

# SSE - Climate Change 2018

## C0. Introduction

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### C0.1

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#### **(C0.1) Give a general description and introduction to your organization.**

About SSE: SSE plc is one of the UK and Ireland's leading energy companies, involved in the generation, transportation and supply of electricity and in the extraction, storage, transportation and supply of gas. Its purpose is to responsibly provide the energy and related services needed now and in the future. Its vision is to be a leading provider of energy and related services in a low-carbon world. Its strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. SSE supports the drive towards decarbonisation of the economy, electrification of transport and modernisation of critical infrastructure, it does so with a commitment to maintaining and growing a range of complementary businesses that have energy and related services at their core.

Planned SSE Energy Services Transaction: On 8 November 2017, the Board of Directors of SSE plc announced it had entered into an agreement with Innogy SE in respect of a proposed demerger of SSE's household energy and services business in Great Britain (now named SSE Energy Services) and immediate combination of that business with innogy SE's subsidiary npower to form a new independent UK-based group. The planned SSE Energy Services transaction will create an efficient new independent energy supply and services business and help create a new market model by combining the resources and experience of two established players with the focus and agility of an independent supplier. This transaction is subject to necessary shareholder and regulatory approvals, but it is designed to renew the remaining SSE business in a way that will bring benefits to SSE and to energy customers.

A Focused Strategy: SSE's renewed strategy will focus on creating value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. This means being focused on earning returns for shareholders and making a positive economic, social and environmental contribution to the countries in which it operates; being efficient in developing, owning and operating infrastructure and related services and being agile in creating and securing value from them; and maintaining a range of complementary business activities with a depth of insight into a core sector and doing things responsibly. As SSE changes over the years to come, it will remain focused on improving energy infrastructure for the future; committed to being a transparent, responsible company that makes good decisions for the long-term; and guided by the SSE SET of values (Safety, Service, Efficiency, Sustainability, Excellence and Teamwork).

A New Business Model: Networks and renewable generation will be core to the 'NEW' SSE business, with flexible thermal generation also having a key role. SSE will also continue to maintain and grow a range of complementary businesses that

have energy and related services at their core. The needs of energy customers will continue to be SSE’s key focus. SSE’s four key businesses:

1. Retail (demerger proposed): SSE supplies energy and other services to the GB household market through SSE Energy Services, a wholly owned subsidiary formed in early 2018 in preparation for the proposed demerger with npower. Retailing domestic electricity and gas to GB households and providing energy-related products and services to GB households.
2. Retail (to remain in SSE): Energy supply business, supplying electricity and gas to business, commercial and public sector organisations across GB; Energy supply (SSE Airtricity) supplying energy and related services to customers across the island of Ireland; and Enterprise providing innovative energy solutions to business and the public sector.
3. Networks: SSE is the sole-owner of three economically-regulated electricity network licensees that are jointly operated under the brand of Scottish and Southern Electricity Networks (SSEN). The three networks are:
  - Scottish Hydro Electric Transmission plc which owns the high voltage network in the north of Scotland.
  - Scottish Hydro Electric Power Distribution plc which owns the low voltage network in the north of Scotland.
  - Southern Electric Power Distribution which owns the low voltage network in central southern England.
 SSE also has an ownership interest in gas distribution in Scotland and southern England. These businesses are regionally defined and subject to regulatory controls set by Ofgem.
4. Wholesale: Electricity generation using turbines to convert energy from water, wind, gas, coal, oil and multi-fuel to generate electricity; Energy portfolio management managing energy procurement and contracts; Gas production extracting natural gas from fields in the North Sea and west of Shetland, on the outer margins of the Atlantic; and Gas storage playing a role in security of supply by storing natural gas underground in large caverns for future use.

## C0.2

**(C0.2) State the start and end date of the year for which you are reporting data.**

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	April 1 2017	March 31 2018	No	<Field Hidden>
Row 2	<Field Hidden>	<Field Hidden>	<Field Hidden>	<Field Hidden>
Row 3	<Field Hidden>	<Field Hidden>	<Field Hidden>	<Field Hidden>
Row 4	<Field Hidden>	<Field Hidden>	<Field Hidden>	<Field Hidden>

## C0.3

**(C0.3) Select the countries/regions for which you will be supplying data.**

Ireland  
United Kingdom of Great Britain and Northern Ireland

## **C0.4**

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**(C0.4) Select the currency used for all financial information disclosed throughout your response.**

GBP

## **C0.5**

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**(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.**

Operational control

## **C-EU0.7**

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**(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.**

Row 1

### **Electric utilities value chain**

Electricity generation

Transmission

Distribution

### **Other divisions**

Gas storage, transmission and distribution

Smart grids / demand response

Gas extraction and production

## **C1. Governance**

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### **C1.1**

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**(C1.1) Is there board-level oversight of climate-related issues within your organization?**

Yes

#### **C1.1a**

**(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	Climate-related issues are material to the energy industry, and climate-related risks and low-carbon opportunities have a direct impact on SSE's business strategy and its ability to achieve its business objectives. For example, government support for different low-carbon generation technologies and the requirements of the GB and Irish electricity grids in the transition to low-carbon electricity systems, both impact SSE's strategy and the investment decisions it makes. SSE's Chief Executive has ultimate responsibility for the management of climate-related issues, through the delivery of SSE's strategy, as set by the SSE plc Board. SSE's Chief Executive is a member of the SSE plc Board and, in this role, one of their defined responsibilities is 'proposing and delivering strategy as agreed by the Board'.
Board/Executive board	The SSE plc Board has responsibility for the management of climate-related issues through the setting of SSE's strategy. Climate-related risks and opportunities have a direct impact on SSE's business strategy and its ability to achieve its business objectives. When setting the Group strategy direction, the Board considers all material influencing factors including those relating to climate change. The Board also has responsibility for reviewing the effectiveness of SSE's Risk Management Framework and approves any emerging risks or additional material changes to the 10 Group Principal Risks. Climate change and its impacts are considered throughout SSE's Group Principal Risks. The Board has overall responsibility for determining the nature and extent of the risk it is willing to take and for ensuring that risks are managed effectively across the Group. At 31 March 2018, the Board comprised the Chairman, Chief Executive, Finance Director, Wholesale Director and six Non-Executive Directors
Board/Executive board	The Safety, Health and Environment Advisory Committee (SHEAC) is one of the four sub-Committees to the SSE plc Board, and advises the Board on matters relating to safety, health and environment. Climate change is considered a material environmental matter to SSE so therefore comes under the SHEAC's remit. The SHEAC is responsible for reviewing and monitoring the implementation of SSE's Environment and Climate Change Policy. It is made up of three Non-Executive Directors of the SSE plc Board and three Senior Executives from within the business.

**C1.1b**

**(C1.1b) Provide further details on the board's oversight of climate-related issues.**

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	<ul style="list-style-type: none"> <li>Reviewing and guiding strategy</li> <li>Reviewing and guiding major plans of action</li> <li>Reviewing and guiding risk management policies</li> <li>Reviewing and guiding annual budgets</li> <li>Reviewing and guiding business plans</li> <li>Setting performance objectives</li> <li>Monitoring implementation and performance of objectives</li> <li>Overseeing major capital expenditures, acquisitions and divestitures</li> <li>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</li> </ul>	<p>The SSE plc Board meets around 7 times a year and has a formal schedule of matters reserved to it for determination or delegation. In relation to strategy and management, these include approval and review of: Group strategy and business development initiatives; annual operating and capital expenditure budgets; and performance against Group strategy, objectives, business plans and budgets. Matters concerning major transactions are also reserved to the Board, including those around acquisitions or disposals of interests, and capital and revenue expenditure of Group companies of a strategic nature. SSE's 2017/18 investment and capital expenditure, agreed by the Board, was over £1.5bn, around 70% of which was in electricity networks and renewables. When setting Group strategy, the Board considers material influencing factors, including climate-related ones. The Board is responsible for reviewing effectiveness of SSE's Risk Management Framework, and approves emerging risks and material changes to the 10 Group Principal Risks. Climate change and its impacts are considered throughout the Principal Risks. The Executive Committee implements Group strategy set by the Board. It drives climate-related performance programmes across the company. Along with its sub-Committees, it is responsible for overseeing SSE's Group Principal Risks and annual reviews of the effectiveness and appropriateness of the controls, detailed analysis of monitoring information and comprehensive scenario impact analysis. Any resulting emerging risks or material changes resulting from this process are proposed to the Board for approval. The Executive Committee is supported on climate-related issues by its Group Safety, Health and Environment Committee, as well as through support from SSE's Managing Director of Corporate Affairs and Sustainability. Climate-related issues are also managed within each business unit. The Board has reviewed the sustainability strategy, which includes climate-related issues, annually. In 2017/18, a review of SSE's climate change disclosure, reporting and performance was conducted and the Board agreed actions to report against TCFD recommendations and set carbon targets beyond 2020. Both the Executive Committee and the Board monitor on a regular basis the key contributing performance indicators that support overall group targets that tackle climate change.</p>

## C1.2

**(C1.2) Below board-level, provide the highest-level management position(s) or committee(s) with responsibility for climate-related issues.**

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	Half-yearly
Chief Sustainability Officer (CSO)	Both assessing and managing climate-related risks and opportunities	Half-yearly
Other committee, please specify (Group Executive Committee) <i>Group Governance, Culture &amp; Controls Committee</i>	Both assessing and managing climate-related risks and opportunities	Annually
Other committee, please specify (Safety, Health and Environment Committee)	Both assessing and managing climate-related risks and opportunities	Quarterly

## C1.2a

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored.**

### **Where in the organizational structure this position(s) and/or committee(s) lie:**

The Chief Executive has overall lead responsibility for sustainability issues, including climate change, and is a member of the Board, Executive Committee and a regular attendee of the SHEAC. In discharging his responsibilities in relation to climate change, and reporting to the Board on these matters, the Chief Executive is advised and assisted by:

- relevant committees within SSE's governance structure, including: the SHEAC (of which the Chief Executive is a member and which reports to the Board); the Group Executive Committee (of which the Chief Executive is a member and which reports to the Board); and the Group Safety, Health and Environment Committee (SHEC) (reports to the Group Executive Committee); and
- senior management, including: SSE's Managing Director (MD) of Corporate Affairs and Sustainability (equivalent of Chief Sustainability Officer and C-Suite position) and who reports to the Chief Executive; and SSE's Director of Sustainability (who reports to the MD of Corporate Affairs and Sustainability). The Board considers climate-related issues annually through the approval of SSE's Sustainability Strategy, with other climate-related issues being considered as and when required as advised by: the Chief Executive Officer; MD of Corporate Affairs and Sustainability; or Director of Sustainability. The Group Executive Committee also considers climate-related on a standing basis annually, with other climate-related issues being

considered as and when required as advised by: the Chief Executive Officer; MD of Corporate Affairs and Sustainability; or Director of Sustainability. The SHEAC and SHEC consider climate-related issues in line with their Terms of Reference.

