

# SP Energy Networks 2015–2023 Business Plan

Updated March 2014

## Annex

**Environmental Strategy**

SP Energy Networks

March 2014

# Environmental Strategy

March 2014

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# 1. Scope

The focus of this Environmental Annex is on setting measurable objectives related to both narrow environmental impacts (focussing on electricity losses, electricity theft, Business Carbon Footprint ( BCF), Sulphur Hexafluoride (SF<sub>6</sub>); Fluid Filled Cables( FFC)) and broad environmental impacts (undergrounding in Areas of Outstanding Natural Beauty (AONBs), National Parks (NPs) and National Scenic Areas( NSAs)).

# 2. Table of linkages

The following table shows the key linkages into other parts of our Business Plan. The Output Areas listed have strong connections with the Environmental Annex and provide some underpinning context to the objectives presented herein.

Document	Chapter / Section
SP Energy Networks Business Plan 2015-2023	Chapter C5 – Outputs and Incentives d. Environment
SP Energy Networks Business Plan 2015-2023 Annexes	Annex C5 – Losses Strategy – SPEN
SP Energy Networks Business Plan 2015-2023 Annexes	Annex C7 – Innovation Strategy – SPEN
SP Energy Networks Business Plan 2015-2023 Annexes	Annex C7 – Smart Grid Strategy - Creating a Network for the Future – SPEN

# 3. Introduction

The electricity distribution network operators (DNOs) face a number of important challenges in the next 10 years. These key challenges include ensuring that the networks can connect and manage the new low carbon technologies and generation required for the United Kingdom (UK) to meet its carbon targets; and the need for the DNOs to manage their environmental impact and social issues, notably the need to address fuel poverty and the treatment of vulnerable customers.

The RIIO-ED1 encourages SP Energy Networks to play a critical role in facilitating the transition to a low carbon economy in a sustainable way that brings value for money to customers now and into the future. RIIO-ED1 puts sustainability alongside consumers at the heart of what network companies do and it provides a transparent and predictable framework, with appropriate rewards for delivery.

Outputs are at the heart of the RIIO regulatory framework and Ofgem expect DNOs to deliver outputs in the six RIIO primary output categories: safe network services, environmental impact, customer satisfaction, social obligations, connections, and reliability and availability. The RIIO framework requires companies to reduce their business environmental impact, as well as contribute to meeting UK environmental targets. The environmental outputs to meet the RIIO criteria include both “narrow” and “broad” environmental impacts:

- *Narrow environmental impacts - electricity losses on the distribution network; electricity theft; Business Carbon Footprint (BCF); sulphur hexafluoride (SF<sub>6</sub>); fluid filled cables (FFC); and noise reduction.*
- *Broad environmental impacts - undergrounding in Areas of Outstanding Natural Beauty (AONB), National Parks (NPs) and National Scenic Areas (NSAs); facilitating the uptake of Low Carbon Technology by its customers and environmental discretionary reward.*

The DNOs performance is encouraged by a number of “incentives”. For example, Ofgem set a requirement for DNOs to report their BCF annually, with the publication of an annual league table of percentage change as a reputational incentive. Whilst an increasing responsibility for losses reduction is to be placed on suppliers during RIIO-ED1, Ofgem will place a licence obligation on DNOs to ensure network losses are as low as reasonably practicable. The DNOs are required to set out how they will reduce losses in their business plans, and publish annual reports on loss reductions achieved against those planned. There will also be a discretionary reward of up to £32m available over the RIIO-ED1 period to encourage DNOs to undertake additional losses reduction actions over and above those set out in their business plans.

