NEW DOCUMENT

RIIO T1

Environment Submission

December 2011

Issue: SPT_Upd_7

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Contents

Environment – Executive Summary

ScottishPower is working to improve our environmental performance and meet the needs of our customers by delivering energy that is secure and sustainable. In common with most energy utilities, the fundamental environmental challenge we face is producing and transporting electricity more sustainably, to protect the environment for future generations. This means reducing the carbon footprint of the energy we produce, distribute and sell, minimising emissions to air, land and water and helping customers to use energy more efficiently to reduce consumption, saving money and CO2. It also means being mindful of the way we use resources through responsible sourcing of goods and services, efficient resource use and minimising the amount of waste we produce. Notably, Iberdrola achieving second place ranking in the Dow Jones Sustainability Index this year

Respect for the environment is a value that is shared throughout the Iberdrola Group and which is enshrined in the Group's vision:

> *"We aspire to be the preferred company because of our commitment to the creation of value, people's quality of life and the protection of the environment."*

As one of the UK's major energy utilities we recognise that our activities can have impacts on the environment and so respect for the environment means striving to eliminate, minimise or control our environmental impacts, in particular:

- Minimising the carbon footprint of our business
- Reducing emissions to air, land and water
- Ensuring full regulatory compliance
- Minimising our use of natural and man-made resources
- Sourcing material resources responsibly
- Cutting waste and encouraging re-use and recycling
- Protecting natural habitats and biological diversity.

In the UK we have translated our vision and values into a series of Big Goals, one of which is: ***Respect the Environment***. This was rolled out to all employees during 2010 via a communication programme.

This paper sets out our approach to four areas which Ofgem has asked for more clarification relating to the environment covering SF6 leakage, transmission losses, visual amenity, and business carbon footprint.

RIIO T1 Business Plan Update

November 2011

Direct Network Emissions - SF6 Leakage

Issue: 2011-11-22 SF6 Update

Date: 22 November 2011

Contents

1. Introduction

Leakage of SF6 into the atmosphere has a damaging effect on the environment. In SPT's RIIO T1 Business Plan submitted in July we set out our proposal for a symmetric SF6 leakage rate incentive based on a target leakage rate. This paper provides more information, and updated information, on our approach in reaching the target leakage rate.

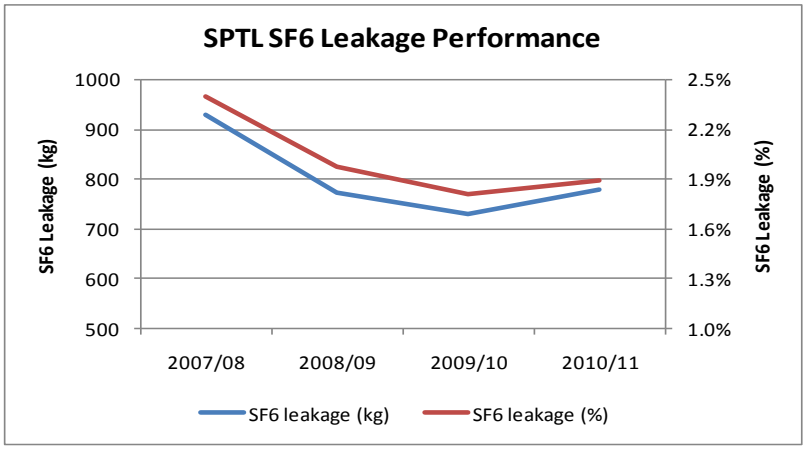
2. Background

We explained in our Plan that the installation of assets which make use of SF6 have various benefits. We make use of equipment containing SF6 as it provides a safe and cost efficient electrical insulation medium, while also helping to minimize substation footprint.

Over RIIO-T1 we will install new SF6 equipment as part of our load and non-load capital expenditure programmes and in so doing significantly increase our inventory of SF6 mass used in transmission equipment. Currently we have over 41 tonnes of SF6 gas equipment installed on our network, by the start of RIIO-T1 this will have increased by a further 30%, and as a result of our investment plans will increase by at least a further 80% by the end of RIIO T1.

We manage our SF6 inventory in accordance with industry good practice, and have not identified projects above this level.

The graph below shows the leakage of SF6 from SPT equipment over the last four years. Through focussed operational efforts we have driven reductions in the kg of SF6 leakage from the 2007/08 levels. However, in 2010/11 the leakage increased back to 2008/09 levels. We believe this represents the expected background level of leakage and cannot be improved without significant investment.



3. SF6 Policy and Standards

All new equipment procured will comply with relevant British and International standards and specifications which require the equipment has a maximum leakage level of 0.5% or 1% per annum. These standards have been tightened over recent years to reflect the environmental impact of SF6. The historic SF6 equipment on SPEN's transmission network has leakage rates of up to 3%.

Currently almost all transmission assets have been purchased and installed to specification IEC 60694 (which quotes a maximum leakage rate of 3% for outdoor switchgear).

For new assets, we intend to buy some 132kV indoor gas insulated switchgear to specification IEC 62271-203 which may have a design leakage rate of up to 0.5%. We are also likely to purchase 275kV / 400kV outdoor SF6 switchgear to specification 62271-1 which may have a design leakage rate of up to 1%. These IEC specifications define best practice. We are not aware of any 132kV, 275kV and 400kV SF6 switchgear that offers exceptionally low leakage rates. More explanation on this design leakage level is provided in Appendix 2.

Our current operating regime is already performing much better than the overall equipment specification (3% leakage). Throughout RIIO-T1 we intend to continue to focus on minimising leakage and where necessary replace life expired SF6 equipment with modern equivalent equipment when the opportunity arises. However, the absolute level of SF6 leakage will increase over RIIO-T1 as life expired oil circuit breakers, presenting a different environmental hazard, are replaced with SF6 breakers.

4. Forecast SF6 Leakage

Currently almost all transmission assets have been purchased and installed to IEC specifications which vary up to 3% leakage as design rating. Our current leakage rate at over 1.81% of total installed SF6 gas is on, if not below design standards. In effect, our operating regime is already performing much better than the equipment specification and we have determined that it is not possible to improve the performance further. The only effective method of reasonably operating at a significantly lower target would be a substantial capital programme of asset replacement. Therefore our plans for a flat background leakage profile are appropriate as we believe there is limited scope for further reductions.

We have re-forecast our leakage performance over RIIO-T1 based on our existing performance and our planned network investments. For all new assets we have applied the design rating leakage rates which are 0.5% for indoor equipment and 1% for outdoor equipment.[1]

The table below details our predicted performance over RIIO-T1.

[1] This is a change from our July business plan where we quoted design leakage rates of 1.5% outdoor and 1% indoor in Section 3 - Outputs. The correct figures are 1% outdoor and 0.5% indoor as detailed in Section 5 - Non-Load.

	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
SF6 leakage (mass)	829.03	843.37	900.39	996.98	1021.89	1021.89	1039.585	1041.71
Leakage as % age of mass	1.47%	1.45%	1.39%	1.34%	1.31%	1.31%	1.29%	1.29%
SF6 Installed Volumes	56292	58160	64814	74632	78014	78014	80353	80778

We assessed our growth in SF6 inventory at an asset level, and calculated our SF6 inventory year on year. This has been populated by considering our current leakage rate for existing assets, and adding the impact of new SF6 circuit breaker installations detailed throughout the load and non-load investment programmes.