### **Why responsibilities for climate-related issues have been assigned to this/these position(s) or committee(s)**

The Board is responsible for setting the strategic direction of SSE; the implementation of which is overseen by the Group Executive Committee which is led by the Chief Executive. As climate change is an issue material to SSE's strategy, both the Board and the Chief Executive have a responsibility to oversee climate-related issues. In addition, the Board has overall responsibility for determining the nature and extent of the risk it is willing to take, and for ensuring that risks are managed effectively across the SSE Group - climate change and its impacts are considered through the Principal Risks. The Group Executive Committee is responsible for managing and mitigating these risks (where climate change features). The MD Of Corporate Affairs and Sustainability is responsible for: the function of Group Strategy which considers and monitors climate-related issues in the context of strategic development; and overseeing external reporting, which includes non-financial disclosures such as those in relation to climate change.

### **Specific responsibilities with regard to assessment and management of climate-related issues:**

The Board considers material influencing factors when setting Group strategy direction, including those relating to climate change. The Group Executive Committee and its 11 sub-Committees has responsibility for driving climate-related performance programmes across the organisation. It does this primarily through the SHEC which governs safety, health and environmental management, including climate-related issues. The Executive Committee and sub-Committees have responsibility for overseeing SSE's 10 Group Principal Risks. The sub-Committees are responsible for undertaking an annual review of their assigned Principal Risk. The outputs from these committee assessments are then presented to the Executive Committee for full review, with any emerging risks or additional material changes resulting from this being proposed to the Board for approval. The committees that have oversight of Group Principal Risks with identified climate-related material influencing are: - Executive Committee: 'Development and Change', influenced by climate change and the necessity to generate the energy required in a responsible and sustainable way; and 'Energy Infrastructure Failure', influenced by severe adverse weather that causes damage or interrupts energy supply/ generation. - SHEC: 'Safety and the Environment', influenced by adverse weather. The Board and these committees are supported by the MD of Corporate Affairs and Sustainability, who is responsible for driving sustainability performance across the organisation and reports progress on sustainability activities to the Board and SSE's stakeholders. They identify specific sustainability issues arising from SSE's responsibilities to its customers, communities, employees and shareholders, and develop policy in line with the values agreed by the Board. SSE's most material sustainability issues, incorporating economic, social and environmental impacts, are managed by its sustainability function.

## C1.3

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**(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?**

Yes

### C1.3a

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**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.**

**Who is entitled to benefit from these incentives?**

Chief Executive Officer (CEO)

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction target

**Comment**

Part of the remuneration for SSE's Executive Directors is determined by their performance against the Annual Incentive Plan (AIP). The AIP award is determined by performance against both financial metrics and non-financial performance. An element of the non-financial performance is performance against SSE's six values, one of which is sustainability. Performance against climate-related issues is a key component of SSE's sustainability performance.

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**Who is entitled to benefit from these incentives?**

Board/Executive board

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction target

**Comment**

The Annual Bonus scheme for Executive Directors was based on personal objectives, which included the achievement of sustainability targets and goals (which includes climate and environment related targets and goals).

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**Who is entitled to benefit from these incentives?**

Corporate executive team

**Types of incentives**

Monetary reward

**Activity incentivized**

Other, please specify (Achievement SSE's sustainability value)

**Comment**

The executive team are awarded incentive payments connected with the achievement of a variety of targets, including sustainability. NB: Activity incentivised is reported as Other: Achievement of SSE's sustainability value.

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**Who is entitled to benefit from these incentives?**

Chief Sustainability Officer (CSO)

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction target

**Comment**

There are several managers in SSE whose jobs are directly related to sustainability management (which includes climate change objectives and targets), and therefore their salary and any incentive (monetary and non-monetary) is linked to the fulfilment of these sustainability related personal targets.

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**Who is entitled to benefit from these incentives?**

All employees

**Types of incentives**

Monetary reward

**Activity incentivized**

Other, please specify (Achievement SSE's sustainability value)

**Comment**

Annual appraisals for all SSE employees are based around its 6 core values, one of which is sustainability. Individual performance is assessed and has implications on whether annual incremental pay rises and/ or bonuses are given. NB: Activity incentivised is reported as Other: Achievement of SSE's sustainability value.

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**Who is entitled to benefit from these incentives?**

All employees

**Types of incentives**

Recognition (non-monetary)

**Activity incentivized**

Emissions reduction target

**Comment**

Better Off is SSE's energy and water campaign, working with staff to highlight and adopt positive behaviours and develop a 'switch off' culture both at work and at home. As part of this campaign, SSE has a target to reduce carbon emissions from energy use in non-operational buildings by 18% by 2017/18. A network of Energy Champions, made up of SSE employees, is helping to share the Better Off messages with colleagues and act as a local source of advice on energy reduction measures.

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**Who is entitled to benefit from these incentives?**

Management group

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction project

**Comment**

There are several managers in SSE whose jobs are directly related to environmental management and climate change, and therefore their salary and any incentive (monetary and non-monetary) is linked to the fulfilment of environment and climate change related personal targets.

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## C2. Risks and opportunities

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### C2.1

**(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.**

	From (years)	To (years)	Comment
Short-term	0	3	SSE's time horizons for assessing climate-related risks and opportunities are aligned with other business practice time horizons. The three climate related time horizons mirror the investment/capital and regulatory time horizons that govern our financial, operational and capital plans. SSE's short-term horizon for assessing climate-related risks and opportunities is 0 to 3 years. This is influenced by the viability assessment of the company. Each year, in line with the requirements within provision C.2.2 of the UK Corporate Governance Code and as part of the risk assessment process, the Board assesses the prospects of the Company over the next 3 financial years. It is through this process that SSE determines its

	From (years)	To (years)	Comment
			Group Principal Risks. Material influencing factors are considered when reviewing Group Principal Risks including those relating to climate change. The Directors have determined that as this time horizon is consistent with the Group's current capital programme and is within the strategy planning period, a greater degree of confidence over the forecasting assumptions modelled can be established.
Medium-term	4	12	SSE's medium-term horizon for considering climate-related risks and opportunities is 4 to 12 years (to 2030). This is influenced by work done by the Committee on Climate Change (CCC), which is an independent, statutory body set up to monitor the UK's progress towards meeting targets set out in the Climate Change Act 2008 and to ensure emissions targets are set based on expert independent assessment of the evidence. The Act requires the Government to set legally-binding, five-yearly carbon budgets, twelve years in advance, from 2008 to 2050, to act as stepping stones towards these targets. In relation to the power sector, the CCC has estimated that the average grid intensity of electricity generated in 2030 should be between 50 and 100 gCO <sub>2</sub> /kWh. It has recommended that the UK Government provide a longer-term view of future low-carbon power auctions to support an emissions intensity below 100 gCO <sub>2</sub> /kWh by 2030. The carbon budgets and the CCC's recommendations both impact policy makers' time horizons, which in turn provides a framework for SSE's business planning. An example of SSE using this target in its planning is through the setting of its new, longer term carbon intensity target: to reduce the carbon intensity of the electricity it produces by 50% by 2030, based on 2018 levels. A key influencing factor in SSE adopting this target year to work towards was the guidance from the CCC of what the average grid intensity of electricity generated in 2030 should be in order to meet UK emission reduction targets. In addition to this, within this medium-term time horizon, the end of Ofgem price control periods for both electricity transmission and electricity distribution regulatory settlements fall (2021 for transmission and 2023 for distribution). These price control periods are currently in 8-year blocks, albeit there are proposals to reduce this to 5 years, meaning that the planning for future price control periods will take place within this medium-term horizon.
Long-term	13	30	Many of SSE's assets have a lifetime that exceeds 20 years, therefore SSE naturally has a long-term business outlook. The long-term horizon runs beyond 13 years and is focused on the trends and scenarios that may shape the future energy system, including climate-related policy, markets, technology and weather/climate impacts. The period from 2030 and beyond, is the period where there is far less clarity or certainty around the market and policy. Nevertheless, it is possible for SSE to understand and consider a number of permutations of both opportunities and threats it may face in that period, which are detailed within SSE's Post-Paris report, which assessed the resilience of SSE's business models to various warming scenarios (see more detail in C3.1d). As part of work undertaken for Post-Paris, SSE has undertaken scenario analysis for the long-term horizon. Three scenarios were established by using publicly available data from National Grid's Future Energy Scenarios which forecasts energy scenarios out to 2040 and SSE projected these out to 2050 using the same assumptions.

## C2.2

**(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.**

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

## C2.2a

**(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.**

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	The Board is responsible for the overall system of risk management and internal control. It directly sets the Group Risk Management and Internal Control policy and reviews risk management performance at SSE on an ongoing basis. The SHE Committee supported by the Board's SHE Advisory Committee oversee environment and safety risks. Group Principal Risks are continuously assessed with mitigating actions implemented where necessary. Material influencing factors are considered when reviewing Group Principal Risks including those relating to climate change, customer expectations and technological developments. SSE has 10 Group Principal Risks and climate change (the physical impacts of climate change, international and national agreements around climate change and the need for low-carbon generation) materially influences the following risks: Commodity Prices; Development and Change; Energy Infrastructure Failure; Politics, Regulation and Compliance and Safety and the Environment.

## C2.2b

**(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.**

How SSE defines substantive financial/strategic impact:

The Board of Directors has ultimate responsibility for the effectiveness of SSE's management of risk. SSE defines risk as any event or circumstance which has the potential to threaten the achievement of its objectives or compromise its SSESET values.

