

# SP Energy Networks Transmission Annual Sustainability Statement

April 2018 – March 2019



**SP ENERGY  
NETWORKS**

# Contents

This **SP Transmission Annual Sustainability Statement for 2018–19** provides an overview of strategy developments, describes our performance against key metrics, and gives examples of activities carried out to support the transition to a low carbon economy and manage the environmental and social impacts of our transmission network and operations.

This report conforms to the requirements of the Executive Level Annual Statement (ELAS), submitted as part of Ofgem’s Environmental Discretionary Reward (EDR) Incentive for regulatory year 2018–19.

The annual EDR Incentive encourages Transmission Operators (TOs) ‘to achieve high standards in environmental management as well as to help move the industry towards a low carbon energy system, where it can do so effectively while providing value for money to consumers’.

Our Sustainable Business Strategy is underpinned by six key drivers, developed in collaboration with stakeholders. Throughout this document, the link between significant outcomes and sustainability drivers will be made clear by the use of one or more sustainability driver icon:



Sustainable Society



Carbon and Energy Reduction



Climate Change Resilience



Water Efficiency and Protection



Land and Biodiversity Improvement



Sustainable Resource Use

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# Foreword

**In 2018–19 scientific consensus, youth movement activity and geopolitical factors – heightened by extreme weather events – have converged to create a watershed year in the global movement to halt climate change and biodiversity loss.**

**Representing 60% of total UK greenhouse gas emissions, fast decarbonisation of energy supply and transport is essential to keep within safe global temperature limits and reverse biodiversity loss. Scotland is the UK's powerhouse of renewable energy and the SP Transmission network forms a vital link, transporting renewable energy from Scotland to meet demand in England.**

As an electricity transmission business, our primary aim is therefore to provide safe, reliable network capacity to enable the widespread uptake of low carbon generation and transport. While we do this, we also aim to provide environmental, social and economic benefits for society.

In the past year, we've continued to drive decarbonisation by connecting 139MW of renewable generation to our network, which will displace the equivalent 110,000 tonnes of CO<sub>2</sub> emissions annually.

We've seen applications for the connection of renewables to our network increase by 45% and our customer-focussed approach has enabled a 73% increase in the total number of applications which make it through to a final offer. Despite this rapid increase, we have delivered 100% of connections offers on time and our Empowering the Connections Customer initiative is making the connections process even more efficient.

Traditional network expansion or upgrade to accommodate exceptionally rapid increases in renewable generation in Scotland is typically slow, costly, and brings with it a wide range of potential environmental impacts. Smarter utilisation of our existing network capacity has remained a key aim in 2018–19. Current initiatives such as our Generation Export Management Scheme, Load Management Schemes, Project Phoenix and Project MIGRATE are therefore globally significant in enabling the capacity and system stability required to quickly accommodate increased renewable generation whilst significantly reducing the need for network reconfiguration and upgrade.

Beyond driving societal decarbonisation, reducing our Business Carbon Footprint is a key focus. Overall, we have achieved a 9% reduction in our controllable carbon footprint since our 2013–14 baseline year, however, despite considerable efforts, our 2018–19 emissions were 36% higher than those of 2017–18.

Sulphur-hexafluoride (SF<sub>6</sub>) emissions dominate the footprint and account for the majority of this increase. Although our overall leakage rate remains comparatively low, restricted outage availability, variable success rates for leakage repairs and the strategic importance of many leaking SF<sub>6</sub>-filled electrical assets mean that repairs are extremely challenging. SF<sub>6</sub> leakage

is the subject of intense focus for my senior leaders and right through our organisation, and will continue to be so as we work to achieve our ambitious carbon reduction targets.

Our efforts to drive decarbonisation, avoid the installation of new network assets and enable the move to low carbon generation and transport provide biodiversity benefits by reducing three key impacts; climate change, land use change and pollution. We also protect and enhance the ecosystems within which we operate to prevent the introduction of invasive non-native species and to ensure that ecosystems are not unduly exploited by our operations.

This year, our ongoing Stirling Enhanced Landscape Mitigation project received a Royal Town Planning Institute (RTPI) Award for its innovative habitat creation and active travel initiatives. Year two of our extensive three-year environmental training programme delivered a wide range of courses to ensure that all our staff know how to reduce the specific environmental impacts and risks related to the SP Transmission network. This training, together with our robust ISO14001-certified management and governance systems, meant we received zero environmental regulatory interventions and achieved a 96% reduction in notifiable environmental incidents.

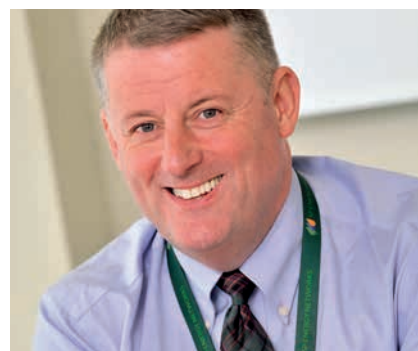
Recognising that our ability to influence our environmental and sustainability impacts is greatest at the point at which we specify contracts, this year we updated our specifications for key contracts to optimise environmental impacts. We're engaging with our supply chain and across the infrastructure sector to align our specifications and expectations for emissions reduction, biodiversity net gain and the move towards a circular economy.

Inclusive, responsive engagement with our stakeholders forms the foundation of all of our activities and enables us to target our attention towards the most material issues, delivering tangible and meaningful impacts for all of society.

I'm proud of the outcomes that our integrated approach is delivering, driven by our Sustainable Business Strategy.

We will continue to build on our performance in the coming year as we deliver the investments and connections that society requires and work with stakeholders to define our 2021–26 business plan.

**Frank Mitchell, CEO,  
SP Energy Networks**



# Welcome

## Who we are

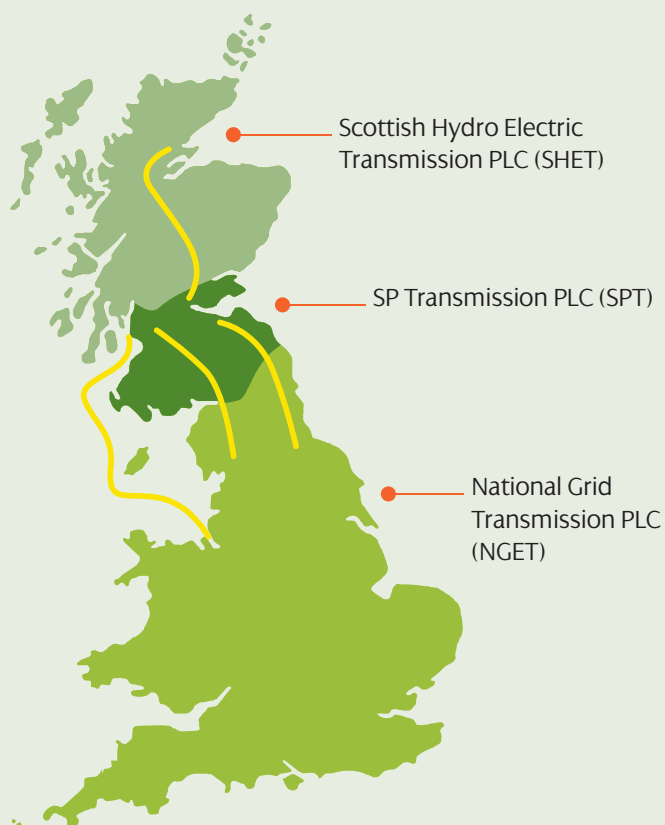
SP Transmission is the Electricity Transmission Operator (TO) that delivers electricity to homes and businesses in Central and Southern Scotland as one of three network operation licences held by SP Energy Networks (SPEN).

## We are responsible for:

- Providing a safe, reliable and economic transmission system for current and future network users; and
- Delivering a sustainable, low carbon energy system.

By adopting a more sustainable approach, we are managing the network more effectively for customers and the environment, year on year.

### GB Transmission Operators and Interconnections

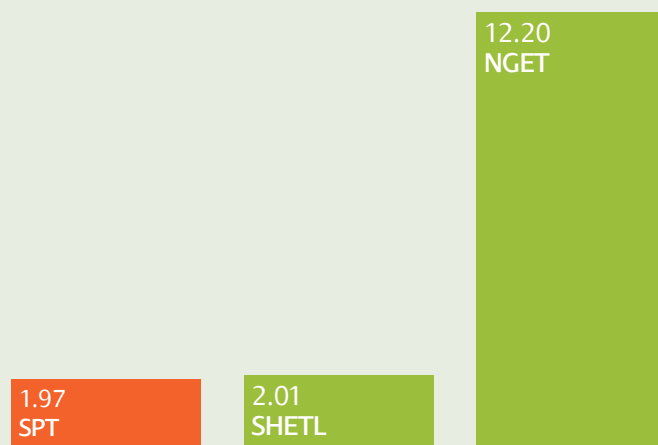


## Company size and scale

SP Transmission is third in terms of the current worth of our regulated assets, but not in terms of our ambition when comparing all three electricity Transmission Operators. We play a critical role in providing security of supply across GB and in facilitating the connection of new renewables.

### Value of Regulated Assets

£ billions



(Ofgem Regulatory financial performance report 2017/2018)

## Our activities and assets

- Supply around 2 million customers
- Cover an area of approximately 22,950km<sup>2</sup>
- Comprise 4,000km of overhead lines
- 320km of underground cables
- 140 substations operating at 400, 275 and 132kV

SP Energy Networks also own and operate the distribution network in Central and Southern Scotland, and the electricity distribution network in Merseyside, the Wirral, Cheshire, North Shropshire, Mid and North Wales. The environmental aspects of these licence areas are discussed in our annual ED1 Environmental and Innovation Report.

## Our responsibilities

The SP Transmission network is a crucial enabler of the UK's renewable energy objectives.

### Opening up renewable energy to the rest of the UK

Our location in an area of exceptional renewables resource and our position linking SHE 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 SHE 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 integrating fair and responsible environmental practices with socio-economic considerations.



## About this report

### This report provides:

- A concise explanation of how we have developed and adapted our business strategy to manage the low carbon transition, protect the environment and support social sustainability.
- An exploration of significant relevant initiatives contributing to sustainability and low carbon objectives.
- An indication of the next steps for the coming three years.

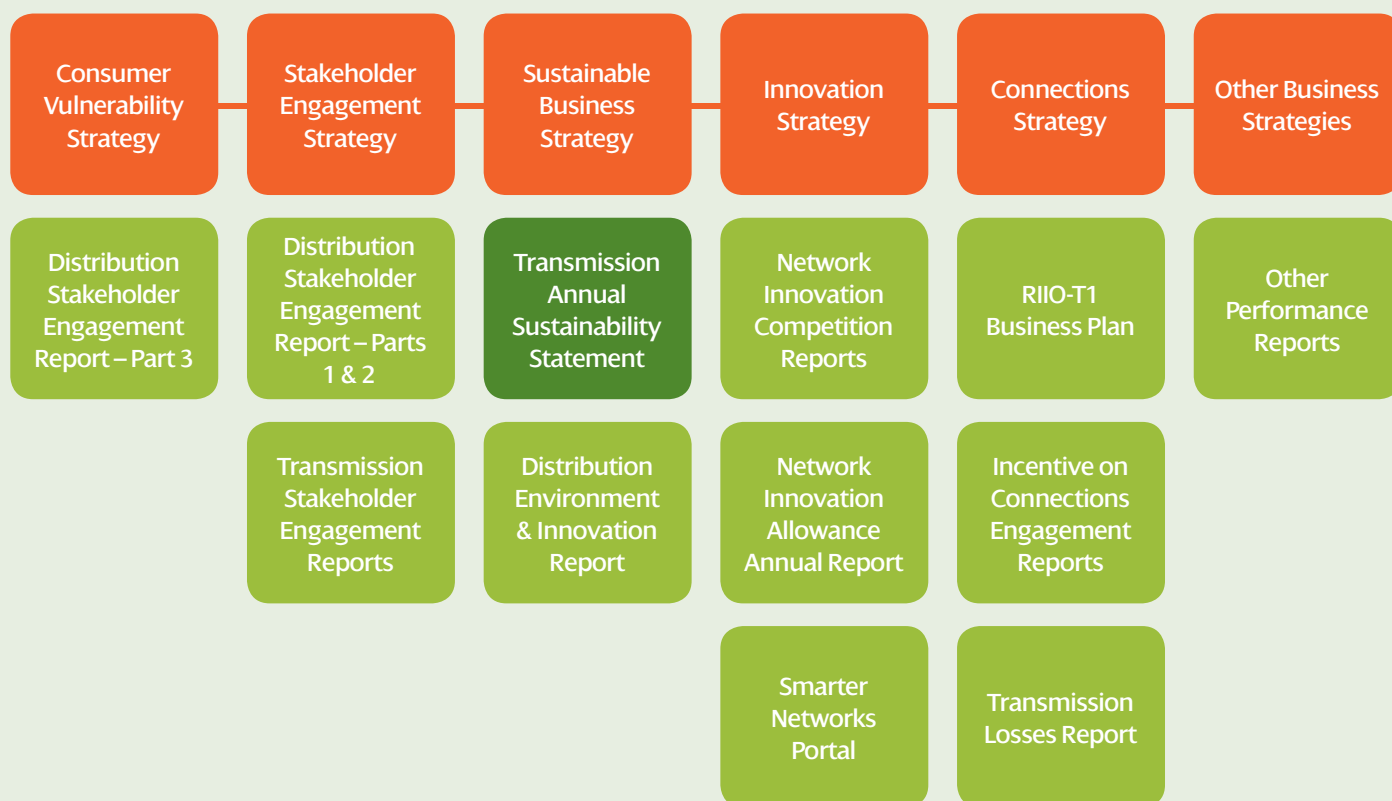
It conforms to the requirements of the Environmental Discretionary Reward (EDR) Scheme, a key incentive under the Ofgem price control process for electricity transmission from 2013 to 2021 (RIIO-T1).

