

SSE's criteria used for GHG emissions reporting

1 Introduction

This document details the annual greenhouse gas (GHG) emissions reporting approach used by SSE plc (SSE) to report the tonnes of carbon dioxide equivalent (CO₂e) during the financial year (1 April 2017 to 31 March 2018) as a result of operational activities undertaken by the SSE Group.

The document provides details of the amount of GHG emissions that can be directly attributed to SSE 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.

2 Aim of this document

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

3 Organisation description

SSE's purpose is to responsibly provide the energy and related services needed now and in the future. It is involved in the generation, transmission, distribution and supply of electricity; energy trading; the development of major renewable energy projects; the extraction, storage, distribution and supply of gas; electrical and utility contracting; data centres and telecoms.

4 Organisational boundaries included for this reporting period

There are two methods that are described in the GHG 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. Figure 1 shows what has been included in the operational approach used to report GHG emissions and Table 1 describes the business units that are within the operational boundary approach.



Figure 1: Organisational structure.

Table 1: Brief description of business units included within the scope of GHG reporting process.

Company/Business Unit	Description
Networks	SSE has an ownership interest in five economically-regulated energy network companies: Scottish Hydro Electric Transmission (100%); Scottish Hydro Electric Power

Company/Business Unit	Description
	<p>Distribution (100%); Southern Electric Power Distribution (100%); Scotland Gas Networks (33.3%); and Southern Gas Networks (33.3%) (collectively known as Scotia Gas Networks) (SGN is excluded from SSE's emissions reporting see section 5).</p> <p>SSE's electricity networks transmit and distribute electricity to around 3.7 million businesses, offices and homes through overhead lines and underground cables. SGN's gas networks distribute gas to around 5.7 million homes, offices and businesses.</p>
Wholesale	<p>SSE is a leading generator of electricity from renewable sources in the UK and Ireland. It provides sustainable energy and related services for wholesale customers through energy portfolio management and electricity generation, gas production and gas storage.</p> <p>Electricity generation Using turbines to convert energy from water, wind, gas, coal, oil and multi-fuel to generate electricity.</p> <p>Energy portfolio management Managing energy procurement and contracts.</p> <p>Gas production Extracting natural gas from fields in the North Sea and west of Shetland, on the outer margins of the Atlantic.</p> <p>Gas storage Playing a role in security of supply by storing natural gas underground in large caverns for future use.</p>
Retail	<p>SSE supplies electricity, gas and related services, to around 8 million household and business customer accounts across Great Britain and the island of Ireland. SSE Retail also incorporates SSE Enterprise, which brings together key SSE services for industrial, commercial and public sector customers.</p>

5 Organisational business units excluded from inventory

SSE has excluded any joint ventures in which it does not have operational control. Below is a list of some of the largest business units excluded from the inventory. For a full list of SSE's subsidiary undertakings, partnerships, joint ventures and associates, please refer to pages 210 to 216 of SSE's Annual Report 2018.

Business	Activities	Reason for Exclusion
Scotia Gas Networks (SGN) Limited	Investment in gas networks	Joint venture
Greater Gabbard Offshore Winds Limited (GGOWL)	Offshore wind generation	Joint venture
SSE E&P UK Limited	Gas exploration and production	Although this company is wholly owned by SSE, it does not hold a controlling stake in any assets.

6 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 SSE operations are included in the GHG emissions reporting:

The direct GHG emissions (scope 1) cover:

- **Generation power stations** – coal, oil, gas and biomass consumed in SSE’s thermal power generation plant (including Power Purchase Agreements) to generate electricity.
- **Gas consumption in buildings** – this is the gas consumed by SSE’s non-operational buildings (offices, depots, call centres) to maintain building temperatures.
- **Distribution network fuel consumed** – this includes diesel and gas oil used by generators and mobile generators to generate electricity to maintain the distribution network.
- **Company vehicles** – this is the petrol or diesel used by SSE’s operational vehicles for business activities (operational vehicles are those vehicles that are owned by SSE and used by employees for SSE business activities).
- **Fugitive emissions** – use of sulphur hexafluoride (SF₆) in the transmission and distribution networks for conductivity (used in the switchgears and substations).