SSE's Risk Management Framework (RMF) identifies and evaluates risk at both a Group and divisional level (including assets) by considering, controlling and monitoring the impact of risks against the achievement of SSE's strategic objectives. SSE's RMF involves a comprehensive Principal Risk Self-Assessment process being implemented through the Group Executive Committee and its sub-committees. This includes a full review of the Group Principal Risks (defined as those that could threaten its business model, future performance, solvency or liquidity), associated controls and monitoring information, and an assessment of emerging risks to the Group. Climate change and its impacts are considered throughout SSE's Group Principal Risks.

SSE's Executive Committee and relevant sub-committees are assigned oversight of each of SSE's Group Principal Risks. The Group Risk department works with the Managing Directors (MDs), Executive Committee and Executive Sub-Committees on an ongoing basis to develop and improve risk management tools and processes, to ensure that business level risks are identified, managed and regularly reviewed, and that risk reporting to the Board, Audit Committee and Executive Committee is in line with Corporate Governance Code requirements.

Climate-related identification/assessment, company level:

Group-level risks and opportunities are identified through the RMF. Strategic risks and opportunities are identified, evaluated, reviewed by the Board and reported in SSE's Annual Report and its annual Group Principal Risk Report. Climate change and its impacts are considered throughout SSE's Group Principal Risks. For example, international and national agreements on climate change, such as the 2015 Paris Agreement, is considered a material influencing factor in both the 'Commodity Prices' and 'Politics, Regulation and Compliance' Group Principal Risks.

Climate-related risk identification/assessment, asset level:

Each of SSE's divisional MDs implements a Divisional Risk Approach to identify and manage key risks. Climate-related impacts and risks will be considered in this approach where appropriate. E.g. an increasing frequency of flooding events arising from climate change can cause a significant challenge to SSE's Networks and Wholesale divisions in the management of infrastructure and delivery of the Group's major projects. SSE has crisis management and business continuity plans to deal with severe weather events that can damage energy infrastructure.

Process for assessing size/ scope of identified climate-related risks:

SSE's RMF ensures that all risks, including climate-related risks, are identified, assessed, evaluated, recorded, monitored and reviewed to understand the impact on the business. As part of the ongoing assessment of the Group's Principal Risks, Key Risk Indicators are reported to SSE's various oversight committees on a regular basis. During the third quarter of SSE's financial year, an assessment of each Principal Risk is completed by the assigned oversight committee. This requires committee members to provide commentary on contextual changes to the risks and whether they consider them to have become more/less material during the year. Responses are consolidated into reports, one for each Principal Risk, and presented back to the committees along with the results of provisional viability testing and analysis of relevant, current management information and key information relating to interconnecting risks.

Determining significance of climate-related risks in relation to other risks:

The Board and Executive Committee assess Group Principal Risks. A suite of severe but plausible scenarios is developed for each risk. These scenarios are based on relevant real life events that have been observed either in the markets within which the Group operates or related markets globally. Examples include persistently low commodity prices ('Commodity Prices' Principal Risk) and changes to key government energy policies ('Politics, Regulation and Compliance'). Analysis relating to reverse stress testing is also included. Scenarios that most have the potential to adversely affect SSE's ability to deliver its

core purpose are stress tested against forecast available financial headroom. In addition to considering these in isolation, the Directors also consider the cumulative impact of different combinations of scenarios, including those that individually have the highest impact and those that are most heavily interconnected with SSE's other Principal Risks. In SSE's 2017/18 Group Principal Risk Report, a matrix maps the Group Principal Risks (low to high risk) against potential impact on Group viability.

## C2.2c

### (C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	SSE faces risks from changes in obligations arising from operating in markets in the UK and Ireland which are subject to a high degree of regulatory, legislative and political intervention or uncertainty. The climate-related risks and opportunities relating to current regulation are identified through the Group Principal Risk review process for the 'Politics, Regulation and Compliance' Principal Risk. International and national agreements such as the 2015 Paris Agreement on Climate Change have been identified as a material influencing factor on the 'Politics, Regulation and Compliance' Principal Risk. Climate Change legislation (UK Climate Change Act 2008 and Irish Government's National Mitigation Plan) impacts financial, strategic and operational decisions. The risks and opportunities to SSE in relation to the impact of current legislative frameworks is in terms of its financial and strategic decisions around renewables investments, operation of thermal assets and development of new infrastructure. For example, the UK Climate Change Act 2008 sets out the framework for managing climate change issues in the UK. This is supported through the Electricity Market Reform Act 2013 using Contracts for Difference (CfD), Carbon Price Support and Capacity Market mechanisms to deliver the goals of the legislation. In October 2017, the UK Government announced that £557m will be available for future CfD auctions for less established technologies, including offshore wind. SSE has expertise in offshore wind and is developing Dogger Bank (up to 3.6GW) and Seagreen (phase 1 up to 1,050MW) to potentially enter the next CfD auction. The risk SSE faces is that key off-shore developments fail to succeed in any CfD auction, thereby risking the viability of the projects. SSE seeks to mitigate this risk through robust project governance frameworks to ensure the most competitive bids as possible are constructed. The future of CfD auctions impacts on SSE's electricity networks too as it determines the scale and locations of future new generation plant that requires to be connected to the grid. Uncertainty over the medium-term on the future scale, shape and timing of new generation plant is determined by policy and lack of certainty means system planning can be more difficult.
Emerging regulation	Relevant, always included	SSE faces risks from changes in obligations arising from operating in markets in the UK and Ireland which are subject to a high degree of regulatory, legislative and political intervention or uncertainty. The climate-related risks and opportunities relating to emerging regulation are identified through the Group Principal Risk review process for the 'Politics, Regulation and Compliance' Principal Risk. International and national agreements such as the 2015 Paris Agreement on Climate Change have been identified as a material influencing factor on the 'Politics, Regulation and Compliance' Principal Risk. Climate Change legislation (UK Climate Change Act 2008 and Irish Government's National Mitigation Plan) has the potential to impact the strategy, finance and investment decisions that are made by

	Relevance & inclusion	Please explain
		<p>SSE. The risks and opportunities SSE faces in relation to the impact of emerging legislative frameworks is in terms of its financial and strategic decisions around renewables investments, operation of thermal assets and development of new infrastructure. For example, the UK Climate Change Act 2008 sets out the framework for managing climate change issues in the UK. This is regulated through the Electricity Market Reform Act 2013 using the Contracts for Difference (CfD), Carbon Price Support and Capacity Market mechanisms to deliver the goals of the Acts. In February 2018, the UK Government received State Aid clearance from the European Commission to enable wind projects on the remote islands of Scotland to compete in the next CfD auction alongside other less established technologies. This impacts SSE's decision on its future pipeline of renewable projects on the islands of Scotland and SSE awaits confirmation of the treatment of remote islands projects in the next allocation round of the CfD auction. This ongoing uncertainty presents risks to the ability of SSE to meet the expectations of its stakeholders, particularly the island communities themselves. The announcement also impacts on SSE's electricity transmission business which is the Transmission Operator in the north of Scotland. Over the last 18 months SSE's transmission business has been focused on delivering the transmission infrastructure required to connect these renewable energy customers.</p>
Technology	Relevant, always included	<p>The climate-related risks relating to technology are identified through the Group Principal Risk review process for the 'Development and Change' and 'Major Projects Quality' Principal Risks. SSE's 'Development and Change' Principal Risk, highlights that SSE faces the risk of failing to recognise and react appropriately to competition, technological advancements and changes in customer expectations. Climate change and the necessity to generate energy in a sustainable way is identified as a material influencing factor on this Principal Risk. SSE's 'Major Projects Quality' Principal Risk highlights that SSE faces the risk of the major assets that it builds not meeting the quality standards required to support economic lives of typically 15 to 30 years. New or unproven technology is identified as a material influencing factor on this Principal Risks. Technology is a relevant risk because there are a number of the types of technologies that SSE' Wholesale, Networks and Retail businesses rely on to deliver their business objectives, in particular in relation to development of assets that generate renewable energy, or allow intermittent renewable generation to connect to the grid. The reason why technology is included in SSE's risk reviews is because technology has the potential to impact the strategy, finance and investment decisions that are made by SSE. For example, technology risk is relevant to Scottish and Southern Electricity Networks (SSEN), both in transmission and distribution networks. These businesses are central to supporting the transition to a low-carbon electricity system – connecting clean energy, supporting electrification of transport and facilitating change as local 'system operators' – and require significant modernisation and reform. SSEN's distribution businesses in the north of Scotland and central southern England are leading the industry through a number of high impact innovation and demonstration projects. The risk is that SSEN fails to adapt quickly enough to changed patterns of electricity demand and supply, and that customer expectations are not met. That is why SSEN has a deliberate strategy to take a leadership position within the electricity networks industry with innovative demonstration projects that enable far greater levels of flexibility.</p>
Legal	Relevant, always included	<p>SSE faces risks from changes in obligations arising from operating in markets in the UK and Ireland which are subject to a high degree of regulatory, legislative and political intervention or uncertainty. The climate-related risks</p>