This Environmental Annex presents our plan in terms of how we intend to deliver improved environmental performance during the RIIO-ED1 price control period aligned to the narrow and broad environmental impacts and the wishes of our stakeholders. We have recognised that our stakeholders want to see the following;

- *Increase the amount of ‘future-proofing’ on the network*
- *Minimise oil and greenhouse gas (Sulphur Hexafluoride, SF6 ) leakage*
- *Continue to underground cables where there is a proven benefit in terms of visual amenity*
- *Engage with local authorities and developers to understand their priorities and align our plans.*
- *Develop our network in a way that is sensitive to the environment.*

## 4. Process

### 4.1. Gap Analysis

The development of this Environmental Annex has been undertaken in a two stage process. The first stage was to undertake a “gap analysis” of the environmental components of our Business Plan, submitted to Ofgem on 01 July 2013 set against our stakeholder responses (as set out in 1a above) and our Environmental Management Systems - Aspects and Impacts process. The second stage was to take the gaps identified in the gap analysis, as a starting point for developing bespoke objectives with clear indicators which then form the basis for this Environmental Annex. This was done through a linear process detailed in below.

### 4.2. Objective Development

A SMART approach to setting objectives was adopted, which has been detailed below.

Objective	Description
Specific	Relevant to the objectives and targets. Do the targets state exactly what needs to be done?
Measurable	Measurable, therefore quantified. Can proof be shown that targets have been achieved?
Achievable	Achievable but challenging. Are the targets easy enough to achieve in the timeframe given?
Realistic	Realistic and in recognition of the wide variety of progress in the industry. Are the targets things that something really can be done about?
Time-bound	Have dates been determined for achieving the targets?

Objectives have been developed, which align with the narrow and broad definitions of environmental impact as well as industry best practice. In some instances, objectives have been further separated into sub-objectives. Each objective / sub-objective has been assigned key performance indicators (KPIs) so that a measurable target

is in place that will assist in determining whether the objective is being met. Where possible each objective / sub-objective has been assigned a time frame to indicate when it should be delivered by.

We have also identified a number of best practice initiatives which will be implemented during the RIIO-ED1 price control period. These are non-quantifiable in terms of the benefit they will deliver to the environmental performance of our business activities; however it is recognised that they offer longer term improvements, so it is important that these are captured as part of this Environmental Annex.

## 5. The strategy

### 5.1. The approach

The approach to be taken for the remainder of Distribution Price Control Review (DPCR) 5 is to adopt and embed an approach which is “RIIO-ED1 ready”, which will allow a smooth transition to the new price control structure. Our strategy for environmental issues for RIIO-ED1 will continue to focus on a number of fronts; however, it broadly identifies two measures for improving our impact on the environment, based on the requirements set out in the RIIO-ED1, and through consultation with our stakeholders. These measures are to:

- *Assist with the achievement of the UK low carbon targets; and*
- *Reduce the environmental impact of our business activities.*

### 5.2. The initiatives

#### Assist with the achievement of the UK low carbon targets

The UK has set legally binding targets to reduce its carbon emissions by 80% by 2050. We understand the role and responsibility we have to connect and manage the technologies which will enable the UK’s transition to a low carbon economy.

In the development of our investment plans, we considered the four scenarios that DECC envisaged for meeting the UK’s greenhouse gas emissions targets to describe an “envelope” of possible future scenarios and as such the most likely scenario would lie somewhere inside this. As part of the stakeholder engagement process, we invited stakeholders to comment on DECC’s forecasts for LCT uptakes. Using the views of stakeholders, historical data and information from a range of other, independent sources, we have arrived at a view which we believe will allow for the uptake of Low Carbon Technology (LCT). Our outputs package includes identifying/using modern “smart grid” network solutions in order to improve efficiency, to identifying low carbon technology (LCT) hot spots by gathering data from our network, smart metering data and stakeholder engagement. We will also use a variety of technical and commercial solutions to allow the network to accommodate a “best view” LCT uptake.

More information on the Scenarios we have assumed and the technology we will use can be found in **Annex C7 – Smart Grid Strategy - Creating a Network for the Future – SPEN**.

#### Reduce the environmental impact of our business activities

We recognise the role we have to play in reducing the overall environmental impact of our business. We currently operate an Environmental Management System (EMS) certified to BS EN ISO14001:2004. The overall aim of the EMS is to avoid, reduce, or remediate significant adverse environmental impacts resulting from the activities being carried out on the network. These impacts have been identified from an examination of operational and business driven activities likely to arise during normal and abnormal (including incidents/emergency) situations within the workplace and the wider environment.