In deriving a leakage rate, we applied IEC standard leakage rates of 0.5% for indoor equipment and 1.0% for outdoor equipment to all asset additions. In order to move below the IEC standard for outdoor equipment we would need to move to installation of indoor kit to further reduce the target and performance.

The above leakage rates were based on the volumes specified in our July business plan (and adjusted for minor errors). The weight of SF6 installed per unit is as per the following table:

SF6 volumes	**AIS Switchgear**		**GIS Switchgear**
	dead tank kg	live tank kg	kg per bay
132	29		100
275		33	
400		66	950

In Appendix 2 we set out the derivation of the above leakage rate forecast ranging from 1.47% at 2013/14 to 1.29% at 2020/21.

In our Business Plan we stated that our strategy is to converge with Ofgem's view of a best practice leakage rate of 1%. However, given our extensive inventory of older SF6 assets, the scope for achieving this target without significant investment is extremely challenging.

For forecast SF6 emissions on the load and non-load investment programmes the engineers follow the methodology shown in Appendix 3 '*SP Transmission SF6 Leakage Rate Methodology Statement'*. This information provides useful background on the approach to the management of SF6 leakage.

SF6 emissions are based on our Best View Load related and Non-Load related investment supported by table 4.15 '*Asset Quantities for Age Based Modelling - Total Annual Additions and Disposals'.*

5. Application of a Cost-Benefit Approach

Leakage of SF6 from any plant item is an environmental risk. However the level of risk is dependent on the severity of the leak (the leakage rate). Leaks with low risk could relatively easily be topped up. However leaks with a higher risk, i.e. higher leakage rate, may require more intrusive forms of intervention. This would be either a repair or a complete replacement of the leaking unit. A cost benefit analysis would be required to determine the best course of action taking into account the cost of a repair or replacement and the expected leakage rate post any repair.[2]

Other factors that we consider are access to the network, given that we have a major programme of work over at least the next two price control period, and projected future use. For example, we have one connection site which has SF6 gas leaking from current transformers. However, we are also aware that the end user intends to terminate this connection site in the near future. The combination of the current level of SF6 leakage, system access and known end user requirements leads to a decision not to replace these assets.

[2] For example, a leakage of 1kg per annum would cost £1.2k (based on £55/Tonne CO2 with a multiplying factor of 22000kg CO2 equivalent to 1kg SF6) while the minimum cost to repair is £80k and to replace is £200k.

Appendix 1 Design Leakage

Design Standard

The design leakage figure of 1% for outdoor SF6 kit is based on IEC 62271-1, "High voltage switchgear and control gear- Part 1: Common specifications". This is the "high-level specification" for HV switchgear i.e. all other specifications for different types of HV switchgear types (e.g. circuit-breakers, disconnectors, GIS, etc...) sit below this specification. A common clause numbering process is used throughout the 62271 suite. Clause 5.15.2 of EC 62271-1 states that relative leakage rates shall be "For SF6 and SF6 mixtures, the standardised values are 0.5% and 1% per annum".

The IEC for circuit-breakers which sits below this IEC (IEC 62271-100) does not modify the 62271-1 clause, so an outdoor circuit-breaker may have a leakage rate of 1% per annum and will be fully compliant with IEC and global marketplace requirements.

Clause 5.15.2 of IEC 62271-203,"High voltage switchgear and control gear- Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52kV" modifies IEC 62271-1 and states that, "The leakage rate from any single compartment of GIS to atmosphere and between compartments shall not exceed 0.5% per year for the service lifetime of the equipment". The reason that IEC modifies this clause is that GIS has very large SF6 quantities compared to, say live tank circuit- breakers, hence "gas tightness" is very important.

Hence when we purchase, say outdoor AIS circuit-breakers then we may expect a design leakage rate of up to 1%, but for indoor GIS the maximum leakage rate is restricted to 0.5%

Incremental Costs for Improved Leakage

It is very difficult to determine incremental costs for improved leakage values above those specified. We have just completed the 420kV GIS specification which refers to IEC 62271-203 and our specification states that leakage rate must be <0.5%. We have also asked manufacturers to declare total SF6 quantity and leakage rate in their tender schedules. We will than use the figures to carry out a life-cycle cost which will be used as part of the capital cost assessment – hence the cost of SF6 leakage will be considered as part of the solution.

The key point is that we are now be highlighting to manufacturers that SF6 leakage will be used as part of the commercial assessment of their offer.

We are also asking manufacturers to provide an option price for on-line SF6 gas loss trend analysis which should help allow us to detect leaks more quickly, albeit there will be a capital cost impact. Such equipment may well offer a better solution than simply changing the GIS design and we can more easily assess benefits versus cost.

Appendix 2 Forecast SPT Leakage

SF6 Leakage Analysis

SF6 volumes	AIS dead tank kg	live tank kg	GIS kg per bay
132	29		100
275		33	
400		66	950

Total Switchgear additions per year

		13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
132	AIS	2	14	19	3	0	0	4	1
	GIS	19	10	0	0	16	0	12	0
275	AIS	0	2	9	7	6	0	31	12
	GIS	0	0	0	0	0	0	0	0
400	AIS	8	6	16	0	24	0	0	0
	GIS	0	0	5	10	0	0	0	0

SF6 Volumes changes per year (kg)

		13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
132	dead tank	58	406	551	87	0	0	116	29
	GIS	1900	1000	0	0	1600	0	1200	0
275	live tank	0	66	297	231	198	0	1023	396
	GIS	0	0	0	0	0	0	0	0
400	live tank	528	396	1056	0	1584	0	0	0
	GIS	0	0	4750	9500	0	0	0	0
Overall Cumulative Volume		2486	1868	6654	9818	3382	0	2339	425

Pre 13/14 value from TPCR4 roll-over table 4.3

	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Mass SF6 at	53806	56292	58160	64814	74632	78014	78014	80353	80778
SF6 leakage	807.1	829.03	843.37	900.39	996.98	1021.89	1021.89	1039.585	1041.71
Leakage as %age of mass	1.50%	1.47%	1.45%	1.39%	1.34%	1.31%	1.31%	1.29%	1.29%

Leakage has been calculated, for GIS (**indoor**) assets, on applying IEC spec leakage rate of	0.50%
Leakage has been calculated, for AIS (**outdoor**) assets, on applying IEC spec leakage rate of	1.00%

Indoor assets are assessed as installations at 132kV voltage level
Outdoor assets are assessed as installations at 275kV and above voltage level

The above information sets out the derivation of the SF6 leakage targets. It derives the volume of SF6 added for particular assets types from 2013/14 through to 2020/21.

It assumes a starting asset volume of 53,806 kg, and assumes that the leakage rate for these assets will continue at 1.5% (807kg) through RIIO T1 i.e. we have not included an assumption for increased SF6 leakage on existing assets as assets age.

There are no plans in RIIO-T1 to replace existing SF6 assets.