	Relevance & inclusion	Please explain
		and opportunities relating to emerging regulation are identified through the Group Principal Risk review process for the 'Politics, Regulation and Compliance' Principal Risk. International and national agreements such as the 2015 Paris Agreement on Climate Change have been identified as a material influencing factor on the 'Politics, Regulation and Compliance' Principal Risk. Climate Change legislation (UK Climate Change Act 2008 and Irish Government's National Mitigation Plan) has the potential to impact the strategy, finance and investment decisions that are made by SSE. Compliance is core to securing SSE's legitimacy as a provider of energy. There are different levels of legal risk relating to climate change. The first is the risk of not meeting existing legislative requirements, for example the current Emissions Performance Standard. This risk is considered low because SSE has a transition plan where no electricity generation from coal will occur after 2025. However, a greater risk might be where carbon targets across the country are failing to be met heightening the risk of new legislation implemented in a less orderly way and meaning that industry participants, including SSE, are unable to develop transition pathways in an orderly manner.
Market	Relevant, always included	SSE 'Commodity Prices' Group Principal Risk highlights that SSE faces risks associated with the Group's exposure to fluctuations in both the physical volumes and price of key commodities, including electricity, gas, CO2 permits, oil and related foreign exchange values. International and national agreements such as the 2015 Paris Agreement on Climate Change have been identified as a material influencing factor on this Principal Risk. SSE's 'Energy Affordability' Group Principal Risk highlights that SSE faces risks from the combination of the cost of providing reliable and sustainable energy and the level of customers' incomes means that energy becomes unaffordable to a significant number of SSE's customers. This risk is directly connected to political interventions and commodity price exposure. Public policies, including those aimed at reducing carbon emissions and energy consumption is identified as a material influencing factor on this Principal Risk. Market forces are a relevant risk because there are a number market forces that impact on SSE's wholesale, retail and transmission/ distribution activities in the countries in which SSE operates and invests (i.e. UK and Ireland), which have the ability to influence the capital, operational and financial decisions of the company and the markets in which it operates. For example, offshore wind represents an opportunity for SSE to deliver its own decarbonisation ambitions and contribute to the achievement of the UK's and Ireland's carbon targets. The Crown Estate and the Crown Estate Scotland have signalled their intent to make new seabed rights available to offshore wind developers to ensure new projects can start to operate from the late 2020s. SSE is following this process closely to prepare for potential new offshore wind leasing in the form of extensions and new sites. The risk to this opportunity is the highly competitive nature of the growing offshore wind industry. The CfD auctions to date are proven to be highly competitive resulting in aggressive cost reductions. SSE's strategy to mitigate this risk is to bear down on its own costs at the same time as developing very large projects in joint ventures with key strategic partners.
Reputation	Relevant, always included	Reputational risk is not considered a risk in its own right, however impacts are evaluated and 'Reputation' is used as an indicator in the risk assessment process. Climate-related reputational risks arise as a result of not managing and responding appropriately to the other climate-related risks highlighted in this table. For example, there is a public and political consensus on the need to address climate change, evident through international support for the 2015 Paris Agreement. SSE publicly supports the aims of the Paris Agreement. SSE has also publicly announced its new, longer term carbon ambition: to reduce the carbon intensity of the electricity it generated by 50% by 2030, based on

	Relevance & inclusion	Please explain
		2018 levels. Failure to take action to meet this ambition could result in reputational damage to SSE for a number of SSE's key stakeholders, including society, shareholders, and government and regulators – especially in the context of the growing public support for tackling climate change.
Acute physical	Relevant, always included	SSE's 'Energy Infrastructure Failure' Group Principal Risk highlights that SSE faces the risk of national energy infrastructure failure, whether in respect of assets owned by SSE or those owned by others which SSE relies on, that prevents the Group from meeting its obligations. Severe adverse weather that causes damage or interrupts energy supply or generation is identified as a material influencing factor on this risk. In addition to this, weather associated seasonal fluctuations in demand, supply and generation capabilities – which may or may not be in line with historical trends both in GB and across Europe – is highlighted as a material influencing factor on the 'Commodity Prices' Principal Risk. Severe adverse weather that causes damage or interrupts energy supply or generation can impact the Group's ability to meet its business objectives and influences investment decisions made. For example, SSE's Networks business is at risk of the impacts of severe adverse weather events which can result in flooding of substations and/or damage to overhead lines. In late February/early March 2018, SSE's Network's business was impacted by severe weather conditions when a cold wave, named the 'Beast from the East', combined with Storm Emma to bring high winds and significant snowfall to the UK and Ireland. Power needed to be restored to over 22,500 customers in its central southern England network region.
Chronic physical	Relevant, always included	SSE's 'Energy Infrastructure Failure' Group Principal Risk highlights that SSE faces the risk of national energy infrastructure failure, whether in respect of assets owned by SSE or those owned by others which SSE relies on, that prevents the Group from meeting its obligations. Severe adverse weather that causes damage or interrupts energy supply or generation is identified as a material influencing factor on this risk. In addition to this, weather associated seasonal fluctuations in demand, supply and generation capabilities – which may or may not be in line with historical trends both in GB and across Europe – is highlighted as a material influencing factor on the 'Commodity Prices' Principal Risk. Long-term changes in climate have the potential to impact SSE's ability to meet its obligations. For example, changes in climate could impact SSE's ability to produce electricity from its wind and hydro generation assets, which would impact on SSE's Wholesale business. Changes in climate could also impact the amount of gas and electricity used by customers which would affect SSE's Retail business. SSE's Networks business is at risk of the impacts of changes in climate, including severe adverse weather events which can result in flooding of substations and/or damage to overhead lines. It would also need to adapt its approach to operation and investment in infrastructure to meet the change in electricity generation and consumption patterns as a result of long-term changes in climate.
Upstream	Relevant, sometimes included	SSE relies on its supply chain to deliver major projects and ensure it operates successfully. A significant proportion of SSE's expenditure with suppliers supports large capital projects, which enable the generation of low-carbon energy or the connection of low-carbon generation to the grid. Many of these projects are in remote areas which are subject to harsh weather conditions in the north of Scotland. Severe adverse weather as a result of changes in climate can impact the ability of SSE's suppliers to deliver these projects in a timely manner, which could impact

	Relevance & inclusion	Please explain
		SSE's ability to meet its objectives. In addition, like SSE, some of its suppliers may face similar climate-related political, regulatory and compliance risks, which may impact their ability to deliver their products/services for SSE.
Downstream	Relevant, sometimes included	SSE defines risk as any event or circumstance which has the potential to threaten the achievement of its business objectives or compromise its values. By definition, SSE's ten Group Principal Risks have the potential to impact on SSE's customers as they have the potential to impact the achievement of SSE's business objectives and its delivery of its obligations. SSE's customers are primarily impacted through climate-related aspects of the two Group Principal Risks: 'Energy affordability' and 'Energy Infrastructure Failure'. Impacts on SSE's customers are considered in the 'Energy Affordability' Group Principal Risk, which highlights that SSE faces risks from the combination of the cost of providing reliable and sustainable energy and the level of customers' incomes means that energy becomes unaffordable to a significant number of SSE's customers. This risk is directly connected to political interventions and commodity price exposure. Public policies, including those aimed at reducing carbon emissions and energy consumption are identified as a material influencing factor on this Principal Risk. For example, the cost of government levies (which support things such as carbon reduction initiatives and renewable energy projects) in the GB energy market increase the cost of energy customers' bills, which impacts on the affordability of energy for SSE's customers. SSE has long been an advocate for these to be collected through general taxation. SSE's 'Energy Infrastructure Failure' Group Principal Risk highlights that SSE faces the risk of national energy infrastructure failure, whether in respect of assets owned by SSE or those owned by others which SSE relies on, that prevents the Group from meeting its obligations. Severe adverse weather that causes damage or interrupts energy supply or generation is identified as a material influencing factor on this risk, which can impact on SSE's ability to provide energy to its customers. In addition to this, weather associated seasonal fluctuations in demand, supply and generation capabilities – which may or may not be in line with historical trends both in GB and across Europe – is highlighted as a material influencing factor on the 'Commodity Prices' Principal Risk, which is closely linked to energy affordability for SSE's customers.

## C2.2d

### **(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.**

The achievement of SSE's strategic objectives necessarily involves taking risk, but SSE will only accept risk where it is consistent with its core purpose, strategy and values; is well understood and can be effectively managed; and offers commensurate reward. SSE's Group Executive Committee and sub-committees undertake an annual review of SSE's Principal Risks. The review requires committee members to comment on contextual changes to risks and whether they consider them to have become more or less material during the year. The committees discuss and confirm risk trend, overall effectiveness of risk control and monitoring environment, and whether any additional actions are required to improve controls. Climate change and its impacts on the Principal Risks is considered where relevant. This process highlights material influencing factors, key developments, and key mitigations SSE is taking in relation to each risk. Transition: SSE's key

mitigation action taken against changes in obligations due to international and national agreements on climate change is its strategy to reduce the carbon intensity of its electricity generation, which is also an opportunity. The Climate Change Act 2008 provides the framework to decarbonise the energy sector in the UK. Renewable energy investment aligns with SSE's strategy to support the transition to a low-carbon electricity system. SSE expects to increase its installed renewable energy capacity to over 4.2GW by 2020, from about 3.8GW in 2017/18. Physical: SSE's key mitigation action taken against severe adverse weather that causes damage or interrupts energy supply or generation, is investment in maintenance and upgrading of networks assets, and having crisis management and business continuity plans in place across the Group. SSE also continues to invest in a diverse range of generation assets, representing an opportunity as it can continue to serve in the public interest and remunerate investment made by shareholders despite short/long-term climate changes.

## **C2.3**

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**(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes

### **C2.3a**

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**(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.**

**Identifier**

Risk 1

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type**

Physical risk

**Primary climate-related risk driver**

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

**Type of financial impact driver**

Reduced revenues from lower sales/output

**Company- specific description**

Fluctuation in weather patterns reducing the generation output achieved from SSE's renewables assets: Much of what SSE does is affected by the weather, therefore it is an important contributor to SSE's business performance. Weather affects production of renewable energy, the operation of the electricity transmission and distribution networks, and the amount of gas

and electricity SSE's energy customers use. One of the most material impacts that weather can have is fluctuations in weather patterns impacting adversely on the output of SSE's hydro-electric and wind generation assets. SSE has hydro-electric generation assets across the north of Scotland, and onshore wind farms across the UK and Ireland (with the majority of installed capacity in Scotland). Weather associated seasonal fluctuations in generation capabilities is already a factor identified through SSE's Risk Management Framework, and there is the possibility that climate change could exacerbate these seasonal fluctuations, as well as impact longer term trends in weather patterns. The risk facing SSE is that lower levels of wind and rainfall could reduce the output from SSE's wind and hydro assets which could result in a reduction in revenue.