The EMS covers all front line and business support functions concerned with the planning, design, construction, operation and maintenance of the distribution network and the associated facilities such as offices, depots and infrastructure installations.

We are continuing with the integration of environmental requirements, risk control and resource efficiency opportunities within an Integrated Management System. This seeks to integrate Health, Safety, Environmental and Asset Management activity into a single package.

The robust set of policies and objectives listed below have been developed to manage and reduce the impact of our business activities, in line with the requirements of RIIO-ED1 and our stakeholders.

1. *Measures for managing losses.*

Electricity losses are an inevitable consequence of transferring energy across electricity distribution networks. Losses occur in both transformers and cables as electrical power is transferred across the network. This power is generated, but never consumed by customers, and is considered to be a significant source of greenhouse gas (GHG) emissions. We have therefore identified specific initiatives to minimise technical losses during RIIO-ED1 and we have produced a Losses Strategy (see **Annex C5 – Losses Strategy – SPEN**), which describes the measures that we will be put in place.

2. *Measures for managing non-technical losses.*

We are committed to minimising theft from the system and in conveyancing throughout the RIIO-ED1 price control period and we will take a proactive approach to minimising under-reporting of Unmetered Supplies by establishing a more stringent auditing procedure of inventories as set out in the Losses Strategy.

3. *Reducing our business carbon footprint (BCF).*

BCF is a measure of the amount of CO<sub>2e</sub> that enters the atmosphere as a result of a businesses activities (e.g. direct emissions, including fuel combustion, electricity consumption, fugitive emissions and indirect emissions, including business travel, waste disposal and so on) and it is important we quantify our BCF so that we are able to understand our impact on the environment and climate.

We support the “policy against climate change” and as such we have developed a series of outputs which demonstrates our commitment to reducing CO<sub>2</sub> emissions by 15% by the end of the RIIO-ED1 price control period. In particular, we will target a reduction in Scope 1 (i.e. direct emissions, including fuel combustion, company vehicles, fugitive emissions) and Scope 2 (i.e. indirect emissions, including purchased electricity, heat and steam) CO<sub>2e</sub> emissions associated with the business during the RIIO-ED1 price control period.

In addition, we will continue our commitment to report on carbon emissions annually including both internal audit arrangements and the external verification.

4. *Reducing fugitive emissions (Sulphur Hexafluoride – SF<sub>6</sub>).*

SF<sub>6</sub> is a synthetic insulating gas present in electrical switchgear and is considered the most potent of all Green House Gases (GHGs). Fugitive emissions of SF<sub>6</sub> can escape from gas-insulated substations and switchgear through seals, especially from older equipment. It can also be released during equipment installation and when equipment is opened for servicing.

We have prepared ourselves for the possibility of increased external obligations and reporting on SF<sub>6</sub> emissions, such as the proposed amendments to the F Gas Regulations 2009 and Greenhouse Gas Emissions Regulations 2013, by working closely with switchgear manufacturers, procuring market leading technology and improving data collection techniques, to ensure that the opportunity for SF<sub>6</sub> losses is strictly managed and avoided.

5. *Minimising leakages from Fluid Filled Cables (FFCs).*

Fluid Filled Cables (FFCs) have been used in the UK since the 1960s; the fluid in the cables acts as an electrical insulator. FFCs have proved to be extremely reliable electrically. However, there are environmental risks associated with leakage from old cables.

We have identified the need to reduce oil leaks from poorly performing 132kV cables. Therefore, we plan to replace 10.8km of the 132kV cables by 2017, with solid polymeric alternatives, which should result in a 50% reduction in leakages over the duration of the RIIO-ED1 price control period.

6. *Increasing Visual Amenity.*

A non-mandatory undergrounding scheme was first established for electricity distribution in DPCR4 and has been carried forward in subsequent price control periods. It allows for undergrounding of existing overhead lines in specific designated areas. The primary objective of this scheme is the protection of visual amenity. Visual

amenity is a measure of the visual quality of a site or area experienced by receptors (e.g. local residents, workers or visitors) and in certain sensitive locations overhead lines can cause a reduction in visual amenity.