Appendix 3 SP Transmission SF6 Leakage Rate Methodology Statement

SP Transmission

Transmission SF6 Leakage Rate Methodology Statement

1. This leakage rate methodology statement has been prepared pursuant to Special Condition J5 Part 4 of the electricity transmission licence to set out the methodology, consistent with best industry practice, by which SP Transmission will determine the leakage rate of sulphur hexafluoride (SF6) gas. This methodology is consistent with Engineering Recommendation S38 for the Reporting of SF6 Banks, Emissions and Recoverables.

2. In demonstrating sound environmental management practice, SP Transmission will record quantities of SF6 gas filled assets installed, quantities of gas used to replace SF6 gas emitted and also quantities recovered during service life and at end of life activities.

   SP Transmission will not report on installation gassing during manufacture, as this will be the responsibility of the manufacturer.

3. ***Actual SF6 leakage*** will be the total mass of SF6 gas, in kg, that is added to the ***SF6 transmission asset inventory*** to replace gas emitted so as to maintain acceptable operating levels.

   For each asset service, the leakage will be based on the SF6 gas used to recharge assets at servicing less any SF6 gas recovered from assets at servicing.

4. The ***total mass of SF6 gas in service*** will be the sum, in kg, of the manufacturer's ***nameplate SF6 design capacity*** for each asset in the SF6 transmission asset inventory as at 31 March in a relevant year.

5. ***Actual SF6 leakage rate*** will be the total mass of SF6 added to the SF6 transmission asset inventory in relevant year t divided by the ***total mass of SF6 gas in service*** as at 31 March in relevant year t-1, expressed as a percentage.

6. Measurement of SF6 additions will be undertaken on an asset-by-asset basis by either (i) mass of kg recorded by sensitive gas flow gauges which provide a conversion to mass of gas or (ii) by change in mass of SF6 gas bottle in kg.

   During an emergency situation an estimate of ***actual SF6 leakage*** may replace the measurement of SF6 additions.

7. The ***target SF6 leakage rate*** shall take the values in Table 1 below.

   Table 1:

Relevant year t	2007/08	2008/09	2009/10	2010/11	2011/12
	2.0%	1.9%	1.8%	1.7%	1.5%

8. For each financial year, SP Transmission will report ***Actual SF6 leakage rate,*** to the Authority as part of the price control review information provided through Standard Condition B15 Part C.

9. Where new SF6 assets are installed, these will be added to the ***SF6 transmission asset inventory*** and reported in respect of the relevant year t.

10. SF6 transmission ***asset disposals*** will be removed from the SF6 asset inventory and reported in respect of relevant year t. This will include adjustment for ***final use emissions***.

11. For ease of reporting and to facilitate any audit requirements, asset measurement information will be stored electronically.

12. Measurement will not cover (i) cylinders in stock, (ii) equipment not commissioned and (iii) SF6 assets maintained but not owned by SP Transmission.

13. ***Exceptional Events*** will be excluded from the actual leakage rate calculation.

14. SP Transmission will notify the Authority if it is necessary to change asset or asset type data information, and the impact this has on actual and target leakage. For example, this may occur if a manufacturer's ***nameplate SF6 design capacity*** is incorrect.

15. SP Transmission reserves the right to make revisions to this statement and will submit to the Authority a notice of such revisions including an explanation of the reason for such amendment(s). It is expected that any amendments will be made to align with working arrangements and industry best practice.

16. Definitions:

actual SF6 leakage	-	the sum of SF6 gas used to recharge assets during servicing to maintain acceptable operating levels measured in kilograms (kg) adjusted for SF6 recovered during servicing and final use emissions.
actual SF6 leakage rate	-	the total mass of SF6 added to the SF6 transmission asset inventory in relevant year t divided by the ***total mass of SF6 gas in service*** as at 31 March in relevant year t-1, expressed as a percentage.
asset disposals	-	Assets disconnected from the transmission network and removed from service.
exceptional events	-	disruptive failure or an event causing SF6 leakage resulting from one-off causes such as severe weather or third party damage and as defined in paragraph 30 of part 4 of the Special Condition J5 of SP Transmission's transmission licence.
nameplate SF6 design capacity	-	the capacity of SF6 as defined by the manufacturer found on the nameplate of each individual piece of equipment.
SF6 transmission asset inventory	-	the inventory of SF6 filled equipment owned and in service by SP Transmission.
total mass of SF6 gas in service	-	the sum in kilograms (kg) of the manufacturer's ***"nameplate SF6 design capacity"*** of each asset in the SF6 transmission asset inventory.
target SF6 leakage rate	-	The target leakage rate of SF6 gas in the relevant year t expressed as a percentage of ***total mass of SF6 gas in service*** at commencement of relevant year t and taking the values in Table 1 above.
final use emissions	-	the ***nameplate SF6 design capacity*** less the mass of SF6 gas recovered from the asset at decommissioning in kilograms (kg).

RIIO T1 Business Plan

SP Transmission Approach to Transmission Losses

Issue: 31 October 2011

Ref: 2011_SPT_Narrative_Losses

Introduction

This document outlines the SP Transmission (SPT) approach for transmission losses and seeks to outline our key strategic investment options for our network infrastructure within the framework of the increased system loading during RRO T1.

Contents

1. Summary

SP Transmission (SPT) recognise that losses are systematic of operating a transmission network, but as a responsible transmission owner, we should strive to limit the system losses recorded by NGT as the transmission System Operator, and the costs paid by customers through the replacement and purchase of lower loss equipment and the application of new technology e.g. HVDC.

SPT will consider the whole life costs (incl. losses) of transmission equipment and will utilise appropriate equipment on the network.

SPT will also continue to consider the impact of losses when developing the network and will work with NGET to develop optimal designs to support a cost efficient network.

2. Background

Copper and aluminium based assets by their very nature have a proportion of conducted energy lost through resistance, which is expressed through heat loss, or in electrical terms, I^2R losses. Transmitting electricity at high voltage reduces the amount of energy lost to resistance, which averages around 1.5%. For a given amount of power; a higher voltage reduces the current and thus the resistive losses in the conductor.

Utilities use low loss transformers and add capacitor banks and other components throughout the system to control reactive power flow for reduction of losses and stabilization of system voltage.

3. Regulatory Requirements

An explicit output will be set to ensure that companies as part of their planning process fully assess the lifetime cost of assets, including losses.

RIIO T1 Business Plan

As part of SPT's business plan for future capital expenditure, Ofgem expects SPT to take into account the lifetime cost of new assets. This should include the choice of transmission plant with respect to loss performance, and whether any long term added investment in loss reduction is in the interest of consumers. Added to this, we must also consider the NPV of any additional costs of low loss assets and the costs that customer pay for losses on the system.

Outputs

Ofgem expect to include a simple output on TOs against the modelled lifetime net benefits to customers (in MWh) arising from low loss investments on our networks. If we do not consider losses for investments, the output in terms of MWh will not be as preferential.

Ofgem expect as part of our business plan on the modelled avoided losses with an explanation of our investment appraisal process and working assumptions e.g. value of losses, loading of the network.