This document is intended to be suitable for a non-technical audience, to enable the widest possible range of interested stakeholders to understand the progress we are making in efficiently developing our network to support the low carbon transition, and achieving neutral or positive environmental and social impacts.

If you have any questions about the content of the report, please contact [sustainable@spenergynetworks.co.uk](mailto:sustainable@spenergynetworks.co.uk)


### Other sources of information

This document forms part of a suite of interrelated strategies and stakeholder facing performance reports.



Distribution & Transmission Annual Reports

The case studies featured in this report represent our broad portfolio of initiatives in progress to enhance the sustainability of the SP Transmission network and the services it provides.

Initiative		 Carbon and Energy Reduction	 Climate Change Resilience	 Sustainable Society	 Land and Biodiversity Improvement	 Water Efficiency and Protection	 Sustainable Resource Use
Driving Decarbonisation	Generation Export Management Scheme	✓		✓			✓
	Load Management Schemes	✓		✓			✓
	Empowering the Connections Customer	✓		✓	✓		
	Enhanced services to maximise renewable generation	✓		✓			✓
	Project Phoenix	✓		✓	✓		✓
	Black Start from Distributed Energy Resources	✓					
	Project MIGRATE	✓		✓			
	System Solutions for Harmonics	✓		✓			✓
Mitigating Climate Change	Updating our Network Losses Strategy	✓		✓			✓
	Network Loss Reduction Activities	✓					
	Sulphur Hexafluoride (SF <sub>6</sub> ) Emissions Reduction	✓					
	Other Carbon Footprint Reduction Initiatives	✓		✓			
	Flood Prevention		✓				
Enhancing the Natural Environment	Project VIEW			✓	✓		
	Stirling Enhanced Landscape Mitigation			✓	✓		✓
	ISO14001 Certification	✓	✓	✓	✓	✓	✓
	Training & Awareness	✓	✓	✓	✓	✓	✓
Sustainable Resource Use	Sustainable Procurement			✓			✓
	Re-use of Concrete	✓			✓		✓
Sustainable Society	Green Economy Fund	✓		✓			
	Modern Slavery			✓			
	Diversity and Inclusion			✓			

# Performance

## Driving Decarbonisation

### 1192MW

1192MW of renewable generation connected to our network since April 2013, displacing over 900,000 tCO<sub>2</sub>e annual carbon emissions<sup>1</sup>.

### 100%

100% connections offers delivered on time and 100% of connections projects delivered as planned.

### 73%

45% increase in total connections applications received and 73% increase in final connections offers provided.

### 139MW

139MW renewables connected in 2018–19, displacing 110,000 tCO<sub>2</sub>e annual carbon emissions<sup>1</sup>.

## Enhancing the Natural Environment



Full ISO 14001 Environmental Management Certification.

### Zero

Zero environmental regulatory interventions in 2018–19.

### 96%

96% reduction in notifiable environmental incidents on previous year.



Royal Town Planning Institute (RTPI) Award winner for Excellence in Planning for the Natural Environment 2019.



Recipients of Keep Scotland Beautiful Gold Award for Environmental Excellence.

## Mitigating Climate Change

### 9%

Business Carbon Footprint excluding network losses has decreased by 9% since our 2013–14 baseline year.

### 36%

Business Carbon Footprint excluding network losses increased by 36% this year, primarily due to increased Sulphur-Hexafluoride (SF<sub>6</sub>) leakage.

### 9%

Business Carbon Footprint from network losses increased by 9%, primarily due to increases in the amount of energy flowing through our network from renewable generation sources in the north to demand centres in the south.

### 51%

SF<sub>6</sub> leakage increased by 51% in the year but remained ahead of target at 0.65% leakage rate against a target of 0.85%<sup>2</sup>.

## Sustainable Society

### 8.5/10

Stakeholder satisfaction rose to 8.5/10, well above our 7.4/10 benchmark.



Network Awards – Network of the Year 2019.



World's first utility company to achieve the BSI Kitemark for Customer Service.

### £25m

£25m innovation investment over 40 projects since 2013.

### £6m

£6m invested in 12 projects through our Green Economy Fund, delivering an estimated 337.5 tCO<sub>2</sub> per annum reduction.

### 20.06%

20.06% Gender Pay Gap for SP Transmission in 2018.

## Sustainable Resource Use



Signatories of the Procurement Skills Accord and Award winners in our first year.



Enhanced environmental requirements introduced to procurement processes.

### 3,000

3,000 tonnes of concrete re-used.

<sup>1</sup>Calculated using Scottish Government Renewable Electricity Output Calculator (Onshore Wind / Grid Mix selected) <https://www2.gov.scot/Topics/Statistics/Browse/Business/Energy/onlineTools/ElecCalc>

<sup>2</sup>Leakage expressed as a percentage of total mass of SF<sub>6</sub> on the network.



# Strategy

## Vision and Drivers

### 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.

### Our sustainable business model is characterised by:

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

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

Our Sustainable Business Strategy 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.

Our Sustainable Business Strategy is built around six Sustainability Drivers, 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.

### Sustainability Drivers



Sustainable Society



Carbon and Energy Reduction



Climate Change Resilience



Water Efficiency and Protection



Land and Biodiversity Improvement






Sustainable Resource Use

Our annual Sustainability Plan lays out the actions we are taking to deliver the aims of the Strategy. The current plan was developed in consultation with expert stakeholders from within and outside our organisation and published in March 2019. The plan can be viewed here: [www.spenergynetworks.co.uk/SustainabilityPlan](http://www.spenergynetworks.co.uk/SustainabilityPlan)

Environmental, Economic and Social Sustainability are also key priorities in the development of our business plan for 2021–2026, which will be finalised by the end of 2019. Our Draft Business Plan is the result of extensive stakeholder engagement and aims to deliver the objectives of the Sustainable Business Strategy whilst delivering excellent network performance and value for money.

### Key goals




















	 <b>Carbon and Energy Reduction</b>	 <b>Sustainable Resource Use</b>	 <b>Water Efficiency and Protection</b>
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 <sub>2</sub> 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).

## Contribution to the UN Sustainable Development Goals

The UN Sustainable Development Goals provide a global framework for delivering improvements against all areas of sustainability. We contribute to the delivery of all of the SDGs, with particular emphasis on the following goals:

	SDG	Goal Aims and Our Contribution	Sustainability Drivers
Main focus	<b>7 AFFORDABLE AND CLEAN ENERGY</b> 	<b>'Ensure access to affordable, reliable, sustainable and modern energy for all'</b> <ul style="list-style-type: none"> <li>Providing excellent network reliability and value for money</li> <li>Connecting renewables to the network quickly and sustainably</li> </ul>	 
	<b>13 CLIMATE ACTION</b> 	<b>'Take urgent action to combat climate change and its impacts'</b> <ul style="list-style-type: none"> <li>Enabling decarbonisation of electricity, heat and transport through providing the required network capacity and connections</li> <li>Reducing our Business Carbon Footprint</li> <li>Ensuring the electricity network is resilient to the effects of climate change</li> </ul>	 
Direct Contribution	<b>6 CLEAN WATER AND SANITATION</b> 	<b>'Ensure availability and sustainable management of water and sanitation for all'</b> <ul style="list-style-type: none"> <li>Reducing the risk of water pollution from our operations</li> <li>Reducing business water consumption</li> </ul>	
	<b>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</b> 	<b>'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'</b> <ul style="list-style-type: none"> <li>Significant investment in innovation</li> <li>Providing system solutions that enable the most efficient use of the network, reducing the need for costly upgrades</li> </ul>	  
	<b>15 LIFE ON LAND</b> 	<b>'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'</b> <ul style="list-style-type: none"> <li>Reducing the risk of biodiversity loss or land contamination from our operations</li> <li>Understanding and protecting the ecological value of the environments in which we operate</li> </ul>	
	<b>17 PARTNERSHIPS FOR THE GOALS</b> 	<b>'Strengthen the means of implementation and revitalize the global partnership for sustainable development'</b> <ul style="list-style-type: none"> <li>Inclusive, responsive stakeholder engagement, acting on the issues that are most material for stakeholders, and delivering meaningful impact</li> <li>Working in partnership with stakeholders and organisations to co-create solutions for sustainability</li> </ul>	     
Indirect Contribution	<b>1 NO POVERTY</b> 	<b>'End poverty in all its forms everywhere'</b> <ul style="list-style-type: none"> <li>Providing value for money</li> <li>Supporting customers in fuel poverty</li> <li>Supporting vulnerable communities to adopt low carbon technologies</li> </ul>	
	<b>3 GOOD HEALTH AND WELL-BEING</b> 	<b>'Ensure healthy lives and promote well-being for all at all ages'</b> <ul style="list-style-type: none"> <li>Enabling air quality improvement through the connection of low carbon technologies</li> <li>Enabling access to green spaces and active travel through landscape and visual mitigation schemes</li> </ul>	 
	<b>4 QUALITY EDUCATION</b> 	<b>'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'</b> <ul style="list-style-type: none"> <li>Providing a wide range of training and development opportunities for staff</li> <li>Providing educational opportunities in the communities in which we operate</li> </ul>	
	<b>5 GENDER EQUALITY</b> 	<b>'Achieve gender equality and empower all women and girls'</b> <ul style="list-style-type: none"> <li>Driving down the gender pay gap</li> <li>Empowering women through staff networks and gender neutral recruitment processes</li> </ul>	

	SDG	Goal Aims and Our Contribution	Sustainability Drivers
Indirect Contribution		'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all' <ul style="list-style-type: none"> <li>• Providing network capacity and connections to accelerate growth in green industries</li> </ul>	
		'Reduce inequality within and among countries' <ul style="list-style-type: none"> <li>• Targeting investment to where it's needed the most</li> <li>• Working to ensure a just transition into the low carbon transition</li> </ul>	
		'Make cities and human settlements inclusive, safe, resilient and sustainable' <ul style="list-style-type: none"> <li>• World class safety performance</li> <li>• Working with communities to enhance resilience</li> </ul>	   
		'Ensure sustainable consumption and production patterns' <ul style="list-style-type: none"> <li>• Minimising overall resource consumption</li> <li>• Increasing re-use and recycling</li> </ul>	 
		'Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels' <ul style="list-style-type: none"> <li>• Transparency, inclusivity and accountability in our business processes and activities</li> </ul>	     

## Adapting our Strategy

### Our Sustainable Business model is 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.

In line with these key principles, our Sustainable Business Strategy is reviewed annually by key internal and external stakeholders, including our Sustainability Stakeholder Working Group made up of key external stakeholders including SEPA, Scottish Natural Heritage and the Sustainable Scotland Network. Strategy development is underpinned by expert advice and benchmarking from sustainability-focussed organisations including AccountAbility and Planet First. The Strategy is reviewed and signed off by the SPEN Executive Team and governed by our Executive Sustainability Steering Group.

### In 2018, the following updates were made following extensive review and engagement (described in more detail on page 32 of the Strategy):

- Raw material and waste Drivers were combined into a single Driver: 'Sustainable Resource Use'
- Existing Business Carbon Footprint and Waste graphs updated to show actual performance as well as targets.

- All Sustainability Objectives were reviewed, resulting in the introduction of 12 new objectives, updates to 4 objectives, and the removal of one objective (this was split into two new objectives).
- New sections were added to reflect the Opportunities and Challenges resulting from recent political, scientific and societal changes and the Enablers for the low carbon transition.

The specific actions to be taken in 2019 to deliver these Objectives are outlined in our 2019 Sustainability Plan: [www.spenergynetworks.co.uk/SustainabilityPlan](http://www.spenergynetworks.co.uk/SustainabilityPlan)

The actions to be taken during 2020 to 2030 are contained in our 2020–2030 Sustainability Plan, which is refined on an annual basis in line with actual performance, key trends and feedback from internal and external stakeholder engagement.