**Time horizon**

Long-term

**Likelihood**

Likely

**Magnitude of impact**

Medium

**Potential financial impact**

100000000

**Explanation of financial impact**

The risk facing SSE is that lower levels of wind and rainfall could reduce the output from SSE's wind and hydro assets which could result in a reduction in revenue (financial impact driver: reduced revenues from lower sales/ output). An illustrative figure for the potential financial impact is from extreme variability in weather patterns impacting on generation output which in turn impacts revenues, this is estimated to be around £100 million. This figure represents a worst-case scenario of a combination of the worst year of hydro generation output and the worst year of onshore wind generation output from the past decade coinciding. The calculation is based on differences between average and lowest outputs over the last 10 years combined with reasonable assumptions for forward power prices. This weather risk is a perennial feature of risk for SSE as the largest generator of renewable electricity in the UK and Ireland.

**Management method**

SSE monitors short- and long-term weather conditions so that it can manage and respond to conditions for the benefit of customers and to support the fulfilment of its business objectives. This includes: determining short-, medium- and long-term wind forecasts and the electricity generation output from renewable generation assets; and assessing how rainfall patterns could impact SSE's hydro-electric generation output and storage capabilities. In addition, SSE has a meteorological team to enable us to plan and respond to weather related events across the business.

**Cost of management**

250000

## Comment

Costs are incorporated into ongoing stakeholder engagement activities, strategy, maintenance, asset monitoring and investment programmes. One element of these costs is the monitoring/forecasting of weather by SSE's meteorological team. The cost of management of weather is in the region of £250,000. However, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, the majority of which was in renewable generation. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn.

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## Identifier

Risk 2

## Where in the value chain does the risk driver occur?

Direct operations

## Risk type

Physical risk

## Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

## Type of financial impact driver

Other, please specify (Reduced revenue through adverse impacts)

*Other: Reduced revenue through adverse impact of severe weather on assets/operations*

## Company- specific description

Exceptional weather events impacting on SSE's assets: Severe adverse weather events, such as storms and flooding, that cause damage or interrupt energy supply or generation is a key risk to SSE's business as it can impact the Group's ability to meet its business objectives and influences investment decisions made. For example, SSE's Networks (SSEN) business is at risk of the impacts of severe adverse weather events which can result in flooding of substations and/or damage to overhead lines and cause power supplies to customers to be disrupted. In late February/early March 2018, SSE's Network's business was impacted by severe weather conditions when a cold wave, named the 'Beast from the East', combined with Storm Emma to bring high winds and significant snowfall to the UK and Ireland.

## Time horizon

Short-term

**Likelihood**

Very likely

**Magnitude of impact**

Low

**Potential financial impact**

7000000

**Explanation of financial impact**

The potential financial impact is hard to determine, the primary impact is to SSE's customers (from loss of power) and SSE's reputation which impacts SSE's revenue. An illustrative example of the financial impact is the loss of income to SSEN's business from the Interruption Incentive Scheme (IIS). The RIIO-ED1 price control, incentivises the electricity distribution business on its performance against the loss of electricity supply through the recording of Customer Interruptions and Customers Minutes Lost, which include both planned and unplanned supply interruptions, which is part of the IIS. In 2017/18, SSEN's business IS income fell from £13.9m to £6.8m. This was largely due to an unusual and sustained pattern of weather in southern England leading to pockets of unplanned supply interruptions that did not qualify under Ofgem's 'exceptional event' definition. This loss of IIS income was < 1% of total revenue from electricity distribution for SSEN in 2017/18.

**Management method**

To mitigate the impact of severe weather events, SSE monitors short-term weather conditions so it can manage and respond for the benefit of customers and fulfilment its business objectives. SSE has crisis management/ business continuity plans to deal with severe weather events that can damage energy assets. These were successfully implemented in Feb & March 2018 in response to the "Beast from the East" cold weather front that presented challenges for the UK's energy system. Power was restored to over 22,500 customers in its central southern England network region. SSEN is committed to providing a safe and secure electricity supply and to minimising unplanned interruptions, which requires a continuous programme of investment in the electricity network. This includes the refurbishment/ reinforcement of assets; upgrades to automation which reduces the number of customers affected and the duration of faults; minimise the impact of tree related damage; as well as investments in new innovative technologies. It also runs the Resilient Communities Fund which supports communities in its network areas, with the cost of adaptation initiatives and emergency response procedures. By monitoring weather to inform strategic placing of employees and resources, SSEN ensures it is well prepared/resourced to respond promptly to any damage.

**Cost of management**

20000000

**Comment**

Costs are incorporated into ongoing stakeholder engagement activities, strategy, maintenance and investment programmes. One example of the cost to management is the investment in tree cutting (which is fundamental to the ongoing maintenance

of SSE's assets). In 2017/18, the cost of tree cutting was £20m and this represents a reasonable proxy for the cost of management risk. However, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSEN's adjusted capital expenditure and investment across its networks distribution businesses was over £326m, with capital and investment expenditure of around £1.7bn planned for 2018/19 (around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects). Over the five years to March 2023, based on existing plans, SSE expects capital and investment expenditure to total around £6bn.

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### **Identifier**

Risk 3

### **Where in the value chain does the risk driver occur?**

Direct operations

### **Risk type**

Transition risk

### **Primary climate-related risk driver**

Policy and legal: Other

### **Type of financial impact driver**

Policy and legal: Write-offs, asset impairment, and early retirement of existing assets due to policy changes

### **Company- specific description**

The long-term outlook for SSE's gas generation assets: As the UK and Ireland transition to a low-carbon economy, there has been a significant increase in intermittent renewable generation. The public policy framework that supported this growth in renewables impacted SSE directly making it the largest renewable energy operator (by installed capacity) in the UK and Ireland. However, this policy framework also impacts SSE's thermal generation portfolio. The increase in intermittent renewable generation requires more flexibility from generators able to meet demand when renewable output is low (particularly during winter demand peaks when there is little solar generation and wind generation output is variable). This is identified as a priority area by government and regulators to ensure security of supply throughout UK and Ireland. In the short- to medium-term, gas generation is replacing coal to provide both base load and flexibility. The importance of highly efficient gas generation as a transition technology is well documented. SSE has 5.3GW of installed gas- and oil-fired generation, the vast majority of which is gas-fired generation. Much of SSE's existing Combined Cycle Gas Turbine (CCGT) portfolio will move towards the end of its natural life during the 2020s and SSE announced its intention in May 2018 to invest £350m in a new CCGT power station at Keadby, Lincolnshire, which will use state-of-the-art technology, making it the most efficient on the UK power system, and making a significant contribution to securing Britain's electricity supplies through the 2020s. The Committee on Climate Change (CCC) has highlighted the importance of carbon capture and storage (CCS)

technology in helping the UK to achieve its carbon targets. SSE has 10 years' experience of working towards commercial demonstration of CCS technology in the UK and endorses the CCC's view of its long-term importance. However, the longer term risk is that in the absence of an economically feasible method of CCS, the output of unabated gas plants may need to be curtailed if the UK is to meet its carbon targets. It is not certain that this will result in a financial impact as the output of any electricity generation plant is determined by market scarcity and the role it plays in the overall electricity system. Nevertheless, risks surround the operation of unabated gas plants in the 2030s.

**Time horizon**

Long-term

**Likelihood**

Unlikely

**Magnitude of impact**

Medium-low

**Potential financial impact**

**Explanation of financial impact**

The potential financial impact is undetermined in the medium- to long-term due to the fluctuations in customer demand, importance of security of supply and the increasingly renewable/intermittent nature of the UK grid as renewable energy makes up a larger proportion of the electricity generation capacity. It is important to note that much of SSE's existing thermal generation portfolio will be moving towards the end of its natural life in the course of the 2020s. There is the expectation that to ensure security of supply and respond to the increasingly intermittent nature of the grid arising from higher renewable energy capacity, that gas capacity will remain at around the same level as it is today however that the role of stations in the electricity system will change and that output from the gas-fired generation will reduce over time. SSE's investment in the new Keadby 2 CCGT represents 6% of forecast Capex until 2023.

**Management method**

To manage this risk, SSE Wholesale continues to invest in a diversified generation portfolio of renewable and thermal generation assets, in order to reduce the impact of policy and regulation changes on any one element of its generation fleet. For example, the majority of SSE's £458m adjusted capital expenditure and investment in Wholesale during 2017/18 was in renewable generation, and it has also announced its intention in May 2018 to invest £350m in a new Combined Cycle Gas Turbine power station at Keadby. It also maintains diversity through the role of its Energy Portfolio Management (EPM) business, responsibilities of which include: procuring fuel required by the generation plants that SSE owns or has a contractual interest in; and selling the power output from this plant. EPM seeks to manage the impact of policy, economy, customer and infrastructure demand and world events by maintaining a diverse and well balanced portfolio of contracts, trading positions and assets in the short-, medium- and long-term. SSE also engages directly with stakeholders on key

regulations. For example, SSE has been engaging with UK and Irish Governments, European Commission, Members of European Parliament and others on low-carbon policy. During these discussions, SSE supports a Carbon Price Floor, the EU ETS, Levy Control Framework and other legislation that supports a move towards a low-carbon economy, with gas providing an important role in the security of supply.

### **Cost of management**

#### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities, Energy Portfolio Management, strategy and maintenance and investment programmes. In addition, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, the majority of which was in renewable generation but which also includes maintenance of existing thermal plants and gas production. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn.

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### **Identifier**

Risk 4

### **Where in the value chain does the risk driver occur?**

Direct operations

### **Risk type**

Transition risk

### **Primary climate-related risk driver**

Technology: Unsuccessful investment in new technologies

### **Type of financial impact driver**

Technology: Capital investments in technology development

### **Company- specific description**

Increase in local distributed generation challenging the role of SSE's existing transmission infrastructure: In the UK, BEIS and Ofgem have set a clear direction in the recent Smart Systems Plan that prioritises a customer-led energy system in which network users who operate Distributed Energy Resources (DER) can trade local energy and flexibility with ease. The Scottish Government has also set a target of 1GW of community and locally owned energy by 2020 and 2GW by 2030. Meeting these ambitions will result in a significant increase in distribution connected energy generation. In addition, decarbonisation in the UK over recent years has led to a reduction in the thermal generation plant on the system and now the vast majority of

generation connected to SSEN's transmission network is variable renewable generation. These power stations provided essential services to the system operator to ensure system security but with fewer of them to provide these services, DER will need to be enabled to support system operation. The existing model of a high voltage national grid capable of transmitting large volumes of power over large distances was created to deliver power to homes from large generating stations. In the case of significantly expanded local and distributed generation, the risk facing SSEN is the need for grid-level infrastructure, such as its transmission network, could be questioned. It is plausible, but unlikely, that with increased distributed generation in the 2040s, transmission networks are not needed in the same way they are now. While the impact of this risk would be high, there is a very low likelihood of it materialising. The nature of SSEN's transmission assets in the north of Scotland, where 90% of the power transmitted is from renewable sources, provides some protection. The key feature of renewables is that there are no ongoing fuel costs, and power is generated when the wind blows and the rain falls. That means it is unlikely that these assets will not continue to make an important contribution to securing electricity supplies in GB even in the case of a dramatic shift towards distributed generation. It is also unlikely that most areas in GB would be able to maintain security of supply, particularly through the winter without access to and use of the national grid and transmission-connected generation.