A primary output will not be set on the actual volume of losses as it is unlikely to show any impact and in addition would be complex to derive.

The output that is considered appropriate is a reputational incentive as it is modelled, and we may face financial consequences for non-delivery if variations to the baseline are not explained. A financial reward may be earned if we exceed the baseline for losses.

4. RIIO T1 Stakeholder Feedback

Although responses were limited, there was stakeholder support in our on-line Stage 1 stakeholder consultation for transmission companies to be incentivised to minimise transmission losses.

In feedback from our workshops, incentivisation of transmission & environmental losses was considered to be a positive driver of long term benefit. Overall the output measures were considered appropriate to encourage the right investment with a proviso that they should not result in favouring a particular type of energy source.

5. Losses Strategy

Strategy

- As a network utility company we aim to limit system losses and the costs customers are expected to pay

Objectives

- Influence system losses through key strategic asset choices and the application of new and alternative technology

- Consider NPV low cost options and the benefit of reduced losses

Targets and Plans

- Removing unnecessary transmission lines. The SPT network is organic and OHL and transformers are decommissioned as required. For example, we are considering removing the Kilmarnock to Neilston 132kV circuit as a result of the ENSG planned network reinforcements.

- By investing in higher voltage circuits (e.g. 2800MW Upgrade, East Coast onshore upgrade). Most new transmission circuits are for generation connections and the decision on which voltage to connect will be taken with the developer taking into account overall cost and the best option for obtaining consents. Where we can we will also consider factors such as the longer term development of our transmission network, and minimising transmission losses, which can encourage a higher voltage solution.

- By investing in lower loss transformers. Our approach to transformer procurement considers transformer capital and operating costs, including losses, over the complete life cycle of the transformer. By replacing an old 120MVA SGT with a modern low-loss unit, we save in the order of 1MWh in losses per year.

  *(I.e. Old transformer has load and no-load losses of approximately 725kW and 75kW respectively. For a new unit, these figures are around 430kW and 45kW. Assuming a load factor of 0.3, losses go from 0.3x725+75 = 292.5kW to 0.3x430+45 = 174kW. Per year, you have (292.5-174)*365*24 = 1MWh.)*

- As part of a joint venture with National Grid, SPT plan to commission the Western HVDC link which will reduce system losses considerably. Losses and their life-time cost form an important part of the tender evaluation process which is currently underway.

6. Establishment of RIIO T1 Business Plan

Current and Future System Loading

Key to the amount of losses incurred in any network is the system load which is a function of demand, generation and transfers on the transmission network. The following table shows the level of demand, generation and system boundary capacity anticipated by the end of RIIO T1.

	2011 – Current Position	2021- End of RIIO T1
System Demand	4.2GW	4.2GW
Generation	8.2GW	9GW
Boundary Transfers Actual Thermal Capacity – Best View	2011 – Current Position	2021 – End of RIIO T1
B4	1.7 GW	3.5 GW
B5	3.1 GW	4.3 GW
B6	2.8 GW	6.6 GW

Asset Investment and NPV

Key to the establishment of our business plans are the lifetime costs of new assets, including the losses associated with these assets. For example, we will assess higher cost low loss transformers and lower cost high loss transformers as part of our design and procurement process.

We are aware that Ofgem expect the transmission companies to take into account lifetime costs, including transmission losses when deciding between different transmission equipment and intend to include an output on transmission companies against "the modelled lifetime net benefits to consumers arising from low loss investments on their network over RIIO-T1".

In developing our RIIO T1 plan, our engineering team did take account of the need to minimise transmission losses and considered the present value of the additional cost of a low loss option against the benefit of reduced losses over the lifetime of the asset.

The following 60MVA transformer scheme presents a (reacted) example of options that SPEN undertook for the procurement of 132kV transformers for both SP Manweb and SP Transmission. Losses, capital cost, transformer specification and timeline are all considered when we purchase transformers. The two successful bids are from ABB and TIRONI, and are at the lower end of losses compared to the other manufacturers. In addition to this the total cost of ownership is a key determining factor upon which our investment options are based. Both ABB and TIRONI have the lowest cost of ownership for these examples of transformers.

CAERNARFON + WELSHPOOL + WITCHURCH + ELSMERE + CHESTER + GILLMOSS (6 pcs)	TIRONI	ABB	SGB	EFACEC	SIEMENS	INCOESA	TAMINI	HYUNDAI	HYOSUNG
Cost (£)	£2.684.000,00	£2.745.000,00	£3.398.300,00	£2.717.200,00	£3.020.221,00	£3.032.100,00	£2.820.000,00	£3.499.458,00	£3.600.345,00
	0%	2%	27%	1%	13%	13%	5%	30%	34%
Losses:	**£2.408.400,00**	**£2.486.730,00**	**£2.081.400,00**	**£2.732.400,00**	**£2.477.400,00**	**£2.652.200,00**	**£2.813.700,00**	**£2.433.800,00**	**£2.575.800,00**
Capitalization cost of Ownership (£)	£5.092.400,00	£5.228.730,00	£5.479.700,00	£5.449.600,00	£5.497.621,00	£5.664.300,00	£5.633.700,00	£5.913.258,00	£6.176.145,00
	0%	3%	8%	7%	8%	11%	11%	16%	21%
NEWTON STEWART SUBSTATION (1 pcs)	TIRONI	ABB	SGB	EFACEC	SIEMENS	INCOESA	TAMINI	HYUNDAI	HYOSUNG
Cost (£)	£477.500,00	£444.000,00	£523.400,00	£432.200,00	£489.124,00	£499.400,00	£469.000,00	£569.346,00	£587.245,00
	10%	3%	21%	0%	13%	16%	9%	32%	36%
Losses:	**£602.700,00**	**£608.955,00**	**£846.900,00**	**£676.000,00**	**£602.900,00**	**£885.000,00**	**£673.450,00**	**£830.300,00**	**£829.300,00**
Capitalization cost of Ownership (£)	£880.200,00	£857.955,00	£870.300,00	£908.200,00	£902.024,00	£885.400,00	£942.450,00	£980.646,00	£1.016.545,00
	3%	0%	1%	6%	5%	3%	10%	14%	18%
GREAT TOTAL (7 pcs)	TIRONI	ABB	SGB	EFACEC	SIEMENS	INCOESA	TAMINI	HYUNDAI	HYOSUNG
Cost (£)	£3.161.500,00	£3.189.000,00	£3.921.700,00	£3.149.400,00	£3.509.345,00	£3.531.500,00	£3.289.000,00	£4.068.804,00	£4.187.590,00
	0%	1%	24%	0%	11%	12%	4%	29%	33%
Losses:	**£2.811.100,00**	**£2.897.685,00**	**£2.928.300,00**	**£3.208.400,00**	**£2.890.300,00**	**£3.108.200,00**	**£3.287.150,00**	**£2.825.100,00**	**£3.005.100,00**
Capitalization cost of Ownership (£)	£5.972.600,00	£6.086.685,00	£6.350.000,00	£6.357.800,00	£6.399.645,00	£6.549.700,00	£6.576.150,00	£6.893.904,00	£7.192.690,00
	0%	2%	6%	6%	7%	10%	10%	15%	20%

7. Outputs

We recognise that losses are a major consideration and we will take whatever measures we can as a responsible transmission owner to limit transmission system losses.

