SSEN Transmission criteria for GHG emissions reporting

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1 - About SSEN Transmission

Scottish Hydro Electric Transmission plc (SSEN Transmission), part of the SSE Group, is responsible for the electricity transmission network in the north of Scotland. Operating under the name of Scottish and Southern Electricity Networks, together with our sister companies, Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD), who operate the lower voltage distribution networks in the north of Scotland and central southern England.

As the Transmission Owner (TO) we maintain and invest in the high voltage 132kV, 220kV, 275kV and 400kV electricity transmission network in the north of Scotland. Our network consists of underground and subsea cables, overhead lines on wooden poles and steel towers, and electricity substations, extending over a quarter of the UK's land mass crossing some of its most challenging terrain.

We power our communities by providing a safe and reliable supply of electricity. We do this by taking the electricity from generators and transporting it at high voltages over long distances through our transmission network for onwards distribution to homes and businesses in villages, towns and cities.

2 - Aim of this document

This document details the reporting approach used by SSEN Transmission to report on GHG emissions during the financial year (1 April 2020 to 31 March 2021) as a result of operational activities undertaken by SSEN Transmission.

3 - Organisational boundaries included for this reporting period

There are two methods that are described in the GHG reporting protocol and ISO14064-1:2006 standards: the equity share and control (financial or operational) approaches. An operational control consolidation approach was used to account for emissions.

4 - GHG Reporting Criteria

This section outlines the annual greenhouse gas (GHG) emissions reporting approach used by SSEN Transmission to report the tonnes of carbon dioxide equivalent (CO_2e covers CO_2, CH_4, N_2O, and SF_6) from the Company's operational activities.

The document provides details of the amount of GHG emissions that can be directly attributed to SSEN Transmission operations within the declared boundary and scope for the specified reporting period. The inventory has been prepared in accordance with requirements of the UK Government's environmental reporting guidelines (DEFRA, June 2013); the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (revised edition)* developed by the World Resources Institute and the World Business Council for Sustainable Development (2004); and *ISO 14064-1:2006 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*. Where relevant, the inventory is aligned with industry or sector best practice for emissions measurement and reporting.

This document aims to detail the GHG collection, collation, conversion and reporting process used by SSEN Transmission to report annual GHG emissions.

5.1 - GHG emissions source inclusions

The GHG emissions sources included in this inventory are those required by BEIS reporting standards (https://www.gov.uk/guidance/measuring-and-reporting-environmental-impacts-guidance-for-businesses), GHG Protocol (http://www.ghgprotocol.org/standards/corporate-standard) and ISO14064-1:2006 standards (https://www.iso.org/obp/ui/#iso:std:iso:14064:-1:ed-1:v1:en). GHG emissions are classified, in accordance with these standards, into the following categories:

- **Direct GHG emissions (scope 1):** GHG emissions from sources that are owned or controlled by the company.
- **Indirect GHG emissions (scope 2):** GHG emissions from the generation of purchased electricity, heat and steam consumed by the company.
- **Indirect GHG emissions (scope 3):** GHG emissions that occur as a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Inclusion of other scope 3 emissions sources is done on a case-by-case basis in accordance with the guidance given in the *Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (Supplement to the GHG Protocol Corporate Accounting and Reporting Standard).

The following emission sources from SSEN Transmission's operations are included in the GHG emissions reporting:

The direct GHG emissions (scope 1) cover:

- **Gas consumption in buildings** – this is the gas consumed by SSEN Transmission's non-operational buildings (offices, depots, call centres) to maintain building temperatures.
- **Network fuel consumed** – this includes diesel used to provide backup source of energy to substations in the event of other supplies being unavailable.
- **Company vehicles** – this is the petrol or diesel used by SSEN Transmission's operational vehicles for business activities (operational vehicles are those vehicles that are owned by SSE and used by employees for SSEN Transmission's business activities).
- **Fugitive emissions** – use of sulphur hexafluoride (SF_6) in the transmission network for conductivity (used in the switchgears and substations).

