours.
- Work with our supply chain throughout the investment process, by involving them earlier to maximise opportunities to design out impacts and working with them throughout the planning, construction and operation stages to identify opportunities to reduce environmental impacts.

Table 11: RIIO T2 Commitments: Supply Chain Sustainability

Commitment	External source/ justification	Timeline
We will introduce consideration of environmental sustainability in our procurement processes in line with ISO20400 Sustainable Procurement Standard, including a carbon metric as a minimum.	External Stakeholder - Environmental Regulators, Supply Chain, User Group, Operators	By 2023
We will work in collaboration with our suppliers and industry peers to develop a suite of targets and impact metrics designed to drive environmental improvements throughout our value chain.	External Stakeholder - Supply Chain, Environmental Regulators, Operators	Throughout RIIO-T2
We will further enhance environmental management standards and KPIs within contract specifications and supplier codes of conduct (including requirements for public disclosure of metrics) and cascade to all relevant suppliers.	External Stakeholder - Ofgem, Supply Chain, Environmental Regulators, Operators	By 2021

Commitment	External source/ justification	Timeline
We will target more than 80% of RIIO-T2 suppliers (by value) meeting these enhanced environmental standards.	External Stakeholder - Ofgem, Operators	By 2026
We will report on the actual percentage of suppliers (by value) meeting these standards.	External Stakeholder - Ofgem, Operators	By 2023
We will engage with suppliers throughout the duration of their contracts to continue to reduce impacts and optimise benefits	External Stakeholder - Supply Chain, Operators, Expert Reviewers	Throughout RIIO-T2
We will increase our internal supply chain management resources to enable the collection and analysis of enhanced data and a greater level of collaborative working.	External Stakeholders - Supply Chain, Ofgem	By 2021
We will become a Supply Chain Sustainability School Partner, requiring contractors and suppliers for all new contracts to become members and undertake relevant sustainability and environmental training.	External Stakeholders - Supply Chain, Operators	By 2023
We will engage with suppliers early in the development of projects to enable them to propose environmental improvements at concept and design stages	External Stakeholder - Supply Chain, Operators, Expert Reviewers	By 2026

Table 12: RIIO T2 Metrics: Supply Chain Sustainability

Metric	Unit	Normalisation Factor
Suppliers compliant with enhanced environmental standards	% by value	n/a
Supply Chain Sustainability School - supplier members	% by value	n/a
Supply chain metrics to be developed during T2		

RIIO-T2 Cost

£0.4m

RIIO-T2 Proposed Output Incentive

Our procurement model rightly focusses on minimising the cost of delivery of our specified requirements. This can be a barrier to environmental improvement, particularly new activities.

We propose to introduce in our tender documentation a request to suppliers to identify further environmental impact reduction options, with associated quantified costs and benefits, which they can deliver beyond their core bid. This is to allow us to leverage our supply chain's expertise and knowledge, and to bring forward opportunities to deliver greater environmental impact reductions than would otherwise be proposed as part of suppliers bids given the significant focus on minimisation of price. We expect to see proposals for additional activities, alternative equipment and approaches, and even options where a deviation from our specification/design can deliver our required outputs at lower environmental impact.

These proposals being part of the tender assessment process will need to be cost effective and competitive. Due to the unpredictable nature of potential opportunities, we have not included any associated costs in our Business Plan. This will protect consumers and is why we have proposed this as a discretionary financial reward.

Please see Category 3 within the 'Output Incentive Proposals' chapter in our T2 Business Plan for details of this ODI proposal.

6. DECARBONISING OUR ENERGY NETWORK

While our network plays an important role in meeting the government's net-zero GHG targets by connecting low carbon generation, we must also reduce the carbon footprint of our business and operations and ensure that our network is climate change resilient. In this section we provide further detail of our ambitious long-term targets and the actions we will deliver during the RIIO-T2 price control to contribute to delivery, with particular focus on our priorities of Sulphur HexaFluoride (SF_6) and network losses.

6.1. Our Vision

We will be a carbon neutral company throughout our value and supply chains, and will actively support our customers and local communities towards achieving this goal. We will develop our network to mitigate impacts of climate change.

6.2. Our Goals

Reduction in Business Carbon Footprint of 15% by 2023, 80% by 2030 and carbon neutral by 2050 (from a baseline of 2013/14)

6.3. Our Objectives

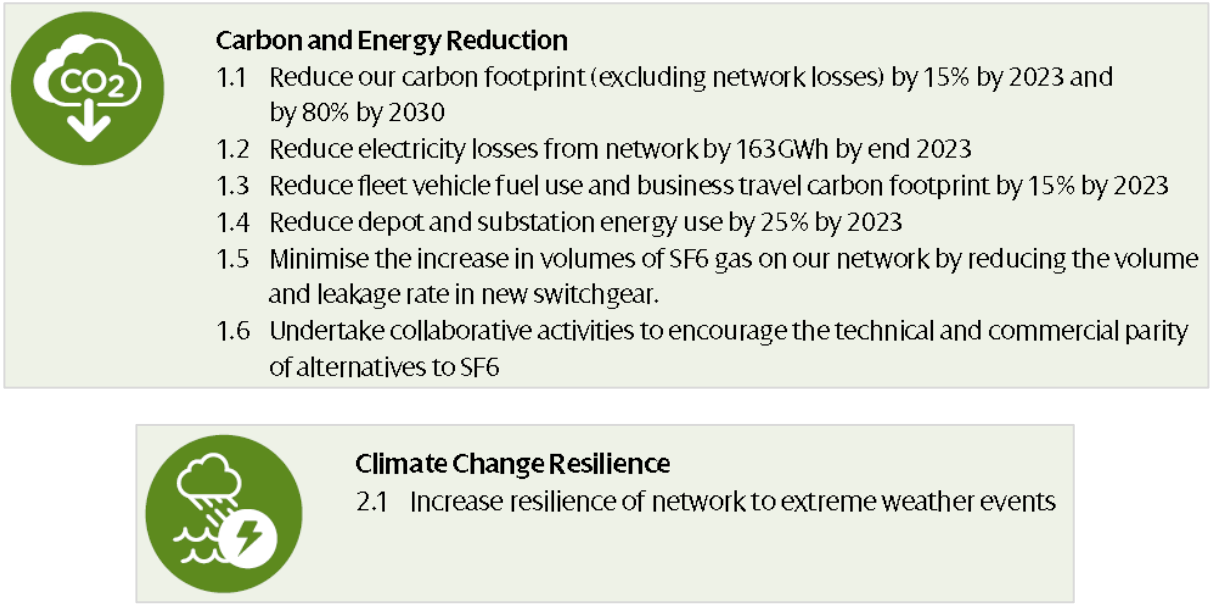


Figure 22: SP Energy Networks Sustainable Business Strategy – Carbon and Energy Reduction and Climate Change Resilience Objectives

We demonstrate our performance against these targets by reporting our Business Carbon Footprint (BCF) annually to Ofgem. We calculate our emissions according to the Greenhouse Gas Protocol, which defines emission categories by the level of control as follows:

- Scope 1: Direct GHG emissions – from sources owned or controlled by the company

- Scope 2: Electricity indirect GHG emissions – from the generation of electricity purchased by the company
- Scope 3: Other indirect GHG emissions - a consequence of the activities of the company but occur from sources not owned or controlled by the company (e.g. business travel, contractors' emissions)

Our BCF comprises the following:

- Fugitive emissions - SF6 (Scope 1)
- Buildings energy use – electricity (Scope 2) and other fuels (Scope 1) associated with our buildings, substations and radio base stations
- Operational transport – road, diesel and petrol (Scope 1) and electric (Scope 2)
- Business transport – road, air, rail travel (Scope 3)
- Fuel combustion – diesel e.g. in generators (Scope 2)
- Network Losses (Scope 2/3)

6.4. RIIO-T2 Commitments: Decarbonising our Energy Network

In order to be able to understand and influence the carbon emissions associated with our network, we must be able to accurately measure, analyse and report carbon data and to operate business processes that allow this information to be used to drive business decisions that result in reductions. We report Business Carbon Footprint emissions already, but do not yet have good data on Scope 3 emissions particularly in relation to our supply chain and the carbon 'embodied' in our projects. We must use good, complete data to set targets, and these targets must ensure that we are delivering our share of the reductions required to deliver the Paris Climate Agreement (1.5oC).

We have therefore committed to setting science-based targets in line with the Science Based Targets Initiative[4] methodologies. Targets are considered 'science-based' if they are in line with the level of decarbonisation required to keep global temperature increase below 1.5oC, as described in the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC).

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

We conducted a review of available tools, standards and methodologies to embed consideration of carbon and wider environmental impacts in our business processes and decision making and have concluded that PAS2080: Carbon Management in Infrastructure best fits our business and our needs. We have therefore committed to align our processes with this standard by the middle of RIIO-T2.

Commitments

Table 13: RIIO-T2 Commitments: Decarbonising our Energy Network

Commitment	External source/ justification	Timeline
We will implement processes for carbon management in relevant business activities, aligned with PAS 2080 Carbon Management in Infrastructure.	External Stakeholders - Supply Chain, Operators	By 2023
We will adopt a science based target for scope 1* & 2* carbon reduction.	External Stakeholder - Ofgem, Operators	By 2021
We will adopt a science based target for scope 3* carbon reduction.	External Stakeholder - Ofgem, Operators	By 2023

[4] the SBTI is a collaboration between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI), and the World Wide Fund for Nature (WWF) and one of the We Mean Business Coalition commitments.

Commitment	External source/ justification	Timeline
We will identify, and subsequently monitor, metrics to track progress towards our science-based carbon reduction targets.	External Stakeholder - Ofgem, Operators	By 2021

Metrics

Table 14: RIIO-T2 Metrics: Decarbonising our Energy Network

Metric	Unit	Normalisation Factor
Total Carbon Emissions	tCO2e	turnover/ profit
Total - Scope 1 Carbon Emissions	tCO2e	turnover/ profit
Total - Scope 2 Carbon Emissions (Losses)	tCO2e	turnover/ profit
Total - Scope 2 Carbon Emissions (other)	tCO2e	turnover/ profit
Total - Scope 3 Carbon Emissions	tCO2e	turnover/ profit
Total - Business Carbon Footprint	tCO2e	turnover/ profit

RIIO-T2 Cost

£0.22m

Detailed Commitments

We provide details below of our T1 performance to date and T2 Commitments for the following areas of carbon emissions associated with our operations:

- Embodied Carbon (the carbon emitted as a result of our network across its whole life cycle)
- Business Carbon Footprint (as described above)
    - SF6 emissions
    - Other BCF emissions
    - Networks Losses

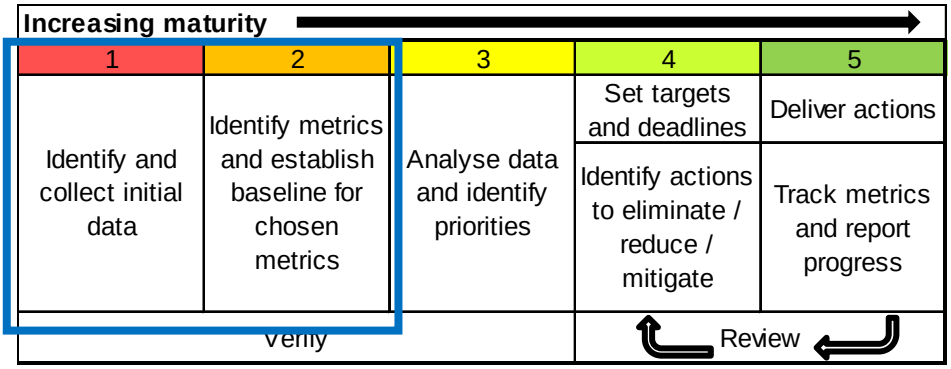
6.5. Embodied carbon

Our recent life cycle assessment pilot, on a windfarm connection project, indicates that activities in our supply chain may represent over 70% of the total carbon impact of our network and operations. This finding is supported by similar figures reported by other organisations that have also started to quantify whole life carbon footprints. Our stakeholders frequently highlight the need for us to cascade our environmental targets throughout our value chain.

In order to reduce this impact, we must work with our suppliers and continue to collaborate with other client organisations. We are engaging with our supply chain, other infrastructure companies and enterprise and environmental advisories to

develop an aligned approach that encourages our supply chain to deliver steep carbon reductions whilst maintaining value for money and supplier diversity.

Level of maturity:



RIIO-T2 Commitments: Embodied Carbon

Having spent most of T1 focussing on Scope 1 and 2 carbon emissions to reach maturity levels 4 and 5, we are now turning our attention to our Scope 3 emissions. To this end we have identified PAS 2080, a Standard for Carbon Management in Infrastructure, as the most relevant Standard on which to base our action plan for carbon management (see Figure 23). We will conduct a gap analysis in advance of T2 to inform the creation our action plan and will collaborate with our supply chain and other TOs to introduce an embodied carbon measurement tool and metrics to track performance. We will then pilot the measurement tool and metrics on selected T2 projects, to inform ongoing actions and to establish a baseline which will be used to prioritise areas for carbon reduction activities and the setting of an embodied carbon reduction target(s) for delivery post-T2.

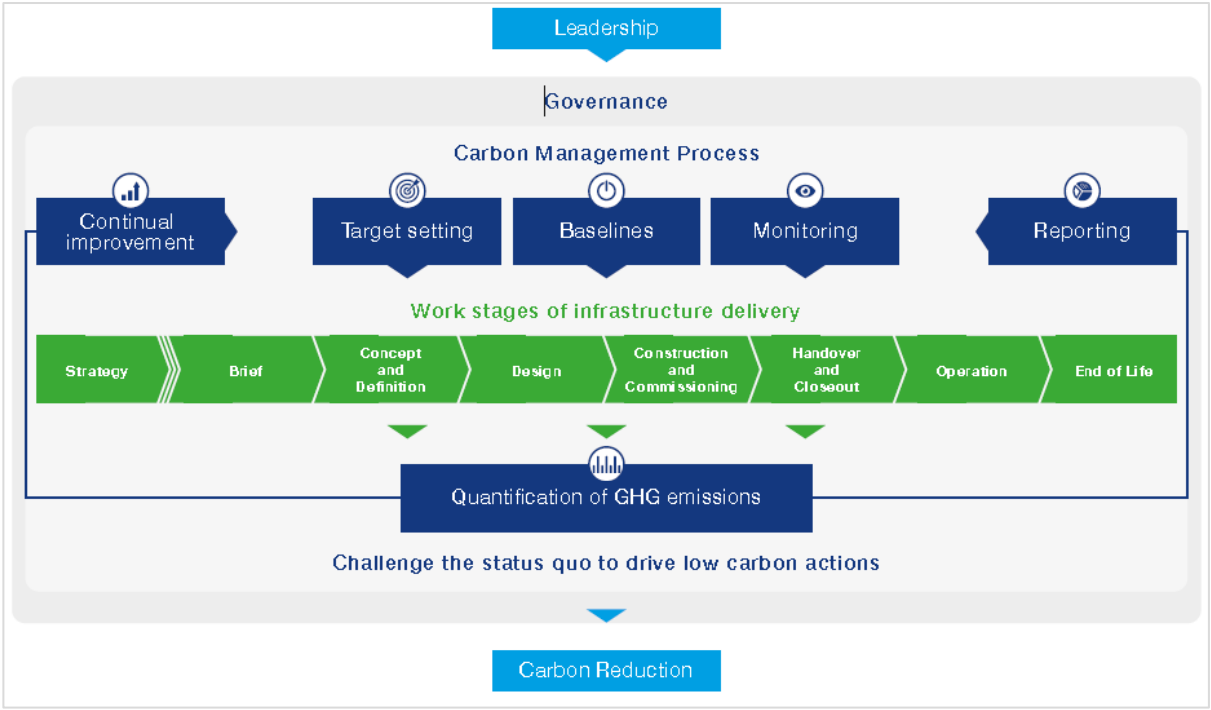


Figure 23: PAS2080 Carbon Management Process

Source: PAS 2080:2016 – Carbon Management in Infrastructure

For other activities to improve the sustainability of our supply chain, please see above Section 5.5 Supply Chain Sustainability and also p39 in our T2 Business Plan document which in turn refers to Annex 22: Supply Chain.

Table 15: RIIO-T2 Commitments: Embodied Carbon

Commitment	External source/ justification	Timeline
We will work collaboratively with our stakeholders, including the other Transmission Operators, throughout RIIO-T2 with the aim of assessing and managing capital carbon on our projects, driving efficiencies throughout our supply chain, and sharing best practice.	External Stakeholder - Ofgem, Operators	Throughout RIIO-T2
We will, in collaboration with the other Transmission Operators, introduce a measurement tool for embodied carbon in new projects, in order to establish a baseline and set a reduction target.	External Stakeholder - Ofgem, Operators	By 2023
We will identify, and subsequently monitor and report, metrics to track progress towards our Scope 3 science-based carbon reduction target.	External Stakeholder - Ofgem, Operators	By 2023
We will collaborate with our supply chain and other Transmission Operators to drive scope 3 and embodied carbon footprint reductions.	External Stakeholder - Ofgem, Operators, Environmental Regulators, Supply Chain	Throughout RIIO-T2
We will collaborate with our supply chain to implement sustainable project sites to reduce carbon and other impacts, for example energy efficiency, diesel use, re-use of materials and reducing impact of transportation.	External stakeholder - Supply Chain	By 2023

Metrics

Table 16: RIIO-T2 Metrics: Embodied Carbon

Metric	Unit	Normalisation Factor
Embodied Carbon in new projects	tCO2e	total cost of new projects, £
Embodied Carbon in new projects	breakdown by life cycle stage, %	
Embodied Carbon per new project	tCO2e	total project cost, £
Embodied Carbon per new project	breakdown by life cycle stage, %	

RIIO-T2 Cost

£0.09m

6.6. Business Carbon Footprint

As well as collecting data and reporting on our BCF annually, we have started to collect data on the Scope 3 emissions made by contractors on our behalf. Our contract terms now require carbon (as well as waste) data to be reported to us by our contractors.

Where appropriate, we applied the carbon emission reduction hierarchy as described within PAS 2080 Carbon Management in Infrastructure in our T2 investment decision making process to identifying potential opportunities to reduce carbon:

a) **Build nothing:** evaluate the basic need for an asset and/or programme of works and shall explore alternative approaches to achieve outcomes;

b) **Build less:** evaluate the potential for re-using and/or refurbishing existing assets to reduce the extent of new construction required;

c) **Build clever:** consider the use of low carbon solutions to minimise resource consumption;

d) **Build efficiently:** use techniques that reduce resource consumption.

This approach supported the development of options for the Cost Benefit Analysis (CBA) process (Annex 8). With the RIIO-T2 Transformer Refurbishment Programme (SPNTL2068 - 2074, SPNTL2094, SPNTL2096), for example, a number of transformers have been assessed as being in a deteriorated condition and therefore requiring consideration for intervention. The option appraisal process prioritised reuse, then refurbish and finally replace, where this option was supported by CBA.