#### **Time horizon**

Medium-term

#### **Likelihood**

Unlikely

#### **Magnitude of impact**

Medium-high

#### **Potential financial impact**

#### **Explanation of financial impact**

The potential financial impact of this risk is difficult to determine. SSE's Networks business is economically regulated and key strategic investments in transmission infrastructure are made following a robust process with the regulator Ofgem, where a needs case is made and the investment will only proceed if the need case is agreed. The Regulated Asset Value (RAV) of SSEN's Transmission network in 2017/18 was £3.07bn, the business is on track to increase this to around £3.6bn by the end of the current Price Control period in 2021. It is plausible, however unlikely, that with increased distributed generation in the 2040s, the transmission networks are not required in the same way they are today.

#### **Management method**

SSEN recognises it must adapt system planning to consider whole system implications of changes at the distribution level. This will ensure the optimum solution is identified, whether this requires investment on the transmission system, distribution system, or provision of services from flexibility markets. The use of future energy scenarios (FES) in the system planning process is increasingly important, with SSEN's transmission business using scenario planning to understand likely future

network requirements. While National Grid's provides guidance in the use of FES, SSEN has recognised that developments on its transmission network in the north of Scotland do not fit a GB standard. To address this, it is developing localised FE S with increased granularity in the assumptions based on its local knowledge, which will allow it to best meet customers' needs. This should allow SSEN to identify the range of potential requirements on its transmission network and to identify the least regret investments. In 2016, SSEN's transmission development team introduced a regional network development approach which considers existing generation and demand, as well as connections activity at both transmission and distribution level. These regional dashboards are regularly updated to capture changes and developments that will affect SSEN's investment plans. This regional approach captures whole system development and has already led to investment deferral to reduce the risk of stranded assets.

### **Cost of management**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities, strategy and maintenance and investment programmes. In addition, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSEN's transmission networks capital expenditure was over £434m. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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### **Identifier**

Risk 5

### **Where in the value chain does the risk driver occur?**

Direct operations

### **Risk type**

Transition risk

### **Primary climate-related risk driver**

Technology: Unsuccessful investment in new technologies

### **Type of financial impact driver**

Technology: Capital investments in technology development

### **Company- specific description**

A dramatic increase in uptake of electric vehicles (EVs), which has potential to overwhelm electricity distribution networks: Distributed generation, demand side response, energy storage and, most particularly, electric vehicles are transforming the energy system, giving customers access to new products and services from a new range of providers. SSEN's Distribution business will need to complete a transition from a traditional Distribution Network Operator (DNO) to a Distribution System Operator (DSO) – moving from simply managing a physical asset (the distribution network) to actively managing the flows of energy around the network, e.g. demand, generation and other flexible distributed energy resources, to get the maximum value out of that asset. A key aspect of the transition to a smart, flexible electricity system is the electrification and decarbonisation of transport. Whilst the number of EVs on SSEN's network is currently estimated to be 25,000, it is expected to grow rapidly in the coming years in response to ambitious targets set by the UK and Scottish Governments to phase out petrol and diesel vehicles by 2040 and 2032 respectively. National Grid's 2018 Future Energy Scenarios (FES) report estimates a maximum potential for 38.5 million EVs in Britain by 2050, increasing significantly from 25 million estimated by the same year in its 2017 FES report. SSEN is undertaking work to prepare for this transition, however, if the uptake in EVs takes place at a pace which is dramatically higher than expected in the current models, this could pose challenges to SSEN's distribution networks. The risk is that a disorderly transition to EVs could overwhelm SSEN's distribution network, as investment in adapting to EVs and the transition to DSO may not have time to be implemented effectively. This could increase the costs of reinforcement of the network and the response to the smart, flexible revolution.

**Time horizon**

Medium-term

**Likelihood**

Unlikely

**Magnitude of impact**

Medium-high

**Potential financial impact**

**Explanation of financial impact**

The potential financial impact of this risk is difficult to determine. The financial implication of a disorderly transition to electrification of transport has the potential to be considerable, resulting in increased costs of reinforcing the network. SSEN continues to undertake a major capital investment delivery programme across its electricity distribution networks which will deliver significant improvements for customers. This includes the refurbishment and reinforcements of assets; upgrades to automation, reducing the number of customers affected and the duration of faults; minimising impacts of tree related damage; and investments in new innovative technologies. During 2017/18, SSEN's adjusted capital expenditure and investment across its networks distribution businesses was over £326m. It continues to progress innovation through Ofgem funded structures, and in 2017/18 had secured over £95m in regulatory funding for innovation projects since 2010.

### **Management method**

SSEN is managing this risk in the short-term by staying close to emerging models and behaviour patterns around the uptake of EVs. It seeks to take a leadership role in understanding and sharing challenges the sector may face, to anticipate and prevent problems before they arise. As part of this work, SSEN's My Electric Avenue project monitored the impact EV charging had on the electricity network. Its findings will help safeguard, maintain and develop smarter networks, to provide a secure electricity network to cope with increasing EV usage in the future. This included overcoming the potential risk posed by 'clustering', which could cause issues on electrical networks long before large-scale adoption of EVs in the UK takes place. SSEN has also launched a consultation on Managed Electric Vehicle Charging, seeking views on proposed solutions to help avoid potential overloads on local electricity networks caused by sharp increases in the use of EVs. In the longer-term, SSEN will manage this risk through a well-managed transition from DNO to DSO. In November 2017, SSEN published its 'Supporting a Smarter Electricity System' report, outlining the principles it will adhere to in its transition to a DSO. Alongside the report, SSEN launched a public consultation on its transition, in order to engage with stakeholders and to achieve a phased transition that is customer focused, cost efficient and collaborative with other stakeholders in the industry.

### **Cost of management**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities, strategy and maintenance and investment programmes. In addition, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSEN's adjusted capital expenditure and investment across its networks distribution businesses was over £326m. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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### **Identifier**

Risk 3

### **Where in the value chain does the risk driver occur?**

Direct operations

### **Risk type**

Transition risk

### **Primary climate-related risk driver**

Policy and legal: Other

**Type of financial impact driver**

Policy and legal: Write-offs, asset impairment, and early retirement of existing assets due to policy changes

**Company- specific description**

The long-term outlook for SSE's gas generation assets: As the UK and Ireland transition to a low-carbon economy, there has been a significant increase in intermittent renewable generation. The public policy framework that supported this growth in renewables impacted SSE directly making it the largest renewable energy operator (by installed capacity) in the UK and Ireland. However, this policy framework also impacts SSE's thermal generation portfolio. The increase in intermittent renewable generation requires more flexibility from generators able to meet demand when renewable output is low (particularly during winter demand peaks when there is little solar generation and wind generation output is variable). This is identified as a priority area by government and regulators to ensure security of supply throughout UK and Ireland. In the short- to medium-term, gas generation is replacing coal to provide both base load and flexibility. The importance of highly efficient gas generation as a transition technology is well documented. SSE has 5.3GW of installed gas- and oil-fired generation, the vast majority of which is gas-fired generation. Much of SSE's existing Combined Cycle Gas Turbine (CCGT) portfolio will move towards the end of its natural life during the 2020s and SSE announced its intention in May 2018 to invest £350m in a new CCGT power station at Keadby, Lincolnshire, which will use state-of-the-art technology, making it the most efficient on the UK power system, and making a significant contribution to securing Britain's electricity supplies through the 2020s. The Committee on Climate Change (CCC) has highlighted the importance of carbon capture and storage (CCS) technology in helping the UK to achieve its carbon targets. SSE has 10 years' experience of working towards commercial demonstration of CCS technology in the UK and endorses the CCC's view of its long-term importance. However, the longer term risk is that in the absence of an economically feasible method of CCS, the output of unabated gas plants may need to be curtailed if the UK is to meet its carbon targets. It is not certain that this will result in a financial impact as the output of any electricity generation plant is determined by market scarcity and the role it plays in the overall electricity system. Nevertheless, risks surround the operation of unabated gas plants in the 2030s.

**Time horizon**

Long-term

**Likelihood**

Unlikely

**Magnitude of impact**

Medium-low

**Potential financial impact**

**Explanation of financial impact**

The potential financial impact is undetermined in the medium- to long-term due to the fluctuations in customer demand, importance of security of supply and the increasingly renewable/intermittent nature of the UK grid as renewable energy makes up a larger proportion of the electricity generation capacity. It is important to note that much of SSE's existing thermal generation portfolio will be moving towards the end of its natural life in the course of the 2020s. There is the expectation that to ensure security of supply and respond to the increasingly intermittent nature of the grid arising from higher renewable energy capacity, that gas capacity will remain at around the same level as it is today however that the role of stations in the electricity system will change and that output from the gas-fired generation will reduce over time. SSE's investment in the new Keadby 2 CCGT represents 6% of forecast Capex until 2023.