Over RIIO T1, our wider system reinforcements will have a significant impact in reducing transmission losses. Our transformer replacement programme will also contribute.

We agree with Ofgem that it is not appropriate to set a primary output on the actual volume of losses on our transmission system. We broadly support the use of a reputational incentive based on modelled savings in order to encourage companies, as part of their network planning practices to fully assess the lifetime costs including losses.

We also note that there is the potential for companies to earn some financial reward for reducing network losses that is in addition to their baseline activity through the broad environmental output following consultation.

RIIO T1 Business Plan Update

November 2011

SP Transmission's Approach to Visual Amenity

Issue: 2011-11-30 Visual Mitigation

Ref: 30 Nov 2011

Willingness to Pay Allowance for Existing Infrastructure

SP Transmission stated in its response to Ofgem's initial assessment in respect of willingness to pay that:

> *"The challenge to develop a consolidated position on 'Willingness to Pay' is complex and we are unclear how a further survey will effectively inform the issue for our transmission network development over RIIO T1. However, in cognisance of Ofgem's initial assessment, and on examination of the London Economics report provided recently by Ofgem, we would welcome the opportunity to discuss the need case and strategy for development of a 'Willingness to Pay' allowance appropriate for SP Transmission requirements over RIIO T1. "*

At the meeting with Ofgem on 16th November we explained our position in further detail. We were then asked by Ofgem to confirm whether we required an allowance for visual mitigation in National Parks and Areas of Outstanding Beauty.

We commend Ofgem's proposal for an allowance for visual mitigation of existing assets and would confirm our full support. Potentially this would facilitate our current practice of considering visual amenity on a case by case basis, based on stakeholder consultation and thorough cost benefit analysis.

However, the scope of the allowance defined in Ofgem's RIIO guidelines to consider only assets within National Parks and Areas of Outstanding Natural Beauty (AONB), unfortunately limits the relevance in our licence area. Only 3% of our Transmission overhead line network is constructed in a designated National Park and Scotland does not have a designation of Areas of Outstanding Beauty. This is supported by our stakeholder engagement which has not indicated interest in seeking visual mitigation in this area.

This factor, combined with political sensitivities in respect to the ongoing consultation on Beauly Denny with the Scottish Government, led us to decide against conducting a willingness to pay survey in the preparation of our July submission. However, we have been in discussions with National Grid about the possibility of sharing a willingness to pay survey, that would include our licence area, and the lessons learnt from their willingness to pay for undergrounding survey.

As we explained on 16th November, we have some concerns that this allowance has the potential to undermine attempts to secure planning permission for new overhead lines or other infrastructure. If the allowance is granted for a specific area it will set a precedent which could dilute legitimate arguments for not undergrounding overhead lines or providing other visual mitigation.

Although we do have a concern over setting a precedent, a visual amenity allowance that is not limited to National Parks or AONB could encourage a greater degree of focus and opportunity to respond to stakeholder views on appropriate visual amenity.

We believe therefore, the approach described in our recent paper on Visual Amenity[3] of considering each project on a case by case basis, in line with the process of thorough stakeholder engagement, is the most effective means to deliver appropriate visual mitigation. This may include undergrounding sections of a new overhead line, and/or undergrounding lower voltage circuits in proximity areas, tree planting and other screening, re-sizing or painting of towers, re-conductoring amongst other options. Costs to deliver these measures are considered in light of our requirement to provide an 'economic, efficient and co-ordinated network'. Funding is currently included within the business case for the overall project allowance, but development of a specific allowance could deliver more benefits for stakeholders and we believe this is the best approach for the RIIO period.

Our approach is tried and tested based on our extensive experience in successfully addressing the visual amenity impacts of major projects to install new transmission network assets. These projects include the replacement of the western interconnector circuits from Scotland to England completed in 1993 (over 100km), the overhead line from Coylton to Auchencrosh connecting to the Moyle Interconnector (over 60km), the reconfiguration of the 132kV network in Fife, and several significant substation developments including Strathaven, Eccles, and Dewar Place.

In addition, we currently are in the consenting process for two significant TIRG projects; the southern 20km section of 400kV double circuit line from Beauly to Denny, and around 40km of 275kV and 132kV overhead line infrastructure in South-West Scotland. As noted above, a visual amenity allowance that is not limited to National Parks or AONB could encourage a greater degree of focus on appropriate visual amenity. Should Ofgem consider this allowance to be appropriate for the RIIO period, we suggest that Ofgem consider extending the scope of the allowance to include areas beyond National Parks and Areas of Outstanding Natural Beauty. This could include sites of special scientific interest, National Scenic Areas (NSA) Regional and Country Parks and potentially Natural Heritage Areas, although this is not a definitive list.

Another approach could be to consider where new lines are being constructed, or existing lines are to be refurbished. This would alleviate the potential issue of regional bias, and encourage the consideration of visual mitigation in all projects.

Clear guidelines should be established for prioritising visual mitigation allowance funding, that included a broad range of issues from landscape to ecological considerations as well as cost benefit analysis with potential caps evaluated. Visual amenity options should be determined as part of the guidelines. Furthermore the issue of how this allowance would be funded should also be informed from further stakeholder engagement and consultation. The option to consider localised schemes as an alternative to socialising of revenue should be debated. A willingness to pay survey could form part of this process but should not be the sole indicator. Should an allowance be developed it would encourage an increased focus on visual mitigation in specific schemes within our RIIO Investment plans. For example, the £333m strategic reinforcement at Dumfries and Galloway and the £120m East Coast 400kV Upgrade. The latter involves two clear options one costing more which avoids the construction of a new 275kV line in Central Scotland. Should a visual mitigation allowance become available SP Transmission would

[3] 2011-11-23 Approach to Visual Mitigation

consider this an example of where the fund could be appropriately used, given the considerations and priorities listed above. We have other projects which also involve opportunities for visual mitigation of existing infrastructure but not within National Parks or AONB, such as V, U and AT routes in the Scottish Borders Hence we would encourage Ofgem to consider broadening the scope of the allowance to incorporate Scottish customers.

Conclusions

With respect to an allowance for visual mitigation of existing transmission infrastructure, SP Transmission's views are:

- We support an allowance for visual mitigation for existing infrastructure.
- The allowance as it stands would be of limited value to our customers as only 3% of our overhead line network is within a designated area.
- A potential downside to the allowance could be that it becomes a dominant factor in debates on undergrounding and visual mitigation, potentially complicating and delaying further the planning process.
- We recommend our current approach of considering visual mitigation on a project by project basis to give a more balanced and targeted mechanism that delivers real benefits for all stakeholders.
- If there is to be a "visual amenity allowance" then for consideration, the scope of this allowance should widen be widened support a case-by-case approach. We are fully committed to engaging in this process should Ofgem decide to continue with this option.