Utilising the available funding, we will further develop our approach to determining the priority areas that will be subject to overhead line (OHL) undergrounding. This programme will be developed through consultation with key stakeholders. Our strategy during the RIIO-ED1 price control period is directed at improving visual amenity through the undergrounding of 85km of OHLs in AONB, NPs and NSAs, at a cost of £11.32m.

### 5.3. Environmental Impact Reduction Objectives

The table below presents the objectives for our Business Plan which respond directly to the RIIO-ED1 definitions of narrow and broad environmental impacts. Objectives and sub-objectives have been developed considering the requirements of Ofgem our stakeholders.

Secondly, the table provides KPIs to measure success and a timeframe within which each objective will be achieved. Indicators allow for the tracking of longer-term trends from a retrospective point of view. Understanding these trends allows for making short-term projections and relevant decisions for the future. Without measuring, it is difficult to evaluate the impact which an activity has with respect to the environment, or the extent to which progress is being made towards a stated goal.

Finally, environmental reporting is an essential means by which we can keep our stakeholders informed about activities undertaken in relation to environmental matters; therefore we will report annually on the measures set out below in the Ibedrola Sustainability Report.



Environmental Aspect	Objective	Sub Objective	Key Performance Indicator (KPI)	Time Frame
Low Carbon Technology (LCT)	By the end of the RIIO-ED1 price control period, we will provide the enablers which will allow the UK's transition to a low carbon economy and decrease network connection times from renewable generation projects.	Roll out of 1300 monitors across the network to increase visibility of the impact of LCT.	Number of monitors installed	RIIO-ED1 price control period
Technical losses	In addition to continuing cost/loss optimised transformer procurement policy we will reduce network losses by a total of 163 GWh over the ED1 period.	Deliver our grid & primary transformer replacement policy	Achieve a losses reduction of 77 GWh; Equivalent to 33,442 tonnes CO <sub>2</sub> e saved.	RIIO-ED1 price control period
		The pro-active replacement of 922 high loss transformers installed prior to 1962.	Achieve a losses reduction of 42 GWh; Equivalent to 18,475 tonnes CO <sub>2</sub> e saved.	RIIO-ED1 price control period
		The installation of larger conductors during overhead main line reinforcement and replacement works.	Achieve a losses reduction of 18 GWh; Equivalent to 7,804 tonnes CO <sub>2</sub> e saved.	RIIO-ED1 price control period
		Adoption of new Ecodesign Tier1 efficiency standards for secondary transformers. (Our large transformers already exceed the 2021 Ecodesign Tier 2 standard).	Achieve a losses reduction of 26 GWh; Equivalent to 9,152 tonnes CO <sub>2</sub> e saved.	RIIO-ED1 price control period
Non-technical losses	We are committed to improving the detection and reduction of energy theft from our networks.	Our revenue protection unit is to increase its capabilities and enhance initiatives with partner agencies.	Number of theft and fraud leads investigated, success rates and trends	Monthly during RIIO-ED1 price control period