### **Management method**

To manage this risk, SSE Wholesale continues to invest in a diversified generation portfolio of renewable and thermal generation assets, in order to reduce the impact of policy and regulation changes on any one element of its generation fleet. For example, the majority of SSE's £458m adjusted capital expenditure and investment in Wholesale during 2017/18 was in renewable generation, and it has also announced its intention in May 2018 to invest £350m in a new Combined Cycle Gas Turbine power station at Keadby. It also maintains diversity through the role of its Energy Portfolio Management (EPM) business, responsibilities of which include: procuring fuel required by the generation plants that SSE owns or has a contractual interest in; and selling the power output from this plant. EPM seeks to manage the impact of policy, economy, customer and infrastructure demand and world events by maintaining a diverse and well balanced portfolio of contracts, trading positions and assets in the short-, medium- and long-term. SSE also engages directly with stakeholders on key regulations. For example, SSE has been engaging with UK and Irish Governments, European Commission, Members of European Parliament and others on low-carbon policy. During these discussions, SSE supports a Carbon Price Floor, the EU ETS, Levy Control Framework and other legislation that supports a move towards a low-carbon economy, with gas providing an important role in the security of supply.

### **Cost of management**

#### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities, Energy Portfolio Management, strategy and maintenance and investment programmes. In addition, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, the majority of which was in renewable generation but which also includes maintenance of existing thermal plants and gas production. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn.

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**Identifier**

Risk 4

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type**

Transition risk

**Primary climate-related risk driver**

Technology: Unsuccessful investment in new technologies

**Type of financial impact driver**

Technology: Capital investments in technology development

**Company- specific description**

Increase in local distributed generation challenging the role of SSE's existing transmission infrastructure: In the UK, BEIS and Ofgem have set a clear direction in the recent Smart Systems Plan that prioritises a customer-led energy system in which network users who operate Distributed Energy Resources (DER) can trade local energy and flexibility with ease. The Scottish Government has also set a target of 1GW of community and locally owned energy by 2020 and 2GW by 2030. Meeting these ambitions will result in a significant increase in distribution connected energy generation. In addition, decarbonisation in the UK over recent years has led to a reduction in the thermal generation plant on the system and now the vast majority of generation connected to SSEN's transmission network is variable renewable generation. These power stations provided essential services to the system operator to ensure system security but with fewer of them to provide these services, DER will need to be enabled to support system operation. The existing model of a high voltage national grid capable of transmitting large volumes of power over large distances was created to deliver power to homes from large generating stations. In the case of significantly expanded local and distributed generation, the risk facing SSEN is the need for grid-level infrastructure, such as its transmission network, could be questioned. It is plausible, but unlikely, that with increased distributed generation in the 2040s, transmission networks are not needed in the same way they are now. While the impact of this risk would be high, there is a very low likelihood of it materialising. The nature of SSEN's transmission assets in the north of Scotland, where 90% of the power transmitted is from renewable sources, provides some protection. The key feature of renewables is that there are no ongoing fuel costs, and power is generated when the wind blows and the rain falls. That means it is unlikely that these assets will not continue to make an important contribution to securing electricity supplies in GB even in the case of a dramatic shift towards distributed generation. It is also unlikely that most areas in GB would be able to maintain security of supply, particularly through the winter without access to and use of the national grid and transmission-connected generation.

**Time horizon**

Medium-term

**Likelihood**

Unlikely

**Magnitude of impact**

Medium-high

**Potential financial impact**

**Explanation of financial impact**

The potential financial impact of this risk is difficult to determine. SSE's Networks business is economically regulated and key strategic investments in transmission infrastructure are made following a robust process with the regulator Ofgem, where a needs case is made and the investment will only proceed if the need case is agreed. The Regulated Asset Value (RAV) of SSEN's Transmission network in 2017/18 was £3.07bn, the business is on track to increase this to around £3.6bn by the end of the current Price Control period in 2021. It is plausible, however unlikely, that with increased distributed generation in the 2040s, the transmission networks are not required in the same way they are today.

**Management method**

SSEN recognises it must adapt system planning to consider whole system implications of changes at the distribution level. This will ensure the optimum solution is identified, whether this requires investment on the transmission system, distribution system, or provision of services from flexibility markets. The use of future energy scenarios (FES) in the system planning process is increasingly important, with SSEN's transmission business using scenario planning to understand likely future network requirements. While National Grid's provides guidance in the use of FES, SSEN has recognised that developments on its transmission network in the north of Scotland do not fit a GB standard. To address this, it is developing localised FES with increased granularity in the assumptions based on its local knowledge, which will allow it to best meet customers' needs. This should allow SSEN to identify the range of potential requirements on its transmission network and to identify the least regret investments. In 2016, SSEN's transmission development team introduced a regional network development approach which considers existing generation and demand, as well as connections activity at both transmission and distribution level. These regional dashboards are regularly updated to capture changes and developments that will affect SSEN's investment plans. This regional approach captures whole system development and has already led to investment deferral to reduce the risk of stranded assets.

**Cost of management**

0

**Comment**

Costs are incorporated into ongoing stakeholder engagement activities, strategy and maintenance and investment programmes. In addition, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During

2017/18, SSEN's transmission networks capital expenditure was over £434m. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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### **Identifier**

Risk 5

### **Where in the value chain does the risk driver occur?**

Direct operations

### **Risk type**

Transition risk

### **Primary climate-related risk driver**

Technology: Unsuccessful investment in new technologies

### **Type of financial impact driver**

Technology: Capital investments in technology development

### **Company- specific description**

A dramatic increase in uptake of electric vehicles (EVs), which has potential to overwhelm electricity distribution networks: Distributed generation, demand side response, energy storage and, most particularly, electric vehicles are transforming the energy system, giving customers access to new products and services from a new range of providers. SSEN's Distribution business will need to complete a transition from a traditional Distribution Network Operator (DNO) to a Distribution System Operator (DSO) – moving from simply managing a physical asset (the distribution network) to actively managing the flows of energy around the network, e.g. demand, generation and other flexible distributed energy resources, to get the maximum value out of that asset. A key aspect of the transition to a smart, flexible electricity system is the electrification and decarbonisation of transport. Whilst the number of EVs on SSEN's network is currently estimated to be 25,000, it is expected to grow rapidly in the coming years in response to ambitious targets set by the UK and Scottish Governments to phase out petrol and diesel vehicles by 2040 and 2032 respectively. National Grid's 2018 Future Energy Scenarios (FES) report estimates a maximum potential for 38.5 million EVs in Britain by 2050, increasing significantly from 25 million estimated by the same year in its 2017 FES report. SSEN is undertaking work to prepare for this transition, however, if the uptake in EVs takes place at a pace which is dramatically higher than expected in the current models, this could pose challenges to SSEN's distribution networks. The risk is that a disorderly transition to EVs could overwhelm SSEN's distribution network, as

investment in adapting to EVs and the transition to DSO may not have time to be implemented effectively. This could increase the costs of reinforcement of the network and the response to the smart, flexible revolution.

**Time horizon**

Medium-term

**Likelihood**

Unlikely

**Magnitude of impact**

Medium-high

**Potential financial impact**

**Explanation of financial impact**

The potential financial impact of this risk is difficult to determine. The financial implication of a disorderly transition to electrification of transport has the potential to be considerable, resulting in increased costs of reinforcing the network. SSEN continues to undertake a major capital investment delivery programme across its electricity distribution networks which will deliver significant improvements for customers. This includes the refurbishment and reinforcements of assets; upgrades to automation, reducing the number of customers affected and the duration of faults; minimising impacts of tree related damage; and investments in new innovative technologies. During 2017/18, SSEN's adjusted capital expenditure and investment across its networks distribution businesses was over £326m. It continues to progress innovation through Ofgem funded structures, and in 2017/18 had secured over £95m in regulatory funding for innovation projects since 2010.

**Management method**

SSEN is managing this risk in the short-term by staying close to emerging models and behaviour patterns around the uptake of EVs. It seeks to take a leadership role in understanding and sharing challenges the sector may face, to anticipate and prevent problems before they arise. As part of this work, SSEN's My Electric Avenue project monitored the impact EV charging had on the electricity network. Its findings will help safeguard, maintain and develop smarter networks, to provide a secure electricity network to cope with increasing EV usage in the future. This included overcoming the potential risk posed by 'clustering', which could cause issues on electrical networks long before large-scale adoption of EVs in the UK takes place. SSEN has also launched a consultation on Managed Electric Vehicle Charging, seeking views on proposed solutions to help avoid potential overloads on local electricity networks caused by sharp increases in the use of EVs. In the longer-term, SSEN will manage this risk through a well-managed transition from DNO to DSO. In November 2017, SSEN published its 'Supporting a Smarter Electricity System' report, outlining the principles it will adhere to in its transition to a DSO. Alongside the report, SSEN launched a public consultation on its transition, in order to engage with stakeholders and to achieve a phased transition that is customer focused, cost efficient and collaborative with other stakeholders in the industry.

**Cost of management**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities, strategy and maintenance and investment programmes. In addition, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSEN's adjusted capital expenditure and investment across its networks distribution businesses was over £326m. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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## **C2.4**

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**(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes

### **C2.4a**

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**(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.**

#### **Identifier**

Opp1

#### **Where in the value chain does the opportunity occur?**

Direct operations

#### **Opportunity type**

Products and services

#### **Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

#### **Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

#### **Company- specific description**

Enhanced investment in onshore wind farms: In a low-carbon world, new onshore wind has an important role to play. However, changes to the UK policy framework in 2015 meant that onshore wind was excluded from the Contracts for Difference (CfD) mechanism. That means there is no 'route to market' for new onshore wind projects (with the exception of those located on remote Scottish island groups). In Ireland, SSE awaits the outcome of the Irish Government's consultation on the development and design of a new Renewable Electricity Support Scheme (RESS) and its impact on the renewable energy industry. In order for SSE to continue to develop onshore wind projects, there needs to either be favourable market conditions to encourage investment, or policy intervention to enable market conditions that would bring about greater investment in onshore wind generation. This might include: onshore wind becoming eligible to participate in the CfD process; a sustainable carbon price that makes projects economically viable; or an energy price of sufficient value to support the investment case in new onshore wind generation. Given that onshore wind continues to be the lowest cost low-carbon energy source, SSE is optimistic that the economic conditions will arise – whether through government intervention, or market development - where the opportunity for increased investment in onshore wind results.