The indirect emissions (scope 2) cover:

- **Electricity consumption in buildings** – this is the electricity consumed by SSEN Transmission's non-operational buildings (customer call centres, offices). This data excludes leased buildings (which represent less than 1% of employees).
- **Electricity consumption in Transmission's Substations** – this is the electricity used by SSEN Transmission's operational buildings (e.g. substations) in the transmission network.

The indirect emissions (scope 3) cover:

- **Transmission losses** – the electricity lost in the SSEN Transmission network (the network between the generator and the distribution company) in the north of Scotland. The transmission of electricity is managed by the network operator, National Grid ESO.
- **Contractor emissions** – emissions from contractors undertaking activities on behalf of SSEN Transmission.
- **Business Travel -** domestic (between UK airports), short haul (international flights to/from UK less than 3,700km, usually to European destinations), long haul (international flights to/ from UK greater than 3,700km, usually to non-European destinations) and international (international flights to/ from non-UK destinations) travel by air, rail and car miles travelled using third party transport (this is vehicles owned and operated by other organisations that SSE employees use to conduct business activities).

The emission sources are explained in detail in Table 2.

Table 1: GHG emissions sources included in the inventory.

The SSEN Transmission management will report all Scope 2 emissions using the market-based methodology provided by the GHG Protocol:

1. Market-based: All electricity purchased is converted to CO_2 using emissions factors from contractual instruments which SSEN Transmission has purchased or entered into.

The SSEN Transmission management will report all Scope 2 emissions using the market-based methodology.

GHG emissions source[1]	*GHG emissions level scope*	*Data source & collection process*	*Data collection unit*	*Uncertainty (description)*
Operational vehicles & plant (diesel) *	Scope 1	Fuel is bought using fuel cards from independent fuel suppliers or dispensed at onsite fuel depot. Fuel card data is provided by independent fuel suppliers to Fleet Services. Fuel cards are reconciled with supplier invoices. Fuel dispensed from onsite depots is recorded and consolidated with fuel dispensed data from the independent suppliers.	litres	

[1] The activity data highlighted with an asterix (*) are also subject to assurance by PwC and this is separate to the carbon emissions assurance completed by PriceWaterhouseCoopers LLP (PwC).

Mobile Plant - Gas Oil *	Scope 1	Fuel purchased is recorded through a fuel card or through purchase of fuel stock – all recorded in fleet database.	litres	
Fugitive emissions (SF_6) *	Scope 1	Transmission engineers record SF_6 top ups and exception events requiring SF_6 top up in the asset management system, Maximo.	kg	
Office Buildings Electricity Use *	Scope 2	Non-operational buildings are classed as offices, depots, warehouses and call centres. Sites are shared with non-SSEN Transmission staff and a percentage of the sites floor space occupancy is used to calculate the usage of SSEN Transmission staff. Most non-operational buildings have automatic electricity meter. Records of electricity use are transmitted through automatic meter readings to Clarity and IMServ. Clarity and IMServ integrates with ESG ecomonitor web based facility where the electricity use is downloaded into an excel spreadsheet. Reconciliation of meter reads is completed with monthly invoices.	kWh	Not all non-operational buildings are on half hourly meters. Some are based on submitted actual meter reading or estimated on billing system. Less than 5% of data points were based on estimates in the reporting period. Data excludes leased buildings with small number of employees (less than 1% of employees).

Gas consumption - non operational buildings *	Scope 1	Non-operational buildings are classed as offices, depots, warehouses and call centres. Sites are shared with non-SSEN Transmission staff and a percentage of the sites floor space occupancy is used to calculate the usage of SSEN Transmission staff. Most non-operational buildings have automatic electricity meter. Records of electricity use are transmitted through automatic meter readings to Clarity and IMServ. Clarity and IMServ integrates with ESG ecomonitor web based facility where the electricity use is downloaded into an excel spreadsheet. Reconciliation of meter reads is completed with monthly invoices.	kWh	Not all non-operational buildings are on half hourly meters. Some are based on submitted actual meter reading or estimated on billing system. Less than 3% of data points were based on estimates in the reporting period Data excludes leased buildings with small number of employees (less than 1% of employees).