RIIO-T1 Performance: Business Carbon Footprint

Table 17: RIIO-T1 Business Carbon Footprint Performance

	Units	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Depot Buildings Energy Use	tCO2e	188	270	161	365	336	563
Substation Buildings Energy Use	tCO2e	2311	2553	2377	2124	1798	1439
Operational Transport	tCO2e	288	271	322	582	855	431
Business Transport	tCO2e	113	127	127	214	428	547
SF6	tCO2e	17435	14904	12983	11781	13420	18795
Losses	tCO2e	169282	240210	194120	263712	186327	203810
Total BCF (excl. losses)	**tCO2e**	**20,334**	**18,125**	**15,971**	**15,066**	**16,837**	**21,778**
Total BCF (incl. losses)	**tCO2e**	**189,617**	**258,498**	**210,091**	**278,778**	**203,164**	**225,589**

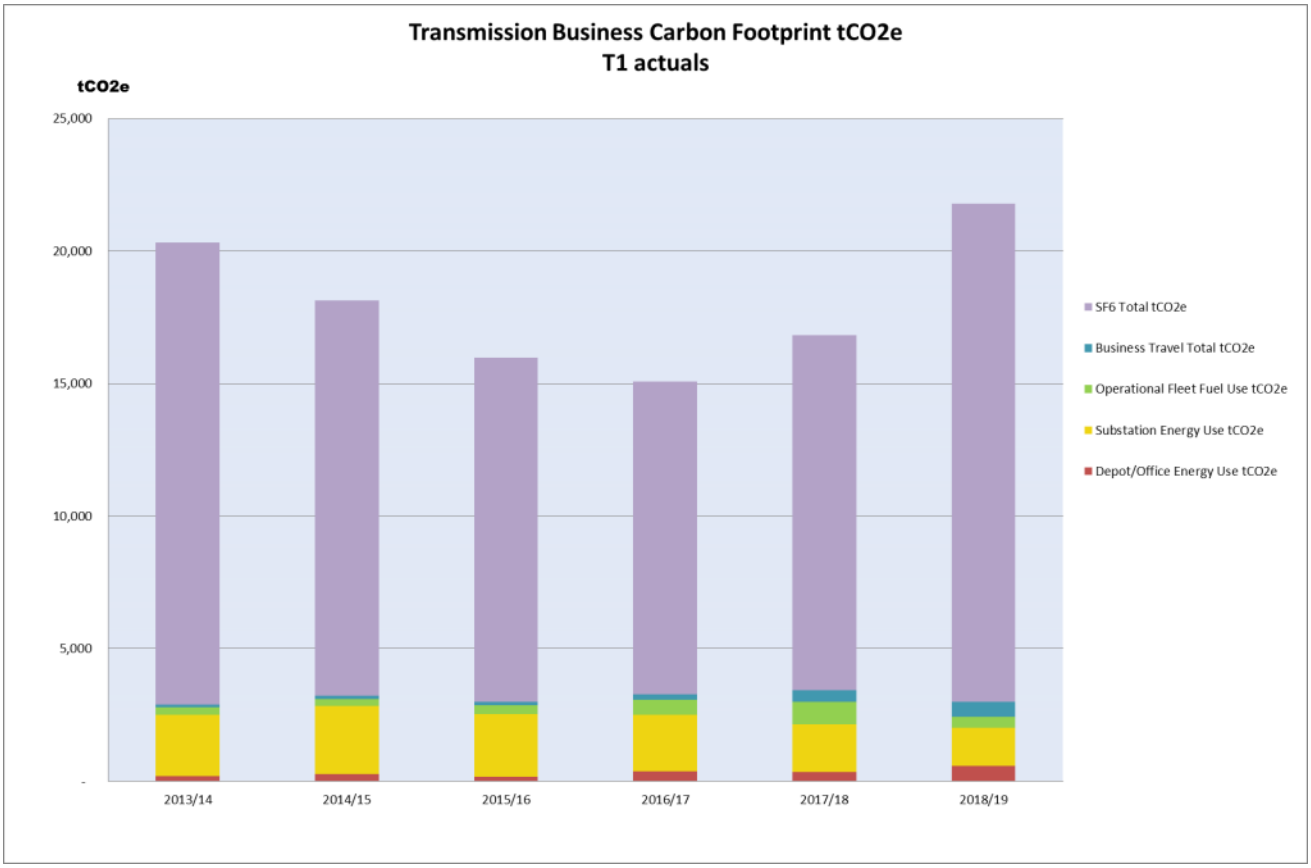


Figure 24: RIIO-T1 Business Carbon Footprint (excluding Losses)

(Our Business Plan Data Table A4.3 Business Carbon Footprint contains details of these historic emissions and also our business as usual forecast to the end of RIIO-T2.)

SF6 leakage and network losses

Despite considerable reduction efforts, our controllable Business Carbon Footprint has increased by 7% since our 2013-14 baseline year. This is due to increased leakage of Sulphur Hexafluoride (SF6) gas, which is an industry-wide issue and is described in detail in Section 6.7.

As illustrated in Table 17 above, the largest contributors to our carbon footprint are SF6 leakage and network losses. We have therefore continued to prioritise these for action; building on our T1 activities to develop specific reduction strategies (see sections 6.7 and 6.9 respectively).

Carbon emissions from network losses are to a significant extent not within our control as they are determined by the amount and carbon intensity of electricity generated and transmitted through the network. Losses are therefore excluded from the graph above for clarity, but our Losses Strategy in Section 6.9 outlines the measures we will take to minimise the increase in losses arising from increased renewables on the network.

Other sources of carbon emissions

Beyond losses and SF6 leakage, the remainder of our Business Carbon Footprint as reported to OFGEM consists of the carbon impact of the energy used in our depots and substations, and the energy and fuels used for operational and business transport. In 2018–19, these categories represented around 14% of our total carbon footprint excluding losses and 1.3% of our total carbon footprint including losses.

The changes in carbon emissions associated with these sources since our baseline year (2013/14) are as a result of:

- Improvements in data quality and completeness, including improvements to estimation methodologies (these improvements are explained in the RRP Commentary documents for the relevant years)
- Reductions in operational fleet emissions as a result of increased vehicle efficiencies and the introduction of a vehicle management system to monitor and influence driver behaviour, including driving efficiency.

We seek to reduce impacts across these categories by employing energy efficiency measures, implementing opportunities for self-supply using renewables, encouraging staff to reduce their business travel and use low carbon options and by enabling the move towards low carbon vehicles. See Section 6.8 for further details.

(Our Business Plan Data Table A4.4 Environmental Action Plan includes initiatives planned for RIIO-T2 which will reduce carbon emissions, including predicted reductions.)

Level of maturity

Our current levels of maturity for the various aspects of our carbon impacts are:

<table>
<tr><td></td><td colspan="5">Increasing maturity →</td></tr>
<tr><td>Maturity Level</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td rowspan="3">Impact Area</td><td rowspan="2">Identify and collect initial data</td><td rowspan="2">Identify metrics and establish baseline for chosen metrics</td><td rowspan="2">Analyse data and identify priorities</td><td>Set targets and deadlines</td><td>Deliver actions</td></tr>
<tr><td>Identify actions to eliminate / reduce / mitigate</td><td>Track metrics and report progress</td></tr>
<tr><td colspan="3">Verify</td><td colspan="2">Review</td></tr>
<tr><td>Business Carbon Footprint – Sulphur Hexafluoride (SF6)</td><td></td><td></td><td></td><td>4</td><td>5</td></tr>
<tr><td>Business Carbon Footprint - Other</td><td></td><td></td><td></td><td>4</td><td>5</td></tr>
<tr><td>Losses Carbon Footprint</td><td></td><td></td><td></td><td>4</td><td>5</td></tr>
</table>

6.7. Business Carbon Footprint: Sulphur Hexafluoride (SF6) Strategy

Sulphur hexafluoride (SF6) is a gas used extensively in electricity transmission and distribution as an insulator and arc-quenching medium in high voltage equipment such as circuit breakers, gas insulated switchgear (GIS) and gas insulated busbars (GIB). As SF6 has excellent insulating properties that could not be commonly matched by other gases available in the market, SF6 has become the primary insulation and interrupting medium for voltages above 66 kV over the last 40 years. It has therefore been perceived to be in consumers' economic interests to utilise equipment that uses SF6 as it was typically the most cost effective solution. SF6 is, however, a fluorinated gas (F-gas) and a potent greenhouse gas with a Global Warming Potential (GWP) 23,500 times that of CO2. The rise of climate change awareness has therefore changed the perception of SF6, and the longer term impact of the cost of carbon emissions is now altering the life-cycle assessment of equipment which utilises the gas.

By stopping or reducing SF6 leaking into the atmosphere, the global warming impact of SF6 is avoided or mitigated. We have consistently endeavoured to achieve this by procuring SF6 equipment with increasingly stringent standards of technically necessary leakage rates, mitigating the risk of leakage arising and limiting it where it does occur.

Mitigating and ultimately avoiding the use of SF6 is now an urgent and critical priority. However, the extremely high short term costs of replacing existing SF6 assets and the lack of alternative options at higher network voltages for new equipment could place an unreasonable financial burden on consumers and risk the reliable operation of the network if all SF6 assets

were to be replaced. This section sets out our robust, reasonable and thoroughly considered strategy for the management of our existing SF6 gas inventory and our approach to new and replacement assets, all intended to contribute to the Scottish and UK Governments' net-zero greenhouse gas emission targets.

Background

SF_6 was incorporated in the 1997 Kyoto Protocol, which set internationally binding emission reduction targets. Relevant EU & UK regulations addressing F-gases such as SF6 include:

- Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006:and
- Fluorinated Greenhouse Gases Regulations 2015 (SI 2015/310)

These regulations place obligations on operators of equipment containing F-gases, including leak checks on equipment; record keeping; recovery of F-gases; and use of appropriately qualified personnel.

While we work to ensure that SF_6 gas is never intentionally released, it is not technically possible to ensure that no gas is lost over the lifetime of an asset. These fugitive emissions account for a significant proportion of our business carbon footprint. In 2018/19, for example, SF_6 emissions contributed approx. 86% of our total carbon footprint.[5] There is, therefore, significant interest in reducing SF_6 emissions to facilitate achieving SPT's ambitious carbon neutrality target by 2050, and meeting the long-term goals of the Climate Change (Scotland) Act and the Paris Agreement.

Management of SF_6 Emissions from Existing Assets

SF_6 is used mainly in circuit-breakers as an insulator and to quench arcs that result from the action of interrupting current, and has uses in other plant items such as instrument transformers and connections between equipment. Plant using this technology was introduced onto the SPT network in the 1960s, and SF_6 circuit-breakers became the preferred option in the 1980s due to significant cost and reliability improvements over other technologies. As with any vessel containing gas, there is an inevitable leakage rate which is technically necessary (or unavoidable) for the operation of the SF6 equipment, which may change over time as the equipment ages. When this kind of equipment was first introduced, the technology was novel and the environmental impacts of greenhouse gases was less understood than it is today which was reflected in both the design and operation of the equipment. As designs matured, the expected technically necessary leakage rate reduced and the ageing effects were less prevalent. Occasionally, manufacturing or assembly defects affecting the equipment are revealed over time which can result in increased leakage rates from SF_6 filled equipment.

We have a range of SF_6 filled assets on our network dating from the 1960s to the present day, with a range of inherent leakage performance, early life defects and aged components. Modern assets are designed with low levels of inherent technically necessary leakage (leakage rates of 0.5% per annum are now specified in the latest issue of international standards (IEC 62271 series)), and therefore the majority of new installed equipment should not require to be 'topped-up' with SF6 during its service life. SPT typically requires manufacturers to provide new equipment with a leakage rate of half that of the internationally recognised standards. In cases where we have concerns about gas tightness with a particular manufacturer's equipment, we may require them to carry out additional testing for SPT assets in addition to those required as standard, to ensure that the assets are gas tight. As a responsible operator, we carefully manage our existing assets in order to minimise SF_6 leakage. In line with legal requirements, we will continue to carefully monitor and manage our assets to minimise SF6 leakage, repair leaks quickly, and where this is not possible, replace the asset before its anticipated end of life.

Figure 25 illustrates our performance to date across the RIIO-T1 price control period and identifies the SF6 Incentive 'target' trajectory into T2. Since 2013, average SF6 leakage as a % of total volume has remained comparatively low, at 0.75% of total mass against a target of 0.85%. Despite a considerable amount of effort spent in repairing leaky assets, SF6 leakage increased by 40% overall in 2018/19. Over 50% of leakage in the year was due to increased leakage from aging assets at a single site requiring increasing repair efforts. This site will continue to be our top priority for leakage repairs.

[5] T2 BPDT A4.3 Business Carbon Footprint

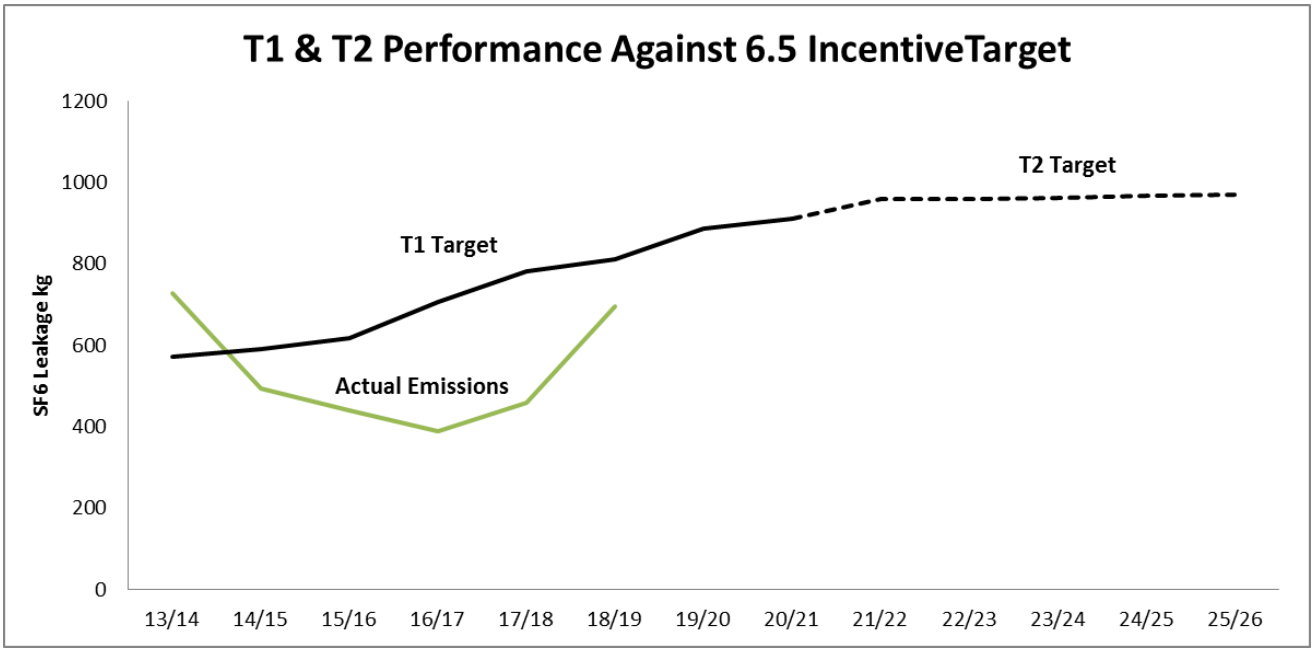


Figure 25: RIIO-T1 SF6 Emissions

Approach to new and replacement of existing SF6 assets

To mitigate the environmental impact from our SF6 emissions, we explored all opportunities to utilise SF6- alternative insulating gases at the investment planning stage, incorporating these as options within our CBA process where technically feasible. Currently SPT's main suppliers have different strategies when it comes to SF_6 alternatives, all with their strengths and weaknesses. None of the alternative solutions provide the same dielectric strength as SF_6 and the manufacturers have had to overcome this challenge. Moving from utilising one gas to a mix of different gases on our network provides SPT with a logistical challenge, which we are prepared to face to allow us to reduce our reliance on SF_6.

As part of this strategy, all new circuit-breakers and GIS installations will use alternative insulating gases where there are market-ready solutions (i.e. type-tested and commercially available, but at potentially higher cost). We have assessed the associated increase in capital costs of currently available market-ready solutions for T2 investments and secured stakeholder support for this strategy. We have written to our suppliers to advise them that in the RIIO-T2 period SPT will be installing SF_6 alternatives as a first choice where market ready solutions are available.

By taking this approach while developing our RIIO-T2 investment plan, we will avoid adding an estimated 9700kg of SF_6 to our inventory. This will avoid estimated additional annual emissions of 51.8kg (1,200tCO2e).

As illustrated in Figure 26, our SF_6-free strategy is slowing the rate at which we add SF_6 to our network, while still maintaining a similar rate of investment to T1.

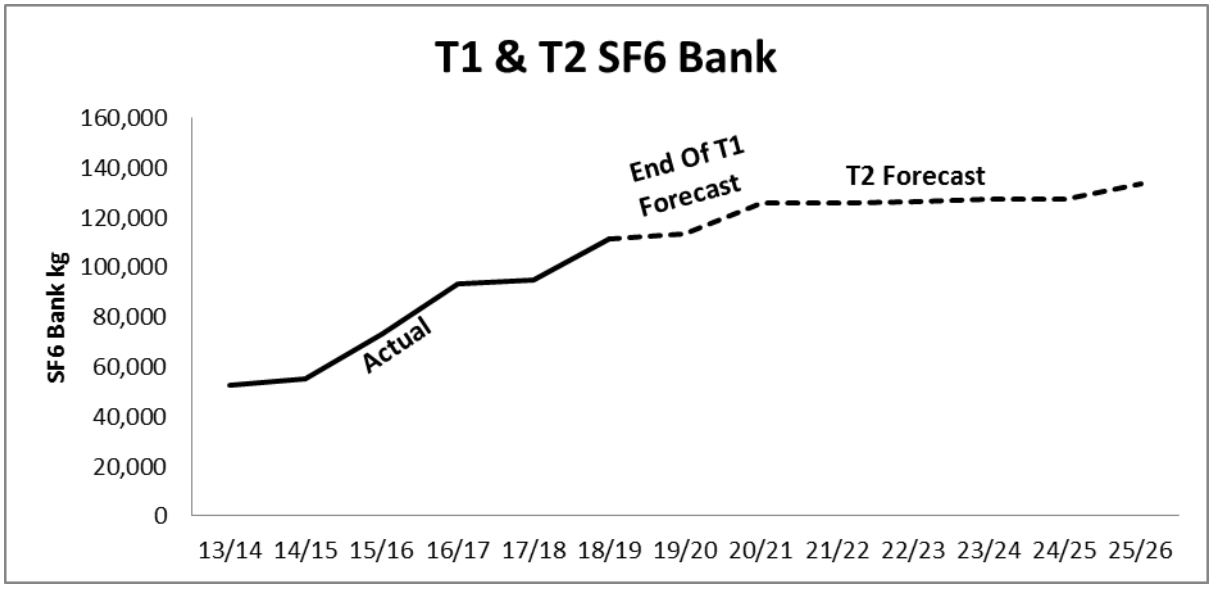


Figure 26: Estimated impact of RIIO-T2 works on SF6 bank

RIIO-T2 Commitments: SF_6 Reduction

Table 18: RIIO-T2 Commitments: SF_6 Reduction

Commitment	External source/ justification	Timeline
We will continue to require manufacturers to provide equipment with an SF6 leakage rate which is half that of the internationally recognised standards, where technically viable.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
We will continue to carefully monitor and manage our assets to minimise SF6 leakage, repair leaks quickly, and where this is not possible, replace the asset before its anticipated end of life	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
Where a repair to a leaking asset proves ineffective and the asset requires to be replaced, we will offset the SF6 emissions from that asset until its replacement via a Carbon Offsetting partner.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2
We will use alternatives to SF6 insulating gas for all new circuit-breakers and GIS installations where there are technically feasible market-ready solutions.	External Stakeholder - SF6 Strategy consultation	Throughout RIIO-T2
We will drive the development and adoption of SF6-free technologies, collaborating with supply chain and industry peers and piloting new technologies where technically viable.	External Stakeholder - Consumer Challenge Group, Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2

Table 19: RIIO-T2 Metrics: SF_6 Reduction

Metric	Unit	Normalisation Factor
Business Carbon Footprint – Sulphur Hexafluoride (SF6) emissions	kg, tCO2e	SF6 bank (kg)
Business Carbon Footprint – other IIG emissions	kg, tCO2e	IIG bank (kg)
Business Carbon Footprint – Total IIG emissions	tCO2e	Total gas bank (kg)

RIIO-T2 Cost

£4.76m

6.8. Business Carbon Footprint: Other

Beyond Scope 3 emissions, SF6 leakage and Losses, the remainder of our controllable Business Carbon Footprint consists of the carbon impact of the energy used in our depots and substations, and the energy and fuels used for operational and business transport. In 2018–19, these categories represented around 14% of our total carbon footprint excluding losses and 1.3% of our total carbon footprint including losses.