The case studies in this Statement illustrate some of the key ways in which we are adapting our strategy and activities to manage the transition to a low carbon energy system over the next three years.

Please see Stakeholder Engagement and Feedback for details of the engagement we have carried out in 2018–19 in order to adapt our Strategy.

## Trends

**Regular review and update of our Strategy enables us to recognise and adapt to changes in the way the network must operate. Current trends and scenarios for the next decade include:**

- Continued decarbonisation of electricity generation with further volumes of renewable generation connecting, most notably large volumes of offshore wind.
- Continued reduction in synchronous generation in Scotland with the closure of the large nuclear power stations, which will change the dynamics of the system in Scotland.
- A move to electrified transport and heat, increasing customers' dependency on electricity as an energy source.
- Increasing focus on environmental accountability and biodiversity enhancement.
- A move to a more decentralised system, where more electrical energy is generated locally by smaller renewable generators.
- Increasing focus on social justice and mobility.
- Increasing flexibility with evolving energy markets and new business models where electricity is a more readily traded commodity at local and national level.
- Demand and storage will provide services to new network operators as the DSO (Distribution System Operator) model is established.

## External Influences

**These energy trends are driven by a wide range of external influences, each of which presents opportunities and challenges.**

These influences are described in detail on pages 26 to 31 of our Sustainable Business Strategy, and include UK and devolved Government strategies, plans and regulatory frameworks, and national and international reports, on the following topics:

- Driving Decarbonisation
- Mitigating Climate Change
- Enhancing the Natural Environment
- Sustainable Resource Use
- Sustainable Society

## Initiatives and Progress

The following sections of this Statement outline our progress in line with our Sustainable Business Strategy, highlighting the significant initiatives that contribute to sustainability, environmental enhancement and low carbon objectives, and laying out drivers, current status, impacts, justifications, alternative considerations and next steps.

**In line with our Strategy Drivers, current key trends and influences and EDR requirements, our case studies cover the following subject areas:**

- **Driving Decarbonisation**
  - Connections for decarbonised energy, transport and heat
  - Smart energy system solutions for decarbonisation
- **Mitigating Climate Change**
  - Network Losses
  - Business Carbon Footprint
  - Climate Change Resilience
- **Enhancing the Natural Environment**
  - Environmental Planning and Mitigation
  - Environmental Management
- **Sustainable Resource Use**
  - Resource Management
  - Resource Use Optimisation
- **Sustainable Society**
  - Enabling Societal Sustainability
  - Promoting Sustainable Working





# Driving Decarbonisation

Driving societal decarbonisation through the timely connection of renewable electricity generation ranks as our top priority alongside continuing to provide excellent network reliability and availability.

The key uncertainty facing our network – and how we develop it economically and efficiently – is the changing generation landscape, the scale, timing and location of new generation and the timing of generation closures.

Not responding quickly enough risks delaying the connection of new generation and the transition to a low carbon energy sector. But building too much or too far ahead of time leads to higher customer bills. We have an ongoing role to help strike the right balance. This means proactive scenario planning and, where necessary, taking decisive action to modify our investment plans.

**A wide range of our established activities contribute to managing this uncertainty:**

- **Scenario planning:** We contribute key information to the Government's Future Energy Scenarios and National Grid's annual Electricity Ten Year Statement, and we update our own forecasts for new connections to capture new information.
- **Developing strategic investment options:** We work jointly with National Grid and SHE Transmission to develop and specify Strategic Wider Works proposals.
- **Optimising investment needs:** We apply the Security and Quality of Supply Standard, a common and rigorous set of standards to identify what is required in any set of circumstances.
- **Minimising investment costs:** We manage the cost of any necessary investment down to the minimum efficient costs, developing and deploying innovation where required.

Our Transmission Economic Connections Assessment (TECA) Steering Group – developed in response to our commitment to the facilitation of low carbon connections – regularly reviews and adjusts our best view of the contracted generation background over the coming years and evaluates timely delivery of reinforcement works. This regular assessment activity results in more accurate projections of renewable development in Scotland and feeds into our plans on an annual basis, ensuring our investments best meet the needs of users and customers now and into the future.

Our monthly Transmission System Review Group reviews whole system planning issues and agrees the best technical solutions and initiatives to deploy, working hand in hand with the SP Distribution System Review Group to ensure solutions deliver whole-system benefits.

This year, one key example of SP Transmission proactively taking account of whole system developments in planning for future transmission network capacity is the development of our own SP Transmission-specific Future Energy Scenarios (FES). The SP Transmission FES considers a variety of different network pathways that could develop in the future, taking into account the impact of Scottish energy strategy, changes to generation and demand, and the impact of increased interconnection, energy storage and decentralisation. This SP Transmission FES will be updated in 2019 and in future as required. Our FES formed a key input in our participation in the collaborative development of the subsequent cross-sectoral 'Common View' scenario developed by electricity and gas operators.

## Performance

- 1192MW of renewable generation connected to our network since March 2013, displacing over 900,000 tCO<sub>2</sub>e annual carbon emissions<sup>3</sup>
- 139MW renewables connected in 2018–19, displacing 110,000 tCO<sub>2</sub>e annual carbon emissions<sup>3</sup>
- £25m innovation investment across 40 projects since 2013
- 100% connections offers delivered on time and 100% of connections projects delivered as planned
- 45% increase in total connections applications received and 73% increase in final connections offers provided
- Load Management Schemes installed since 2016 have enabled 376MW of generation to connect early

<sup>3</sup> Calculated using Scottish Government Renewable Electricity Output Calculator (Onshore Wind / Grid Mix selected) <https://www2.gov.scot/Topics/Statistics/Browse/Business/Energy/onlineetools/ElecCalc>

## Initiatives

Theme	Our Contribution	Sustainability Drivers	SDG
Connections for Decarbonised Energy, Transport and Heat	Generation Export Management Scheme	  	     
	Load Management Schemes	   	     
	Empowering the Connections Customer	 	   
	Enhanced services to maximise renewable generation	  	   
Smart Energy System Solutions for Decarbonisation	Project Phoenix	   	    
	Black Start from Distributed Energy Resources		  
	Project MIGRATE	 	  
	System Solutions for Harmonics	  	  



## Connections for Decarbonised Energy, Transport and Heat

### Generation Export Management Scheme

#### Project Background

The South West area of Scotland has great potential for renewable electricity generation, but under conventional approaches, costly network reinforcement would be required to get this energy to where it is needed. Taking future energy scenarios and changes in the low carbon generation sector into account, it is uneconomical to carry out these network reinforcements, but this means that the transmission system in South West Scotland will be operating beyond its firm capacity in the coming years.

SP Transmission is therefore working to develop the Generation Export Management Scheme (GEMS), an innovative, whole-system, cost-efficient technological, operational and commercial solution to actively manage the flow of energy on the network to facilitate up to 2500MW of future generation connections and ensure that the system is not exposed to unacceptable overloads.

#### Current Status

Principles and high level functional requirements have been developed in collaboration with National Grid Electricity System Operator (ESO), SP Distribution and the South West Scotland developer community. NGENSO have submitted a planning request to develop the Generation Export Management System (GEMS) and collaborative work took place in 2018-19 to develop the design and tender for the proposed system, including joint engagement with connections stakeholders in June 2018.

A number of complex workstreams and processes have been agreed with ESO and SP Distribution in order to coordinate whole system planning and define how the new technology will interact with the proposed roll-out of the corresponding active network management on the Distribution network.

#### Timescales for Completion and Next Steps

The project is scheduled from 2017 to 2022 – with scheme scoping in 2017–18, design and tender in 2018–19, scheme development in 2019–20, implementation and testing in 2021 and operational go-live planned for 2022.

#### Sustainability Drivers



##### Carbon and Energy Reduction

GEMS will enable up to 2500MW of renewable generation to connect sooner, and access to the additional revenue from selling balancing services has the potential to make a greater number of renewables projects viable, helping to increase the overall proportion of renewable generation in Scotland.



##### Sustainable Society

Currently only larger generators are able to take part in the national electricity balancing market. Under GEMS – an evolution from load management schemes – generators of all sizes will not only be able to connect sooner and more economically, but to also take part in a balancing mechanism by agreeing for their systems to ramp up or down to balance the network. This enables smaller enterprises to access new markets, increasing the potential for greater local benefit from local renewables resources.



##### Sustainable Resource Use

GEMS will enable more efficient utilisation of the energy network in the South of Scotland, avoiding the progression of a c. £500m capital investment scheme which would have involved the development of c. 170km of new 400kV overhead line, thereby reducing the use of concrete, steel, aluminium, copper and plastics, visual intrusion and construction impacts.

#### SDGs

This initiative supports the delivery of the following SDGs:



## Connections for Decarbonised Energy, Transport and Heat continued

### Load Management Schemes

#### Project Background

Much of our investment is related to reinforcing the network in areas with rich wind resource to facilitate the connection of renewable generation. However, the time that it takes to carry out reinforcement works, due to necessary periods of stakeholder engagement, consenting, construction and system access restrictions, can often be significant. Renewable development customers need to receive their network connection on time and they appreciate the ability to connect sooner via an alternative non-build network solution when offered.

We have therefore devised a novel system of wide-area load management schemes that enable renewable generators to connect in advance of network reinforcement via a 'non-firm' contract. This means that they can use the available capacity to export the energy they generate onto the grid, but the load management system will constrain these exports when it is necessary to remove overloads from the system. By 2021, we expect to have in excess of 1GW of directly connected and embedded generation connected via load management schemes, spanning a geographical area from Stranraer to Berwick.

#### Current Status

A total of 14 connections have been connected to the SP Transmission network early via Load Management Schemes (LMS) since 2016, including three in regulatory year 2018–19. The schemes have been installed on Grid Supply Point transformers, 132kV circuits and supergrid transformers to facilitate a total of 376MW of generation to connect early.

#### Timescales for Completion and Next Steps

A further 654MW of generation is contracted to connect, facilitated by these Load Management Schemes in the forthcoming years.

#### Sustainability Drivers



##### Land and Biodiversity Improvement, Sustainable Resource Use

By deploying smart technology, the constraints on the transmission network can be significantly relieved, often without new overhead line build, reducing use of concrete, steel, aluminium, copper and plastics, visual intrusion and construction impacts from duntakings and excavation.



#### Carbon and Energy Reduction and Sustainable Society

This project is critical in supporting the target of supplying the equivalent of 50% of Scotland's energy for heat, transport and electricity from renewable sources by 2030. Releasing transmission network capacity ahead of reinforcement work – and in some cases avoiding reinforcements altogether – enables a greater amount of electricity generated by wind to access the market. This improves security of supply and reduces the periods of constraint of low-carbon generation, the associated costs of which are borne by the consumer to a value of around £850m annually<sup>4</sup>.

By advancing the connection dates for renewable generators, this project also contributes to the reduction and stabilisation of the levelised cost of energy, calculated by summing the cost of building, operating and decommissioning of the plant over its lifetime against the total electricity generated by the asset. By allowing 376MW of generation to connect early so far these schemes have the potential to displace approximately 1 million tonnes of CO<sub>2</sub> compared to generation from a traditional mix of generation methods. For those generators who are now able to avoid reinforcement, the carbon savings are increased by avoiding new construction or upgrades to the network and further transport of materials to facilitate their projects.



#### SDGs

This initiative supports the delivery of the following SDGs:



<sup>4</sup>From Ofgem consultation for final proposals for electricity System Operator incentives, April 2017.



## Connections for Decarbonised Energy, Transport and Heat continued

### Empowering the Connections Customer

#### Project Background

As the decarbonisation agenda gains momentum, the number of renewable projects wishing to connect to the SP Transmission network is sharply increasing. SP Transmission saw a 45% increase in total in- and out-of-area connections applications received during 2018–19, leading to a 73% increase in in- and out-of-area final offers provided.

Whilst SP Transmission successfully made 100% of connections offers within the relevant deadlines, customers requested access to self-service online application tracking and information, and we also recognised that we could make the application process even smoother for customers if we carried out a corresponding review of our internal processes.

#### Current Status

In 2018–19 we kicked off a two year project to design and implement an online connection process, focused on customers, where the whole request and project management for new connections can be done online. We also designed a new transmission planner tool, which changes the internal connections application process from a manual, email and spreadsheet-based process to an end-to-end digital process. Although these processes will become more streamlined, customers will continue to be supported by our connections teams as required throughout the connection process.

This tool streamlines the transmission economic connection assessment (TECA) process and reporting, enables multiple control points against critical-to-quality indicators and enhances accountability across all business teams, making the connections process faster and smoother for customers.