Substations Electricity Use *	Scope 2	Most substation electricity consumption is estimated as there are limited meters in place. This is done by classifying the types of consumption and estimating the energy use of using the electrical load of the appliance. This includes establishing that there is a proportional relationship between the numbers or transformers and circuits and energy use at each substation, represented by the formula: Number of Transformers (n) * 57,500 kWh + Number of Transmission circuits connected (n) * 16,800 kWh = Total energy consumption (kWh) This is due to the assumption that larger substations which contain more transmission circuits, and more transformers will be larger consumers of energy due to the likely increased size of the substation building as well as the increased amount of protection and control equipment located at the substation. Within the reporting year 2 substations, Blackhillock and Tummel Bridge had metered data available which were used as the basis of our estimates. Historical data from 2017 and 2018 Loch Buidhe and Braco West was also available which was used as a basis of estimated	kWh	Substations are predominately not metered so their energy consumption is based upon estimates which are based on the size of the substation, electricity capacity and the operation activities of each building through the financial year.

		energy usage across our portfolio of sites. An annual update of our network map is used to confirm the number of substations and transformers connected to each substation.		

Losses (transmission) *	Scope 3	When transferring power across the SSEN Transmission System, some of the power is 'lost' known as 'Transmission Losses'. Figures for transmission losses (kWh) are calculated using standard transmission losses guidance (produced by Elexon) to compute the losses in the transmission system. This data is reported by National Grid as the system operator. They report this figure for the period of July to June to SSE for its assets. The data is verified by an independent third party, WSP, for National Grid. SSEN Transmission collects the following data: • SHET Renewable Generation – Energy generated on SHET network by renewable sources which have zero carbon intensity • SHET Non-Renewable Generation - Energy generated on SHET network by non-renewable sources • SHET-Other Transmission Operator (TO) Boundary Imported Power – Imported power from TO boundary for consumption in SHET network area. Carbon emissions from these sources use the standard BEIS emissions	tonnes CO2e	Based on industry standards for transmission losses

		factors for electricity • SHET-SHEPD Boundary Imported Power – Power imported from grid supply points through the distribution network operator. Carbon emissions from these sources use the standard BEIS emissions factors for electricity. • SHET Total Generation – the total power generated on SHET network area through all sources • SHET Transmission Losses – total transmission losses as provided by the electricity system operator • Non-Renewable Carbon emissions – EU ETS regulatory information for carbon emissions of non-renewable sources Transmission losses (tonnes CO2e) are calculated by the following: SHET Transmission $Imported\ Generation\ Boundary\ Carbon\ Emissions\ (tCO2e)$ = $Imported\ Generation\ Boundary\ Carbon\ Intensity * SHET\ Imported\ Generation\ – Boundary$ SHET $Imported\ Generation\ SHEPD\ Carbon\ Emissions\ (tCO2e)$ = $Imported\ Generation\ SHEPD\ Carbon\ Intensity *$		

		$SHET\ Imported\ Generation\ SHEPD$ SHET $Network\ Carbon\ Intensity$ ($tCO2e/MWh$) = Total emissions / total generation Total emissions are the sum of carbon emissions from generators on SHET Network SHET Transmission Losses Carbon Emissions (tCO2e) = Total losses * SHET $Network\ Carbon\ Intensity$ SHET Transmission Losses $Carbon\ Intensity$ (g$CO2e$/kWh) = Total emissions from losses/ total generation SHET Transmission Losses Carbon Emissions (tCO2e) = Total losses * SHET $Network\ Carbon\ Intensity$		

Scope 3 transmission losses intensity*	Scope 3	Power flows across the SSEN Transmission network are recorded within PI Historian, and are collected annually. Through understanding the direction and generation source of power flowing on the transmission network an intensity of transmission losses can be calculated. SSEN Transmission calculates the intensity of transmission losses with the following formula: SHET Transmission Losses $Carbon\ Intensity$ (g$CO2e$/kWh) = Total emissions from losses / total generation	gCO2e/kWh	SSEN Transmission has no visibility of the carbon intensity of power flowing into its network. For power generated that does is not directly connected to the SSEN Transmission network industry standard BEIS emissions factors are used for electricity.