RIIO-T1 Performance

We seek to reduce impacts across these categories by employing energy efficiency measures, implementing opportunities for self-supply using renewables, encouraging staff to reduce their business travel and use low carbon options, and by enabling the move towards low carbon vehicles. We have moved to a renewable tariff for our Depot/Office electricity to minimise the associated carbon emissions (although the DEFRA methodology for calculating the carbon emissions associated with electricity use does not allow consideration of this to avoid double counting – so this is not reflected in our Business Carbon Footprint figures).

Figure 23 below shows T1 performance to date for our BCF components excluding SF6.

RIIO-T2 Commitments and Metrics: BCF Other

Figure 27 below shows two scenarios for forecast emissions:

a) Business As Usual (ref T2 BPDT A4.3) which incorporates expected network growth only, and

b) With the expected impact of the successful implementation of our impact reduction initiatives identified in T2 BPDT Table A4.4.

The initiatives identified in T2 BPDT Table A4.4 are:

- Energy efficiency measures and renewables to be delivered at one third of our substations
- The electrification of our operational fleet (excluding HGVs).

The impact reduction forecast does not include any estimation of improvements from other planned and ongoing activities that are also expected to reduce our carbon impact but which are difficult to quantify with any confidence, including:

- Staff awareness communications on energy efficiency (expected to impact on energy consumption at depots and offices primarily, but also substations)
- Recent move to a renewable tariff for depot and office electricity consumption (which also cannot be reflected in our BCF data in future due to DEFRA methodology)
- The ongoing installation of thermostats and sensors/switches at older substations

- The ongoing impact of more efficient fleet vehicles and improved logistics management via our recent enhancements to our SAP system e.g. planning of jobs to minimise time and mileage associated with travel to site
- Actions arising from the use of our vehicle management system e.g. dashboard indication of aggressive (inefficient) driving techniques
- Ongoing initiatives to encourage staff to move from air to rail options for relevant journeys, provision of electric pool cars and improved video and laptop based conferencing systems to minimise need to travel.

The forecasts relating to electricity consumption are converted to tCO2e using a forecast UK electricity carbon intensity factor calculated from the National Grid Community Renewables Future Energy Scenario, assuming that the UK grid achieves the level of carbon intensity forecast for 2050 under that scenario and also achieves the 2030 carbon intensity identified in the Committee on Climate Change Net Zero report (for further details see p10). The BAU graph shows a falling trend, despite incorporating expected network growth impacts on our carbon emissions, because the UK electricity grid carbon intensity is falling due to the increasing proportion of renewable generation as forecast in all Future Energy Scenarios.

Also identified on the graph are our current business short and medium term carbon reduction targets as outlined in our Sustainable Business Strategy.

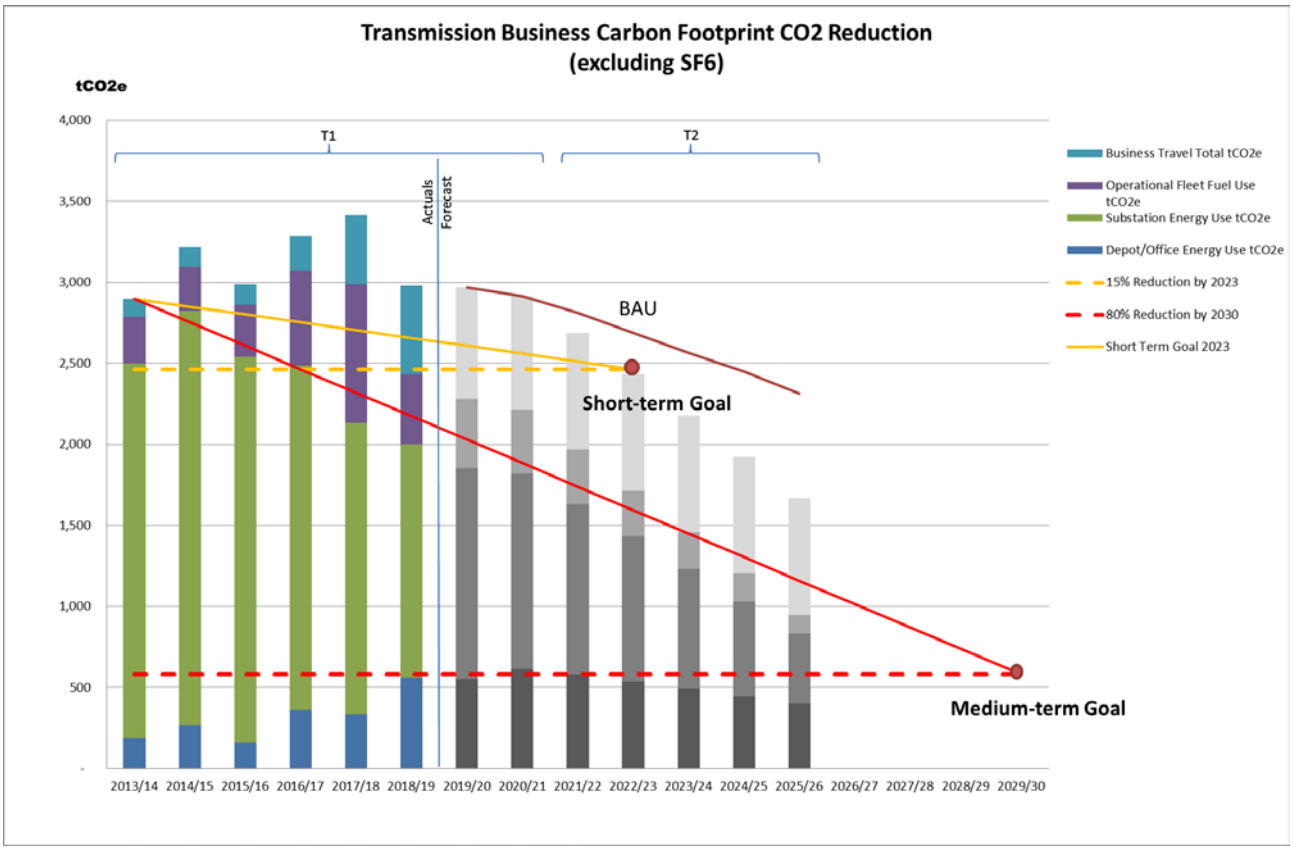


Figure 27: Forecast Business Carbon Footprint reductions (excluding SF6)

RIIO–T2 Building Refurbishment Programme and Energy Reduction Measures

Network protection and smart control assets are designed for indoor use and are housed within substation buildings. These assets are susceptible to poor environmental conditions that can reduce performance, cause main network assets such as circuit breakers to operate incorrectly leading to extended loss of supply incidents, potential damage to equipment and risk to staff and the public. Such failures can lead to increased lifecycle costs ultimately passed onto consumers through use of system charges. We therefore need to ensure the substation building environment is suitable, which we can do through appropriate design, control and upkeep of the building fabric and the heating, lighting, ventilation and air conditioning systems.

The energy used by building services to achieve the right internal conditions contributes to the overall network losses attributed to the transmission system. We are committed to reducing these losses as they are in our control. Timely maintenance and repair of our substation buildings extends the lifespan of the structure and building services as well as preventing damage to internal electrical assets. These programmes aim to prevent early replacement of building structures, building services and electrical assets thereby avoiding the carbon impacts, financial outlay and disturbance to the local community and environment associated with lengthy construction projects.

We have therefore included proposals within our investment plan to reduce energy consumption at substations by refurbishing the building fabric and building services where they have been identified as being in poor condition. This is informed by historical Energy Saving Opportunity Scheme (ESOS) assessments and an extensive study undertaken by Napier Edinburgh University[6] to monitor and evaluate energy losses arising from substation energy consumption.

Read more about this in the Non-Load section of our Business Plan and Justification Paper SPNLT20101: Building Refurbishment Programme and SPNLT20142: Building Energy Reduction Measures

RIIO-T2 Fleet Decarbonisation Programme

Our business has signed up to The Climate Group´s EV100 initiative. This is a global initiative bringing together forward-looking companies committed to accelerating the transition to electric vehicles (EVs) and making electric transport the new normal by 2030. Under the agreement, SPT will electrify our vehicle fleet, a total of 72 vehicles, by 2030.

We have successfully piloted the use of small electric vans (see Figure 28 below) and are working with our General Services fleet providers, and our vehicle leasing provider, to bring electric vehicles into our fleet. During 2020, we aim to transition 8 small vans in our fleet to electric, followed by more rapid transition from 2021 onwards as technology for medium sized vans becomes available and more cost-effective.

Figure 28: One of the 6 small electric vans in our pilot

[6] SPT NIA Project https://www.smarternetworks.org/project/nia_spt_1608

As a network operator, required to connect customers who wish to charge their electric vehicles and with a fleet of our own, we believe that we are uniquely placed to lead this electrification of transport and our stakeholders agree. We are therefore proposing to accelerate the electrification of our operational fleet, targeting the end of T2, as one of our key decarbonisation ambitions. This ambitious target will require the early adoption of new technology and considerable effort to address the various technological, regulatory and economic challenges, with the associated risks and costs.

Achieving this goal requires the removal of several barriers over the coming years, for example:

- development of technology for larger vehicles, higher load carrying capability, longer travel distances and faster charging
- HMRC rules covering provision of charging points at employees homes to allow company vehicles to be charged there (all SPT employees with vehicles start their working days from home).
- business continuity considerations require the mitigation of the risks associated with full reliance on electricity for our fleet.

We have created a programme for the decarbonisation of our fleet to meet our 2030 EV100 commitment. As we commence implementation of this programme, we will look for opportunities to accelerate this transition, such as the piloting and early adoption of new vehicle and charging technologies.

We have proposed that this acceleration of the electrification of our fleet forms part of an Accelerating the Low Carbon Transition Operator Defined Incentive (ODI), see the Output Incentives chapter and the associated Annex 12 in our T2 Business Plan. We have embedded the extra costs of electrifying our fleet in our business plan, as these costs are reasonably predictable, with the incentive designed to reward the effort and risks associated with accelerated delivery.

RIIO-T2 Commitments: BCF Other

Table 20: RIIO-T2 Commitments: BCF Other

Commitment	External source/ justification	Timeline
We will implement energy efficiency measures as part of our RIIO-T2 building refurbishment programme at 48 substations (representing around 1/3 of our sites) with the aim of reducing energy consumption by more than 1000MWh per year.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	By 2026
We aim to decarbonise our operational fleet by replacing 100% of our 72 cars and vans with electric alternatives by the end of T2.	External Stakeholder - Sustainability Stakeholder Working Group	By 2026
We will strive to lead the decarbonisation of fleet vehicles, working with suppliers and other fleet operators to pilot technically viable alternatives to drive technical advancements and early adoption.	Continuing business as usual	Throughout RIIO-T2

RIIO-T2 Metrics: BCF Other

Table 21: RIIO-T2 Metrics: BCF Other

Metric	Unit	Normalisation Factor
Business Carbon Footprint - Buildings (Offices and Depots)	kWh, tCO2e	No. of staff
Business Carbon Footprint - Buildings (substations)	kWh, tCO2e	No. of buildings,

		m2
Business Carbon Footprint - Operational Fleet Fuel Use	litres, tCO2e	network length
Business Carbon Footprint - Business Travel	tCO2e	km travelled

RIIO-T2 Cost

£8.8m

6.9. Business Carbon Footprint: Network Losses Strategy

Losses are an inevitable consequence of transferring energy across electricity networks, from generation to demand. Transmission losses are due to the heating of various components of the network.

Transmission losses can be managed during investment planning, e.g. by selecting equipment with lower losses where this is economic, or in operational time scales e.g. by adjusting circuit flows via the balancing market or by changing quadrature booster tap positions. In our role as a Transmission Owner (TO) we have limited scope to influence transmission losses in operational time frames. The Electricity System Operator (ESO) has the responsibility to operate and direct the flow of energy over the GB electricity transmission system, taking into account underlying constraints while optimising the performance of the whole system. Therefore, our initiatives toward managing transmission losses are mainly focused on optimising the consequential environmental impacts of our investment decisions.

In procuring equipment, we consider an estimate of the total cost of ownership in order to determine the most economic approach for consumers. This evaluation recognises both the purchase price and the cost of losses over the expected life-time of the equipment. The impact on losses has been considered for all of the major reinforcements and asset replacement plans in our business plan and has been summarised in Table 22[7]. For comparison, the total transmission losses on the SPT network for the year to 31 March 2018 were about 720,000 MWh[8]. This is a relatively high annual value. Historically, annual losses have averaged around 520,000 MWh.

Table 22: Estimated annual impact of RIIO-T2 works on losses

Equipment or Works	Reduction due to Asset Replacement (MWh)	Increase to Facilitate New Renewables (MWh)
Transformers	8,110	10,250
Shunt and series reactors	2,390	6,770
Overhead lines	4,040	2,510
Harmonic filters		3,680
STATCOMs		37,120
New Connections		31,565
Total As % of typical annual SPT losses	**14,540** 3%	**91,895** 17%

Effective electricity losses management is required to protect customers from unnecessary costs and to limit the greenhouse gas emissions associated with power generation. However, it should be noted that further integration of renewable energy resources over coming years will reduce the carbon content of the power system, but the expansion of

[7] This is a preliminary assessment due to T2 works in isolation, based on typical annual equipment load factors and does not account for changes in power transfers across the main SPT transmission network.
[8] SP Energy Networks, Transmission Losses Report 2019, October 2019

the network to connect and facilitate large volumes of renewable generation, in remote parts of the country will play a major part in increasing losses.

We will continue to analyse and report losses to demonstrate how our decisions are helping to reduce losses where that is economic and efficient and consistent with wider environmental and stakeholder objectives.

Introduction

Losses are an inevitable consequence of transferring energy across electricity networks. They represent the difference between all the energy that is injected into a system from generation and the energy that is taken out of the same system by demand. In the case of SP Transmission (SPT), the energy being transferred across our transmission system between Scottish Hydro-Electric Transmission (SHE Transmission) to the north and National Grid Electricity Transmission (NGET) to the south also contributes to our transmission losses.

The Electricity Act 1989, Section 9(2), requires all electricity transmission licensees to develop and maintain an efficient, co-ordinated and economical system of electricity transmission. In addition, our transmission licence Special Condition 2K requires SPT to develop and maintain a strategy for managing transmission losses and to report on how we have acted accordingly to make sure losses are as low as reasonably practicable.

This paper sets out SPT's strategy with regard to managing transmission losses in the RIIO-T2 price control period commencing 2021.

This strategy describes:

- How we take losses into account when planning load related reinforcements and non-load related asset replacement on our transmission system;
- How we determine optimal specifications in our asset procurement processes;
- Key developments on our transmission system and estimates of their impact on losses;
- Our asset replacement programme and estimates of the impact on losses; and
- The potential application of new and innovative technologies and the impact of these on transmission losses.

To conclude we present our plans for reporting and stakeholder engagement during the T2 period.

Causes and Impacts of Losses

Transmission losses are largely due to the heating of various components of the power system and can be categorised as follows:

- **Fixed Losses:** This refers to electrical power being lost when equipment such as transformers, overhead lines and power cables are energised even if there is no power flowing through them. This component of technical losses mainly depends on the electromagnetic and dielectric characteristics of the energised equipment and the applied voltage. Considering that the operating voltage of transmission equipment needs to remain within statutory limits, the commonly used approach to manage these losses is to improve the electromagnetic and dielectric characteristics of equipment.
- **Variable Losses:** This refers to electrical power being lost in the current carrying conductors of transmission equipment. This type of power loss is proportional to the square of the current, or power flow, passing through the conductor and its electrical resistance (often referred to as I2R losses). Therefore, efforts to mitigate variable losses are mainly focused on reducing power transfers or reducing the resistance in the power transport path.
- **Substation Auxiliaries:** This refers to electrical energy being used by the auxiliary facilities in transmission substations. Cooling, air and hydraulic systems, protection, control and monitoring are all essential services, as is environmental management for sensitive equipment. Power is also required for the safety and comfort of those working in and around substations, e.g. heating, air conditioning and lighting. These energy uses are essential for safe and reliable operation of the system although some actions can be taken to improve energy efficiency.

Apparent losses can also arise due to energy theft and errors in unmetered supplies but these are more applicable to distribution networks and are not considered relevant for the management of losses on the SPT network.

Losses are closely related to the overall power transfer capability of the transmission network, which is often due to the thermal limits of circuits or transformers, i.e. the heating effect of losses. For a given flow of power, losses can be reduced

by a decrease in series resistance, as in the conductors on overhead lines, or an increase in shunt resistance, as in the no-load losses of transformers.

Transmission losses can be managed within both the investment planning and operational time frames. However, in our role as a Transmission Owner (TO) we have limited scope to influence transmission losses in operational time frames. National Grid Electricity System Operator (NGESO) has the responsibility to operate and direct the flow of energy over the GB electricity transmission system, taking into account underlying constraints while optimising the performance of the whole system. Therefore, our initiatives toward managing transmission losses are mainly focused on optimising the consequential environmental impacts of our investment decisions.

Effective electricity losses management is required to protect customers from unnecessary costs and to limit the greenhouse gas emissions associated with power generation. However, it should be noted that further integration of renewable energy resources over coming years will reduce the carbon content of the power system, including losses, helping to reduce carbon emissions from GB as a whole.

The Impact of Key Developments and Asset Replacement

Taking Account of Losses in Investment Planning

Our investment planning decisions are driven by customer needs and our licence obligations including the requirements of the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS). There is a wide range of factors that determine the design of both load related reinforcements and non-load related asset replacement. These include the practicalities of construction and deliverability, overall environmental impact of each development, as well as the impact on system performance, capability and operability. The impact on losses is considered, but in most cases it will not be a determining factor in the overall design. In instances where the impact on losses will affect the decision being made more detailed analysis is performed.

The losses associated with a proposed reinforcement can be estimated in power system studies by comparing the results from simulations with and without the reinforcement. As per industry codes, our investment planning studies are based on generation and demand backgrounds provided by NGESO that reflect the Future Energy Scenarios (FES). Studies are performed to assess the impact of proposed reinforcements against these backgrounds, with losses being one of the results that can be extracted from the studies.

Losses associated with asset replacement can be estimated by examining historical data to determine the power flows in that asset, then calculating how losses may be different following replacement. This approach can provide only indicative results because the differences in resistance and other parameters between the old and new asset will affect the power flows. Furthermore, asset replacement often involves upgrades or improvements that affect the behaviour of the wider system, or they are partly to accommodate anticipated changes in usage patterns, so historical power flow measurements may not be representative of future use.

The following section explains our approach to the specification and procurement of various types of new equipment and how this includes consideration of transmission losses.

Transformers

When procuring transformers, we consider an estimate of the total cost of ownership in order to determine the most economic purchase. This evaluation recognises both the purchase price of the transformer and the transformer losses, by capitalising the cost of these losses over the expected life-time of the transformer9.

Modern transformers have considerably lower losses when compared to transformers that have been in service for many decades. Our business plan includes the replacement of 15 transformers. We estimate that this will reduce losses by 8,110 MWh10 per year, which represents an annual saving of £487k.

We are also installing 9 new transformers on the network, which will add to transmission losses. Five of these transformers are large 1000 MVA units with proportionally high losses. Our estimate is that the new transformers will increase annual

[9] Appendix A-20 of Specification for Transmission System Double Wound Transformers (TRAN-03-022, Issue No. 7) and Specification for Transmission Autotransformers (TRAN-03-024, Issue No.5).
[10] This includes 6810MW.h in fixed no-load losses and 1300MW.h in load losses.

transmission losses by around 10,250 MWh at a cost of £615k. The savings from asset replacement are therefore offset by new transformers that provide increased network capacity. Note that transformers that form part of new customer connections have not been included here.