#### Timescales for Completion and Next Steps

Work to design the online connections portal started in 2019 and it is expected to launch during 2020, following stakeholder engagement and testing. The transmission planner tool will become fully operational during 2019. These internal and external processes will then be integrated to enable end-to-end management and visibility of connections requests for both the customers and the SP Transmission teams involved.

### Sustainability Drivers



#### Carbon and Energy Reduction

This initiative is critical in enabling the level of renewable generation required to meet UK and Global carbon reduction targets. By improving the customer experience and smoothing the related processes, we can continue to successfully manage increases in transmission connection applications and support applicants through the process.



#### Sustainable Society

This initiative enables a more sustainable society by making the connections application process more accessible, understandable and self-service for all customers. In doing so, it enables us to target our expertise more directly to those customers who need the most support, helping to increase the chances of less experienced connections customers achieving successful outcomes.

### SDGs

This initiative supports the delivery of the following SDGs:



## Connections for Decarbonised Energy, Transport and Heat continued

### Enhanced Services to Maximise Renewable Generation

#### Project Background

Network outages are often required during upgrade, connection and maintenance programmes. If a renewable generator is connected on a non-firm contract, (where they have accepted the risk of outages or constraints in order to connect and generate sooner), these outages can occasionally mean that they are unable to generate for periods of weeks or months, losing revenue. We wanted to offer renewable generators and other customers another option that could reduce the impact of outages, thereby supporting the low carbon market and the wider decarbonisation of societal energy use.

We therefore led the introduction of the new industry-wide ESO/TO Code Procedure STCP11-4 – Enhanced Service Provision, which was finalised in October 2018. This procedure specifies the process and procedures associated with the Electricity System Operator (ESO) buying either a Commercial Operational Service (COS) or a Joint Works projects (JW) service from a TO, where that service is deemed to have a positive impact in assisting the ESO in reducing system operating costs such as constraint costs. This innovative new process benefits low carbon connections by enabling us to provide additional services to reduce the impact of outages.

#### Current Status

A connected windfarm raised concerns during one of our regular outage forums over possible disruption due to an upcoming major upgrade to one of SP Transmission's largest substations. This would have required the windfarm to shut down for a period of five months to allow modernisation of the network. This outage would have a multi-million pound impact on the windfarm's turnover in that calendar year, so we agreed to work to find a solution to reduce outage times for the windfarm. Through discussion with the windfarm it became clear that it was imperative for the windfarm to be in operation throughout vital winter months.

This year, using the new Enhanced Service Provision procedure, we have agreed an innovative solution with the windfarm operator which involves creating a temporary transformer connection by building a new bay at the Grid Supply Point and using this as a temporary connection, reducing the impact of the outage significantly. The windfarm operator will pay for the extra costs we will incur to deliver the project in ten weeks, rather than five months. Using this process provides benefit to the windfarm operator as their loss of generation time is mitigated, and the windfarm will be available in the balancing market over the crucial winter period.

#### Timescales for Completion and Next Steps

The new industry process was finalised in October 2018 after multi-year industry and stakeholder engagement. The process has already been used in the example above, and we have updated our outage planning processes to ensure that all generators are aware of the potential impact of outages and the enhanced services on offer to mitigate this impact.

#### Sustainability Drivers



##### Carbon and Energy Reduction

This initiative is critical in enabling renewable generators to maximise their output, whilst still meeting the busy transmission network outage schedule, enabling further renewables to connect and keeping the network stable for all users.



##### Sustainable Society

This initiative enables a more sustainable society by supporting the low carbon market and ensuring that local generators who may not be able to absorb long outages are able to operate on an even playing field.



##### Sustainable Resource Use

Where the enhanced services offered require the installation of physical assets, we are also considering the potential re-use of these assets at the outset, reducing the amount of new materials required.

#### SDGs

This initiative supports the delivery of the following SDGs:



## Smart Energy System Solutions for Decarbonisation

### Project Phoenix

#### Project Background

Phoenix seeks to allow greater use of renewable power from windfarms, solar arrays and batteries whilst maintaining security and stability of supply against a background of recent and planned closures of conventional generation plants. The project will develop and demonstrate the deployment of a new technology, the Hybrid-Synchronous Compensator (H-SC). Project partners include ABB, National Grid, The University of Strathclyde and The Technical University of Denmark.

Phoenix will facilitate carbon reduction targets by enhancing network strength and stability to ensure renewable energy sources can be securely accommodated and fully utilised to backfill the services traditionally obtained from those large synchronous generators recently closed or planned for closure. The project will address the technical, engineering and commercial challenges that are currently perceived as the main barriers for wider scale adoption of renewables.

#### Current Status

The project started in mid-2017 with the selection of an installation site and agreement of modelling requirements. In 2018–19, the project placed contracts and set up a bespoke knowledge dissemination centre, supported by extensive technical and commercial stakeholder engagement.

#### Timescales for Completion and Next Steps

The project is funded under the Network Innovation Competition and scheduled to run for four years, from 2017 to 2021, with the live trial running 2019–2021. Site installation commences in 2019.

#### Sustainability Drivers



##### Sustainable Resource Use

The project will release 662MW additional network capacity, greatly reducing raw material and waste impacts by reducing the need for network reinforcement while enabling more Distributed Energy Resources – such as solar arrays and windfarms – to connect and flow through the network. The decommissioning of numerous coal-fired power stations across the UK presents an opportunity to divert potentially reusable assets from waste streams, including the potential re-use of existing equipment from decommissioned sites.



##### Carbon and Energy Reduction

The project aims to minimise carbon footprint and continue creating a sustainable network for customers, enabling a saving of just over 62 thousand tonnes of carbon – equivalent to the electricity use of over 6,000 homes. Additionally, the deployment of such devices is likely to further reduce the associated carbon emissions and costs by reducing the need for “must run” thermal generation – a practice that is currently essential to acquire auxiliary system support services particularly in times of light load.



##### Land and Biodiversity Improvement

Sites previously used for power generation, or close to the existing network, are ideal candidates for reuse, as proximity to the network avoids many issues that arise when considering an alternative green field site. Phoenix will not only evaluate the commercial mechanisms to facilitate future rollout but also conduct an assessment of potential locations for future installations that will include the use of existing generation sites.



##### Sustainable Society

This collaboration represents a strong commitment from all parties to respond to the changing energy landscape and deliver solutions to meet the needs of all stakeholders. Phoenix will aid the transition to a future GB transmission network that can benefit from clean energy resources without compromising the security and quality of supply to the customers. The project will enhance system stability, helping to reduce power cuts, and supporting the prosperity of an increasingly electrified economy. The joint project will explore future commercial mechanisms by which Synchronous Compensators will be able to compete to provide sustainable electricity network services on the open market. It will reduce the electricity network operating costs, financially benefitting customers.

#### SDGs

This initiative supports the delivery of the following SDGs:



## Smart Energy System Solutions for Decarbonisation continued

### Black Start from Distributed Energy Resources

#### Project Background

The recovery procedure from total or partial shutdown of the GB Transmission System is called Black Start. The process involves isolated power stations being started individually in sequence and gradually being connected to each other in order to restart the electricity system. Generators can sign up to provide their services in the event of a Black Start, but traditionally this market has only been open to thermal generators and pump storage, as they are self-starting and can provide consistent levels of generation irrespective of the weather. Inability to access this market is a key barrier for many low carbon generators.

As the GB energy mix decarbonises, there are fewer and fewer of these thermal generation sources available to provide Black Start capability. This is especially true in the South of Scotland, where the majority of electricity is generated by renewables. It is therefore vital that the industry builds a strong understanding of the opportunities and challenges in enabling renewables to provide this essential service. Recognising the specific challenges in the SP Transmission area, where there are now no non-nuclear thermal power stations larger than 120 MW, we are working in partnership with SP Distribution, National Grid and TNEI on a project which aims to investigate the options for using Distributed Energy Resources (DERs), such as renewable generation or storage, during Black Start restoration.

#### Current Status

Started in late 2018, this project seeks to understand the significant commercial, organisational, regulatory and technical risks involved in coordinating black start capability from DERs and develop and test the technical, commercial, procurement and regulatory strategies required to accelerate provision of black start services from DERs into business as usual. SP Transmission and SP Distribution are partnering National Grid due to the breadth of the prior work that SP Transmission had carried out to investigate the use of large wind and embedded generation in a black start scenario and its co-authorship of the 2017 System Operability Framework (SOF) publication on “Black Start from Distributed Sources”.

#### Timescales for Completion and Next Steps

The project was launched in December 2018 and will run until 2022. The project comprises three workstreams – organisational, technical, and procurement and regulation. Viability assessments will be completed in 2019, followed by process and technical design and procurement proposals in 2020, then technical and commercial demonstration in 2021.

#### Sustainability Drivers



#### Carbon and Energy Reduction

If the project is successful and is rolled out GB-wide from 2025, it will enable the avoidance of 810,000 tCO<sub>2</sub>e.

#### SDGs

This initiative supports the delivery of the following SDGs:





## Smart Energy System Solutions for Decarbonisation continued

### Project MIGRATE

#### Project Background

By 2020, we expect a number of transmission systems to experience a high penetration of power electronic interfaced generators as a result of the growing uptake of low carbon technologies, such as wind and solar generation. At certain times, this growing penetration could mean that networks are only supplied by low carbon technologies.

Electricity transmission networks will behave more dynamically, resulting in a need to upgrade the ways in which the network deals with fluctuations in the quality of the power flowing through the network. European Transmission Operators (TO) came together under Project MIGRATE (Massive Integration of Power Electronic Devices) to address these challenges and propose solutions to progressively adjust transmission systems.

#### Current Status

MIGRATE is the only TO-led project under the European Horizon 2020 research and innovation framework, supported by academics and industrial partners. SP Transmission represented GB transmission operators and led project Work Package 2 (Wide Area Monitoring, Protection and Control) as part of the project consortium. This meant direct collaboration between SP Transmission, 11 other European transmission operators and 14 academic and industrial partners, representing 13 countries. Work package 2 identified new key performance indicators such as area inertia, providing a new dimension to the analysis of system performance as the energy system decarbonises. It developed and tested new monitoring and forecasting tools to provide real-time information of the true stability limits of the system. It tested a world-first live implementation of a real-time wide area control algorithm on GB and Icelandic networks and demonstrated that wide area control solutions are capable of working with a wide range of power systems.

#### Timescales for Completion and Next Steps

The project started in early 2016 and completed in mid-2019. The learnings from the project will be included in the relevant business processes and governance structures in the next three years.

#### Sustainability Drivers



##### Carbon and Energy Reduction

The outcomes of the project will enable Europe-wide decarbonisation by helping Europe's transmission networks to understand how to best manage the new issues brought about by increased penetration of power electronics on the system. Project learnings on the management of network stability will help to prevent transmission network outages and other events which would impact renewable generators ability to export electricity onto the grid.



##### Sustainable Society

This collaboration between all European transmission operators helps to guarantee the network stability and availability necessary as society moves towards greater reliance upon low carbon electricity.

#### SDGs

This initiative supports the delivery of the following SDGs:



## Smart Energy System Solutions for Decarbonisation continued

### System Solutions for Harmonics

#### Project Background

An adequate level of power quality is essential for both customers and the network. If the 50Hz supply becomes too distorted, appliances and machinery may function incorrectly or fail. One cause of power quality issues is the harmonic voltages or currents that are introduced by the connection of power electronic devices of all kinds to the network, from phone chargers to wind turbines. These harmonic voltages or currents create distortion of the 50Hz power supply by introducing additional higher-frequency components, resulting in increased heating/losses and other problematic characteristics.

The progressive removal of large controllable synchronous generation sources, such as coal-fired power stations, is weakening the transmission network's ability to subsume harmonic issues. At the same time, more cable is being used in the transmission network instead of overhead lines, including the cable that is used to connect a growing number of wind turbines and other renewable generation to the network. The combination of weaker networks and more cable leads to resonant conditions that amplify any harmonics present on the network, exacerbating the problem.

#### Current Status

Generally, Transmission Owners require network users such as renewable generators to comply with harmonic voltage distortion standards. In 2017–18, we completed a study which developed a standardised harmonic filter design that would ensure compliance for most renewable generator connections. This filter design can be used by wind farms to ensure their own harmonic compliance. In 2018, recognising that the source of harmonic issues is not always obvious, that harmonics can behave dynamically in real time, and that there may be a more efficient way to deploy the filters on our network for universal benefit, we took the concept a step further. After discussion with stakeholders, we developed a proposal to install standardised filters at the most appropriate locations on the network, whilst fully socialising the costs.

#### Timescales for Completion and Next Steps

Subject to User Group acceptance and stakeholder consultation, plans for the installation of around six filters at key points on the network will be included in our investment plans for 2021–2026.