RIIO T1 Environmental Submission

December 2011

SP Transmission Approach to Business Carbon and Wider Environmental Footprint

Issue: 2011-10-31 Business Carbon Footprint

Ref: 28 October 2011

Contents

1. Introduction

The transition to a low carbon economy will bring significant opportunities and challenges for ScottishPower Transmission. During RIIO-T1 and beyond ScottishPower Transmission will invest billions of pounds in its network to accommodate a huge increase in new low carbon generation. ScottishPower Transmission will need to manage the uncertainties associated with those new technologies and large investments to deliver timely, good value and sustainable network infrastructure.

In our RIIO-T1 submission we stated that "We support Ofgem's proposal to require the network companies to submit an annual report of their BCF in line with the emissions reporting methodology introduced for DPCR5 in 2010". This report sets out SP Energy Networks' Business Carbon Footprint statement for 2010 for SP in accordance with Ofgem's guidelines during our RIIO consultation.

The following section describes with more details the company structure and the approach taken for developing BCF requirements for transmission.

Group Structure and Commitments

SP Energy Networks is the Scottish Power division responsible for the licensed Transmission and Distribution networks in Central and Southern Scotland, North West England, and North Wales. The network licensees involved are;

SP Manweb plc

SP Distribution Ltd

SP Transmission Ltd

SP Power Systems Limited provides network management and operation services to the three licensees above. All of the above companies are members of the Scottish Power group which in turn is part of the Iberdrola group of companies. There is an existing report for SP Distribution and SP Manweb of Business Carbon Footprint Statement for 2010. This document is attached to the current report (Appendix 1). We will make use of synergies, processes and data by taking advantage of work already done under SP Manweb and SP Distribution licences to provide a report for SP Transmission. In the nearby future the three licences will be included under the same Business Carbon Footprint Statement Report.

In 2010 Scottish Power set out a Big Goals framework for forward environmental targets, this sets out a 20% target for reduction of carbon emissions in coming years. As an initial measure SP Power Systems has set a target of 15% reduction in non-operational buildings energy use.

2. SPT Challenges

ScottishPower Transmission as a transmission operator has some key challenges to face under RIIO-T1 as we submitted in our Business Plan. We will explain challenge four in further detail because is the reason of this report. These factors are:

1. To build an optimal delivery strategy
2. To manage the outage impact on existing customers
3. To manage the capability of the supply chain
4. To meet planning and environmental requirements

   Obtaining all necessary consents is dependent on other agencies and grantors, providing consent approval to competent planning applications in realistic timescales. Historically securing planning consents for major development work can take years and constitutes a significant risk to achieving our plans. The scope and extent of environmental planning activities for this investment plan and the requirement for land access and way leaves negotiation is enormous, and we will require to secure additional resources and support to achieve them.

   To ensure that our direct and indirect environmental impacts are identified and the required controls to minimise these impacts are in place during project design, planning, construction, operation and maintenance of our assets.

5. To secure investment

3. The Big Goals Initiative

Since ScottishPower joined the Iberdrola Group, we have responded to some of the biggest challenges that our industry has ever faced. We have learned the value of setting goals at an individual and business level, proving that together, we can achieve more when we focus on specific goals.

Iberdrola has established its strategy for future growth; as an integral part of this truly international organisation, ScottishPower is ready to help realise the Group ambition to become **the preferred global energy supplier**. We support sustainability via corporate led initiatives resulting in Iberdrola achieving second place ranking in the Dow Jones Sustainability Index this year.

To this end, everyone in the Energy Networks Business will try to align and focus their combined energies on a set of six Big Goals which apply to the whole ScottishPower group of companies. The Big Goals are focus on themes of Health and Safety, Environment, Ethics, Customer Service, Performance, Staff motivation, Scorecard etc.

One of our key goals is environmental Goals. We consider and respect the environment in everything we do. Our main commitment to developing sustainable energy sources will help maintain our world leading status in the energy market. We will continually work to reduce waste and to minimise our environmental impact, exploring and harnessing new and sustainable technologies where possible. This Environmental goal involves different levels of actions that can be seen below.

Level 1: The Goal. Respect the Environment.

Level 2: The Behaviour. We consider and respect the environment in everything we do.

Level 3: The metric. Improve our CO2 emissions performance by 20% by 2020.

We have carried out a 2011 Environment plan where we go through each action with more detail. This plan is made with the purpose of that the key environmental goal going forward are better control and segregation of waste and overall reduction of carbon emissions. In table bellow can be seen a part of this plan.

Goals were set via our big goals forum and the appointment of a director level champion, consideration of recommendations from our environmental big goals team of five including two directors. Communications topics and content was considered jointly with other SP Businesses and our corporate environment team. Our initial action plan is for three years.

	1	2	3
Introduction to Environmental Big Goal target	Preventing and Managing Environmental Incidents	• Oil/Chemical containment • Material Storage • Communication of environmental footprint from 2010 Corporate Environmental Report.	• Reporting and responding to faults and incidents • Incident review and investigation regarding • Introduction of new shared incident reporting database Cintellate • Trial of PFT location for FFC leaks • Establishment of group Environmental Forum
Energy and Resource Use	Resource and Energy Reductions	• Switch off (energy, water, resource efficiency) • Resource efficiency facts for SP • Housekeeping (Sort it out - house keeping campaign) • Focus within site and systems audits	• Communications campaign highlighting Energy and Waste performance monthly • Highlight to forthcoming Corporate Environmental Report reporting requirements
Progress against targets	• Waste Segregation • World Environment Day	• Minimising travel - SP travel stats • Tele/video conferencing • Awareness of Car free • Options European Mobility Week • Car free day	• Increasing volume of recyclables provided to segregated disposal. • Nuisance - Different types of nuisance, e.g. noise, odour, dust

We implement this view through SPT RIIO-T1 Business Plan:

- Embedded within our plans is our focus on sustainable and environmentally acceptable solutions.
- Our plans maximise the use of existing assets and minimising new build for wider reinforcements reducing overall, environmental footprint.
  - For example, we plan to remove a 20km 132kV line from Galashiels to Eccles benefiting visual impact and local communities.
  - Our plans reflect our experience on Beauly-Denny, Beauly-Denny itself has a commitment to underground (7km) of adjacent overhead line at lower voltages.
  - Delivery of the plan will facilitate connection of a further 2.8GW of renewable capacity accelerating the move from reliance upon carbon based generation.

Throughout the delivery programme we will maintain our commitment to identification of environmental and community impacts, and consultation and communication processes.

4. Business Carbon Footprint Statement

General Carbon Reporting Methodology

The data to complete table 4.10.1 Business Carbon Footprint was compiled in 2011 based upon available data for calendar year 2010 drawn from a number of data reporting sources.

Scottish Power Group has reported carbon emissions at group level for many years and SP Energy Networks has contributed data to that commitment. For that reason most of the datasets used are sourced from the SP Group annual Corporate Social Responsibility report submission and co aligned to calendar year scope. The data sources are verified annually via corporate CSR audit arrangements.

General methodologies are in line with internal corporate procedures for environmental reporting which in turn align with the Greenhouse Gas Protocol and Defra Guidelines.