Shunt and series reactors

Similar to transformers, when procuring reactors, we establish the total cost of ownership in order to determine the most economic purchase.

Our business plan shows that we are replacing two shunt reactors. Like transformers, modern reactors have lower losses than older equipment. Therefore, replacing these assets leads to a reduction in losses of about 2,390 MWh per year.

However, we are also planning to install 5 new shunt reactors, which will lead to additional losses of approximately 6,770 MWh per year. Therefore, shunt reactors will account for a net increase in losses of 4,380 MWh at a cost of approximately £263k, annually.

Note that we are not proposing to replace or install any new series reactors, which therefore also has no impact on losses.

Overhead lines

On overhead lines, modern conductors offer a number of improvements over older types including a small reduction in losses. Over the RIIO-T2 period, we are proposing the replacement of 334 circuit-km of twin Zebra (400 mm2 Aluminium Conductor Steel Reinforced (ACSR)) conductor bundles with twin Totara (425 mm2 All Aluminium Alloy Conductor (AAAC)). The new “Extra High Conductivity” Totara conductor has a resistance that is 7.3% lower than that of the old “Standard Conductivity” Zebra conductor. This reduces losses by 7.3% when loaded on a like for like basis.

Further, we are replacing 149 circuit-km of Lynx 175 mm2 ACSR conductor, mostly with Poplar 200 mm2 AAAC conductor, which reduces the conductor resistance by 17.5%.

The overall impact on transmission losses is difficult to quantify as it depends entirely on the loading of the affected circuits. However, it is estimated that overhead line conductor replacements will reduce annual losses by 4,040 MWh or an annual cost saving of £242k.

However, asset replacement on overhead lines also illustrates how increasing power flows across the SPT network may lead to higher losses. One approach to increasing network capacity is for overhead line routes to be upgraded with new conductor technology that can be run at much higher temperatures (so-called High Temperature Low Sag or HTLS conductor types). This allows the same tower routes to carry much higher amounts of power, and thereby accommodate the growth in renewable generation, and while the higher temperature means higher losses, the need to build new or rebuild existing overhead line towers is avoided.

The Denny – Wishaw project (DWNO) adds 17km of twin Totara AAAC overhead line circuit to the SPT network. This will increase network losses by approximately 2,510 MWh per year at an annual cost of £151k.

Losses are also affected by the upgrading of circuits to operate at higher voltage, e.g. from 275 kV to 400 kV. For the same power flow, operation at a higher voltage will mean lower current and so lower losses. However, the nature of the interconnected network is such that the higher capacity circuit is likely to carry more power than the circuit it replaced. Significant upgrades often mean fundamental changes to the network topology so it is not practical to calculate before and after values for losses on individual circuits. In the present context, upgrades to the network like this are primarily driven by the required increase in power transfers due to the connection of new renewable generation. No such voltage upgrades are proposed in our business plan.

Harmonic filters

To efficiently mitigate harmonic resonance problems in the 132 kV network, our business plan proposes the installation of 6 harmonic filters. The losses of these devices vary with harmonic levels and system frequency. When the frequency deviates from 50 Hz, losses increase. However, under normal operating conditions, losses are not expected to exceed 70 kW per filter.

The 6 filters would therefore lead to total losses of 3,680 MWh every year, increasing annual operational costs by £221k.

The installation of harmonic filters will lead to lower harmonic distortion levels across the network, which in turn reduces total losses. Complex network simulations are required to quantify wider harmonic losses and these have therefore not been included here.

STATCOMs

Our business plan proposes the installation of a STATCOM at Mark Hill to provide network support during rapid voltage changes, improving power transfer capability and system stability. Estimated annual losses for the Mark Hill STATCOMs are 1,640 MWh.

At Eccles, we are proposing the installation of two hybrid shunt compensators, which combine the system strength improvement provided by a synchronous compensator with the fast response of a STATCOM. Here we will use techniques developed as part of our Phoenix NIC project to optimise the overall performance of the system, including loss minimisation. However, synchronous compensators are rotating machines and therefore have relatively high losses, typically about 4.5 MW for the Eccles installation, leading to a total annual increase in losses of 29,1710 MWh.

Note that our plan also includes an uncertainty mechanism for synchronous compensators, should these be required to improve the strength and stability of our network. It is very difficult to predict the future operating regime of any synchronous compensators that we might install, but total annual losses could be as high as 35,500 MWh at an operational cost of £2.1m per year. Although this cost is deemed to be very low compared to the system benefits provided, minimising losses will be a very important part of the design and procurement of this equipment. Our strategy is not to order equipment of a fixed rating, but rather to specify the required system strength improvement and invite suppliers to offer suitable equipment, including equivalent non-rotating plant if this is cost-effective. Suppliers will be encouraged to reduce losses as far as possible, e.g. by offering installations with multiple units that could be partially shut down to reduce losses. Note that this would also improve the overall synchronous compensator availability.

Our baseline plan (the installations at Mark Hill and Eccles) is estimated to increase losses by 37,120 MWh.

New Connections

Through the process of connecting new customers to the network, additional assets inevitably need to be added to the network to allow this to happen. For SPT, the majority of these connections are associated with renewable generation and are far from existing infrastructure, requiring many kilometres of overhead lines or cables to allow these to be connected to the wider network. The scale and technology of different generation sites will result in connection at different voltage levels which may also necessitate new transformers. These components, whilst enabling the connection of renewable generation, will increase the proportion of losses on the network.

A quantification of this impact is difficult to make as it is dependent on the assets and location of new generation that materialises in the RIIO-T2 period. However, we estimate that new connections will account for approximately 31,570 MWh of additional losses per year, increasing network losses by about 6% at a cost of £1.9m. Note that this assessment only accounts for losses in the network components that connect new generators to the main transmission network. The increased losses due to increased network power flows have not been considered.

Substation Auxiliaries

The power used by the facilities in our substations is required for safe and reliable operation of our transmission system and represents a small fraction of the overall transmission losses. Most equipment at substations is essential, such as protection relays, communication hubs and servers hosting control systems. These cannot be switched off, but as assets are replaced the energy efficiency of this technology is improving, although the consumption is quite small. Substation buildings are also heated and lit. Heating is essential to preserve the operating environment and prevent condensation or other conditions which could result in this equipment failing prematurely. We aim to identify where efficiencies can be made through energy saving measures for heating and lighting and will implement these where it is cost effective to do so. Energy-saving measures to be considered can include:

- Improved insulation in the walls, roof and floor of substation buildings
- Draught proofing to reduce heat loss, while maintaining adequate ventilation
- Replacement of doors or blocking out windows to improve insulation

- Lowering of heating set points, taking account of the risks of condensation build-up
- Replacement of lighting with energy efficient equivalents
- Occupancy detection control of lighting

New Technologies and Innovation

Our strategy is to remain informed of the latest technological developments in the field of electricity transmission and their impact in respect of transmission losses. Technological advancement over the price control period is expected to facilitate application of technologies that are currently impractical and/or too expensive to be used on the transmission system. New technologies may have a beneficial effect and help to reduce transmission losses but it is also possible that new technologies deployed to deliver benefits in other areas may actually result in higher losses. As described above, our approach will be to assess the costs and benefits of each investment, examining losses in detail where they may be critical to the decision, then to procure equipment based on an assessment of whole lifetime costs, including losses.

Our major driver is to facilitate carbon reduction and other environmental improvements. Of particular relevance to our transmission system, there are currently technical limitations on the proportion of renewable energy that can be allowed to contribute to the energy mix at any given time. We are determined to play a full part in overcoming these by seeking to introduce new and innovative technology within our network that will support ever greater penetration of renewable energy on the whole energy system.

Our innovation strategy and the potential role of new technologies in the RIIO-T2 period are described elsewhere in our business plan. The impact on losses will be considered in each case in line with our broader strategy for investment planning and procurement.

DNOs have put considerable efforts into managing losses in their networks due to their licence obligations and to compete for the available financial rewards. Because of these initiatives, they have developed many innovative ideas for managing losses in their networks. Some of their approaches, if implemented and coordinated properly, may also support management of transmission losses. Therefore, we will continue to engage with DNOs, NGESO and other relevant parties to explore potential opportunities to reduce losses in our transmission system in the context of a coordinated, economic and efficient whole system approach.

Measurement of Losses

It is difficult to accurately measure losses on the transmission network because it involves combining a large number of separate measurements of power flow at all points of input/output, and all of these separate measurements are prone to inaccuracies. As per an agreed methodology, to provide a consistent and coordinated approach to the measurement of transmission losses for each TO, NGESO calculates the losses across the whole GB system using settlement metering data from Elexon, which gives the power flow at each generator connection and grid supply point. The total is then apportioned to each transmission area based on SCADA measurements on the boundary circuits, with corrections applied as deemed necessary. SPT and other the TOs are therefore reliant on the data provided by NGESO to fulfil their obligations under SpC 2K.4.

We see opportunities to improve the measurement and calculation of losses over the course of the price control period; although we are mindful that more accurate measurements are not actually producing a loss reduction and expenditure may be better applied to initiatives with direct impact on losses. This will be reviewed in collaboration with NGESO and other TOs and, subject to cost benefit assessment, might include:

- Reviewing the existing SCADA measurements on boundary circuits, correcting errors, and ensuring that NGESO is receiving all the measurements that may be useful in the losses calculations;
- Supplementing SCADA measurements with Phasor Measurement Unit (PMU), meter-grade or other measurements of higher fidelity;
- Exploring the scope to use state estimation, in the network management systems at NGESO or SPT, to derive losses values in real-time and archive them for cross-checking against calculations at year-end;
- Reviewing the calculation methodology, with NGESO and the other TOs, to make improvements in data processing, error detection and correction, and best use of all available data sources.

Reporting and Stakeholder Engagement

Special Condition 2K requires that we publish an annual report on transmission losses that includes:

- The level of transmission losses on our system (which will continue to be calculated by the ESO according to a methodology agreed with the TOs);
- A progress report on implementation of this strategy; and
- Any changes or revisions made to the strategy.

Embedding the annual losses report in an overarching environmental report is expected to raise the profile of transmission losses and prompt greater engagement with stakeholders, which we welcome. Engaging with stakeholders provides an opportunity to inform our decisions, while encouraging the sharing of knowledge to help shape an industry-wide understanding of best practice for managing electricity losses in the context of a low carbon system. It is important that we position losses in the context of the environmental objectives and benefits that our business is at the heart of delivering for all customers. We consider that a whole systems approach that reduces carbon emissions would be the most appropriate objective and that local initiatives to reduce losses as measured in isolation may not have the desired benefit overall. We will continue to remain engaged with our stakeholders to discuss common issues with respect to managing electricity losses.

We are committed to considering all reasonable measures which can be applied to reduce losses on the transmission system and adopting those measures which provide benefit for customers. As we continue to connect more renewable generation in Scotland we are working toward getting the most out of our existing assets and increasing the capacity of our network to accommodate this generation. At the same time, we are also aiming to improve the overall performance of our network. This includes careful consideration of losses and minimising these as far as possible in a way that balances capital investment, operational cost and environmental impact. We will continue to analyse and report losses to demonstrate how our decisions are helping to reduce losses where that is economic and efficient and consistent with wider environmental and stakeholder objectives.

Conclusions

Over the RIIO-T2 period, we are investing to replace ageing assets, connect new renewable generation and to ensure that our network can be operated reliably when renewable generation is high and large conventional synchronous generation is not running. This shift to a lower-carbon electricity system requires additional equipment to provide network capacity, system strength and voltage control. This introduces significant additional losses in the SPT area. We estimate that transmission losses will increase to as much as 1,400,000 MWh, or 1.4TWh, by the end of RIIO-T2, roughly doubling the costs to consumers to around £84m per year. However, this increase has to be weighed against the benefit of connecting upwards of 900 MW of renewable generation in the SPT area and transporting significantly increased amounts of renewable energy from across Scotland to consumers in England and Wales.

As outlined in this strategy, we are committed to reducing losses on the transmission system where it is economic to do so and provides benefit for customers.

RIIO-T2 Commitments: BCF Losses

Table 23: RIIO-T2 Commitments: BCF Losses

Commitment	External source/ justification	Timeline
We will implement our T2 Losses Reduction Strategy to reduce losses on the network by an estimated 14,500 MWh (circa 3% of 2018/19 losses), thereby limiting losses to a lower level than would otherwise be the case, where this is economic and provides benefit to customers.	External Stakeholder - Environmental Regulators, Operators, User Group, Sustainability Working Group, Expert Reviewers	Throughout RIIO-T2

RIIO-T2 Metrics: BCF Losses

Table 24: RIIO-T2 Metrics: BCF Losses

Metric	Unit	Normalisation Factor
Total - Scope 2 Carbon Emissions (Losses)	tCO2e	turnover/ profit

6.10. Climate change adaptation

Scotland's changing climate presents risks to the reliability of our network and we must act to ensure on-going resilience.

This requires:

- Seeking to understand our existing resilience to weather
- Understanding the potential impacts of climate change on our network
- Embedding adaptation within our business processes and investment decisions.

As climate predictions evolve, we carry out work to ensure that our assets are resilient to the effects of climate change, including the potential for increased flooding and higher temperatures. For more detail see Flood Mitigation within the Supporting and Securing our Network section of our main RIIO-T2 Business Plan.

RIIO-T1 Performance

Climate Change Management Plans

Since 2010, we have assessed and reported our climate change management plans, as required by the UK Climate Change Act 2008, with our first adaptation report produced in 2011 (round 1 reporting). Our second round report was produced in 2015, which provided an update on the risks identified in the first report, as well as an update on the uncertainties and information available relating to risks from climate change since the first reports were published in 2011. The third round report is due for publication 2020.

Our Round 1 report published in 2011 aligned with an assessment undertaken by the Electricity Networks Association (ENA), which coordinated an industry-wide response to the first call to report. SP Energy Networks was a contributor to this response, and considered the ENA assessment to be a robust and appropriate baseline for our subsequent network-specific assessments.

Our network-specific assessment focused mainly on the impacts listed below, in line with overall climate projections for hotter drier summers, warmer wetter winters and more frequent and intense storm events:

- Increased temperatures including an extension of the growing season;
- Drought and reduced soil moisture contents;
- Rising sea levels and coastal erosion;
- Rainfall and flooding, including river erosion; and
- Storms, including lightning and other extreme events.

Our assessment used the ENA risk assessment framework and was informed by the UKCP09 projections.

The 3 most highly-ranked risks all related to flooding of substation sites and were as follows:

- AR10: Substations affected by river flooding due to increased winter rainfall, with loss of inability to function leading to reduced security of supply;

- AR11: Substations affected by flash flooding due to severe rainfall, with loss of inability to function leading to reduced security of supply;
- AR12: There is a risk that due to extreme sea flooding a substation may be lost or unable to function leading to reduced system security of supply. A number of sites may be at risk from sea level rise/coastal erosion.

During RIIO T1, we have undertaken projects to mitigate the risks from fluvial and coastal flooding at a number of substations in accordance with ENA Engineering Technical Report ETR 138 – 'Resilience to Flooding of Grid and Primary Substations'. This details the electricity industry requirements relating to the protection of substations from flooding.

However when ETR 138 was first published, in advance of the RIIO T1 settlement, it did not take cognisance of pluvial flooding. Mitigation against pluvial flooding is now a requirement of the current version of ETR 138.

RIIO-T2 Commitments and Metrics: Climate Change Adaptation

RIIO-T2 Flood Mitigation

To inform the development of our T2 Investment Plan, and in advance of the third round reporting, a review was undertaken to confirm the risks identified for the transmission network identified in the 2015 second round report were still applicable, and to identify mitigation actions required to be implemented during T2.

> *Changes in weather patterns and sea level rises will test our transport, communication, fuel and energy networks.*
>
> **Scottish Government (2018) Climate Change Plan**

Based on the guidance within ETR 138, a desktop exercise using the latest SEPA modelling information for pluvial, fluvial and coastal flooding was undertaken to review the impact of flooding across the network.

This identified a need to undertake further works, specifically associated with pluvial flooding, to supplement the projects completed in RIIO T1. During the RIIO T2 period we propose to undertake detailed Flood Risk Assessments (FRA) at all 10 identified high risk sites and implement measures which will mitigate the risk to the network from flooding.

Read more about this in the Non-Load section of our Business Plan and Justification Paper – Flood Mitigation.

Figure 29: Example flood mitigation measures

RIIO-T2 Commitments and Metrics: Climate Change Adaptation

Table 25: RIIO-T2 Commitments: Climate Change Adaptation

Commitment	External source/ justification	Timeline
We will undertake detailed Flood Risk Assessments at our remaining 10 high risk sites and implement identified measures to mitigate the risk to the network from flooding.	External Stakeholder - Environmental Regulator	By 2026
We will publish a report in line with the 3rd Round of Adaptation Reporting under the Climate Change Act, in line with the Energy Networks Association work to produce a sector report.	Continuing business as usual	By 2026

Table 26: RIIO-T2 Metrics: Climate Change Adaptation

Metric	Unit	Normalisation Factor
Flood Risk Assessments completed	Number	% total
FRA mitigation measures implemented	Number/£	% total

RIIO-T2 Cost

£5.5m

7. REDUCING OUR NETWORK'S ENVIRONMENTAL IMPACTS

While we deliver the low carbon transition and reduce our own carbon impact, we must also prevent pollution, protect and enhance biodiversity, use resources sustainably and encourage our supply chain to optimise their environmental impacts. Protection of the environment is a key component of how we operate our business. Within this section we describe the opportunities for addressing our key material impact areas identified within Section 2, and the mitigation we have included within our Investment Plan.

The key material impact areas include:

- Pollution of the local environment
- Degradation of land, natural habitats and biodiversity
- Visual amenity
- Use of resources and the production and disposal of waste

7.1. Preventing Pollution

Our Vision

We will have a net positive impact on the environment.

Our Objectives

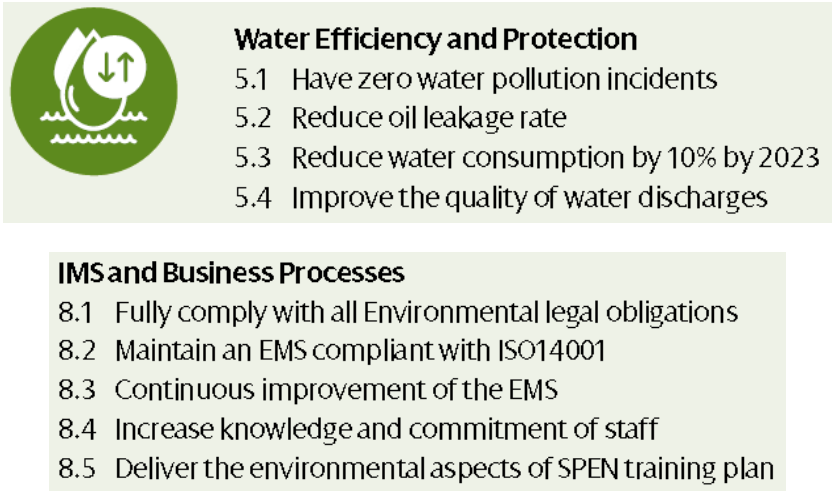


Figure 30: SP Energy Networks Sustainable Business Strategy – Water Efficiency and Protection and IMS/Business Processes Objectives

We operate and maintain linear infrastructure which is routed through, or adjacent to, a wide range of culturally or environmentally sensitive landscapes and structures, ranging from pristine to degraded habitats. While we provide the network connections and services that customers require, we recognise the need to minimise any negative effects these activities could have on the environment and communities as far as is reasonably practicable.

Throughout the life of our assets, we not only meet the requirements of government policies and legislation but strive to move 'beyond compliance' by integrating fair and responsible environmental practices with socio-economic considerations.