#### Sustainability Drivers



##### Carbon and Energy Reduction

This initiative helps to speed up the process of connecting renewables to the network by helping to remove the difficulty of proving harmonic compliance before final network designs are completed and within a context of fluctuating network characteristics. New wind farms will still have to meet their harmonic obligations, which may include the addition of a harmonic filter if the design of their connection warrants it.



##### Sustainable Resource Use

The initiative will reduce the number of filters to be installed across the network, and the related material use by around 70%.



##### Sustainable Society

The cost of installing around six standard filters at key points on the network, although not insignificant, will be significantly less than the costs passed through to customers of installing upwards of 25 filters at wind farms across the SP Transmission area.

#### SDGs

This initiative supports the delivery of the following SDGs:



# Mitigating Climate Change

As discussed in Driving Decarbonisation, we mitigate climate change most significantly through our actions to connect low carbon generation for societal decarbonisation. While we do this, we must reduce the carbon footprint of our business and operations, and ensure that our network is climate-change resilient.

In the year since we launched our Sustainable Business Strategy, we have seen a stark, yet positive shift in the priority given to climate change, decarbonisation and environmental concerns both in the UK and globally. Led by our working group of expert sustainability stakeholders, we are confident that the ambitious carbon footprint reduction targets we set back in 2017 will deliver the reductions required to deliver sub-1.5°C global temperature increases. Our parent company, Iberdrola, has recently set a Science Based Target and we have started the process of agreeing a specific Science Based Target for our network in order to further validate our existing reduction targets.

Our targets are deliberately very challenging and achieving them requires transformation at every level of our business.

## A wide range of our established activities contribute to managing this change:

- **Strategy Development:** In-depth stakeholder engagement with our Sustainability Stakeholder Working Group has resulted in the co-creation of a strategy aimed at industry leadership, and continues to push us to achieve more each year.
- **Data Improvement and Reporting:** Annual Planet Mark Data Certification and increased internal engagement enables us to continually improve the completeness, frequency and analysis of carbon footprint data. Internal and external engagement guides improvements in the content and format of our data reporting. Increased completeness, frequency and analysis of data enables us to manage our carbon impacts more proactively.
- **Taking Action:** Business strategies and processes are updated on a regular basis in line with our ISO 14001 certification, to ensure alignment with our Sustainable Business Strategy. Our Annual Sustainability Plan is developed with expert internal and external stakeholders and contains the key annual activities to deliver our carbon reduction targets. Our staff receive in-depth training and information on their carbon reduction responsibilities.
- **Governance:** Development and delivery of our Sustainable Business Strategy and Sustainability Plan is governed by our Executive Sustainability Steering Group, chaired by our CEO, and supported by our Integrated Management System Executive and Management Review Groups. Delivery of carbon reduction activities is tracked via a range of internal reports and governance forums.

Achieving transformation of this scale is rarely straightforward. This year, our business carbon footprint increased despite our comprehensive carbon reduction programme.

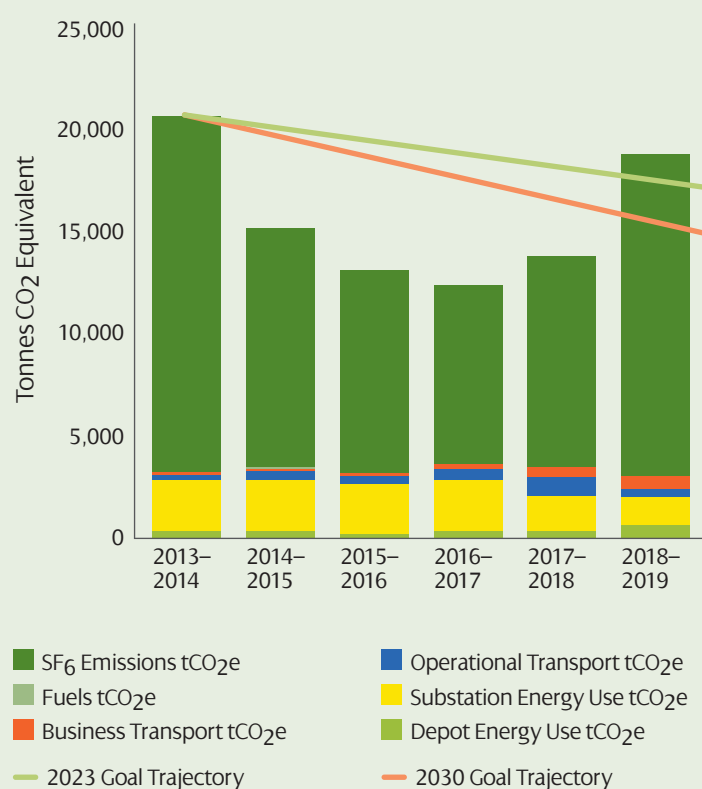


## Performance

Category	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	tCO <sub>2</sub> e difference from 2017–18	% difference from 2017–18
Depot Energy Use tCO <sub>2</sub> e	187.8	280.2	161.36	365.50	336.14	563.24	+227.09	+68%
Substation Energy Use tCO <sub>2</sub> e	2,644.8	2,553.26	2,464.04	2,445.80	1,798.49	1,439.10	-359.39	-20%
Operational Transport tCO <sub>2</sub> e	287.69	416.7	322.27	582.05	854.98	430.66	-424.31	-50%
Business Transport tCO <sub>2</sub> e	113.3	126.8	126.84	212.84	427.25	547.14	+119.89	+28%
Fuels tCO <sub>2</sub> e	0.00	9.00	0.00	0.00	0.00	0.00	0.00	N/A
SF <sub>6</sub> Emissions tCO <sub>2</sub> e	17,435.05	11,819.00	10,050.92	8,849.14	10,488.00	15,863.10	+5,375.10	+51%
<b>Total BCF (excl. losses)</b>	<b>20,668.64</b>	<b>15,204.96</b>	<b>13,125.44</b>	<b>12,455.33</b>	<b>13,904.86</b>	<b>18,843.24</b>	<b>+4,938.38</b>	<b>+36%</b>
Network Losses tCO <sub>2</sub> e	169,282.4	240,210.36	194,120	263,712	186,326.8	203,810.4	+17,483.60	+9%
<b>Total BCF (incl. losses)</b>	<b>189,951.04</b>	<b>255,415.32</b>	<b>207,245.44</b>	<b>276,167.33</b>	<b>200,231.66</b>	<b>222,653.64</b>	<b>+22,421.98</b>	<b>+11%</b>

- Business Carbon Footprint excluding Network Losses has decreased by 9% since our 2013–14 baseline year.
- Business Carbon Footprint including network losses increased by 11% in the year.
- Business Carbon Footprint excluding network losses increased by 36% in the year, primarily due to increased Sulphur-Hexafluoride (SF<sub>6</sub>) leakage.
- Business Carbon Footprint from network losses increased by 9% in the year, primarily due to increases in the amount of energy flowing through our network from renewable generation sources in the north to demand centres in the south.
- SF<sub>6</sub> leakage increased by 51% in the year but remained ahead of target at 0.65% leakage rate against a target of 0.85%<sup>6</sup>.
- Buildings Energy Carbon Footprint (Depot and Substation Energy) has reduced by 6% in the year.
- Transport and Fuel Carbon Footprint (Operational & Business Transport and Fuels) has reduced by 24% in the year.

### SP Transmission Business Carbon Footprint



























<sup>5</sup> Greenhouse Gas data is collected in line with ISO14064.

<sup>6</sup> Leakage expressed as a percentage of total mass of SF<sub>6</sub> on the network.



## Initiatives

Theme	Initiatives	Sustainability Drivers	SDG
Network Losses	Updating our Network Losses Strategy	  	   
	Network Loss Reduction Activities		   
Business Carbon Footprint	Sulphur Hexafluoride (SF <sub>6</sub> ) Emissions Reduction		 
	Other Business Carbon Footprint Reduction Initiatives	 	   
Climate Change Resilience	Flood Prevention		 

## Network Losses

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. The carbon impact of losses is a function of the carbon intensity of the energy flowing through our network (which is decreasing year on year) and the amount of energy flowing through and across our system (which is increasing, due to increased renewable generation).

Increased renewable generation connections in Scotland lead to increasing amounts of energy being transferred across transmission networks, and therefore to higher losses. In the case of SP Transmission, the energy being transferred across our transmission system between Scottish Hydro-Electric Transmission to the north and National Grid Electricity Transmission to the south contributes to our losses. Technical considerations mean that efforts to reduce losses (e.g. by reducing circuit resistance) are often neutralised by factors such as increased current. Additionally, individual loss reductions cannot be separated from the dynamic characteristics of the wider network.

Against a background of increased transfer of electricity across our network, achieving a reduction in total network losses would not be economic or efficient. However, we are working to reduce the losses associated with each unit of energy transmitted across the SP Transmission network by considering losses and wider environmental impacts carefully when evaluating options for transmission reinforcements or asset replacement.



## Network Losses continued

### Network Losses Strategy

#### Project Background

Due to the significant changes in the generation mix, network characteristics and available technologies since our Losses Strategy was developed in 2011, this year we updated our Strategy.

#### Current Status

Our new Strategy was developed during 2018 and published in early 2019. It provides more detail on the impact on losses due to the development and modernisation of the transmission network and the initiatives we are using to mitigate losses where possible through the application of new technology.

#### Timescales for Completion and Next Steps

The Strategy is embedded in our processes, influencing how we consider new and innovative technologies and determine optimal specifications when we procure assets. This Strategy is also influencing investment programmes and strategy within our T2 Business Plan for 2021–2026.

### Sustainability Drivers



#### Carbon and Energy Reduction

In addition to supporting the accelerating decarbonisation of the energy network, our activities to reduce network losses as determined by our Strategy maximise the proportion of green energy that reaches its intended destination.



#### Sustainable Society

Our Strategy supports the introduction of new and innovative technologies that will support ever greater uptake of renewable energy, enabling society to decarbonise at pace and enjoy the related social and economic benefits.



#### Sustainable Resource Use

By striking a balance between investment in additional assets to reduce losses and making full use of existing assets, our Strategy enables us to minimise, avoid or defer network upgrades, thereby minimising the need to use additional resources.

### SDGs

This initiative supports the delivery of the following SDGs:



## Network Losses continued

### Network Loss Reduction Initiatives

#### Project Background

We are committed to reducing losses on our network wherever and however it is economic and efficient to do so. 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.

#### Current Status

Beyond the loss reduction aspects which are now embedded in our asset specifications, two key loss reduction initiatives have been underway during 2018–19.

Westernlink, a joint venture between SP Transmission and National Grid Electricity Transmission, is one of the longest high voltage direct current (HVDC) cables in the world. When operating at rated current, the total losses of the link are in the order of 45MW, which is significantly lower than the losses of an equivalent AC circuit of the same capacity and length. In October 2018 the link was commissioned for its full capacity north to south.

In 2018 we also completed a project with Edinburgh Napier University and Logic Energy that involved the installation of energy metering at a number of transmission substations. Data was collected on power consumed, primarily for heating and lighting, and used to calibrate energy use models that were then used to assess the potential impact of energy-saving measures. Energy-saving measures identified by the project highlighted that the most cost effective option in most cases is to improve draught proofing, followed by improved roof insulation. In specific instances, lighting improvements may also be an economic option. The results from this monitoring have been reviewed and verified, and the applicability to other substations is being considered.

#### Timescales for Completion and Next Steps

We will continue to analyse, monitor and record losses to demonstrate how our decisions are helping to reduce losses and thereby serving our customers better. When we have gained further operational experience on the Western Link and have had an opportunity to assess the resulting changes in power flow on our AC network, we will report on the impact of the Western Link on system losses in further detail. Commercial take-over of the link is expected in late 2019. The outcomes from the substation losses monitoring project will be considered more fully in the coming year, including a more thorough assessment of the costs and practicality of making the proposed improvements.

#### Sustainability Drivers



##### Carbon and Energy Reduction

Not only does Westernlink reduce losses due to the use of direct current, but it also forms a crucial link between Scotland and England, enabling renewable energy generated in Scotland to be efficiently transported to where it's needed in England. Understanding the practical ways in which we can minimise electricity used for auxiliary supplies at our substations enables us to minimise the energy used, leading to potentially significant reductions when aggregated across all of our substations.

#### SDGs

This initiative supports the delivery of the following SDGs:





## Business Carbon Footprint

### Sulphur Hexafluoride (SF<sub>6</sub>) Emissions Reduction

#### Project Background

SF<sub>6</sub> emissions are the largest controllable element of our overall business carbon footprint. This year, as in past years, SF<sub>6</sub> leakage dominates our footprint, due to the substantial number of SF<sub>6</sub>-filled assets on our network, the high global warming potential of the gas itself, and increasing leakage from older assets which cannot be readily fixed despite considerable effort. This issue therefore commands intense focus from our Executive, strategic and operational teams and we are committed to exploring every available solution.