Source data acquisition relies upon a number of mainly supplier related bulk contract reports principally for air travel, electricity supply, and road transport fuel. Internal activity reports are sourced for other smaller scale or specialist activity measures such as red diesel use, SF6 emissions, business miles driven and network losses. Accuracy is therefore limited to that of the source systems including any rounding and estimation techniques. In practice this excludes any minor ad-hoc purchases of fuels or energy supplies made via local suppliers on a cash or credit card basis.

Several of the datasets are supplied with business unit / location source data allowing alignment to the license where this is the case these have been directly allocated. Where business unit allocation is not pre indicated apportionment factors have been used to subdivide the whole based upon relevant operational profiles.

Emissions for SP Transmission operations have been apportioned from the overall business total and reported separately via RIIO-T1 requirements, in line with developing BCF requirements for transmission.

Carbon conversion constants are stated in Defra / DECC Document - 2010 Guidelines to Defra / DECC's Conversion Factors for Company Reporting. Generally unless stated where relevant Net CV (LHV) constants have been used. Where Net CV values are not appropriate available the constant most appropriate to the available data unit of measure has been selected.

To deliver BCF reporting an internal carbon model delivered Excel spreadsheet has been developed. This provides for;

- Input and classification of the base data sets
- GHG Protocol Scope Classification
- Ofgem BCF table classification
- General type classification
- Unit of measure classification
- Data source classification
- Input of the appropriate conversion constant
- Carbon calculation in kg and Tonnes

- Licence / business unit allocation
- Pivot table analysis outputs by Ofgem table classification

Environmental - SF6 leakage

Sulphur Hexafluoride gas (SF6) is used in the electricity industry as a gaseous dielectric medium for high-voltage circuit breakers, switchgear, and other electrical equipment. However, SF6 is one of the most potent greenhouse gases, with a global warming potential of over 22,000 times that of CO2. Transmission assets which make use of SF6 have various benefits; for example SF6 based switchgear help minimize substation footprint, and the SF6 gas insulated transformers being installed at Dewar Place are essential from a safety standpoint.

Currently we have over 40 tonnes of SF6 gas equipment installed on our transmission network and by the start of RIIO-T1 this will have increased to over 55 tonnes. Over RIIO-T1 we will install new SF6 equipment as part of our load and non-load capital expenditure programmes and in so doing significantly increase our inventory of SF6 to around 90 tonnes by 2020/21. We are therefore very aware of the essential requirement to manage our SF6 inventory in accordance with industry good practice.

Through focussed operational efforts we have driven reductions in the kg of SF6 leakage from the 2007/08 levels. However, in 2010/11 the leakage increased back to 2008/09 levels and we believe that this level represents the expected background level of leakage which cannot be improved without significant investment.

Currently almost all transmission assets have been purchased and installed to IEC specifications which vary up to 3% leakage as design rating. Our current leakage rate at over 1.8% of total installed SF6 gas is on, if not below design standards. In effect, our operating regime is already performing much better than the equipment specification and we have determined that it is not possible to improve the performance further. The only effective method of reasonably operating at a significantly lower target would be a substantial capital programme of asset replacement. Therefore our plans for a flat background leakage profile are appropriate and we believe there is limited scope for further reductions.

Out of our current inventory of SF6 gas, around 50% is located at Torness. In order to reduce our inventory and actual loss of gas, one solution would be to replace this site with a modern equivalent with a lower designed leakage rate. However, based on the current non-traded value of carbon the cost benefit of the saving through reduced SF6 leakage does not justify a £30m asset replacement. This would not be best value for customers, as this site is generally in good condition.

We have forecast our leakage performance over RIIO-T1 based on our existing performance and our planned network investments. For all new assets we have applied the design rating leakage rates which are 1% for indoor equipment and 1.5% for outdoor equipment. Ofgem's intention to introduce an output to prompt transmission companies to take into account the environmental costs of SF6 equipment that have different leakage rates does not appear to take account of the physical realities of the assets.

Our strategy for SF6 emissions therefore has been aligned to Ofgem's view, although we believe that convergence towards Ofgem's proposed best practice leakage of 1% is impossible unless we undertake significant investment, such as at Torness, at sites which are in generally good condition. Ofgem would like to introduce a symmetric incentive based on carbon equivalent emissions and we have therefore assessed the impact of an incentive based on the prevailing non-traded annual carbon price recommended by DECC. We recommend that a neutral position should be based on the agreed targets by weight, as set out in our Business Plan, and we believe that this level sets the right risk balance as it maintains background performance despite an ageing asset base which has an increasing leakage rate.

In terms of Business Carbon Footprint and Losses, Ofgem appear to have reached a sensible conclusion in their final Policy document and the output of this work is factored into our plans.

Notwithstanding the projected increase in population volumes and leakage rates we are committed to containing our SF6 emissions to an absolute minimum over the RIIO T1 period. This will be delivered by ensuring;

- Timely detection and repair of leaks.
- Regular monitoring, review and reporting of leak rates.
- Seeking innovations in detection and repair techniques to reduce leakage duration.
- Supporting international industry research into SF6 alternatives.

Environmental – Broad Environmental Output

The transition to a low carbon economy will bring significant opportunities and challenges for SP Transmission. During RIIO-T1 and beyond ScottishPower Transmission will invest billions of pounds in its network to accommodate a huge increase in new low carbon generation. ScottishPower Transmission will need to manage the uncertainties associated with those new technologies and large investments to deliver timely, good value and sustainable network infrastructure.

The stakeholder working group from Ofgem looking at environmental outputs has discussed how to encourage and reward companies to meet this challenge effectively. The suggestion was to align TO incentives directly with the UK's low carbon energy goals by setting a broad output on TOs' contribution to meeting the UK's renewable energy target.

A broad environmental output is a way to give companies a vested interest in the achievement of the UK's renewable and low carbon targets. It is also linked to the UK's targets and consistent with RIIO's high-level objective of encouraging network companies to play a full role in delivery of a sustainable energy sector.

We recognise the impact of our broad environment a footprint and are already striving in line with Scottish Power and Iberdrola **Big Goals** Initiatives to ensure that these impacts are controls and where possible reduced.

5. Deliverability

One of the main objectives of the new RIIO regulatory framework is to ensure network companies play a full role in delivery of a sustainable energy sector. This includes taking responsibility for the direct impacts of their networks on the environment as well as playing their full role in a low carbon economy. This is reflected in the following categories.

Carbon Issues

We recognise our contribution to carbon emissions and have contributed to the development of reporting systems and provision of reports for many years. We are over the next three years currently refining and developing our reporting systems to allow apportioned reporting of carbon related aspects and impacts. This will in turn support wider identification of performance targets on individual issues. Our current reporting systems are at an early stage of development but will take an integrated approach to measurement and reporting in line with and alongside of current DPCR5 BCF requirements.

Transmission Losses and Operational Buildings Energy Use

We will throughout the period of RIIO-T1 develop the required reporting models and methods to allow development of a deeper understanding of Transmission system losses.

This may focus upon;

- Assessment of cable, iron and other technical losses.
- Assessment of associated carbon emissions.
- Development of carbon options modelling for development projects.

We will gain a deeper understanding of operational buildings energy use and seek best practice technology for new and refurbished buildings.