In line with the requirements of ISO14001, we continuously review our environmental risks and impacts and target those of highest priority/impact for reduction. This process has informed the development of our RIIO-T2 programme of measures to

prevent pollution. Priority impacts include: use of hazardous materials, oil leaks, construction site and substation drainage systems, and noise.

Many of our assets are designed to have a lifetime of over 40 years and therefore much of our network was constructed several decades ago, before the introduction of the high levels of environmental protection that we now build in as standard. We are therefore progressively working to bring these older sites up to current standards. To support the development of our RIIO-T2 investment plan, a comprehensive programme of civil inspections was undertaken to inform a condition-based asset risk assessment, identifying a number of bunds and drainage systems requiring refurbishment and upgrade. Additionally, we know we have a legacy risk of land contamination from oil potentially having escaped into the environment at these older sites.

Our RIIO-T2 Business Plan Data Table A4.4 Environmental Action Plan includes historic and forecast performance data on carbon and other environmental impacts.

RIIO T1 Performance

Our commitment to comply with environmental legal requirements is the foundation for all activities to reduce environmental impacts. During T1 we focussed on our target of 0 regulatory interventions and are on target to achieve this in 2019.

Table 27: RIIO-T1 Incident Performance

Category	2013	2014	2015	2016	2017	2018
Environmental regulatory interventions	0	1	0	1	10	1

We have also worked hard to achieve full reporting of environmental incidents, by both staff and contractors, and subsequently to drive down the number and severity of such incidents. We are half way through a 3 year Environmental Training Programme, designed to increase staff knowledge levels to ensure they have the required competence to deliver environmental compliance as it relates to their role. We have an internal engagement plan which ensures that we are regularly communicating environmental requirements and improvement opportunities to staff to drive improved understanding and ongoing action. With a peak in 2017, which coincided with our most significant programme of works for decades, we are now on a trajectory towards our goal of 0 notifiable environmental breaches.

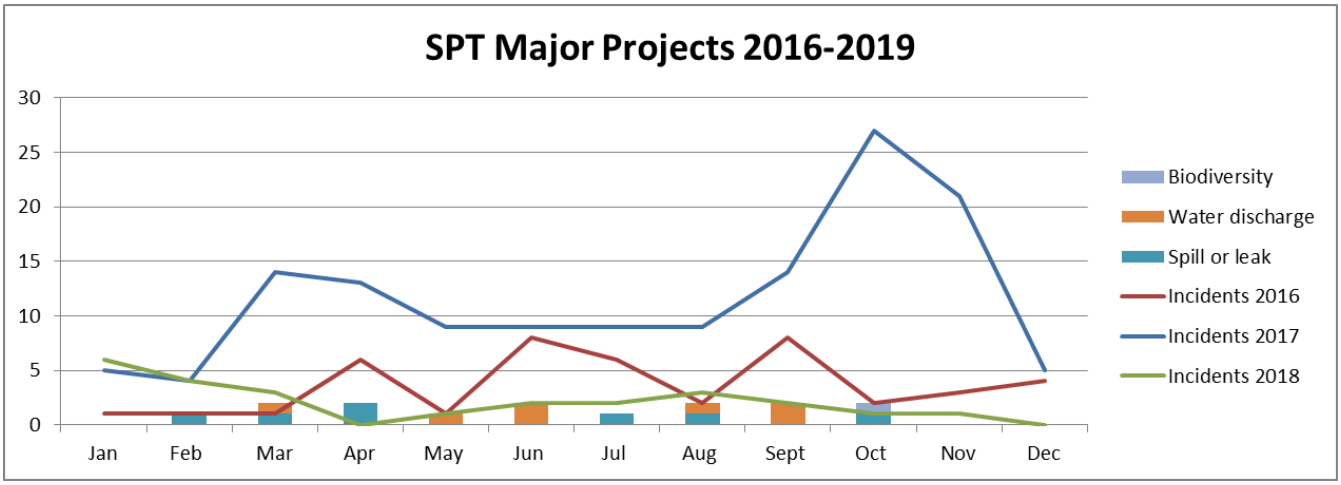


Figure 31: SP Transmission Major Projects Environmental Incidents 2016-19

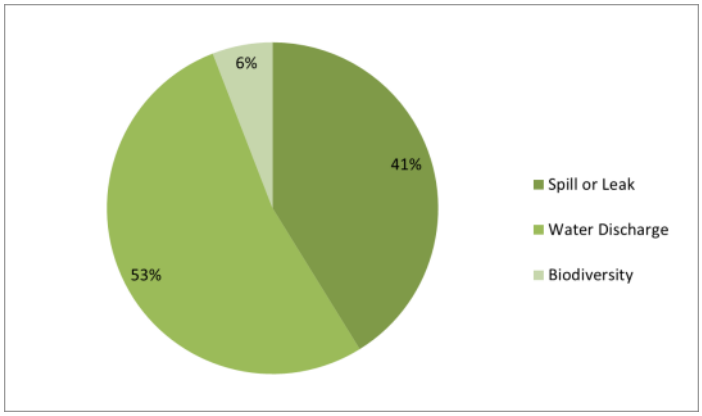


Figure 32: SP Transmission Major Projects Environmental Incident Categories 12 months to Nov 2019

Our most common incidents arise from construction site drainage, where a variety of issues such as quality of drainage system construction, high rainfall or increased vehicle traffic can, if not adequately managed, result in silt runoff. This can reach local water courses in the most significant cases. We have dedicated significant effort to addressing these types of incident, working with our contractors to ensure that site roads and related drainage systems are constructed in line with good practice and the expected traffic levels and that regular maintenance and inspections are carried out. This effort has resulted in a significant reduction in silt pollution events and the lion's share of the reduction in incident numbers over the last couple of years.

Around 40% of our incidents relate to the escape of fuel or oil from vehicles or equipment. These are dealt with using the spill kits provided on site or by calling out our emergency spill response contractor and rarely result in environmental damage.

Occasionally we have an incident relating to disturbance to or damage of the local ecology despite the survey work we do in advance of arriving on site. We continue to work to ensure our staff and contractors are aware of the local ecology and the controls in place to ensure disturbance is minimised and legal requirements are met.

Legacy Land Contamination

During T1 we have been working to better understand the risk of legacy land contamination by oil from older assets, and to prioritise sites for investigation and remediation if required.

PolyChlorinated Biphenols (PCBs)

PCBs are a group of synthetic chemicals with good dielectric properties and a high breakdown voltage. They are non-flammable and were used as a dielectric and heat transfer fluid where low-flammability was of prime importance. They were commonly used in insulating oil used in electrical apparatus including transformers, liquid filled cables, high and low voltage capacitors, switches etc., manufactured prior to 1987.

PCBs have long been recognised as posing a threat to the environment because of their toxicity, persistence and tendency to bio-accumulate (i.e. to build up in the bodies of animals, particularly at the top of the food chain). Increasingly high levels have been found in the body fats of fish, birds and mammals and have been linked with harmful effects such as liver damage and a reduced ability to fight infection.

The Stockholm Convention on Persistent Organic Pollutants, an international environmental treaty became effective from May 2004. To implement this treaty the European Commission published the Persistent Organic Pollutants (POPs) Regulation (EC No 850/2004) and subsequently a recast version which entered into force in June 2019:

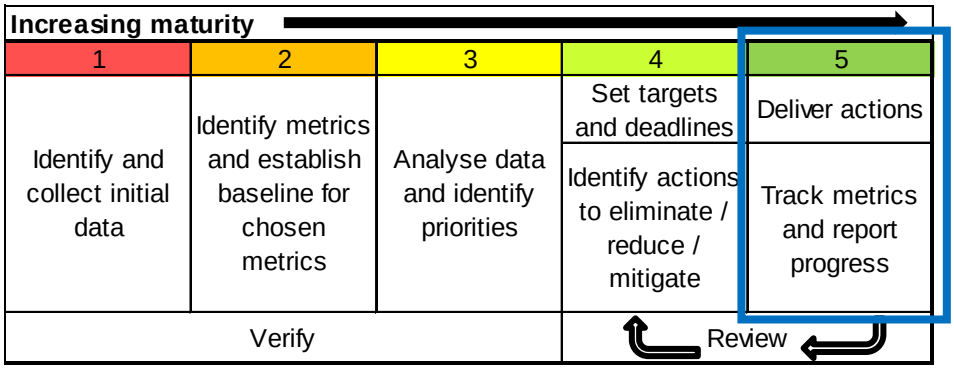
"Member States shall identify and remove from use equipment (e.g. transformers, capacitors or other receptacles containing liquid stocks) containing more than 0.005% PCBs and volumes greater than 0.05dm^3, as soon as possible but no later than 31 December 2025."

The hard deadline of 31st December 2025 and the volumetric threshold of 0.05dm3 (50mL) are significant changes.

During T1, we had been working towards a gradual removal of contaminated equipment (containing more than 0.005% PCBs) at end of life, without a hard deadline, and targeting equipment with fluid volumes greater than 5L. Any equipment that contains PCBs above the threshold, or may contain such a level (where for example the asset is pre-1987 and cannot be tested due to its sealed nature) must now be removed from the network by the end of 2025, or must be confirmed to be PCB free via testing or changing the oil. We have therefore included this requirement in our T2 investment planning.

Level of maturity

Our level of maturity for the prevention of pollution is:



RIIO-T2 Preventing Pollution Commitments

As mentioned above, as part of our T2 investment planning we conducted site surveys to identify where oil containment measures are inadequate and have developed a programme to address this.

Refurbishment of Oil Bunding and Drainage Systems (SPNLT20102)

Transformer bunds and their associated oily water drainage systems are installed with oil filled transformers to prevent oil entering the environment. The bunds are used to contain water and oil and are generally constructed of concrete or brick with a sump to collect the mix of oil and water. The oily water drainage system consists of:

- A network of drainage pipes which transfer the oily water from the bund sump to an oil interceptor,
- An oil interceptor which separates the oil and water and discharges the water whilst retaining the oil.
- A further network of drainage pipes which take the cleaned water from the oil interceptor and convey it to an outfall. This outfall is generally a watercourse, soakaway or another drainage network.

To support the development of our investment plan, a comprehensive programme of civil inspections was undertaken across the network. This identified a number of transformer bunds and associated oily water drainage systems which are in a deteriorated condition and do not comply with current standards. Without intervention, these assets will degrade to a point where they cannot be repaired and will fail.

We applied our resource efficiency hierarchy – reuse, refurbish, replace – and identified refurbishment as the most appropriate approach resulting in a significant reduction in the volumes of raw materials associated with new concrete and reducing the need to dispose of the concrete associated with old bunds to landfill.

Our investment plan includes a programme of refurbishment works which prioritises sites based on:

- The Health Index of the transformer bunds and oily water drainage systems;
- The environmental risks identified through a desktop review of the environmental sensitivity of each site;
- Alignment with our transformer replacement and refurbishment programmes to drive cost efficiency

Land contamination

We expect that our review of legacy land contamination risk may identify some sites where further investigation is required to determine whether there is any contamination that requires remediation. Because this is not predictable at this time with the information that we have, and therefore the costs are uncertain, we have proposed that this potential investment requirement is covered by the Environmental Enhancements Uncertainty Mechanism proposed in our Managing Uncertainty T2 Business Plan chapter and related Annex 20.

PCBs

In line with the revised legislation summarised above, we have included in our RIIO-T2 Investment Plan a programme to replace all remaining assets that contain, or may contain, PCBs (summarised in Table 28 below).

Table 28: Summary of assets to be replaced to ensure removal of PCBs from our network

	11kV	25kV & 33kV	132kV	275kV	400kV
CVT asset addition	2	10	49	47	19
CVT asset removal	2	10	49	47	19
CT asset addition	0	-	26	3	0
CT asset removal	0	-	26	3	0

The scope of other works in the RIIO-T2 business plan will replace some such contaminated equipment and this programme is to complete the removal of the remaining units.

The design of CT and CVT capacitor units manufactured before 1987 in this programme means that they cannot be tested for PCB content causing potentially irreparable damage. Because these cannot be tested to prove that they are not contaminated they must be assumed to be contaminated, as stated in the relevant legislation, and must therefore be targeted for replacement before the end of 2025. Certain CT units with known PCB content have also been identified for replacement.

The units will be replaced on a like for like basis with a PCB free alternate instrument transformer. No CBA has been carried out because this is a legal requirement that must be complied with by the deadline of the end of 2025, which is during RIIO-T2. The minimum solution - simple like-for-like replacement - has been proposed in all cases.

RIIO-T2 Commitments: Preventing Pollution

Table 29: RIIO-T2 Commitments: Preventing Pollution

Commitment	External source/ justification	Timeline
We will target zero environmental regulatory interventions and notifiable breaches	Continuing business as usual	By 2021
We will deliver our RIIO-T2 programme of mitigation measures (oil containment) for pollution prevention, developed via a condition-based asset risk assessment process.	External stakeholder - Environmental Regulators	By 2026
We will implement Pollution Prevention Plans for all future projects for RIIO-T2 and beyond.	External stakeholder - Environmental Regulators	By 2026

Commitment	External source/ justification	Timeline
We will implement a programme to identify, risk assess and address high risk legacy land contamination.	External stakeholder - Environmental Regulators	By 2026
We will eliminate PCBs from our network in compliance with the relevant legislation and in line with the industry approach agreed with the Environmental Regulators.	Continuing business as usual	By end Dec 2025

RIIO-T2 Metrics: Preventing Pollution

Table 30: RIIO-T2 Metrics: Preventing Pollution

Metric	Unit	Normalisation Factor
Regulatory interventions	number	turnover/ profit
Notifiable incidents	number	turnover/ profit
Oil top ups	Litres	Total volume of oil (litres)
Quantity of pesticides applied	kg	Area of land (ha)
Fluid filled cable top up	Litres	km of cable
PCB Contaminated Equipment removed from network	number	% of total number
Environmental complaints	Number of	£ Expenditure
Pollution Prevention Plans implemented	Number of	% of number of projects
Pollution mitigation measures implemented	Number of	% of total number
Land contamination risk matrix - priority sites investigated	Number of	% of high risk sites

RIIO-T2 Cost

£11m

7.2. Land and Biodiversity protection and enhancement

Our Vision

We will protect and continually enhance the biodiversity around our assets and support national and local strategies. Our decision making will incorporate the principles of Natural Capital Assessment to ensure that levels of natural assets are at least protected, if not enhanced. We will have a net positive impact on the environment and communities in which we operate.

Our Objectives

Land and Biodiversity Improvement

3.1 Assess visual amenity and ecological impact when managing and maintaining our network in sensitive environments.
3.2 Implement a process to assess biodiversity and make relevant business decisions to promote net biodiversity gain.
3.3 Implement management process for invasive and non-native species on our land and along our network by 2023
3.4 Incorporate Natural Capital Assessment in our processes where beneficial
3.5 Understand risks associated with land contamination

Figure 33: SP Energy Networks Sustainable Business Strategy – Land and Biodiversity Improvement Objectives

We mitigate biodiversity loss most significantly through our actions to maximise the utilisation of our network and connect low carbon generation for societal decarbonisation, which lead to benefits in terms of climate change mitigation, avoidance of additional land use and reductions in pollution. Whilst we do this, we also protect and enhance the ecosystems within which we operate, mitigating the ecological impacts of construction aiming for 'no net loss' of biodiversity.

We are committed to encouraging ecosystem biodiversity by establishing new and sustainable projects in a way that conserves, protects and promotes the development and growth of the habitats within our network area.

The rate of global change in nature during the past 50 years is unprecedented in human history. The direct drivers of change in nature with the largest global impact have been (starting with those with most impact): changes in land and sea use; direct exploitation of organisms; climate change; pollution and invasion of alien species.

Goals for conserving and sustainably using nature and achieving stainability cannot be met by current trajectories, and goals doe 2030 and beyond may only be achieve through transformative changes across economic, social , political and technological factors

United Nations IPBES (2019) Global Assessment Report on Biodiversity and Ecosystem Services

Figure 34: United Nations IPBES (2019) Global Assessment Report on Biodiversity and Ecosystem Services

RIIO T1 Performance

Our routing and environmental impact assessment process considers a range of environmental factors, including biodiversity, alongside technical constraints and licence requirements. This process is currently under review and we are developing a bespoke approach recognising our role in delivering both fixed site and linear infrastructure across Scotland. This new process, which will be a central pillar in our approach, will be embedded in advance of RIIO-T2.

One of our key successes has been the award-winning Stirling Enhanced Landscape Mitigation Project, an ongoing, innovative project that has empowered community groups to assist in the design and delivery of local mitigation in the corridor of the SPT portion of the Beauly to Denny Overhead Line.

Protection and enhancement of natural habitats and biodiversity – a case study

To facilitate the connection of the new Beauly Denny overhead line to the existing network, a new 275/400kV substation was required near Dunipace, Denny. The substation is in an area where a number of overhead transmission lines converge and therefore forms a key hub in the existing electrical network.

The land at Denny forms part of a habitat of raised peatland. The peatland is teeming with invertebrates, plants, mosses, fungi, birds, mammals, amphibians and reptiles. It is also hugely important for carbon storage and flood prevention roles.

We recognised the potential impact of developing the site. As part of the project we undertook an innovative process of peat deposition to ensure that peat removed from the site, to facilitate the substation would be used to improve habitat and deliver an overall ecological benefit on the remaining area of mire.

In meeting our commitments to mitigate the impact of developing the site we have worked in partnership with our stakeholders (SNH, Scottish Government, Falkirk Council, Buglife, Callander Estates, Forestry Enterprise Scotland) to deliver off-site habitat improvement across 10 sites in the Falkirk Council area. This project addressed a requirement to deliver 58Ha of lowland peat bog restoration. By working with our stakeholders, we managed to far exceed requirements, and commenced work on over 190Ha of peat bog restoration, Management plans are in progress for each site and works on sites are due to commence in early 2017.

It is estimated that the our restored peat bogs will once completed (by end of 2019) have the potential to store over 400 tonnes of CO2e per year along with 200 million litres of additional water and give habitats to over 650 different species.

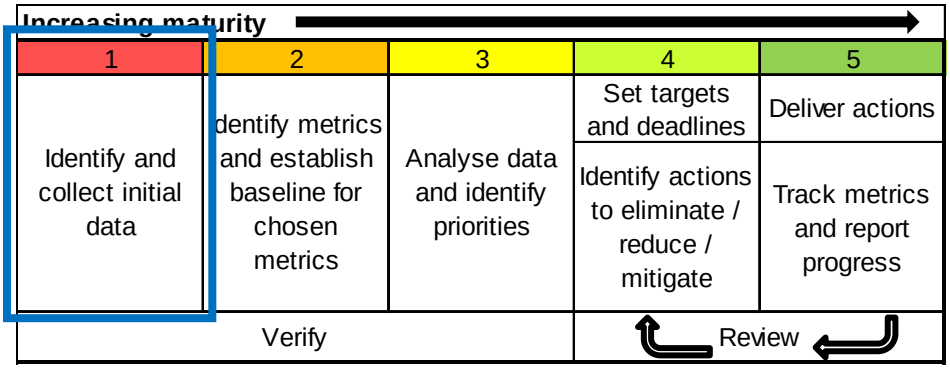
Figure 35: Peat bog plant species

Natural Capital Assessment pilot

We recognise that Biodiversity Net Gain is the first stage in our journey to develop an efficient and deliverable approach to Environmental Net Gain (our ultimate Vision). During T1 we therefore commenced a pilot project on Natural Capital Assessment with partners the Scottish Wildlife Trust, with Phase 1 completed (identification of relevant ecosystem services) and Phase 2 (application of assessment methodology) due for completion by the end of T1. The results of this pilot will inform the future use of natural capital assessment in our business, including the trial of an assessment tool (developed for National Grid). As part of our TO Sustainability Best Practice collaboration, the three TOs are already discussing the use and ongoing development of a common natural capital assessment tool based on the National Grid tool.