#### Our approach to reducing these emissions is to:

- Reduce leakage on existing equipment, targeting the leakiest first where it is economically reasonable to do so;
- Collaborate with manufacturers of new SF<sub>6</sub> equipment and share best practice industry-wide to minimise leakage; and
- Work with manufacturers, innovators and industry peers to develop and install economically viable alternatives to SF<sub>6</sub>.

Despite a considerable amount of effort spent in attempting to fix leaky assets, SF<sub>6</sub> leakage increased by 51% overall in 2018–19. Overall leakage has remained comparatively low, within target at 0.65% of total mass against a target of 0.85%, but SF<sub>6</sub> leakage needs to be significantly reduced in order to achieve our 2030 and 2050 carbon reduction targets.

We intervene promptly to fix leakages, but in addition to the technical challenges relating to fixing leaks, the outages required to fix leaks must be balanced against a range of competing considerations, including existing outages for network maintenance, modernisations and upgrades, and the strategic nature of generation assets connected via the SF<sub>6</sub>-filled equipment.

Measures to address existing plant leakage and the deployment of alternatives currently cost more and will continue to cost more in the medium term. Our ability to meet our challenging business carbon footprint targets will therefore be dependent on securing funding from Ofgem in the forthcoming RIIO-T2 price control and beyond.

The market by which these technologies may become cost-competitive, will, to a large extent, be influenced by legislative and regulatory developments. We are fully involved in influencing legislation and regulatory policy to provide the market stimulation and funding required to address this industry-wide issue.

#### Current Status

We prioritise the repair of leaking assets by leakage rate, taking the accessibility of the asset into account. Specialist surveys are carried out to identify the source of leaks, though the source is not always apparent. We develop action plans then attempt repair or replacement where economically, technically and operationally viable. Unfortunately not all repairs are successful. Due to the age of the assets, like-for-like replacement of these pressurised compartments is often not possible as the assets have become obsolete.

This year, we have explored the option of installing SF<sub>6</sub> gas detection cameras to help to identify leakage sources and these will be installed over the coming year. We are also continuing to review our internal asset management processes to ensure that SF<sub>6</sub> leakage reduction is given the highest possible priority.

Whilst we fix leaking assets, it is also important that we avoid the introduction of new SF<sub>6</sub> assets onto our system where possible. In 2018–19, we successfully completed the construction and commissioning of a Green Gas for Grid (G3) insulated asset on our network. G3 is an insulating gas with comparable performance to SF<sub>6</sub>, but with a global warming potential 98% lower. The installation at Kilmarnock South substation is now fully operational.

#### Timescales for Completion and Next Steps

Our draft T2 business plan for 2021–2026 aims to use new alternatives to avoid up to 6.5 tonnes of additional SF<sub>6</sub>. We will continue to collaborate industry-wide to drive the introduction of new SF<sub>6</sub> alternatives and share best practice to reduce leakage. We will continue in our efforts to identify and fix leaks more quickly and successfully, drawing on innovation where traditional methods prove unsuccessful.

#### Sustainability Drivers



##### Carbon and Energy Reduction

Significant reductions in SF<sub>6</sub> leakage are required in order to achieve our 2030 and 2050 targets to reduce our carbon footprint by 80% and reach carbon neutrality respectively.

#### SDGs

This initiative supports the delivery of the following SDGs:





## Business Carbon Footprint continued

### Other Carbon Footprint Reduction Initiatives

#### Project Background

Beyond Losses and SF<sub>6</sub> leakage, the remainder of our 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 represent around 16% of our total carbon footprint excluding losses and 1.3% of our total carbon footprint including losses.

We seek to reduce impacts across these categories by installing energy efficiency measures, encouraging staff to reduce their business travel and use low carbon options, and by enabling the move towards electric vehicles.

This year, the overall carbon footprint related to these categories fell by 13%. The figures for Depot Energy Use and Business Transport rose primarily due to the inclusion of additional data which was not available in previous years, more accurate apportionment, and the increased use of flights during the development of our 2021–2026 Business Plan. Substation Energy Use footprint reduced by 20%, largely due to the reduction in the carbon intensity of electricity generated. Operational Transport footprint reduced by half, due to the introduction of more efficient vehicles and more accurate reporting processes.

#### Current Status

During 2018–19, we installed a further 21 electric vehicle charging points at our offices and depots. SP Transmission staff now have access to a fleet of 19 electric pool cars, and can access an interest free loan or advertising grant towards the purchase of an ultra-low emission personal vehicle. We are working to reduce energy consumption by installing more efficient lighting systems, passive motion sensors and improved insulation at our sites. During 2018–19, three heat pumps, three heat recovery systems, four LED lighting systems and two light sensor systems were installed at SP Transmission offices and depots. Following on from our successful trial of electric fleet vans in 2017–18, we have reviewed operational considerations, costs, timelines and specifications with the aim of introducing electric vans to our fleet in the coming years.

#### Timescales for Completion and Next Steps

We will continue to install energy reduction measures and drive the use of ultra-low emissions modes of transport over the coming years, implementing new and innovative technologies where required as they become available.

### Sustainability Drivers



#### Carbon and Energy Reduction

The use of less energy and fuel for our buildings and travel, together with the overall decarbonisation of electricity generation, provides significant carbon footprint reductions.



#### Sustainable Society

Our Strategy helps to enable a more sustainable society by enabling our staff to adopt low emissions vehicles and active travel, by encouraging our supply chain to reduce their impacts, and by helping to support the societal shift towards low carbon technologies such as heat pumps and electric fleet vehicles through early adoption.

### SDGs

This initiative supports the delivery of the following SDGs:



## Climate Change Resilience

### Flood Prevention

#### Project Background

Recognising how critical network reliability is for the GB economy, it is important that our substations and assets are resilient to the effects of climate change, including the potential for increased flooding and higher temperatures.

As climate predictions evolve, we carry out work to ensure that our assets are protected from potential flooding. Since 2013, we have been addressing sites with the potential to be affected by coastal and river flooding. One such site is Kincardine Substation.

#### Current Status

Kincardine Substation is sited on reclaimed land on the north shore of the Firth of Forth and as such, is at risk of potential flooding in extreme weather. In March 2019, we started the construction of a major project which will involve the replacement of the ageing existing 275 kV switchgear with the construction of a Gas Insulated Switchgear (GIS) building. The new building will be erected on a raised platform around 6m above ground level, in order to ensure that the electrical system will be protected in the event of a 1/1000 year flood. This adds additional protection to the existing coastal defences already at this site. The design of the project is notable for the use of a stilted platform, designed to enable any flood water to safely flow under the building, minimising the need for flood compensation areas.

In 2018–19, we have reviewed the updated flooding models provided by the Scottish Environmental Protection Agency and proposed a series of projects to mitigate the risk of surface water flooding to be delivered during 2021–2026.

#### Timescales for Completion and Next Steps

The Kincardine Substation project is scheduled to complete by March 2021 and will cost in excess of £20 million. We will be participating in Energy Networks Association led working groups to assess the potential impact of the new UK Climate Projections over 2019–20.

#### Sustainability Drivers



#### Climate Change Resilience

This initiative ensures that all of SP Transmissions assets are suitably resilient against the worst effects of climate change, greatly reducing the risk of negative societal impact in the event of extreme weather events.

#### SDGs

This initiative supports the delivery of the following SDGs:



# Enhancing the Natural Environment

We aim to protect and continually enhance the biodiversity around our assets and support national and local strategies. Our decision making incorporates an assessment of the environment within which we are working to ensure that levels of natural assets are at least protected, if not enhanced.

In line with the Global Assessment on Biodiversity's five drivers of the loss of biodiversity, 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 to avoid the introduction or encouragement of invasive non-native species and to ensure that ecosystems are not unduly exploited by our operations.










































**A wide range of our established activities contribute to this activity, including:**

- Continual improvement of our ISO 14001 Integrated Management System
- Robust environmental planning and management processes, activities and governance
- The requirement for all major projects to have pollution prevention plans
- Extensive training to ensure that staff have the skills and awareness to identify and manage environmental risks

## Performance

- Zero environmental regulatory interventions in 2018–19
- 96% reduction in notifiable environmental incidents on previous year
- Royal Town Planning Institute (RTPI) Award winner for Excellence in Planning for the Natural Environment 2019
- Full ISO 14001 Environmental Management Certification
- Recipients of Keep Scotland Beautiful Gold Award for Environmental Excellence

## Initiatives

Theme	Initiatives	Sustainability Drivers	SDG
Environmental Planning & Mitigation	Project VIEW		  
	Stirling Enhanced Landscape Mitigation	  	     
Environmental Management	ISO14001 Certification	     	       
	Training & Awareness	     	       



## Environmental Planning and Mitigation

### Project VIEW

#### Project Background

In some cases, pre-existing transmission infrastructure has a direct environmental impact on nationally designated protected environments and the stakeholders who access them. Project VIEW seeks to understand the visual impact of such assets and co-create mitigation proposals with local stakeholders.

It is useful to note that while undergrounding overhead lines may appear an attractive option, doing so can come at greater financial and environmental cost than traditional overhead line construction and introduces different environmental impacts such as habitat loss due to the installation of drainage infrastructure. As such, many of the mitigation options considered by VIEW seek to divert or distract attention away from the lines, rather than re-routing or undergrounding them. The mitigation options identified have been challenged robustly to ensure a balance between the minimisation of cost and environmental effects.

#### Current Status

Working in collaboration with its Stakeholder Partnership Group<sup>7</sup>, Project VIEW identified eight potential mitigation projects, of which four were selected for further progression. Of these four, two are particularly noteworthy. The Three Lochs Way proposal, developed jointly with Scottish Hydro Electric Transmission, involved diverting a section of the Three Lochs Way walking route within the Loch Lomond and Trossachs National Park to avoid the existing overhead lines. The project had progressed well since its inception in 2016, however, in 2018, survey work identified that the proposed route was home to a pair of golden eagles. We have since carried out engagement to identify an alternative route and progression of the proposal will be determined by stakeholder feedback.

A second project at Stronachlachar is progressing. This proposal will install a viewing point to direct attention towards a view of Loch Katrine, and away from the overhead lines which sit high on the nearby hillside. This year, the design of the viewing point has been agreed with local stakeholders and is currently awaiting sign-off from the land owners.

#### Timescales for Completion and Next Steps

Project VIEW started in 2016 and will complete in 2021. Plans for the Stronachlachar Viewing Point will be submitted for planning consent in late 2019 or early 2020 for delivery in late 2020 to early 2021.

### Sustainability Drivers



#### Land and Biodiversity Improvement

The project identifies where there is greatest opportunity for successful mitigation through both hard engineering such as route realignment or undergrounding and softer methods such as tree screening or landscape enhancement. By identifying where the greatest opportunities to conserve and enhance natural beauty, wildlife and cultural heritage exist – whilst considering the aim of minimising unacceptable environmental impacts – it is possible to improve opportunities for recreational, educational or social initiatives associated with the use and visual experience of the land.



#### Sustainable Society

The project brings local community members and expert environmental stakeholders together to co-create the solutions that provide the best possible outcome for society. The majority of solutions proposed in the project also encourage enhanced access to active travel options, leading to improved health and wellbeing and reduced emissions.

### SDGs

This initiative supports the delivery of the following SDGs:



<sup>7</sup> Comprising senior representatives of twelve groups and organisations with a national or regional interest in the protection, enhancement and use of the designated landscapes being considered.



## Environmental Planning and Mitigation continued

### Stirling Enhanced Landscape Mitigation

#### Project Background

Operational since 2014 the Stirling Enhanced Landscape Mitigation Project (SELMP) is an ongoing, innovative project that has empowered community groups to assist in the design and delivery of local mitigation in the corridor of the Beauly to Denny 400 kV Overhead Line in and around Stirling. The enhanced mitigation project was required to complement the 220km Beauly to Denny overhead line scheme along an approximate 20km stretch through Stirling. The focus of this project was to turn around real local concerns about the new overhead line, by empowering local communities to shape environmental mitigation to meet their needs.

We have worked in partnership with local communities, Central Scotland Green Networks Trust (CSGNT), Stirling Council (Planning) and the Scottish Government (Energy Consents Unit) to develop a bespoke programme to engage community groups on how to reduce the impact of the overhead line on residents and the environment.

This was achieved through a number of activities, workshops and public events where individuals, groups and communities could share in the development of bespoke mitigation projects and input their thoughts and feedback on the priorities for local areas.

The result has been an innovative devolved planning delivery process with project partners engaging stakeholders from nine communities and interest groups, supporting and facilitating local decision making and giving the community the power to choose how local people benefit from the project.

#### Current Status

To date, the project has delivered:

- Delivery of over 30 Green Network Projects (such as cycle paths, landscape planting, habitat creation, public access projects and large scale landscape enhancement)
- Six new or improved active travel routes
- Over £5 million capital investment directly with local communities over a 4 year period
- Over 20 public engagement charrette-style workshops to be delivered between 2014 and the present
- Ongoing liaison with the Beauly Denny Legacy Steering Group
- Engaging the local community in a large number of targeted briefings over a 4 year period.