The indirect emissions (scope 2) cover:

- **Electricity consumption in buildings** – this is the electricity consumed by SSE’s non-operational buildings (customer call centres, offices). This data excludes leased buildings (which represent less than 1% of employees).
- **Electricity consumption in networks** – this is the electricity used by substations to manage the transmission and distribution electricity system.
- **Distribution losses** – this is the electricity lost in SSE’s distribution network in the north of Scotland (SHEPD) and southern central England (SEPD) transporting electricity to the customer.

The indirect emissions (scope 3) cover:

- **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).
- **Well to tank emissions** – this is the GHG emissions associated with the extraction, refining and transportation of the raw fuel sources to SSE’s sites before they are used to generate electricity at the power station, as defined by BEIS reporting guidelines.
- **Gas sold to customers** – the amount of gas sold to customers (retail and business customers) that is then used by our customers for heating and power purposes. This figure is calculated by taking the amount of gas sold (millions therms) converting it to kWh and then applying a carbon dioxide conversion factor provided by

BEIS reporting guidelines (<https://www.gov.uk/guidance/measuring-and-reporting-environmental-impacts-guidance-for-businesses>).

- **Transmission losses** – the electricity lost in the SHE 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.
- **Transmission and distribution losses** – this is the transmission and distribution losses (the energy loss that occurs getting the electricity to SSE non-operational buildings from the power plant) associated with the electricity consumed by SSE's non-operational buildings (offices, depots, call centres) and operational buildings (substations). This figure is calculated by taking the scope 2 electricity consumption figure for non-operational buildings and electricity consumption in networks and applying a carbon dioxide conversion factor provided by BEIS reporting guidelines (<https://www.gov.uk/guidance/measuring-and-reporting-environmental-impacts-guidance-for-businesses>). This data is separate to the losses that SSE's transmission and distribution networks report.

The emission sources are explained in detail in Table 2.

Table 2: GHG emissions sources included in the inventory.

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
Generation	Fuel used by power stations to generate electricity – coal, oil, gas and biomass	Scope 1	Fuel used (coal, oil, gas and biomass) is measured through meters and weight tickets and converted using EU ETS guidelines for the calendar year. However, SSE reporting period is from 1 April to 31 March, hence Energy Portfolio Management (EPM) team estimate GHG emissions in the final quarter using the power generation data and composition of the fuel used. The estimation is reconciled annually prior to EU ETS calendar year submission. EPM estimates power station emissions based on known plant activity, closures/ acquisitions and power generation data to estimate emissions and for emissions trading purposes.	kWh	
All business units combined	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	

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All business units combined	Operational vehicles & plant (petrol)	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	Fuel invoices do not include fuel dispensed a few days before the invoice so there is delay in reporting periods however this balances during the year and between financial reporting periods.
All business units combined	Mobile plant (used when substations fail) – gas oil	Scope 1	Fuel purchased is recorded through a fuel card or through purchase of fuel stock – all recorded in fleet database	litres	
Networks – transmission and distribution	Fugitive emissions (SF ₆) – SHE Transmission, SHEPD & SEPD	Scope 1	Transmission and distribution engineers record SF ₆ top ups and exception events requiring SF ₆ top up in the Plant Asset Management Data System (PLACAR). The ENA model gives typical loss rate figure as a result of normal operation.	tonnes	
Networks	Losses (SHEPD & SEPD)	Scope 2	Figures for network losses are calculated using standard distribution losses guidance (produced by Elexon) to compute the losses in the distribution system.	kWh	Based on industry standards for line losses and distribution losses

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
All business units combined	Non-operational building electricity consumption	Scope 2	Non-operational buildings are classed as offices, depots, warehouses and call centres. There are around 200 non-operational sites. 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. Data excludes leased buildings with small number of employees (less than 1% of employees).
All business units combined	Non-operational buildings – gas usage	Scope 1	Non-operational buildings are classed as offices, depots, warehouses and call centres. There are around 200 non-operational sites. Most non-operational buildings have automatic gas meters. Records of electricity use are transmitted through automatic meter readings to Gaspower. Gaspower integrates with ESG ecomonitor web based facility where the gas 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. Data excludes leased buildings with small number of employees (less than 1% of employees).