		Smart meter data will be incorporated for faster and more accurate detection of anomalies.	Number of anomalies detected	RIIO-ED1 Price control period
		Recently introduced initiatives to limit the scope of error in conveyancing and unmetered supplies inventory reporting will be refined in the RIIO-ED1 price control period.	Number of unregistered supplies; Unmetered inventory movement and reconciliation	Monthly during RIIO-ED1 price control period
Business Carbon Footprint (BCF)	we will target a reduction in Scope 1 and Scope 2 CO <sub>2e</sub> emissions associated with the business during the RIIO-ED1 price control period.	Reduce the Scope 1 and Scope 2 CO <sub>2e</sub> emissions by 15% against the 2013 baseline by the end of the RIIO-ED1 price control period.	Kg CO <sub>2e</sub> saved; Annual % improvement on baseline.	RIIO-ED1 price control period.
Sulphur Hexafluoride (SF <sub>6</sub> )	We will continue to reduce the rate of SF <sub>6</sub> leakage from our substations by procuring best available switchgear technology and by specifying switchgear with lower leakage rates (typically 0.05%) than the International Electrotechnical Commission (IEC) specification (which is typically 0.1%).	Achieve a 12.6% reduction in the SF <sub>6</sub> leakage rate from substations on SPM network by specifying better performing switchgear when compared against the typical IEC specification.	Decrease in the average switchgear leakage rate at SPM substations when compared with the leakage rate if a typical IEC specification had been used.	Yearly during the RIIO-ED1 price control period
		Achieve a 15% reduction in the SF <sub>6</sub> leakage rate from substations on SPD network by specifying better performing switchgear when compared against the typical IEC specification.	Decrease in the average switchgear leakage rate at SPD substations when compared with the leakage rate if a typical IEC specification had been used.	Yearly during the RIIO-ED1 price control period
Fluid Filled Cables (FFC)	We will reduce oil leaks.	Replace 10.8km of the 132kV cables by 2017, with solid polymeric alternatives, which should result in a 50% reduction in leakages.	Length of cabling replaced as a percentage of overall length of our cable network.	By 2017

Transformer Bunding	We will reduce oil leaks.	Install 526 bunds to minimise the risk of contamination from oil leakage at substations.	Number of substation bunds installed as a percentage of our substations	Duration of the RIIO-ED1 price control period
Visual Amenity	We will seek to reduce the overall impact of OHLs in sensitive locations.	Further develop our approach to determining the priority areas that will be subject to OHL undergrounding.	£ spent on undergrounding; km of cable undergrounded; Supported by justification in line with methodology.	
		Underground 85km of OHLs at a cost of £11.32m.	Length of OHL undergrounded (km); £ spent on undergrounding / % of OHL budget.	Yearly during the RIIO-ED1 price control period

## 5.4. Best Practice Initiatives

We have devised a set of initiatives which demonstrate sound environmental practice and will assist in reducing the overall environmental impacts associated with our business activities. We intend to meet the following objectives throughout the RIIO-ED1 price control period:

### Assist with the achievement of the UK low carbon targets

The following best practice initiatives will be implemented to assist with the achievement of the UK low carbon targets;

During RIIO ED1 we will;

- *Implement advanced monitoring in 1300 of secondary substations sites to help optimise network and identify LCT hotspots as they emerge;*
- *Install an additional 400 voltage control relays to help stabilise the network as the penetration of LCTs increases.*
- *Extend the coverage of modern communications to all main substations to allow us to collect the necessary data.*

### Reduce the environmental impact of our business activities

The following best practice initiatives will be implemented to assist with the reduction of the environmental impact of our business activities;

#### 7. *Measures for managing losses.*

During RIIO we will:

- *Establish an accurate baseline measure for losses using the data from our network monitors and from smart meters;*
- *Enhance our settlement data analysis procedures to improve theft detection.*
- *Continue to work with main unmetered supplies customer groups to ensure equipment inventories are regularly updated;*
- *Target replacement of pre-1962 high loss transformers with low loss units to reduce losses by 60% at 922 of our secondary substations; and*
- *Install larger size, lower loss, conductor when rebuilding Overhead Lines in normal weather areas with higher numbers of connected customers.*

#### 8. *Reducing our business carbon footprint (BCF).*

During RIIO ED1 we will:

- *Enhance the requirements for reporting in contract and set performance criteria for carbon management where appropriate, seeking to influence reduction of our indirect scope 3 carbon footprint as well as improving the scope 3 data collection process and increasing the number of scope 3 emission sources that are reported;*
- *We will continue to gather, monitor and report data on energy use within substations; and*
- *We will deploy enhanced technologies to reduce energy usage in 105 substations.*

9. *Reducing fugitive emissions*

During RIIO ED1 we will:

- *Exceed IEC international standards for SF6 switchgear by specifying a maximum leakage rate five times more stringent for 33kV and below and twice as stringent for higher voltages;*
- *Continue to minimise operational transport mileage through the use of mobile technology amongst our field based workforce; and*
- *During ED1, expand the use of electric vehicles. This approach aligns with the Low Carbon Technology forecast.*

10. *Minimising leakages from Fluid Filled Cables (FFCs).*

During RIIO ED1 we will:

- *Install enhanced oil containment around 526 transformers (new and existing) containing high volumes of oil to minimise the risk of contamination from oil leakage at substations.*
- *Through a circuit breaker replacement programme remove over 1.5 million litres of insulating oil from the system;*
- *Reduce oil leaks by 50% through the replacement of poorly performing 132kV cable; and*

11. *Increasing Visual Amenity.*

During RIIO ED1 we will:

- *Underground 85 km of lines in AONBs, NPs and NSAs; and*
- *As part of a village LV modernisation programme, underground 186km of LV overhead line in villages, thus improving the visual amenity.*

## 5.5. Innovation

Where practicable, in conjunction with our stakeholders, we intend to identify innovative practices throughout the RIIO-ED1 price control period that will further reduce the environmental impact of our business activities. These practices form part of our Innovation Strategy (**Annex C7 – Innovation Strategy – SPEN**). One such practice will be to support any future schemes which seek to help towns/villages identify the ways by which they could reduce their carbon footprint.

An example of where we have been previously involved in such a scheme was working with the residents of Ashton Hayes, which is an award winning village in rural Cheshire, with an ambition to become England's first carbon neutral village. Since 2006 the village has achieved a carbon reduction of 23% by introducing behavioural changes towards energy usage.

Utilising the Low Carbon Network Fund, we assisted Ashton Hayes in its drive towards carbon neutrality. In doing so we were able to learn more about our existing and future networks, more specifically:

- *How we can facilitate the connection of low carbon technologies such as Photo-Voltaic generation, Heat Pumps and Electric Vehicles to the village's existing electrical network without jeopardising the quality of supply to residents;*
- *How a DNO can engage with a community to assist in the reduction of their carbon footprint by providing total electricity consumption information; and*

- *The practicalities of automating secondary substation monitoring and the analysis of LV network characteristics; this is a key enabler to understanding the impact of LCT on the network.*

Our Innovation Strategy has a number of environmental areas of focus in the RIIO-ED1 price control period. Particular initiatives which have been identified within the Innovation Strategy that offer environmental benefits include:

- *Alternative conductor and insulation materials – this involves identifying alternatives to oil and SF6, which have a lower environmental impact, but have the same (or better) electrical properties. We have already had initial discussions with potential manufacturers;*
- *Remote Asset Inspection – using unmanned vehicles to inspect assets, thus reducing the carbon footprint of our operations as well as the health and safety risks.*
- *Energy efficiency measures – for both the portfolio of substations and for customers. Encouraging customers to be more efficient reduces both the loading on the network and the amount of reinforcement we need to undertake.*

## 6. Uncertainty & risk

### 6.1. Uncertainties and risks

There are a number of uncertainties which have the potential to impact on us achieving or needing to revise our objectives, including:

- *More stringent policy (for example the proposed amendments to the F Gas Regulations 2009 and Greenhouse Gas Emissions Regulations 2013);*
- *Any improvement in CO2e emissions inventory data gathering, for example the inclusion of Scope 3 emissions, may in turn increase CO2e emissions in annual reporting;*
- *Any expansion and higher utilisation of the network may increase overall CO2e emissions;*

### 6.2. Mitigation of uncertainties & risks

Mitigation for the above uncertainties and risks are as follows:

- *Work closely with, for example, switchgear suppliers to enable year on year decreases in SF6 leakage;*
- *Although better emissions inventory data may appear to lead to an overall increase on CO2e emissions in annual reporting, the data will be more reliable, robust and transparent. This will help us significantly improve on our overall emissions.*
- *Monitoring of and input to consultation on emerging legislation*
- *Involvement in industry groups such as the Electricity Networks Association.*
- *Continuous engagement with stakeholders and professional bodies.*