The project received the 2019 Royal Town Planning Institute (RTPI) Excellence in Planning for the Natural Environment award.

#### Timescales for Completion and Next Steps

Savings made through efficiencies in completed mitigation phases will be used to fund a final mitigation stage. Projects will be tendered during 2019 and delivered in 2020–2021. A detailed report highlighting best practice will be produced following the completion of this final mitigation stage.

#### Sustainability Drivers



##### Land and Biodiversity Improvement

Enhancement of local natural habitat and biodiversity through woodland, tree and hedge planting. Compensatory planting for trees felled for the new power line.



##### Sustainable Resource Use

Use of sustainable local resources to provide raw materials for the works including site-won material from excavations where appropriate. Reducing waste through the construction period by ensuring contractors have suitable sustainability plans for zero waste.

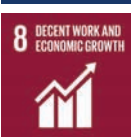


##### Sustainable Society

£5 million invested by SPEN to benefit nine local communities as part of SELMP, targeted towards the areas of greatest need, including three ex-mining communities with a significant legacy of socio-economic and environmental deprivation. Initiatives include upgrading and creating new paths, cycle routes and recreational areas in order to encourage cycling to work or school and providing quieter places for relaxation. Extensive engagement approach has empowered nine local communities to be more socially sustainable. One example of these innovative initiatives was the creation of a Walking Theatre for local schools which made use of the physical upgrades to outdoor access provided through the project. Held over a week, this enabled over 400 school children to engage with a locally set book by using the new access paths to traverse the landscape in which the book was set and experience key scenes being acted out by professional actors.

#### SDGs

This initiative supports the delivery of the following SDGs:



## Environmental Management

### ISO14001 Certification

#### Project Background

We operate an Integrated Management System (IMS) that is externally certified to ISO9001 (Quality Management System), ISO14001 (Environmental Management System), OHAS18001 (Occupational Health and Safety) and ISO55001 (Asset Management System) standards.

We carry out regular audits and assessments including external audit of our Integrated Management System, and use the system to optimise processes and resources.

#### Current Status

During 2018, we prepared the organisation for the recertification of our Environmental Management System (EMS) to ISO14001:2015, which we successfully achieved in October 2018.

#### Timescales for Completion and Next Steps

In 2019–20, we will continue to use our Environmental Management System to improve our environmental management processes and activities. We will seek to continuously improve the system and increase the knowledge and commitment of our staff via training and awareness raising activities.

### Sustainability Drivers

#### All Sustainability Drivers

Our Environmental Management System covers all SP Transmission activities and the associated aspects and impacts and allows us to manage these aspects of our business strategy, processes and activities, driving improvements against all six of our Sustainability Drivers.



### SDGs

This initiative supports the delivery of the following SDGs:



## Environmental Management continued

### Training and Awareness

#### Project Background

It's essential that our staff understand the environmental processes, programmes and targets contained in our Sustainable Business Strategy, Sustainability Plan and Environmental Management System.

Our internal engagement strategy and plan are designed to ensure that all members of staff have the requisite knowledge of environmental aspects and impacts, and the awareness to be able to identify and solve issues as they arise. This training and awareness raising is delivered via a suite of training courses, monthly team briefs, workshops, toolbox talks and online materials.

#### Current Status

2018–19 saw the delivery of year two of our in-depth three-year Environmental Training Plan covering over 3,000 individual SPEN staff across over 30 different training courses. This intensive training plan covers all six of our Sustainability Drivers, and has been championed by our CEO and Directors.

In 2018–19, we developed and rolled out seven new environmental e-learning courses covering our key environmental issues including waste, SF<sub>6</sub> awareness, water pollution and use and wildlife and countryside legislation.

We also developed and delivered a new classroom course on Managing Environmental Risk in Project Management, which focusses upon common construction-related environmental incidents or issues that have been encountered in recent years and seeks to highlight their occurrence, and the ways in which incidents and issues can be avoided by careful planning and design awareness. Over 130 key SP Transmission staff received the Environmental Risk course this year.

Awareness raising activities and communications focussed on all of the key priorities for the year, including water protection, oil management, protection of nesting birds, business carbon footprint, SF<sub>6</sub> leakage reduction, fleet decarbonisation, awareness of waste impacts, waste segregation, reducing plastics and awareness of the Sustainable Business Strategy.

#### Timescales for Completion and Next Steps

Delivery of our three year plan will be completed in 2020, after which we will ensure that all staff receive the required refresher training. We are currently working to update the environment and sustainability training that all new graduates and apprentices receive when they join the business, and we will also continue to work in partnership with regulators and our supply chain to ensure that our contractors have access to the right training and awareness opportunities.

### Sustainability Drivers

#### All Sustainability Drivers

Our environmental training and awareness activities cover all environmental aspects of our business strategy, processes and activities relating to Environmental Management, driving improvements against all six of our Sustainability Drivers.



### SDGs

This initiative supports the delivery of the following SDGs:





# Sustainable Resource Use

We are working to embed the principles of a circular economy and efficient use of resources in our business strategy and activities.

Our aim is that materials required for network construction and operation will come from sustainable sources. We are targeting the production of zero waste, with the components of all end-of-life assets being reused or recycled into new products. In line with this, we have set challenging business targets to divert 95% of our waste from landfill by 2023, to recycle or re-use 100% of waste by 2030, and to move to zero waste by 2050.

## Performance

- In 2018, 46% of waste from our major projects was diverted from landfill
- We are currently on track to meet our 2023 target of 95% waste diverted from landfill
- Signatories of the Procurement Skills Accord and Award winners in our first year
- Enhanced environmental requirements introduced to procurement processes

## Initiatives

Theme	Initiatives	Sustainability Drivers	SDG
Resource Management	Sustainable Procurement		
Resource Use Optimisation	Re-use of Concrete		  





## Resource Management

### Sustainable Procurement

#### Project Background

It is a priority for us to procure services, materials and utilities in a way that achieves whole-life value for money and delivers environmental, societal and economic benefits in the long term.

With this in mind, we have applied a variety of procurement practices focussed on sustainability during 2018–19.

#### Current Status

During 2018–19, we applied a life-cycle approach to costs when purchasing assets. We ensured that the environmental impacts associated with the operation of new plant were considered when comparing design options. We updated our pre-qualification questions (PQQ) for suppliers to request more detailed information on environmental impacts including raw materials, energy used, packaging and shipping miles. We included enhanced environmental requirements in our technical specifications. We also revised the specifications for our framework contracts to incentivise contractors to reduce the environmental impacts associated with their service provision.

#### Timescales for Completion and Next Steps

Building on the progress made in 2018–19, we will extend the updated PQQ to all future tenders as appropriate. We are carrying out detailed engagement with our supply chain and industry peers during 2019 and early 2020 to understand their needs and capabilities, with a view to aligning requirements across the industry.

### Sustainability Drivers



#### Sustainable Resource Use

Understanding the resources and environmental impacts embodied within the materials, products and services we procure is a key step towards being able to manage resources in a circular way, accounting for the whole life of each resource in investment decision making and eventually moving to a zero waste economy.



#### Sustainable Society

Working in partnership with our supply chain and industry peers enables supply chains and network operators to develop sustainable procurement capability which can be applied to other industries to deliver wider societal benefit.

### SDGs

This initiative supports the delivery of the following SDGs:



## Resource Use Optimisation

### Re-use of Concrete

#### Project Background

Our assets and activities can involve the use of large amounts of resources, including concrete and steel. We proactively aim to minimise the use of resources in our projects, and where possible, we will re-use materials.

We assess every relevant project to understand opportunities to reuse the concrete from pre-existing structures where there is sufficient lay-down area on-site to store and prepare it for re-use without the need for the material to be transported off-site.

#### Current Status

Kincardine Substation is mentioned earlier in this statement due to our innovative design which reduces the risk of substation equipment flooding. The project, which is sited on reclaimed land on the north shore of the Firth of Forth is also notable for the re-use of concrete on site.

In March 2019, we started the construction of a major project which will involve the replacement of the ageing existing 275 kV switchgear with the construction of a Gas Insulated Switchgear (GIS) building. As part of the preparation of the site, we removed the large concrete base from where the old electrical equipment sat and crushed it on site, ready to be re-used to form the footing for the new substation buildings.

#### Timescales for Completion and Next Steps

The Kincardine Substation project is scheduled to complete by March 2021 and will cost in excess of £20 million. We will continue to consider the options for re-use of materials in all of our investment projects.

### Sustainability Drivers



#### Sustainable Resource Use

Re-using this concrete eliminated the need to quarry and process new materials, and avoided the need to re-use or dispose of the material off-site.



#### Carbon and Energy Reduction

The re-use of 3,000 tonnes of concrete on site eliminates both the carbon impact of the production and transportation of new materials to site, and the impact of transporting and disposing of the old materials.

### SDGs

This initiative supports the delivery of the following SDGs:



# Sustainable Society















We aim to have a net positive impact on the environment and the communities in which we operate.

We do this by working 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.

## Performance

- Network Awards – Network of the Year 2019
- Stakeholder satisfaction rose to 8.5/10, well above 7.4/10 benchmark
- World's first utility company to achieve the BSI Kitemark for Customer Service
- £25m innovation investment over 40 projects since 2013
- 20.06% Gender Pay Gap for SP Transmission in 2018
- £6m invested in 12 projects through our Green Economy Fund, delivering an estimated 337.5 tCO<sub>2</sub> per annum reduction
- Ranked in the FTSE4Good Index for the tenth consecutive year as part of Iberdrola Group
- AENOR Healthy Company Certified as part of Iberdrola Group

## Initiatives

Theme	Initiatives	Sustainability Drivers	SDG
Enabling Societal Sustainability	Green Economy Fund	 	    
Promoting Sustainable Workplaces	Modern Slavery		  
	Diversity and Inclusion		 



## Enabling Societal Sustainability

### Green Economy Fund

#### Project Background

The Scottish Government's ambitious drive to a low carbon economy will ultimately require a transformation in all forms of transport and heating. This is dependent upon the key infrastructure that the energy network provides. In response, we pledged to voluntarily contribute £20m over a two-year period to support initiatives that will enable communities and businesses to develop their ideas and to fund the implementation of those ambitious projects that support Scotland's low carbon future, helping accelerate existing ideas and supporting projects that may not otherwise occur.

The fund supports a wide range of different activities that positively impact the SP Transmission network in direct or indirect ways, and all projects must demonstrate measurable social and environmental impact. Initiatives seeking funding are required to demonstrate that they have green credentials and are targeted at areas that may ordinarily struggle to access funding. Lessons learned from projects supported by the fund are shared with other communities to ensure others can benefit.

#### Current Status

The first Expression of Interest period closed at the end of July 2018, resulting in 36 responses, amounting to over £20m in funding requests. From these, 12 projects were successful, receiving around £6m of funding, enabling an estimated 337.5 tonnes of carbon per annum reduction through voluntarily helping communities in our geographical area to invest in low-carbon heating and transport technology, building the infrastructure and the learnings needed for the changes in heating and transport expected over the next decade.

#### Timescales for Completion and Next Steps

Funding Round 2 was held in spring 2019. We will continue to support the funded projects to enable successful delivery over a two year timeline, reporting regularly on the benefits delivered and learnings identified.

### Sustainability Drivers



#### Carbon and Energy Reduction

In line with fund criteria, all of the successful projects provide carbon reduction impact estimates, which were totalled to give the estimated annual carbon savings associated with the Round 1 projects as 337.5 tCO<sub>2</sub>e.



#### Sustainable Society

The Green Economy Fund's significance in terms of enabling local communities to adopt low carbon technologies earlier should not be underestimated. The support provided to both applicants and successful projects is helping these community organisations to build capability that will support not only the delivery of their Green Economy Fund-funded project, but the delivery of their subsequent low carbon projects. Many of the projects have a component of community education in energy efficiency and low carbon technologies which will result in further reductions in energy use.

In a regulatory framework that means that (outside of the community liaison carried out around transmission investment projects) many interactions between SP Transmission and its end customers are either conducted via the Electricity System Operator or via SP Distribution as DNO, the Fund enables SP Transmission to reach communities directly.

### SDGs

This initiative supports the delivery of the following SDGs:





## Promoting Sustainable Workplaces

### Modern Slavery

#### Project Background

Modern Slavery is an umbrella term that covers various forms of slavery and human trafficking. We are wholly opposed to modern slavery in all areas of our business and believe that the range of measures we have put in place – coupled with our overall approach to ethics and employee and supplier engagement – are helping to reduce the risk of modern slavery across our business and supply chain.