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
Networks – transmission and distribution	Substations – SHE Transmission, SHEPD & SEPD	Scope 2	<p>Substation electricity consumption is estimated as there are no 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:</p> <ul style="list-style-type: none"> • Space Heaters: Based on multiples of 3kW off peak heating on for 6hrs per day for 4 months of the year in the south and 6 months in the north (only 10% of buildings heated in HV sites). • Panel Heaters: Based on multiples of 0.07kW (only 10% of HV sites with separate lv panels). • Lighting: Based on multiples of 0.2kW, on for 10 days during the year. • Battery-Chargers: Based on multiples of 0.5kW continuous supply to DC standing loads. • Mains powered equipment: Based on 0.5kW continuous supply. • Transformer Coolers: Based on cooler ratings of individual transformers. Substations are assumed to have 2 transformers on average, with coolers in operation for 10 days of the year. • Electrical load has been calculated for each type of substation, using the principles detailed above. The calculated average annual load has then been multiplied by the relevant number of substations giving total figures in kWh 	kWh	Substations are 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.

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
All business units combined	Flights - domestic	Scope 3	Booked through SSE's web based travel booking system, Traveldoo. Flight distances are calculated using world airport codes (www.world-airport-codes) website. Flight distances are in miles and converted to km (using 1.609 conversion factor).	km	The actual flight distance may not always be exactly as standard for the route, the conversion factors used take account of the fact that distances travelled may not be representative of the journey due to changes in flight paths for safety/ weather/ etc. as detailed by CarbonSmart guidance.
All business units combined	Flights – short haul	Scope 3	Booked through SSE's web based travel booking system, Traveldoo. Flight distances are calculated using world airport codes (www.world-airport-codes) website. Flight distances are in miles and converted to km (using 1.609 conversion factor).	km	
All business units combined	Flights – long haul	Scope 3	Booked through SSE's web based travel booking system, Traveldoo. Flight distances are calculated using world airport codes (www.world-airport-codes) website. Flight distances are in miles and converted to km (using 1.609 conversion factor).	km	
All business units combined	Flights – international	Scope 3	Booked through SSE's web based travel booking system, Traveldoo. Flight distances are calculated using world airport codes (www.world-airport-codes) website. Flight distances are in miles and converted to km (using 1.609 conversion factor).	km	
All business units combined	Train	Scope 3	Booked through SSE's web based travel booking system, Traveldoo. Train distances are calculated using the AA route planner. Train distances are in miles and converted to km (using 1.609 conversion factor).	km	

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
All business units combined	SSE & SEC Cars (petrol and diesel)	Scope 3	Claims made through expenses system for business purposes using employees own cars or car ownership scheme (COS) cars. The mileage relates to the date the miles were claimed. The mileage claim data is uploaded into TM1 expense system. Distances are in miles and converted to km (using 1.609 conversion factor).	km	
Generation	Fuel purchased – coal, oil, gas and biomass for generation of electricity	Scope 3	Fuel purchased during the financial year (coal, oil, gas and biomass) is measured through meters and weight tickets and converted into kWh using standard industry recognised conversion factors or supplier specific factors.	kWh	Fuel purchased (coal and oil) may not necessarily be used in the year or reporting as there are on-site storage for these fuels.

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
Retail	Gas sold to customers	Scope 3	<p>Gas volumes are based on settlements data published by Xoserve. SSE receives an allocation of the settlements data based on the total amount of gas used by the local distribution zone based on its portfolio of customers. This number covers both domestic and business customers (industrial and commercial).</p> <p>To calculate the domestic usage values, the monthly demand totals are divided by the mid-month customer number and then totalled for the financial year to give the total energy sold to customers.</p> <p>The carbon emissions are calculated by taking the scope 3 gas sold to customers figure and applying the carbon dioxide conversion factor provided by BEIS reporting guidelines.</p>	Millions therms	In line with gas settlement industry standard, gas reported contains a portion of unidentified gas supplied. This is to ensure total supply matches demand for the UK gas delivery.
Transmission and distribution losses for electricity use	Electricity use in non-operational buildings	Scope 3	This is the transmission and distribution losses (the energy loss that occurs getting the electricity to SSE non-operational buildings from the power plant) associated with the electricity consumed by SSE's non-operational buildings (offices, depots, call centres). This figure is calculated by taking the scope 2 electricity consumption figure for non-operational buildings and applying a carbon dioxide conversion factor provided by BEIS reporting guidelines.	kWh	