For more detail on our current biodiversity activities and performance please see pages 31-33 of our Transmission Annual Sustainability Statement. generation connected to our network has increased from 3GW in 2013

Level of Maturity:



RIIO T2 Commitments and Metrics

Our stakeholders have emphasised the value of us enhancing the biodiversity at our sites where operationally appropriate to do so.

A current lack of robust data on biodiversity and natural capital across our portfolio precludes the setting of biodiversity or natural capital net gain targets at this time. Our aim in RIIO-T2 is therefore to create a baseline dataset and develop, embed and trial a robust biodiversity measurement methodology to facilitate the delivery of 'no net loss', moving to 'net gain' where possible by the end of T2. This will enable us to set realistic, cost efficient targets for net gain whilst retaining the flexibility required to align our targets with Scottish legislation as it is developed.

We will work with our local communities, landowners and other stakeholders to deliver 'no net loss' in biodiversity and natural capital across our Business Plan activities and a net positive impact in biodiversity and natural capital across our existing sites. We will collaborate with our stakeholders and other Transmission Operators to develop and pilot a common approach and robust methodology to measure and drive improvements in biodiversity and the value of natural capital.

RIIO-T2 Commitments: Land and Biodiversity Protection and Enhancement

Table 31: RIIO-T2 Commitments: Land and Biodiversity Protection and Enhancement

Commitment	External source/ justification	Timeline
We will work collaboratively with our stakeholders, including the other Transmission Operators, throughout RIIO-T2 to develop and pilot a common approach and robust methodologies for delivering Biodiversity Net Gain alongside Natural Capital assessment and enhancement.	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2021
We will pilot these biodiversity and natural capital assessment methodologies and associated tools on selected RIIO-T2 projects	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2023
We will embed these biodiversity and natural capital assessment methodologies and associated tools in our business decision making processes for projects and the management of existing sites.	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2023
We will identify, and subsequently monitor and annually report, metrics to baseline and track the levels of biodiversity and value of natural capital on our sites and the achievement of our targets.	External Stakeholder - Environmental Regulators, Ofgem, Operators	By 2021
We will work with our local communities, landowners and other stakeholders to deliver 'no net loss' in biodiversity and identify options for	External Stakeholder - Environmental Regulators,	By 2026

Commitment	External source/ justification	Timeline
delivering 'net gain'.	User Group, Expert Reviewers	
We will work with our local communities, landowners and other stakeholders to deliver a net positive impact in natural capital across our existing sites.	External Stakeholder - Environmental Regulators, Conservation Groups, Sustainability Working Group, Expert Reviewers	By 2026

RIIO-T2 Metrics: Land and Biodiversity Protection and Enhancement

Table 32: RIIO-T2 Metrics: Land and Biodiversity Protection and Enhancement

Metric	Unit	Normalisation Factor
Land monitored (area)	Hectares	% total hectares
DEFRA Biodiversity Metric 2.0 (or equivalent) biodiversity value for each area monitored	Biodiversity metric (tbc)	
Biodiversity Value for each new project	Biodiversity metric (tbc)	Baseline Biodiversity Value
Biodiversity Value increase for each new project	% increase	project cost, biodiversity mitigation cost
Total Biodiversity Net Gain delivered on new projects	Biodiversity metric (tbc)	£ cost (of BNG), total project costs

RIIO-T2 Cost

£0.84m

RIIO-T2 Proposed Output Incentive

We are seeking to develop a detailed mapping of our licence area which will allow us to more quickly and accurately understand our potential impacts at as early a stage as possible – improving the accuracy and efficiency of investment decisions and ensuring that such matters can be considered as early as possible. Alongside this, we will develop a biodiversity measurement methodology and metric.

Until these are delivered, we cannot accurately forecast the mitigation and improvement actions required nor the associated costs, and we have therefore proposed an uncertainty mechanism as described in the Managing Uncertainty section, and associated Annex, of our Business Plan. Works would be carried out once appropriate sites and specific mitigation measures are identified, with site-specific improvements developed with our stakeholders including SNH, SWT, RSPB, Buglife etc., with the most cost effective solutions being prioritised to deliver our targeted level of mitigation.

We intend to focus our activity initially on measuring biodiversity at our sites and establishing a robust baseline. As our methodology develops, it will enable us to deliver ‘no net loss’ and allow us to identify additional opportunities for biodiversity ‘net gain’ in relation to our projects or sites.

This incentive will drive us to deliver biodiversity improvements beyond ‘no net loss’, to achieve biodiversity net gain across our sites and T2 projects during the RIIO-T2 period.

The costs for delivering 'net gain' will be recovered through our proposed Legislative, Policy and Standards Uncertainty Mechanism (please see Annex 20: Uncertainty Mechanisms, should the combined costs exceed the reopener threshold. As such, this incentive is designed to reward the effort and risk associated with implementing new and more extensive biodiversity enhancements.

7.3. Enhancing Visual Amenity

Visual amenity is considered in the planning of new assets or replacement works, but in some cases, pre-existing transmission infrastructure has a direct visual impact upon the surrounding environment and the stakeholders who access it. This can be because settlements have developed around existing assets, because people are accessing landscapes in new or different ways, or simply because visual amenity was not seen as a priority when certain historical assets were installed.

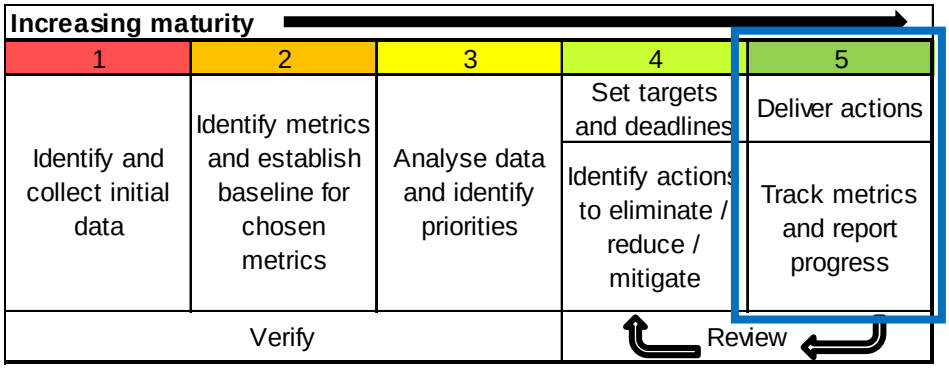
RIIO-T1 Performance

During T1, we examined the visual impact of our network within the landscape areas eligible under the RIIO-T1 visual amenity incentive. Only 3% (approximately 124km) of our network lies within eligible landscape areas. Based on strong stakeholder engagement and support, which enabled us to identify and understand the key sensitivities within each relevant mitigation area, we developed a short list of 12 projects, of which four are currently progressing.

We engaged to a significant degree with stakeholders during this process and can conclude that our approach to routeing has and continues to be a good one resulting in little infrastructure in qualifying areas. Secondly, the overwhelming response has been that undergrounding proposals are not favoured in such sensitive areas. This resulting in all the schemes selected being non-engineering or landscape led approaches.

Details of our Visual Amenity performance and initiatives to date are outlined on page 32 of our Transmission Annual Sustainability Statement.

Level of Maturity:



RIIO-T2 Commitment: Enhancing Visual Amenity

Table 33: RIIO-T2 Commitments: Enhancing Visual Amenity

Commitment	External source/ justification	Timeline
Where supported by visual amenity assessment and stakeholder engagement, and when cost effective to do so, we will deliver visual amenity mitigations for those existing assets not identified for upgrade or refurbishment during RIIO-T2.	External Stakeholder - Sustainability Stakeholder Working Group	By 2026

RIIO-T2 Cost

£0.13m

7.4. Sustainable Resource Use and Waste Reduction

Our Vision

The principles of a circular economy and efficient use of resources will be embedded in our business. The materials required for networks construction and operation will come from sustainable sources. We will produce zero waste, with the components of end of life assets being reused or recycled into new products.

Our Goals

We will divert 95% of waste from landfill by 2023, we will recycle or reuse 100% of waste by 2030 and have zero waste by 2050.

Our Objectives

Figure 36: SP Energy Networks Sustainable Business Strategy – Sustainable Resource Use Objectives

We strive to create opportunities to stimulate a circular economy; implementing processes to ensure that wastes are avoided where possible and those that are inevitable are considered as resources with a value that can be reused and recycled. The principles of a 'circular economy' are:

- Keep resources in use for as long as possible

> *A circular economy aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources, and designing waste out of the system. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles:*
>
> *1) Design out waste and pollution*
>
> *2) Keep products and materials in use*
>
> *3) Regenerate natural systems*
>
> **Ellen MacArthur Foundation**

- Extract the maximum value from resources while in use
- Recover and regenerate products and materials at end of life
- Keep products, components and materials at their highest utility and value at all times.

Figure 37: Principles of a Circular Economy, Ellen MacArthur Foundation

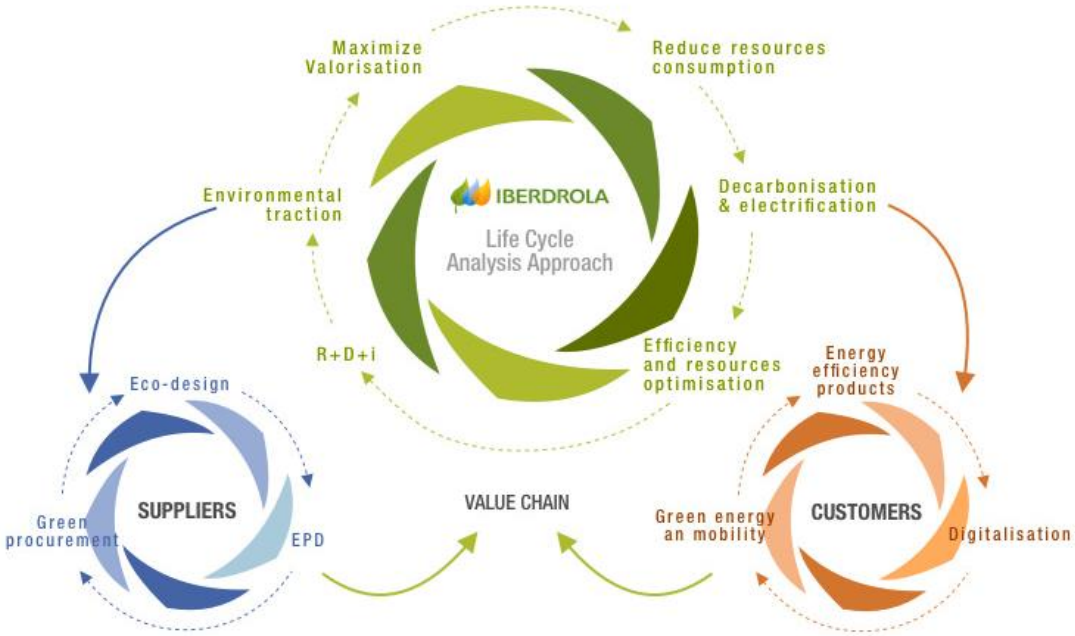


Figure 38: Our circular economy model

RIIO T1 Performance

During RIIO-T1 we worked to improve the quality and completeness of our waste data, identifying the metrics required and including requirements to report waste quantities and fate in our contracts. We continue to work with our contractors to ensure that we receive good data covering all of our waste streams.

Our T1 focus has been on the delivery of our waste Goal of 95% landfill diversion by 2023, with communications to drive improved waste segregation, audits of contractors and collaboration with our own waste contractor and some key suppliers to increase recycling rates.

The Table below shows our annual waste totals, with the variability being a result of both significantly varying investment programmes and data quality issues. In 2018, 56% of waste from our major construction projects was diverted from landfill and we are on track to meet our 2023 target of 95% of waste diverted from landfill (as shown in Figure 39).

Table 34: RIIO-T1 Waste Performance

	2013	2014	2015	2016	2017	2018
Total Waste (T)	n/a	47254	192072	259489	413879	95583
Avoided landfill %	-	10%	72%	43%	50%	56%

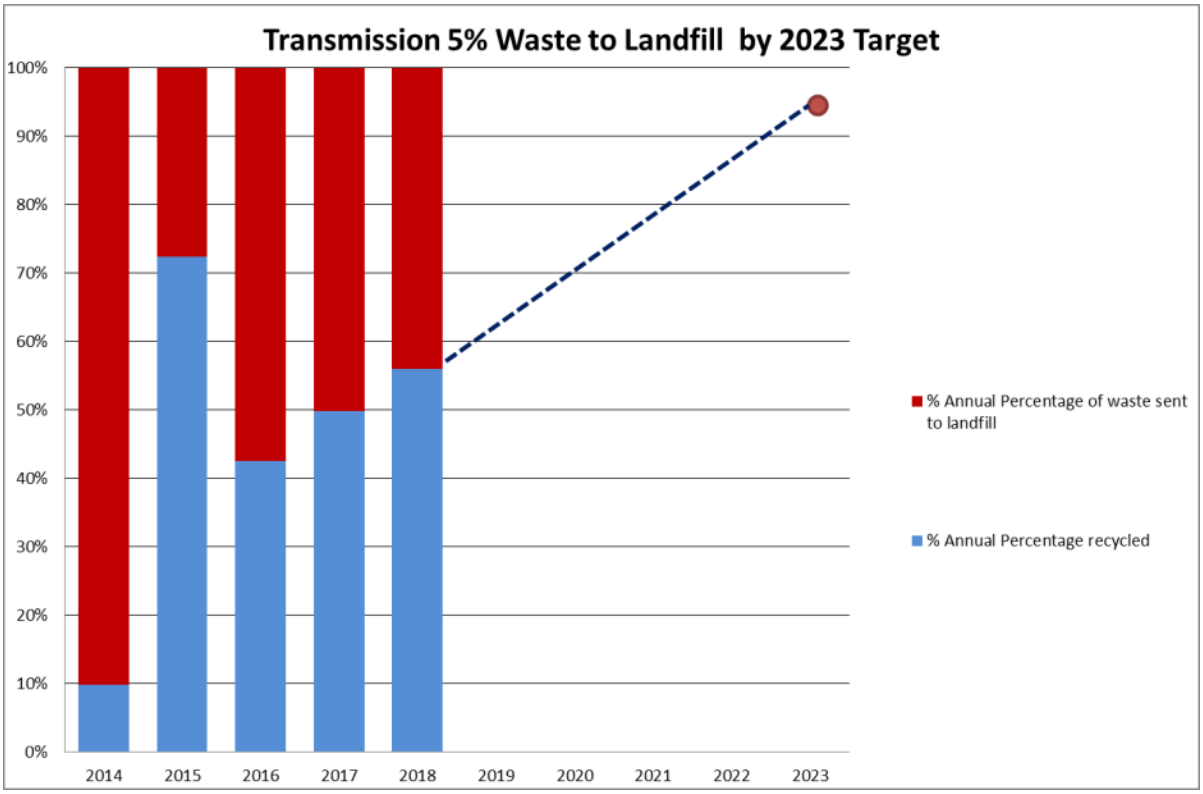


Figure 39: Transmission Waste to Landfill Performance

We have analysed our waste streams and, whilst the quantities and proportions of the different types of waste vary significantly year on year as they are very project and site specific, we have identified our priority waste streams as:

- Soils and stones
- Scrap metal/ end of life electrical equipment
- Concrete
- Cables/conductor
- 'General' waste

Regarding resource use, we reduce the use of natural resources by committing to decarbonisation and by utilising more efficient, cleaner technologies and processes. We aim for greater efficiency and effectiveness in resource use through designing for longevity, ease of repair and replacement. We research into developing new technologies and devise solutions for reusing waste. In RIIO-T1, for example, we delivered a project through the network innovation allowance (NIA) investigating methods to extend the lifespan of existing concrete structures. This includes the development of a new methodology identifying the assessment criteria and the reuse, strengthening and repair processes. It is anticipated that this approach can increase the lifespan of existing structures by 20+ years.

We are members of the Major Infrastructure Resources Optimisation Group (MI-ROG) and founder members of its sister group the Scottish Infrastructure Circular Economy Forum (SICEF). MI-ROG was founded in 2013 as a forum for the UK's infrastructure operators to collaborate across the circular economy theme and to meet the challenge of delivering major infrastructure in a constrained economy.

SICEF was formed in 2017 with the Mission Statement:

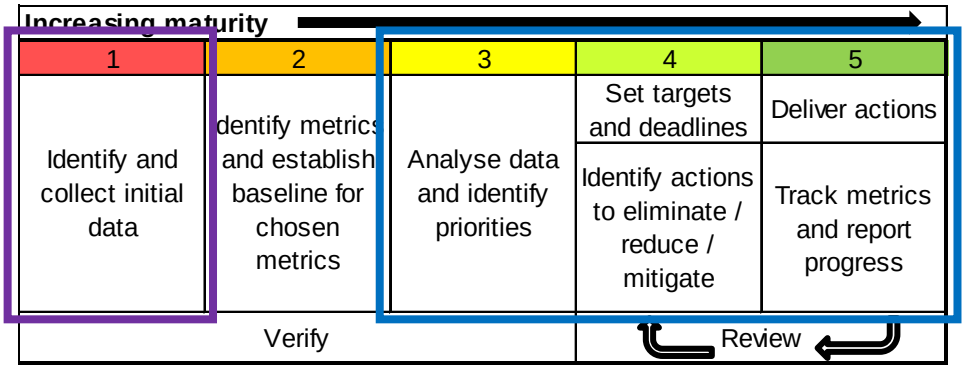
"Jointly applying circular economy principles to member's organisations and major infrastructure development projects with the aim of:

- *Optimising resource use through the project's life cycle;*
- *Embedding collaboration between projects and members;*

- *Partnering with key suppliers and contractors; and*
- *Sharing knowledge and best practice on the circular economy."*

For further details of our performance on sustainable resource use and waste reduction please see pages 36 to 38 of our Transmission Annual Sustainability Statement.

Level of Maturity:



Purple box – Sustainable Resource Use

Blue box – Waste Reduction

RIIO T2 Commitments and Metrics

Data will continue to be a key focus, as we must have good data to inform prioritisation and target setting, and measurement of success. We are now looking to further apply the waste hierarchy (Figure 40) to move from focussing on increasing recycling to reducing waste at source.

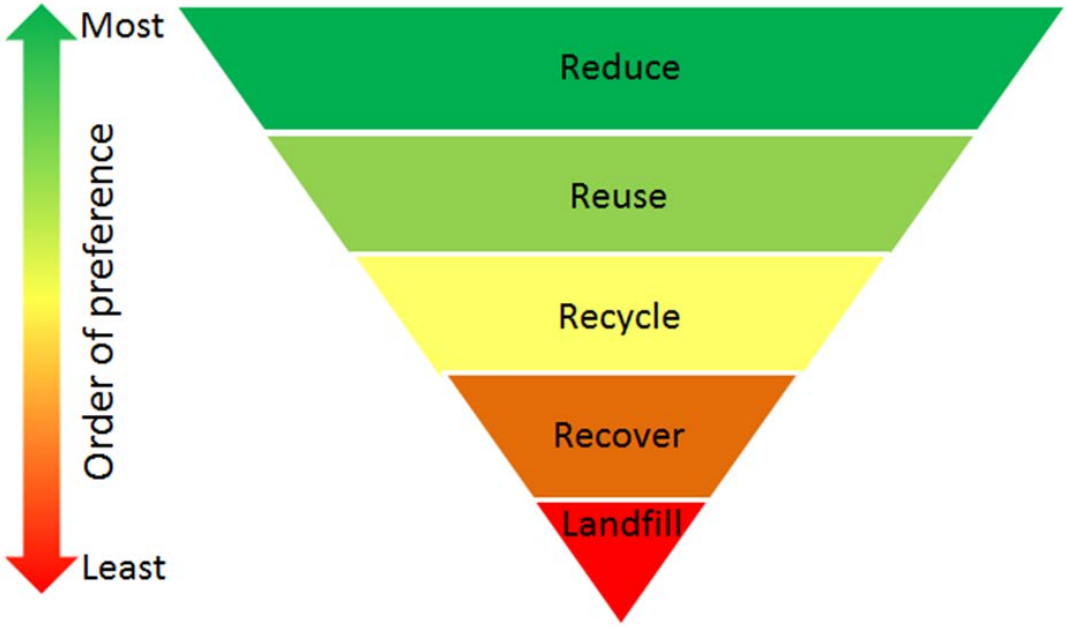


Figure 40: Waste Hierarchy

This will require us to change our focus from how we manage the waste we produce – primarily being about which bin the material goes into, to revising business processes to include considerations regarding resource use and end of life impacts. Resources must be kept in use, at the highest value, for as long as possible. This makes economic as well as environmental sense and we expect that many changes will pay for themselves.