#### Current Status

Led by the ScottishPower Group Modern Slavery Steering Group, which is attended by representatives of SP Transmission, a number of key activities were carried out in 2018–19.

The ScottishPower Policy on Respect for Human Rights, which applies to SP Transmission, was updated in October 2018 and adopted by the ScottishPower board of Directors in December 2018. The ScottishPower Code of Ethics, which confirms our commitment to the principles of business ethics and transparency in all areas of activity, was updated in December 2018.

In 2018, we implemented additional processes for the review of new suppliers through our vendor management system, which now automatically refers potentially high risk suppliers for review prior to them being confirmed in our system.

A seminar was provided for staff and wider industry representatives with a speaker from the Ethical Trading Initiative, and employees were made aware of the several independent and confidential channels by which to report any concerns about ethical working practices.

#### Timescales for Completion and Next Steps

We have committed to a number of actions in 2019–20 as part of ScottishPower Group's activities on modern slavery. These actions include the development of a Modern Slavery Action Plan, review and enhancement of existing employee training, further exploration of options for enhancing the management of suppliers and the development of indicators to better enable us to monitor the effectiveness of our approach. A further review and update of the Code of Ethics will also take place during 2019.

### Sustainability Drivers



#### Sustainable Society

This initiative supports the creation of a sustainable society by ensuring that we act responsibly, promote decent work and ensure that our supply chain is ethically sound.

### SDGs

This initiative supports the delivery of the following SDGs:



## Promoting Sustainable Workplaces continued

### Diversity and Inclusion

#### Project Background

We recognise that by bringing together people with diverse backgrounds and experiences in an inclusive environment, we can inspire innovation and creativity while enabling our team to do their best work and drive better and more sustainable business performance.

SP Transmission's gender pay gap for 2018 was 20.06%, broadly in line with many engineering and utility companies. Men and women within our organisation are paid equally for doing the same job, therefore the key drivers of the gap are the fact that we have more men than women in senior leadership roles, and we have more men than women performing technical roles that command a premium in the market.

#### Current Status

Work to address this gap in 2018–19 has included rollout of unconscious bias training for recruiting and line managers, a pilot of gender balanced shortlists and interviews, and advertising vacancies differently to ensure that messaging and imagery will appeal to a broader range of candidates.

Recognising the need to support diversity and inclusion for all staff, four new employee-led networks were developed in 2018–19. In-Fuse is a network for LGBT+ role models and allies; the Carers Network supports employees to integrate work with all aspects of their lives, including caring for family members; the Connected Women network provides a platform for members to meet regularly to share their experiences and ideas; and the Future Connections network enables employees to take ownership of their career development.

#### Timescales for Completion and Next Steps

Throughout 2019–20, we will extend our unconscious bias training to more managers, build upon the learnings from the pilot of gender balanced shortlists and interviews, and continue to ensure that job adverts are gender neutral and appeal to the widest possible candidate pool. We will increase awareness of diversity and inclusion through delivery of business and network-led activities, training and communications. We will review our policies to identify opportunities to improve inclusive practices.

### Sustainability Drivers



#### Sustainable Society

This initiative supports the creation of a sustainable society by ensuring that we attract and retain a diverse workforce and influence other businesses to do the same.

### SDGs

This initiative supports the delivery of the following SDGs:



# Next Steps

Many of the initiatives highlighted in this report are multi-year projects and will continue into 2019–20. Our next steps for 2019–20 include:

## Adapting our Strategy

### Science Based Target

- We will officially commit to setting a Science Based Target for carbon reduction and define our methodology for setting and tracking the target.

### SF<sub>6</sub> leakage

- We will refine our strategy for SF<sub>6</sub> management and leakage reduction

### Biodiversity Net Gain

- We will continue to engage with stakeholders to define our approach to Biodiversity Net Gain

### Supply Chain Sustainability

- We will continue to engage with stakeholders to define common sustainable procurement practices and environmental performance metrics

## Driving Decarbonisation

### Connections for Decarbonised Energy, Transport and Heat

- We will develop the GEMS active network management schemes and contracts, ready for implementation and testing in 2021.
- We will accelerate the implementation of load management schemes where they can offer earlier connection of renewables, tripling the total capacity of renewables connected via these schemes by 2021.
- We will implement our new online portal to make the process of connecting to our network simpler and easier.

### Smart Energy System Solutions for Decarbonisation

- We will start the live trial phase of our Phoenix Project and communicate learnings to stakeholders.
- We will complete the viability assessment phase of the Black Start from DER project, followed by process and technical design and procurement proposals in 2020.

## Mitigating Climate Change

### Network Losses

- We will use our updated Losses Strategy to influence investment programmes and strategy within our T2 Business Plan for 2021–2026.
- We will consider the outcomes from our substation losses monitoring project more fully in the coming year, including a more thorough assessment of the costs and practicalities associated with making the proposed improvements.

### Business Carbon Footprint

- We will establish a dedicated SF<sub>6</sub> Working Group to strengthen our SF<sub>6</sub> management and reduction strategy
- We will continue to install energy reduction measures and drive the use of ultra-low emissions modes of transport.

## Climate Change Resilience

- We will develop projects designed to mitigate surface water flooding risk at key sites and collaborate with industry peers to understand the potential impact of the 2018 UK Climate Projections.

## Enhancing the Natural Environment

### Environmental Planning and Mitigation

- Plans for the Stronachlachar Viewing Point will be submitted for planning consent in late 2019 or early 2020 for delivery in late 2020 to early 2021.
- Savings from prior stages will fund a final round of projects under the Stirling Enhanced Landscape Mitigation scheme. Projects will be tendered during 2019 and projects will be delivered in 2020–2021

### Environmental Management

- We will complete our comprehensive three year environment and sustainability training plan in 2020.

## Sustainable Resource Use

### Resource Management

- We will extend the updated PQQ to all future tenders as appropriate. We are carrying out detailed engagement with our supply chain and industry peers during 2019 and early 2020 to understand their needs and capabilities, with a view to aligning requirements across the industry.

### Resource Use Optimisation

- We will continue cross-industry engagement to further embed circular economy principles in our processes and operations.

## Sustainable Society

### Enabling Societal Sustainability

- We will continue to support projects funded by our Green Economy Fund to enable successful delivery over a two year timeline, reporting regularly on the benefits delivered and learnings identified.

### Promoting Sustainable Working

- We will carry out our planned actions on Modern Slavery, including the development of a modern slavery action plan
- We will extend our unconscious bias training, build upon the learnings from the pilot of gender balanced shortlists and interviews, and continue to ensure that job adverts are gender neutral and appeal to the widest possible candidate pool
- We will increase awareness of diversity and inclusion through delivery of business and network-led activities, training and communications

# Stakeholder Engagement & Feedback

## Stakeholder Engagement Strategy

Over the last year we have implemented a new Stakeholder Engagement Strategy, which makes our mission, principles, approach and processes much easier to understand.

Our new 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, as 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 real, tangible action in our business and benefits for customers and stakeholders.

## Sustainability Engagement

We develop our Sustainability Stakeholder Engagement Plan in line with the SPEN Stakeholder Engagement Strategy and use the resulting stakeholder feedback to inform the development, review and implementation of our Sustainable Business Strategy.

Our key engagement route on policy level sustainability issues is with our Sustainability Stakeholder Working Group, comprising key organisations with interests in sustainability issues at a policy level.

### Examples of sustainability engagement activities during 2018/19 include:

- Quarterly Sustainability Stakeholder Working Group meetings
- Workshops with key sustainability stakeholder organisations, the Scottish Environment Protection Agency (SEPA) and Scottish Natural Heritage (SNH)
- Transmission Strategic Stakeholder Panel
- Annual SP Transmission Supplier Conference
- Annual SP Transmission Supplier Survey
- Monthly Site and quarterly Supplier Newsletters
- Quarterly Connections Stakeholder Newsletters
- Contractor Health, Safety, Environment and Quality Forum

- Annual Transmission Connections Summit
- Project-based engagement with developers and communities
- Engagement via our Online Stakeholder Community

All SP Transmission Engagement outcomes are summarised in our report, [Making a Difference: Highlights of our activities and outcomes following stakeholder engagement](#).

## Engagement on this Statement

Each year, we provide a draft of this statement to a wide range of stakeholders for their comment before we finalise it.

Once again, stakeholder feedback has been overwhelmingly positive, with stakeholders commenting that they appreciate the inclusion of a broader range of case studies and the transparency with which we are reporting our performance.

They liked the stronger link between our initiatives and the relevant Sustainable Development Goals, and they felt that the document gives a good sense of the ways in which we're adapting our strategy to deliver the low carbon transition.

### Feedback implemented in this statement:

- Including a broader selection of case studies, covering a greater range of impacts.
- Including a table and SDG icons throughout to indicate our contribution to the delivery of the SDGs.
- Providing more detail on what we're doing to improve biodiversity.
- Including details of our business activities in line with the Global Assessment on Biodiversity's five drivers of the loss of biodiversity in order to provide context.
- Shortening the strategy section and moving the Stakeholder Engagement section to the end of the document, so that it gets to the case studies sooner.
- Highlighting where our initiatives enhance opportunities for active travel.
- Including a next steps summary page.

We welcome feedback on the content of this report and hope that it provides you with useful information on our activities. If you have questions or need more information about this report or our sustainability activities, please contact us at [sustainable@spenergynetworks.co.uk](mailto:sustainable@spenergynetworks.co.uk).



# List of Acronyms

AC	Alternating Current
BCF	Business Carbon Footprint
DER	Distributed Energy Resources
EDR	Environmental Discretionary Reward
ELAS	Executive Level Annual Statement
EMS	Environmental Management System
ESO	National Grid Electricity System Operator
ESSG	Executive Sustainability Steering Group
FES	Future Energy Scenarios
g3	Green Gas for Grid
GB	Great Britain
GEMS	Generation Export Management System
GW	Gigawatt
H-SC	Hybrid-Synchronous Compensator
HVDC	High Voltage Direct Current
IT	Information Technology
kV	Kilovolt
LCA	Life Cycle Assessment
LMS	Load Management Schemes
MW	Megawatt
MWh	Megawatt Hour
NGET	National Grid Electricity Transmission
NGO	Non-Governmental Organisation
NIC	Network Innovation Competition
Ofgem	The Office of Gas and Electricity Markets
RIIO-2	Revenue = Incentives + Innovation + Outputs (regulatory framework for period 2)
RIIO-ED1	Revenue = Incentives + Innovation + Outputs (Distribution period 1 2015–23)
RIIO-T1	Revenue = Incentives + Innovation + Outputs (Transmission period 1 2013–21)
RIIO-T2	Revenue = Incentives + Innovation + Outputs (Transmission period 2 2021–26)
SDG	Sustainable Development Goal
SF <sub>6</sub>	Sulphur Hexafluoride
SHE Transmission	Scottish Hydro Electric Transmission
SICEF	Scottish Infrastructure Circular Economy Forum
SPEN	ScottishPower Energy Networks
SPT	SP Transmission
SSWG	Sustainability Stakeholder Working Group
TECA	Transmission Economic Connections Assessment
TO	Transmission Operator

# Further Information

If you would like further information on SP Energy Networks please visit our website: [spenergynetworks.co.uk](https://spenergynetworks.co.uk)

**Our Sustainable Business Strategy:**

[www.spenergynetworks.co.uk/SustBusStrat](https://www.spenergynetworks.co.uk/SustBusStrat)

**Our 2019 Sustainability Plan:**

[www.spenergynetworks.co.uk/SustainabilityPlan](https://www.spenergynetworks.co.uk/SustainabilityPlan)

**Information on our Innovation Strategy and projects:**

[spenergynetworks.co.uk/pages/innovation.aspx](https://spenergynetworks.co.uk/pages/innovation.aspx)

[smarternetworks.org](https://smarternetworks.org)

**All annual reports, including our Transmission Annual Report:**

[spenergynetworks.co.uk/pages/stakeholder\\_reports.aspx](https://spenergynetworks.co.uk/pages/stakeholder_reports.aspx)

**Our Green Economy Fund:**

[spenergynetworks.co.uk/pages/green\\_economy\\_fund.aspx](https://spenergynetworks.co.uk/pages/green_economy_fund.aspx)

**Information on the industry-wide Open Networks Project:**

[energynetworks.org/electricity/futures/open-networks-project/](https://energynetworks.org/electricity/futures/open-networks-project/)

**Information on development of our RIIO-T2 Business Plan:**

[www.spenergynetworks.co.uk/pages/riio\\_t2.aspx](https://www.spenergynetworks.co.uk/pages/riio_t2.aspx)

**If you would like to be informed of forthcoming engagement opportunities, please register as a stakeholder:**

[spenergynetworks.co.uk/pages/register\\_as\\_a\\_stakeholder.aspx](https://spenergynetworks.co.uk/pages/register_as_a_stakeholder.aspx)





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