Non Operational Buildings Energy Use

We are supporting our group wide "Big Goals" programme seeking to reduce carbon emissions group wide by 20%. This includes support for an existing commitment for a 15% reduction over the period 2010 – 2013 in use from a range of 25 AMR metered sites where SPT staff is resident." Once achieved and maintained this is thought to equate to around 30 Tonnes of Co2 for SPT as a subset for the AMR total per annum, This is a tiny percentage of our overall footprint but represents an easily achievable starting point and will also contribute to modest cost reductions.

This will be delivered by coaching best behaviours regarding energy use and where possible enhancement in technology for lighting heating and I.T. systems. Development already includes monthly monitoring of use and staff briefings regarding the goals.

Business Carbon Footprint (BCF)

Ofgem has proposed to electricity and gas transmission companies report annually their carbon dioxide (CO2) equivalent emissions of their BCF. SP Transmission is encouraged

to consider the direct carbon impact of their operations and be proactive in managing these emissions.

The annual report will be based on the emissions reporting methodology introduced for DPCR5 in 2011. A link to our 2010 Distribution BCF report for SP Manweb and SP Distribution can be found in Appendix 1. This report in future developments will also take into account obligations to report on emissions and other outputs under RIIO-T1.

We have are already developed basic Business Carbon Footprint reporting as a combined exercise alongside our distribution networks provisions using CSR reporting data as a baseline. There is scope for improvement within the current provision for improvement in the following areas;

- Measurement and reporting of rail transport.
- Development and inclusion of operational maintenance and construction contractor reporting for significant activities.
- Development and provision of IT systems to ease reporting burdens.
- A combined BCF narrative commentary report for all three Transmission and Distribution systems.
- Enhanced reporting co-operation between distribution and transmission reporting arrangements.

For 2012 we will be developing Credit 360 based carbon reporting systems allowing remote reporting of contractors into data collection systems.

As reporting systems and understanding of our carbon footprint improves, we will seek to integrate carbon reduction and control strategies into asset management policy and programmes over the next decade.

Wider Environmental Protection

Throughout project design, planning, construction we ensure the use of EMS and IMS systems to ensure that environmental impacts are identified and adequate mitigation and control is in place. Also those planning constraints, legal requirements and other technical standards are met, and compliance is monitored, meeting the expectations of Environmental Regulators and other stakeholders. This activity relates to "business as usual" following long established procedures and systems for planning and project delivery.

Transport

Our wider business is currently changing its lease fleet provision which will now include going forward a limited range of lower carbon vehicles as standard and introduction of GPS tracking systems. Electric vehicle provision has been made at our Cambuslang depot location and is now available to SPT operational staff based there.

Local Landscape and Visual Amenity

We already consider local landscape and visual amenity issues via environmental impact assessment arrangements for new and refurbished developments in line with planning

requirements. This will as it already does include possible options for novel design and construction arrangements where requested to better harmonise with local environments. This includes a commitment consultation with local regulators and communities.

Habitat

We already consider habitat via environmental impact assessment arrangements for new and refurbished developments in line with planning requirements. Where there is significant wildlife and habitat issues we consider options for species and habitat management, protection and mitigation. We will always consult with national and local wildlife and habitat regulators, community groups and grantors during the planning phase of developments.

Commitment to Grantors

We already operate within the commitments of a "Grantors Charter" which commits to a range of environmental protection elements when working on third party owned land. This includes agreed land access points, use of vehicles, working near sensitive areas and species and a range of other issues. Our grantors charter is publicly a available via or Energy Networks website which can be found in Appendix 2.

Noise Levels

We already consider noise issues when planning developments, issues such transformer noise levels are considered when planning and delivering developments. This may include for example predictive assessment of the likely noise impacts from transformers and requirements for mitigation. We may also take the opportunity to proactively comment to developers regarding noise when residential or commercial developments are planned which encroach on the noise footprint.

These factors are just a part of continuing commitment to Environmental Planning and Environmental Impact Assessment, Responsible Project Delivery and Transmission Asset Management. It is a key proactive element of project planning and delivery ensuring effective environmental protection, consultation with communities and timely connection of assets.

6. Stakeholder Support

We understand that effective stakeholder engagement is essential to ensure customer satisfaction, as well as to the delivery of our strategic objectives and operational goals. This ongoing engagement, and the specific RIIO-T1 stakeholder engagement, has significantly influenced our Business Plan which we believe balances stakeholder requirements and delivers a sustainable, efficient transmission network for our existing and future customers and significantly contributes to a low carbon society.

Historically, we have always looked to engage effectively with those direct and indirect customers that we provide a service to or are affected by our activities. For example, with respect to Ofgem and government, we actively participate and support the setting of regulatory and energy policy. In particular, we respond to regulatory and industry consultations and ensure we are represented on industry bodies and trade associations.

Under the SO-TO Code we are currently contracted with National Grid as the System Operator to construct over thirty grid connections for various developers. This involves significant stakeholder engagement in tri-partite meetings, and responding to stakeholder contact and requests directly, throughout the entire process of offer, construction and connection. In addition, as part of connection and wider system grid development we undertake continual stakeholder engagement with strategic planning authorities and a broad range of regulatory authorities and other interested parties such as Historic Scotland, National Trust, SEPA, Environment Agency, National Fisheries Scottish Natural Heritage, the Crown Estate, Forestry Commission, Scotland Scottish Water, Coal Authority, RSPB, etc.

Major construction programmes are supported by an appropriate stakeholder engagement. Key stakeholders are identified and assessed for their interest and influence in the delivery of a project. Different communication mechanisms are developed as appropriate to the stakeholder. For example in the Beauly Denny project, a database was established for tracking all contacts and managing each response through to close out. Customers with a generation and/or demand connection to our transmission system have a connection agreement with National Grid. However, our activities in respect of operating, maintaining and extending the network impact these customers and a formal communication route exists through National Grid, but this is supplemented by informal contact with our operations centre at Kirkintilloch.

We have reviewed all our stakeholder interactions in respect of Transmission related activities, identified key stakeholder groupings, developed a contact database, and determined the structure of customer satisfaction and stakeholder engagement surveys on an ongoing basis and to deliver consistent improvements to our customer satisfaction levels we will develop stakeholder engagement strategies specific to each stakeholder group. The key messages from our stakeholder engagement have been considered and grouped to identify specific areas for focussed improvement as follows:

1. Communication to Stakeholders: better, targeted, relevant.
2. New connections: Deliver sustainable low carbon energy through fair, clearer, more accessible processes.

3. Operations: Maintain security of supplies and maximise long term value for end-users through improved network availability and reliability processes.
4. Delivery: minimise environmental impact and mitigate consenting and planning challenges through better stakeholder engagement.

Appendix 1 - Business Carbon Footprint Statement for 2010 SP Distribution and SP Manweb

Our Business Carbon footprint statement for 2010 /11 for SP Manweb and SP Distribution can be found via our Energy Networks website at the link below.

http://www.scottishpower.com/uploads/BusinessCarbonFootprintStatement2010.pdf

Appendix 2 - Grantors Charter

Our grantors charter can be found in English or Welsh via the Energy Networks website at the link below.

http://www.spenergynetworks.com/PublicInformation/grantors.asp