Although we understand our waste streams and quantities and have been increasing our recycling rate steadily over recent years, we have yet to embed considerations of resource use and waste minimisation in our processes. We have yet to quantify the resources we use (inputs). This will be required to achieve our waste Goals and we propose to follow BS8001:2017 Circular Economy to guide our delivery.

We considered a resource efficiency hierarchy – reuse, refurbish, replace – when assessing options during the development of our T2 investment plan (refer to the 'Proposed Expenditure and Outputs' section of the main Business Plan document).

We will continue to be active participants in MI-ROG and SICEF, able to work with our infrastructure operator colleagues to develop and introduce more circular practices, learning from each other and minimising associated risk and costs.

RIIO-T2 Commitments and Metrics: Sustainable Resource Use and Waste Reduction

Table 35: RIIO-T2 Commitments: Sustainable Resource Use and Waste Reduction

Commitment	External source/ justification	Timeline
We will embed circular economy principles where relevant throughout our business processes, considering whole life cycle environmental impacts.	External Stakeholder - Sustainability Working Group, Environmental Regulators, Ofgem, Operators	By 2023
We will divert 95% of our waste from landfill.	External Stakeholder - Sustainability Working Group, Circular Economy Forum	By Dec 2023
As part of our revision of design processes, we will include considerations of operational and end of life stages with the aim of designing out waste.* *See related commitment to align with PAS2080 in Decarbonising our network and assets and supply chain collaboration commitments in Supply Chain Sustainability, which also encourage resource use reduction and waste minimisation.	External Stakeholders - Supply Chain, Circular Economy Forum, Operators	By 2023
We will require project Waste Management Plans for all new projects in RIIO-T2 and beyond.	External Stakeholders - Environmental Regulators, Supply Chain	By 2026
We will implement metrics to measure the sustainability of our resource use, with the aim of establishing a baseline to enable target setting during RIIO-T2.	External Stakeholder - Sustainability Stakeholder Working Group	By 2023
We will set targets for recycled/reused materials as a % of total input materials to be achieved by end RIIO-T2, 2030 and 2050.	External Stakeholders - Environmental Regulators, Supply Chain, Ofgem	By 2026
"We will continue our work to minimise the environmental impacts of our use of aggregates (soils and stones) via collaboration with other TOs, our supply chain and membership on infrastructure resource optimisation groups** with the aim of identifying and implementing solutions to reduce the use and disposal of aggregates, including increased use of secondary aggregates. ** Via the Scottish Infrastructure Circular Economy Forum and Major Infrastructure Resources Optimisation Group.	Continuing business as usual	Throughout RIIO-T2

Commitment	External source/ justification	Timeline
"We will continue to collaborate with environmental / waste regulators, other infrastructure companies** and our supply chain to drive sustainable resource use and waste minimisation in order to meet our RIIO-T2 and Sustainability Goals. ** Via the Scottish Infrastructure Circular Economy Forum and Major Infrastructure Resource Optimisation Group.	Continuing business as usual, External Stakeholders - Environmental Regulators, Circular Economy Forum, Sustainability Working Group	Throughout RIIO-T2

RIIO-T2 Metrics: Sustainable Resource Use and Waste Reduction

Table 36: RIIO-T2 Metrics: Sustainable Resource Use and Waste Reduction

Metric	Unit	Normalisation Factor
Total weight of waste produced	tonnes	per £ project value
Fate of waste	% weight	
Types of waste	% weight	
recovery rate for types of wastes	% weight	
Water use	litres	per £ project value, no. of staff

RIIO-T2 Cost

£0.13m

8. SUPPORTING THE NET ZERO TRANSITION

The energy generation system is changing, moving from a traditional centralised model reliant on fossil fuels, to a decentralised Net Zero model focused on low carbon renewable generation.

Demand for electricity is also changing, with the UK and Scottish Governments setting ambitious targets to decarbonise sectors such as transport and heat. Our network must be prepared for these changes in demand and generation. While we drive this transition, we must ensure that none of our customers are left behind, recognising that those communities and customers who are least likely to have access to low carbon vehicles or heating will frequently also be the most vulnerable in society.

We have developed our plans to align with the Scottish Government's Energy Strategy and ensure we are playing our part in meeting the ambition for Net Zero greenhouse gas emissions by 2045.

What we are doing to support the transition

Taking a whole-systems approach to network planning that delivers the most efficient overall solutions for society, taking heating, transport and distribution network impacts into account. Please see 'Whole System Planning' in our RIIO-T2 Business Plan for more details.

Adopting innovative approaches and technologies to accelerate the connection of low carbon technologies. Please see 'Innovation Built-In' in our RIIO-T2 Business Plan for more details.

Supporting the accelerated connection of low carbon generation and demand connections, including developing non-build solutions. Please see 'Load Related Expenditure' in our RIIO-T2 Business Plan for more details.

Carrying out frequent and detailed analysis of generation and demand scenarios and developing reinforcement and boundary upgrade projects as required. Please see 'Load Related Expenditure' in our RIIO-T2 Business Plan for more details.

8.1. Introducing our Net Zero Fund

Network companies are a key enabler for GB to meet its Net Zero and low carbon targets, not solely through investing in our networks, but by also facilitating low carbon projects that benefit our communities and Britain's electricity system as a whole.

RIIO-T1 Performance

Our two-year, £20m RIIO-T1 Green Economy Fund is currently supporting 33 diverse projects to deliver thousands of tonnes of annual carbon savings, create over 40 local jobs, and directly support over 2,300 vulnerable customers.

Some examples of Projects funded during Round 1 included:

- A Community Transport organisation based in Glasgow who supports more than 75,000 elderly and vulnerable passengers will become fully low carbon.
- A programme of local 'smart energy' action plans developed with community councils in Dumfries and Galloway, the Scottish Borders, Fife and Glasgow.
- Energy efficiency housing upgrade in the heart of Edinburgh's Royal Mile world heritage site
- The establishment of two new Electric Vehicle car clubs in North Ayrshire and Hawick in the Scottish Borders.

RIIO-T2 Commitment

For RIIO-T2 we have proposed a £20m 'Net Zero' Fund so that we can use our central and impartial role within the energy system to ensure local communities, including those identified as 'vulnerable', are financially supported to maximise the social, environmental and economic benefits of local energy solutions.

The Net Zero fund will focus on facilitating practical, low carbon initiatives with tangible outcomes that benefit local communities and help Britain on the path to Net Zero. This fund builds upon our existing Green Economy Fund which has supported initiatives which have delivered demonstrable benefits for the people of Scotland and support Scotland's ambitious green energy plans and local economic growth (details of our existing Green Economy Fund projects can be found on our website).

Engagement and Benefits

We have engaged widely with stakeholders including the Scottish Government and consumer energy groups on this proposed fund as part of a public online consultation and via bilaterals. In the round, the fund has received an overwhelming amount of positive support, and as a result of feedback from our stakeholders, we will clearly demonstrate how this fund will benefit vulnerable communities and consumers in particular to mitigate the resulting 2p per annum bill impact.

For example, if we support our communities in vulnerable circumstances to connect new low carbon heating solutions, this will result in more cost-efficient energy bills as well as the related health benefits associated with properly heated community facilities and homes. Studies have also shown that the associated health benefits limit use of NHS services and therefore wider savings are made.

ESP Scotland

"This funding is critical and will make a difference to low carbon communities as our climate is facing the biggest environmental challenge our generation has ever seen."

Overall, we estimate that this fund will deliver at least £3 worth of social benefits for every £1 invested.

Given the fundamental role of electricity in today's society and our unique position, we know that these investments will quickly and cost-effectively aid the UK and Scottish Government to achieve their Net Zero ambitions with numerous low-carbon projects that will provide scalable learning, reduce community vulnerability, maximise local benefits and further the UK's leading role in low carbon solutions at a global level.

Using SP Energy Networks' well-established and strong voice across our communities, the Net Zero fund will also ensure more communities understand and therefore access the wide-ranging potential economic benefits from Smart energy systems in a Net Zero future. For example, in funding projects that can provide flexibility services or peer-to-peer trading. Many of these more innovative services have already been tried and tested in a number of communities (particularly across Scotland's highlands and islands) with support from Scottish Government funding, but are yet to become commonplace across the country or Britain as a whole.

Warmworks Scotland

"We believe that a pot of funding like the Green Economy Fund should continue to include funding for initiatives/projects that generate low carbon outcomes and help to tackle fuel poverty. The over-subscription to the Green Economy Fund would indicate that there is scope for a pot of funding like this to be expanded in RIIO-T2."

In this respect, we feel our central position as Transmission and Distribution network operator will allow us to build on the wealth of knowledge and experience in the communities we serve and socialise the benefits of such learning, including to those more vulnerable communities who need them most.

Not only will local communities see an increase in local income and more cost-efficient energy bills, but local energy schemes also go some way to mitigate the large-scale investment needed to overcome current and future constraint costs.

A £20M Net Zero fund also provides invaluable practical project learning which may delay or reduce altogether the cost to the consumer of larger scale reinforcement or network costs.

SoulRiders

"Based in Glasgow, and with three councils across Scotland declaring a climate emergency, I believe drastic new, innovative measures are required to tackle the issues we are facing. These measures need to perpetuate economy and not disrupt economy, and at the same time improve social & green environments."

We have consulted with our stakeholders on the final criteria for the fund to ensure that it will directly and indirectly support our communities in vulnerable circumstances. We propose to report on fund activities every year to ensure transparency for all of our stakeholders and the sharing of best-practice as we collaborate across industry to address the climate emergency.

Our recent 'Scotland's Race to Net Zero' event discussed the challenges we face in the race to meet Net Zero targets. It also recognised the benefits of our existing Green Economy Fund and the wider societal impacts associated with a Net Zero future.

Fund Criteria

We have engaged with our stakeholders on our proposed criteria for the Net Zero Fund. The Scottish Government, Citizens Advice, Citizens Advice Scotland and Community Energy Scotland have provided helpful suggestions for our criteria, including the fact that this should have a focus on vulnerable consumers and communities. The Scottish Government also highlighted that the fund should have a focus on heating solutions where appropriate.

The Net-Zero Fund is a RIIO-T2 initiative aimed at supporting energy projects that empower communities and customers in vulnerable circumstances.

SP Energy Network's definition of a Community in Vulnerable Circumstances

A community and its citizens who are disadvantaged and less able than an average community to plan for, cope with, or recover from adverse situations, which are either temporary or permanent.

The fund is open to a wide range of organisations, including:

- Local councils
- Community groups
- Social enterprises
- Small and medium-sized enterprises
- Charities

The fund cannot be used for commercial purposes. Where an application comes from businesses there must be high levels of social outcomes. The scheme is not open for individuals to apply for funding.

The objectives of the fund:

- Support vulnerable communities to build their knowledge and capability to address their energy issues.
- Support community led, innovative energy projects within our operational area in Scotland, supporting both rural and urban areas in particular that suffer from fuel poverty, enabling them to address their energy issues.
- Building the infrastructure and the learnings needed for the changes in heating and transport expected over the next decade, ensuring that all parts of society are included in the energy transformation.
- Stimulate economic activity and create jobs in Scotland at a local level.
- Support the Scottish Government's ambitious energy strategy and the UK's drive to a Net Zero economy.
- Provide access to funding for projects that may ordinarily struggle to obtain funding.

The priorities of the fund include:

- Provide benefit to either vulnerable local communities (urban or rural) or provide benefit to vulnerable consumers.
- Renewable and Net Zero innovative solutions to local energy issues.
- Transport: promoting the uptake and infrastructure provision of Electric Vehicles or other Net Zero transport solutions.
- Heat: provision of affordable energy and more efficient heating systems for consumers to help address fuel poverty and reduce network demand.
- Local energy systems: creation of local energy solutions to match generation and demand.
- Net Zero job creation.

Minimum criteria needing to be met to be considered for funding:

- Demonstrate a direct benefit for vulnerable communities or vulnerable customers.
- Demonstrate a strong link to the energy sector.
- The projects should be able to run independently with little input from SPEN however at the discretion of SPEN, accept a mentor from SPEN's senior team and/or The Energy Saving Trust.
- Projects must be based in the SP Energy Networks area in Scotland and the applicant's team must be mostly based in Scotland.
- Projects should produce tangible, physical outcomes within the desired timeframe.
- There must be clear additionality demonstrating the need for funding.
- An experienced project manager must be assigned by the applicant to manage the project. The Net Zero Fund can contribute to this cost and the project management budget should be in line with the award amount and project complexity.

- All applications should have a match funding contribution, recommended to be between 5-10% or be able to demonstrate the same in time and resource. For all but local community applicants this must be a clear funding commitment (not just in-kind support).
- Demonstrate value for money through a defined formal procurement process or benchmarked rates for project partners.
- Research projects can be funded as part of the Net Zero Fund, but they MUST produce a tangible physical outcome. For example carbon savings from the generation of low carbon power or journeys made by electric vehicles.

Projects will also be ranked on the following key impacts with each of the elements of the criteria receiving a weighting or scoring:

- Reducing greenhouse gas emissions.
- Leading to societal benefits, with income generated being retained locally and put towards activity with good social outcomes (i.e. benefiting vulnerable consumers).
- Support local economic growth, e.g. leading to new jobs and businesses across Scotland at a local level.
- Supporting energy projects whether this is through tackling fuel poverty, innovation around energy systems, low carbon transport and low carbon heating of our homes and buildings.
- Lead to learning outcomes which will further the fund aims. Whilst projects don't need to be innovative or unique we would like to see projects that lead to learning outcome for example by supporting education, testing new innovation, be open to sharing learnings, act as an exemplar to encourage further uptake or provide access to demonstration projects.

Our Stakeholder's Opinions on our existing Fund and proposals for a Net Zero Fund (Please note that this is not exhaustive and we have also engaged with consumer representatives on this subject).

"Based in Glasgow, and with three councils across Scotland declaring a climate emergency, I believe drastic new, innovative measures are required to tackle the issues we are facing. These measures need to perpetuate economy and not disrupt economy, and at the same time improve social & green environments – I believe this is the essence of the Green Economy Fund, and a great initiative it is!" – **SoulRiders**

"There is an urgent need to develop Low Carbon Community funds. There is a willingness for organisations to make the changes required to reduce their carbon impacts. However, without the necessary funding, it is difficult to see how this can be achieved." – **WattsUp Developer**

"This funding is critical and will make a difference to low carbon communities as our climate is facing the biggest environmental challenge our generation has ever seen." – **ESP Scotland**

"...other funders could learn from the good practice that the fund has development. I have been involved with the Third Sector for 30 years and it is one of the best processes I have been through in terms of applying for funding.... a Low Carbon Community pot of funding like this is extremely important. With funding becoming more difficult to source, particularly for Third Sector Organisations, funding being available like the Green Economy Fund is vital to enable us to continue to deliver the services we provide for our communities". – **Community Transport Glasgow**

"If the Government's low carbon ambitions are to be realised, it seems imperative that funding is available to facilitate the necessary infrastructure development and encourage organisational transitions. Whilst I have sympathy for the argument that network consumers should not be funding transport user savings, surely the main objective of any low carbon transport initiative is not about the cost but about the achievement of cleaner air and pursuing the country's climate change ambitions, which ultimately is to the benefit of all the country's population, including the network consumers. As a voluntary sector service provider, the GEF has provided a tremendous opportunity for us to not just reduce our carbon emissions, but to extend our service provision to reach more vulnerable individuals. Many of these individuals will be network consumers who do not consider themselves 'transport system users', however without our electric vehicles, made possible by the GEF, our services, essential to supporting them to live at home, would be unavailable, ultimately impacting on their health and wellbeing and quality of life." – **The Food Train**

"Much of the funding for climate change is administered or provided by government. It can be quite difficult to secure match funding as much funding is derived from the same place. The GEF grant is an extremely important alternative grant." – **For the Environment Link**

"The GEF is a really great and useful fund which is really exciting opportunity to access funding for projects reducing carbon in Scotland." – **Transport for Edinburgh**

"We believe that a pot of funding like the Green Economy Fund should continue to include funding for initiatives/projects that generate low carbon outcomes and help to tackle fuel poverty. The oversubscription to the Green Economy Fund would indicate that there is scope for a pot of funding like this to be expanded in RIIO-T2... Redoubling on the commitment to a pot of funding like the Green Economy Fund will ensure that the efforts of SP Energy Networks continue to align with the work of the Scottish Government who have combined their efforts in reducing carbon emissions and removing poor energy efficiency as a driver for fuel poverty under the Energy Efficient Scotland programme." – **Warmworks Scotland**

"*It is very positive that SPEN continue to support innovation to reduce carbon footprint... this project is key to our development and has assisted with the route to market of 6 new vehicles that will have a considerable impact in both climate change and jobs in the area*" – **Peddlesmart**

"*Retaining a Green Economy Fund on an ongoing basis would be a major and more than welcome improvement. We found the fund very flexible in the way it's been designed so it really allows innovation. In our case, the Canongate Housing Energy Efficiency and Conservation Project, we were unable to secure match funding until we applied for SP Transmission's Green Economy Fund. Our project generated a lot of interest, but unfortunately most of the available funding schemes were focused on one strong priority which prevented us from being eligible for funding. Keeping the current Green Energy Fund priorities while creating new ones would be a very positive evolution. In addition, few funds are open to charities and almost none of them cover energy efficiency works, in contrary to the SP Networks Green Economy Fund. So in our view making sure SP Networks Green Economy Fund can continue to exist is a crucial improvement on that wider position."* – **Edinburgh World Heritage**

"The Green Economy Fund has been a much needed stimulus for communities who wanted to decarbonise their energy use and look to the future. Our project has already brought many people together to talk about how their energy usage might change and what this might mean for them. These discussions need to take place but they need a focus – and the green economy fund has provided this. It should definitely be retained going forward.

Regarding the way it is managed, the application process helped to clarify ideas and brought different community groups together in a way that helped to share learning and good practise. The priorities seemed well chosen to focus the funds specifically on energy related projects and not duplicate other funding streams." – **Ettrick & Yarrow Community Development**

"Forth Valley College welcomes the opportunities that additional funding programmes such as the Green Economy Fund can bring for a range of organisations and we consider that this type of funding can drive innovation, act as a catalyst for change and helps to promote partnership working. The absence of funding can sometimes result in pilot projects or new initiatives simply not taking place which would ultimately be at the detriment of the communities who benefit from the outcomes of the fund." – **Forth Valley College**

8.2. Maximising environmental benefit from non-operational land

We often replace old substation assets with newer versions that take up less space, or remove redundant assets if they are no longer required. The resulting vacant land represents a number of opportunities to maximise environmental benefits, including the installation of renewable technologies.

We have recently undertaken a study to understand the scale of opportunity that these areas of land may represent, including options for enabling community energy groups to use the land for free to site solar PV installations. Our study identifies up to 20 sites initially, which conservative estimates suggest could support upwards of 4MW of new renewable generation.

Our stakeholders have emphasised the value of us enhancing biodiversity at our sites where operationally appropriate to do so. Therefore we will include the requirement for the successful energy groups to also deliver and manage biodiversity enhancement initiatives on these sites over the lifetime of the lease.