<i>Business unit</i>	<i>GHG emissions source</i>	<i>GHG emissions level scope</i>	<i>Data source & collection process</i>	<i>Data collection unit</i>	<i>Uncertainty (description)</i>
Transmission and distribution losses for electricity use	Electricity use in substations	Scope 3	This is the transmission and distribution losses (the energy loss that occurs getting the electricity to SHE Transmission, SEPD and SHEPD substations from the power plant) associated with the electricity consumed in SHE Transmission, SEPD and SHEPD substations. This figure is calculated by taking the scope 2 substation electricity consumption and applying a carbon dioxide conversion factor provided by BEIS reporting guidelines.	kWh	
Transmission	Losses (National Grid)	Scope 3	<p>When transferring power across the SHE Transmission System, some of the power is 'lost' known as 'Transmission Losses'.</p> <p>Figures for transmission losses are calculated using standard transmission losses guidance (produced by Elexon) to compute the losses in the transmission system.</p> <p>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 figure is for the previous financial year as a result of the timing of the data capture process. This means for the financial year 1 April 2017 to 31 March 2018 the data will be based on the previous financial year July 2016 to June 2017. The data is verified by an independent third party, WSP, for National Grid.</p>	kWh	Based on industry standards for transmission losses

7 GHG conversion factors

To calculate all the fuel sources into GHG emissions the BEIS UK conversion factors spreadsheet developed by CarbonSmart is downloaded annually from BEIS website - <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>. The following conversion factors are applied to each source of emissions (table 3).

For the Fuel Used by generation the emissions are calculated by the power stations and converted using the EU ETS guidelines. This is then verified by independent third parties and evidence submitted to regulators in accordance with EU ETS legislation.

Table 3: GHG emissions conversion factors source.

Activity	Conversion Factor source	Category of emission factor used
Generation	EU ETS statements	As per EU ETS categories
Operational vehicles & plant (diesel)	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Fuels
Operational vehicles & plant (petrol)	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Fuels
Mobile plant – gas oil	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Fuels
Fugitive emissions (SF ₆) – SHE Transmission, SHEPD & SEPD	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Refrigerant & other
Fuel combustion – for mobile and fixed generation on distribution networks (diesel) – SHEPD & SEPD	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Fuels
Losses (SHE transmission, SHEPD & SEPD)	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	UK electricity
Non-operational building electricity consumption	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	UK electricity and overseas electricity
Non-operational buildings – gas usage	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Fuels
Substations – SHE transmission, SHEPD & SEPD	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	UK electricity

	conversion-factors-for-company-reporting	
Flights - domestic	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Business travel - air
Flights – short haul	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Business travel – air
Flights – long haul	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Business travel – air
Flights – international	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Business travel – air
Train	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Business travel – land
SSE & SEC cars (petrol & diesel)	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Passenger vehicles
Transmission and distribution losses for electricity use in non-operational buildings	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Transmission and distribution
Transmission and distribution losses for electricity use in SHE Transmission, SEPD and SHEPD substations	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Transmission and distribution
Well to tank emissions for fuel purchased for generation	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	WTT - fuels
Gas sold to customers	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	Fuels

8 GHG emissions source exclusions

Emissions sources in Table 3 have been identified and excluded from the GHG emissions inventory.

Table 3: GHG emissions sources excluded from the inventory

Business unit	GHG emissions source	GHG emissions level scope	Reason for exclusion
	Operational vehicles on the island of Ireland	Scope 1	Minimal
	Bus travel	Scope 3	Bus not used for business travel
	Taxi travel	Scope 3	Minimal – taxis only taken on short journeys – distances not logged.
	Hire Car Travel	Scope 3	Minimal
	Boat and helicopter travel	Scope 3	Minimal
	Electricity consumption in residential property, leased buildings and generation sites	Scope 2	Minimal
	Gas consumption in residential property, leased buildings and generation sites	Scope 1	Minimal
	Waste to Landfill	Scope 3	Minimal
	Water & Waste Water	Scope 3	Minimal
	Fugitive emissions of methane from Gas Storage venting	Scope 1	Minimal
	SF ₆ from Generation switchgear and embedded distribution	Scope 1	Minimal
	Well to tank emissions from other fuel use in operations that is not related to generation activities	Scope 3	Minimal

9 GHG emissions calculations and results

GHG emissions for the organisation are calculated in excel spreadsheet 'Appendix 1' where they are stated by greenhouse gas, by scope, by business unit and as total emissions.