RIIO-T1 Performance

Our experience of working with 33 green community projects via our Green Economy Fund, and working with a wide range of local communities to deliver over 30 habitat creation, public access and landscape enhancement projects near our network investment projects has provided in-depth insight into the needs of our local communities and a drive to do more to support the development of hyperlocal energy solutions.

RIIO-T2 Commitment

Throughout RIIO-T2, we will release unused non-operational land to local community energy projects, allowing them to use sites for free to generate and deliver energy to their local communities.

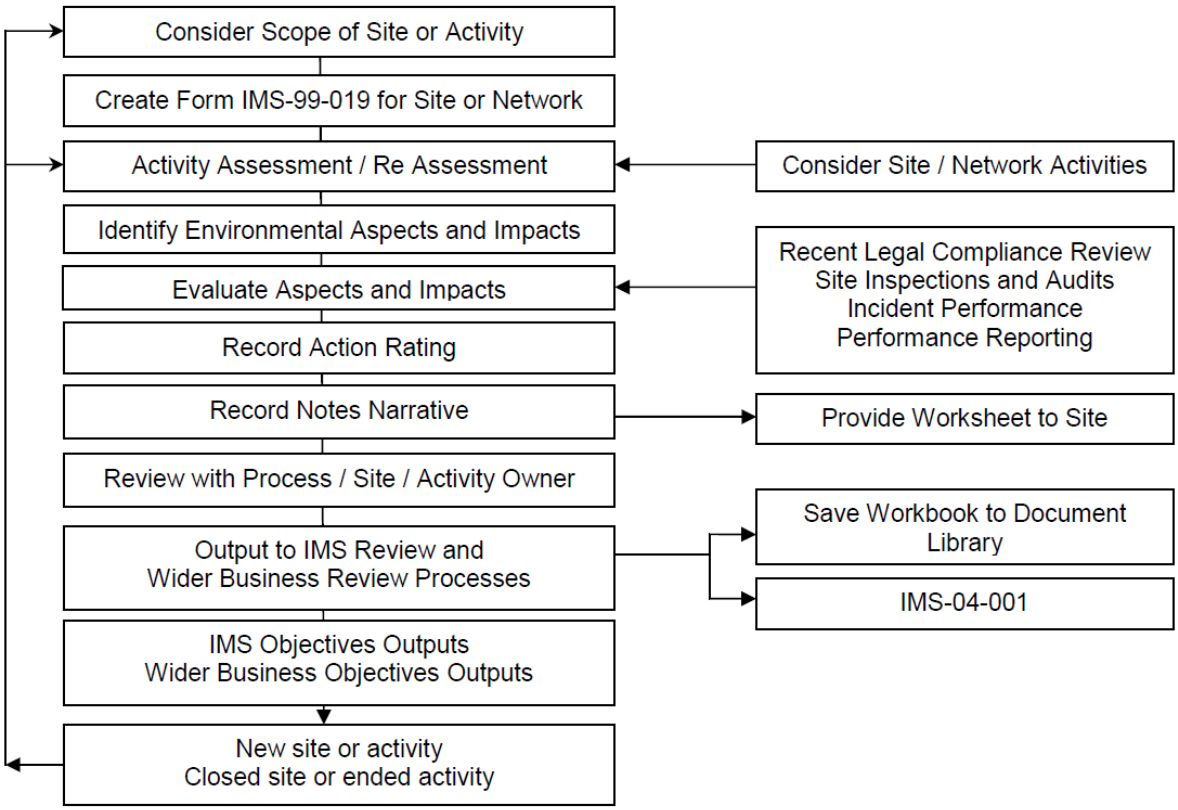
RIIO-T2 Proposed Incentive and Uncertainty Mechanisms

Please see Category 3 within ‘Output Incentive Proposals’ for details of our proposal for an incentive to maximise environmental benefit from non-operational land. We currently do not propose any uncertainty mechanisms specifically relating to this activity.

APPENDIX A: ENVIRONMENTAL ASPECTS AND IMPACTS (A&I) ASSESSMENT PROCESS AND SPT A&I REGISTER

The approach to identify the significant environmental impacts associated with SPEN activities is essentially a risk assessment. The process is detailed in our Aspects and Impacts Assessment procedure, IMS-04-011 A&I Assessments Procedure, and is summarised below:

The flow chart below has been copied from our procedure for identifying significant Aspects and Impacts and shows the high level process followed:



SPEN annually assesses its' operational sites in line with the Environmental Aspects and Impacts Assessment Procedure and document the results in Aspects and Impacts Workbooks (referenced IMS-99-019 in the above process flow). The Aspects and Impacts Workbook is pre-populated with common SPEN activities and their associated aspects and impacts as listed here (but new ones can be added as required):

1. Use of electricity
2. Use of liquid and gaseous fuels
3. Transport of materials, equipment and people to, from and between sites
4. Production, storage & disposal of waste
5. Fugitive emissions of gasses to air
6. Fugitive emissions of polluting solids or liquids to land and water
7. Wildlife and bio diversity
8. Climate and weather effects
9. Use of raw materials & natural resources
10. Visual impact
11. Noise and vibration
12. Restricted harmful substances
13. Competence
14. Design & Procurement of Equipment, Materials, Works, and Services
15. Customers and other third party effects, impacts and influence on networks operation.

The annual review allows SPEN to include any changes that have taken place at the site/business area, to identify any related new Aspects (and associated Impacts) and to take out any previously identified Aspects if they are no longer present.

The Significance of the environmental impact is assessed using a scoring system built into the workbook and detailed in the Environmental Aspects and Impacts Assessment Procedure:

A. Likelihood of Consequence Occurring (**LH**) - Score 0 to 5
B. Severity of Potential Environmental Impact (**SE**) - Score 0 to 5
C. Legal Compliance (**LE**) – Score 0 to 5
D. Stakeholder Interest (**SI**) - Score 0 to 10
E. Control Effectiveness (**CE**) - Score 0% to 100%

Elements A to E will be assessed awarding an appropriate score to each element, utilising the Scoring Matrix included in IMS-99-019.

Total Score = LH x SE x LE + SI

Residual Score = Total Score – (Total Score x CE)

Residual Score will be classified as follows:

0 - 19.9	Low significance (No Action Required)
20 - 39.9	Medium significance (Consider Action and Monitor Performance)
>40	High significance (Action is Required via Agreed Programme)

In-built conditional formatting in green, amber and red automatically indicates significance grading.

The Residual Score thresholds identified above are subject to annual review as part of the continual improvement process.

An initial risk score is calculated by entering scores A to D above in the workbook. Consideration is then given to the Controls that are in place (and documented in the A&I Workbook) and their effectiveness, with a score being attributed (E above). The final (residual) risk score is then calculated by the workbook with a traffic light system deployed to show the Impact significance assessment clearly.
The traffic light system used in the completed workbooks identifies the most significant impacts. These significant impacts are prioritised and considered for improvement action, with any resultant actions forming annual actions being included in the annual Sustainability Plan.

	SPT Network Activities SPEN (2018)		Last Assessment Date:					21/12/2018	Assessed By:		
Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Use and losses of electricity	Planning, Design, Procurement Construction, Operation and Maintenance and Disposal of Network Assets.	Substations, Control Centres and Other Buildings, Heating, Ventilation, Lighting and Control Systems	5	3	4	0	60	**Use of Electricity -** Energy use checks in site inspections. ESOS related energy audits. Compliance with CRC and RRP reporting requirements. Building standards documents: **SUB-03-017, 025, 026, 034**. **ASSET-01-021** Asset Inspection and Condition Assessment Policy Substation inspections, staff awareness campaigns (energy efficiency posters). **Losses** - Implementation of losses strategies via network innovation projects, BCF reporting and compliance with ED1 improvement and reporting requirements. **Transmission Losses Strategy**. Installation of lower loss (eco-design) transformers.	20%	48.00	
Use of liquid and gaseous fuels	Planning, Design, Procurement, Construction, Operation, Maintenance and Disposal of Plant and Equipment	All mobile and fixed plant including generators, fuel tanks, excavators, pumps, breakers, grinders, dumper trucks, tractors	5	3	3	0	45	Containment in regulatory compliant storage systems. Responsible use by competent staff. BCF Reporting meeting RRP RIGS and CSR requirements. Employee awareness campaigns (energy efficiency posters). Project & contractor inspections. **Procedures:** ENV-04-017 Transport Procedure SPEN Health, Safety and Environmental Handbook ENV-04-006 Environmental Training Procedure SMS-04-021 Contractors' Health, Safety and Environmental Standard	40%	27.00	
Transport of materials, equipment and people to, from and between worksites.	Selection, Procurement, Operation, Maintenance and Disposal of Trucks, Vans, Cars	Vehicles - Vans, trucks, cars, trains, aircraft	5	3	3	0	45	Containment in regulatory compliant storage systems. Responsible use by competent staff. BCF Reporting meeting RRP RIGS and CSR requirements. Employee awareness campaigns (energy efficiency posters). Project & contractor inspections. **Procedures:** ENV-04-017 Transport Procedure SPEN Health, Safety and Environmental Handbook ENV-04-006 Environmental Training Procedure SMS-04-021 Contractors' Health, Safety and Environmental Standard	40%	27.00	

	SPT Network Activities SPEN (2018)		Last Assessment Date:					21/12/2018	Assessed By:		
Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Production of waste	Construction, Operation, Maintenance, Demolition and Disposal of Materials and Equipment for the Network Use.	All assets	5	4	4	5	85	**SPEN Staff - A**pplication of the waste hierarchy to design out waste, control and containment of waste at the point of production, during transport, temporary storage and downstream disposal. Maximisation of avoidance, segregation, recovery, re use, recycling. Compliance with requirements of waste related permits, licenses, consents, registrations, authorisations and records. Compliance with Eco Design regulations relating to transformers. Inclusion of contractual conditions in contracts for service providers. **Contractors** - Adherence to all contractual requirements including requirements, Contractor & project inspections. Procedures: ENV-04-012 Waste Management Procedure SMS-04-021 Contractors' Health, Safety and Environmental Standard SPEN Health, Safety and Environmental Handbook.	20%	68.00	
Fugitive emissions of gasses to air	Equipment design, installation, operation, maintenance and disposal.	SF6 Switchgear and some air conditioning plant	4	5	4	5	85	Design and selection of best practice low loss equipment, development and implementation of engineering standards for equipment management. Monitoring and reporting of loss volumes in line within regulatory requirements. Regulatory compliant levels of awareness, (specialist) training and competence. Emergency response to disruptive failures containing hazardous substances. Compliance with engineering standards for equipment installation, maintenance and disposal. Contractors - Adherence to all contractual requirements including requirements. Contractor & project inspections. **Guidance & Procedures:** SWG-14-002 SF6 Gas Switchgear Equipment SWG-14-003 Precautions When Working With SF6 Gas TRANS-04-003 Transmission Operations SF6 Gas Usage and Recording ENV-04-013 Materials Management ENV-04-014 Environmental Incident Reporting. SMS-04-021 Contractors' Health, Safety and Environmental Standard SPEN Health, Safety and Environmental Handbook.	40%	51.00	

	SPT Network Activities SPEN (2018)		Last Assessment Date:					21/12/2018	Assessed By:		
Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Fugitive emissions of polluting solids or liquids to land and water.	Design, procurement, planning, construction, operation and maintenance.	Construction equipment, staff and contractors, generators, fluid filled cables, transformers and auxiliary equipment, switchgear, tanks, pumps, material stores and drainage systems.	5	4	4	5	85	Design and selection of equipment, development and implementation of engineering standards for equipment management. Compliance with legislative requirements. Monitoring and reporting of reportable incidents in line within regulatory requirements. Regulatory compliant levels of awareness, training and competence. Emergency response to incidents including disruptive failures and events containing polluting substances. Contractors - Adherence to all contractual requirements including requirements, Contractor & project inspections. **Procedures and Guidance:** Substation design standards: **SUB-03-017, 025, 026, 034.** ENV-04-013 Materials Management ENV-04-012 Waste Management Procedure ENV-04-014 Environmental Incident Reporting I-PM106UK-C Environmental Technical Specification I-PM106UK-G-01 Issue 1 Pollution Prevention Plan Template SMS-04-021 Contractors' Health, Safety and Environmental Standard SPEN Health, Safety and Environmental Handbook.	20%	68.00	
Wildlife and biodiversity	Network design, planning, construction, operation, maintenance, and demolition.	Overhead lines, underground cables, subsea cables, substations.	4	4	4	5	69	Effective identification of wildlife constraints during asset construction design and planning. Undertaking environmental surveys and working under conditions of required licenses for works to minimise impacts. Working with stakeholder wildlife groups to undertake enhancements beyond legal requirements to provide improvements. Use of suitably qualified staff/consultants to undertake activities where required. Competence/Awareness of staff including Environmental Expresses & other communications. **Procedures and Guidance:** TRANS-04-004 Transmission Projects, Development , Planning & Delivery Process TRANS-11-009 to 012 ENV-04-006 Environmental Training Procedure I-PM106UK-C Environmental Technical Specification I-PM106UK-G-01 Issue 1 Pollution Prevention Plan Template SMS-04-021 Contractors' Health, Safety and Environmental Requirements SPEN Health, Safety and Environmental Handbook.	40%	41.40	

	SPT Network Activities SPEN (2018)		Last Assessment Date:					21/12/2018	Assessed By:		
Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Climate and weather effects	Network planning, design, construction, operation, maintenance and replacement, stakeholder and regulator communications and co-ordination.	All assets	3	3	3	5	32	Climate change risk assessment for storms, temperature extremes and floods. Resilient designs and secondary protective features , liaison with external emergency planning and response agencies. Network emergency planning and response exercises, staff training and extension of resources. Provision of standby generators. **Procedures and Guidance:** Design Specifications: SUB-03-017, 018, 025, 026, 034. Flood Response Procedures: EMP-04-104, EMP-04-121 SMS-04-021 Contractors' Health, Safety and Environmental Requirements SPEN Health, Safety and Environmental Handbook.	40%	19.20	
Use of natural resources (direct control)	Planning, Design, Procurement Construction, Operation and Maintenance and Disposal of Network Assets.	All assets	5	4	2	0	40	**Environment Procedures:** ENV-04-013 Materials Management ENV-04-012 Waste Management Procedure SPEN Health, Safety and Environmental Handbook. **Design standards:** SUB-03-017, 025, 026, 034. Overhead line manual, OHL-16-001, OHL-17-001. SMS-04-021 Contractors' Health, Safety and Environmental Requirements	20%	32.00	
Visual impact of network assets	Design, Planning, Construction, Operation and Maintenance.	Overhead lines, substations, other buildings masts and structures.	4	2	2	0	16	Consideration in design and planning, stakeholder consultations. Asset maintenance regimes, customer complaint management procedures. Development and provision of non standard solutions for problem sites and regulatory agreements regarding undergrounding of assets in sensitive locations. Implementation of Visual Amenity Policy/Strategy. **Procedures:** TRANS-04-004 Transmission Projects, Development , Planning & Delivery Process, TRANS-11-009 to 012 Contractors - Contract requirements, reporting requirements, SMS-04-021. SPEN Health, Safety and Environmental Handbook. Visual Amenity Policy/Strategy.	40%	9.60	

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Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Noise and vibration	Design, Planning, Construction, Demolition, Operation and Maintenance.	Construction equipment, staff and contractors, transformers and auxiliary equipment, switchgear, pumps and fans, OHL insulators.	3	2	3	0	18	Consideration in design and planning, stakeholder consultations, Asset maintenance regimes Compliance with planning consent requirements Customer complaint management procedures. Development and provision of non standard solutions for problem sites. Response to complaints and regulatory notices leading to investigation and site specific survey. Inclusion in site specific risk assessment for construction works and adoption of localised controls. Contractor & project inspections. P**rocedures and Guidance:** Substation & transformer design standards: SUB-03-017, 025, 026, 034. TRAN-03-020, 021, 022, 024. Contractors - SMS-04-021 Contractors' Health, Safety and Environmental Requirements SPEN Health, Safety and Environmental Handbook. Contractor & project inspections.	70%	5.40	
Electric and magnetic fields	Design, Planning, Construction, Operation and Maintenance.	Underground cables, overhead lines, transformers, switchgear, RF transmitters.	4	4	3	0	48	Compliance with public reference levels by the use of standard asset design and construction. Provision of response to public enquiries via customer call backs and surveys. Monitoring of regulatory developments and best practice via the ENA. Inclusion of the position response materials in planning statements. **Procedures:** ENV-04-011 Electric and Magnetic Fields (EMFs) Enquiries	70%	14.40	
Restricted harmful substances	Design, Operation and Maintenance	Transformers, switchgear, wood poles and substations.	3	4	4	5	53	Surveys to identify PCB's and asbestos. Undertaking of isolation, identification, registration and removal programmes. Work with stakeholders to inform, educate and shape legislative requirements. Disposal in line with legislative requirements. Work with stakeholders to identify BAT alternatives. **Procedures:** ENV-04-003 Sustainability Reporting SPEN Health, Safety and Environmental Handbook. SMS-04-021 Contractors' Health, Safety and Environmental Requirements	40%	31.80	

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Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Competence	Training, awareness and communications.	Staff and contractors	3	4	4	5	53	Environmental training needs assessment, training provision in line with company procedures. Inclusion in personal objectives. Environmental Expresses and other communications. SPEN Health, Safety and Environmental Handbook. Contractor & project inspections. **Procedures and Guidance:** ENV-04-006 Environmental Training Procedure IMS-04-008 Training and Related Arrangements SMS-04-021 Contractors' Health, Safety and Environmental Requirements SPEN Health, Safety and Environmental Handbook.	20%	42.40	
Design, Manufacture, Distribution of Materials, Resources and Services.	Design, Manufacture, Distribution, Selection and Procurement, Construction, Operation, Maintenance and Disposals.	All Assets and Direct and Indirect Services	4	3	3	0	36	Undertaking of lifecycle assessment where cost effective. Inclusion of compliant standards in product / service specification. Support for development of low emission alternate products and services. Promotion of extension of asset lifecycle by effective maintenance, refurbishment and reuse. Inclusion of disposal hierarchy meeting or exceeding legislative in disposal contracts, effective internal waste segregation. Monitoring and reporting regarding scope 2 & 3 emissions. Undertaking innovation projects to develop new lower emission best practice. Contractor & project inspections. Supplier factory inspections. **Procedures and Guidance:** Projects - TRANS-04-004, TRANS-11-009 to 012. Environment Procedures - ENV-04-013 Materials Management Contractors - SMS-04-021 Contractors' Health, Safety and Environmental Requirements Contractor Management Improvement Programme.	20%	28.80	

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Aspect	**Activity Types**	**Asset Type(s)**	**Likelihood (L) (1 to 5)**	**Severity (S) (1 to 5)**	**Legal Risk (1 to 5)**	**Stakeholder Drivers SD (1 to 10)**	**Total Score (F4*G4*H4+I4)**	**Control Outline**	**Control Effectiveness (CE) (1 to 100)**	**Residual Score (J4)-(J4*N4)**	**Significance (Threshold x)**
Customers and other third party effects, impacts and influence on networks operation.	Design, Planning, Construction, Operation, Customer Service, Maintenance and Disposal.	All Assets	3	3	3	0	27	Liaison and information exchange with customers and other parties adjacent to our networks assets. Site specific risk assessment and provision of non standard controls where required. Use of planning consultation systems in consideration of developments adjacent to our networks. Asset inspection, maintenance, security and alarm and control systems. Exchange of network plans with other networks operators. Tight control of activities during outbreaks of agricultural and species diseases. **Procedures and Guidance:** Design standards: SUB-03-017, 025, 026, 034 ASSET-01-023 Substation Security Policy ENV-04-020 Bio Security Guidance Contractors - Contract requirements, SMS-04-021	70%	8.10	