**Time horizon**

Medium-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium

**Potential financial impact**

90000000

**Explanation of financial impact**

The potential financial impact is the increased revenue to SSE as a result of higher demand for lower emission products and services (i.e. onshore wind generation). SSE has an onshore wind pipeline (excluding the Scottish island groups) of around 600MW. The potential financial impact of an enhanced opportunity to develop its wind farm portfolio would be reflected in the ability to invest and earn annual cash flows of around £90m. This is calculated on a maximum build out of the existing portfolio, using cash flow assumptions based on existing returns.

**Strategy to realize opportunity**

SSE's overall business strategy means SSE is well placed to take advantage of the opportunities in investment in renewable energy. SSE's strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. As part of this strategy, SSE is investing in renewable energy (including onshore wind) and major transmission projects such as Caithness-Moray. SSE has strong pipeline of renewable energy projects, see company-specific description section. This includes around 800MW pipeline of potential new onshore

wind development (including remote Scottish island onshore developments), meaning it is well placed to take advantage of a second wave in onshore wind development. SSE believes this strategy presents opportunities for the company as the leading generator of renewable energy across the UK and Ireland. To ensure SSE realises these low-carbon opportunities, it has set a new, longer-term carbon ambition to reduce the carbon intensity of the electricity it generates by 50% by 2030, from a 2018 baseline. This will bring the carbon intensity of the electricity SSE generates to below 150gCO<sub>2</sub>e/kWh.

### **Cost to realize opportunity**

#### **Comment**

Costs are incorporated into the maintenance of development consents and grid connections, alongside ongoing stakeholder engagement activities and major project investment governance processes. These costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, the majority of which was in renewable generation but which also includes maintenance of existing thermal plants and gas production. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn.

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### **Identifier**

Opp2

### **Where in the value chain does the opportunity occur?**

Direct operations

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

### **Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

### **Company- specific description**

Enhanced investment in offshore wind farms: Central scenarios by National Grid, the system operator, alongside assumptions and scenarios by the Climate Change Committee, predict a certain proportion of onshore and offshore wind penetration to the GB electricity system in 2030 and beyond. Recent updates to those scenarios suggest offshore wind may have an even greater role than previously assumed to play in the GB electricity system. The Department for Business, Energy and Industrial Strategy expects 10GW of new offshore wind in the 2020s, consolidating the UK's position as global leader in the

sector. Favourable conditions in the UK, such as a strong carbon price, a relatively high price for energy, and continued access to a Contract for Difference or other price stabilisation mechanism, would support an investment case in renewable energy for SSE. With these favourable conditions, there may be an enhanced opportunity for SSE to develop further renewable generation projects and support the transition to a low-carbon electricity system. SSE is one of the largest renewable energy operators across the UK and Ireland. It has over 3.8GW of renewable energy capacity (inc. pumped storage) and expects this to increase to over 4.2GW by 2020. SSE currently has expertise in offshore wind generation, primarily through the Beatrice Offshore Windfarm Limited (BOWL) joint venture (588MW – SSE share 40%), which is currently in construction. SSE has interests in three further offshore wind prospects under development: Dogger Bank (up to 3.6GW), a 50:50 joint venture formed with Equinor (formerly Statoil) to develop three projects in the Dogger Bank zone; Seagreen (Phase One up to 1,050MW), a 50:50 partnership with Fluor Limited; and Arklow Bank (520MW) in Ireland, wholly owned by SSE. This significant pipeline of potential investment projects means SSE is very well placed to benefit from Government support for both onshore and offshore wind projects.

#### **Time horizon**

Medium-term

#### **Likelihood**

More likely than not

#### **Magnitude of impact**

Medium-high

#### **Potential financial impact**

#### **Explanation of financial impact**

The potential financial impact of this opportunity is difficult to determine and is subject to a highly competitive auction process. It would therefore be inappropriate to outline specific financial impact examples, however to give an indication of scale of opportunity, in 2017/18, SSE's capital and investment expenditure totalled £1.5bn, around 70% of this was in renewables and networks. Over the next five years to 31 March 2023, SSE expects its capital and investment expenditure to total around £6bn. Around £4.2bn of this is expected to be in renewables and networks. From this investment, SSE can support the decarbonisation of the electricity system and deliver earning enhancements in future years to the business.

#### **Strategy to realize opportunity**

SSE's overall business strategy means SSE is well placed to take advantage of the opportunities in investment in renewable energy. SSE's strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. As part of this strategy, SSE is investing in renewable energy (including onshore and offshore wind) and major transmission projects such as Caithness-Moray. This includes around 3.3GW of potential new offshore wind farm development, meaning it is well placed to take advantage of an enhanced role for

offshore wind in the UK and Ireland's electricity mix. SSE believes this strategy presents opportunities for the company as the leading generator of renewable energy across the UK and Ireland. To ensure SSE realises these low-carbon opportunities, it has set a new, longer-term carbon ambition to reduce the carbon intensity of the electricity it generates by 50% by 2030, from a 2018 baseline. This will bring the carbon intensity of the electricity SSE generates to below 150gCO<sub>2</sub>e/kWh.

### **Cost to realize opportunity**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities and major project investment processes. These costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, the majority of which was in renewable generation but which also includes maintenance of existing thermal plants/gas production. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks/ renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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### **Identifier**

Opp3

### **Where in the value chain does the opportunity occur?**

Direct operations

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

### **Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

### **Company- specific description**

Further investment in transmission infrastructure in the north of Scotland: The UK Government ratified the Paris Agreement in 2016, reinforcing its commitment to address climate change. The UK Government's Climate Change Act 2008 and its Clean Growth Strategy (published 2017), as well as the UK's Industrial Strategy, set out the mechanisms for the UK to transition to a low-carbon economy as well as the investment in public infrastructure over the next decade. As a result of these policies

there has been, and is expected there will continue to be, an increase in renewable generation contributing to the GB electricity network. SSEN's transmission network is key national infrastructure vital to the transition to a low-carbon electricity system. SSEN operates the transmission network in the north of Scotland, where 96% of the electricity transmitted is from low-carbon sources. SSEN's transmission network allows the renewable energy generated in the north of Scotland to be transmitted down south to areas of higher demand. This makes it fundamental in facilitating the transition to a low-carbon electricity system. To continue to support this transition, SSEN's transmission business will need to invest in infrastructure to support the low-carbon transition and connect renewable generation projects to its network. SSEN continues to make progress with the delivery of its £1.1bn Caithness-Moray transmission reinforcement project, which remains on track for delivery by the end of 2018. SSEN's transmission business has projects with a forecast pipeline of investment of around £900m in the next three years, and is on track to increase the Transmission RAV to around £3.6bn by the end of the current Price Control period in 2021. The possible transmission links to the Scottish islands groups provide further potential for future growth. Following confirmation that the UK Government intends to allow remote island onshore wind to complete in the next Contracts for Difference auction in spring 2019, SSEN continues to work with its generation customers and other stakeholders across the three island groups to take forward proposals to provide transmission connections to enable the connection of renewable electricity generation. As a start to this work, in March 2018, SSEN submitted to Ofgem a Needs Case for the Orkney transmission link.

**Time horizon**

Short-term

**Likelihood**

Virtually certain

**Magnitude of impact**

Medium-high

**Potential financial impact**

700000000

**Explanation of financial impact**

The figure provided is SSEN's contingent projects which are above and beyond its forecast investment in its transmission business over the next three years. It is for illustrative purposes only and is not indicative of a financial impact that will materialise. SSEN Transmission has a current forecast pipeline of investment of around £900m in the next three years, and a further £300m of capital and investment expenditure in SSEN's transmission business in the period to 2023. This £1.2bn of spend in the five years to 2023 is one component of SSE's Group capital and investment plans of £6bn over this period. In addition to its base capital and investment plans of £1.2bn, SSEN's transmission business has visibility of a further £700m of

contingent projects that are dependent of the progress of onshore wind developments against a continued uncertain policy regime.

### **Strategy to realize opportunity**

SSE's overall business strategy means SSE is well placed to take advantage of the opportunities in its transmission business surrounding the provision of key infrastructure to facilitate the transition to a low-carbon electricity system. SSE's strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. As part of this strategy, SSE is investing in major transmission projects such as Caithness - Moray. SSEN has a current forecast pipeline of investment of around £900m in the next three years, and a further £300m of capital and investment expenditure in SSEN's transmission business in the period to 2023. Following confirmation that the UK Government intends to allow remote island onshore wind to complete in the next Contracts for Difference auction in spring 2019, SSEN has been preparing for this opportunity through continuing to work with its generation customers and other stakeholders across the three island groups to take forward proposals to provide transmission connections to enable the connection of renewable electricity generation. As a start to this work, in March 2018, SSEN submitted to Ofgem a Needs Case for the Orkney transmission link.

### **Cost to realize opportunity**

500000

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities and major project investment processes. Attributable costs to this opportunity involve costs that are part of the large capital projects process and the cost of stakeholder engagement. These costs are around £500,000 per annum and are part of project development which is before any investment decision is made. However, these costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSEN's transmission networks capital expenditure was over £434m and it has a planned capital and investment expenditure of £1.2bn in the next three years.

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### **Identifier**

Opp4

### **Where in the value chain does the opportunity occur?**

Direct operations

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

### **Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

### **Company- specific description**

The value of SSE's flexible generation assets in an increasingly decarbonised energy system: Both the UK and Ireland ratified the Paris Agreement in 2016, committing to undertake ambitious efforts to combat climate change and adapt to its impacts. In the UK, there is ongoing consensus to meet the ambitions of the Climate Change Act 2008, exemplified by the work of the UK Committee on Climate Change and by the content of the UK Government's Clean Growth Strategy. The Ireland Energy White Paper reaffirmed the Irish Government's commitment to decarbonising the energy mix through specific actions to achieve its 2050 target. As a result of these policies there has been an increase in the renewable capacity that contributes to energy systems in the UK and Ireland. Increasing volumes of wind energy coming onto the UK system will create the need for more flexibility in the form of energy storage, and SSE's hydro assets are well placed to provide this in an optimal way. Hydro is unique in SSE's portfolio, as it can be characterised as both renewable and flexible. In 2017/18, SSE's hydro stations delivered increased value from their flexibility, enabled by enhancements to SSE's commercial management of these assets. In addition to 400MW of run-of-river hydro, SSE has 750MW of flexible hydro. Alongside SSE's 300MW of pumped storage, flexible hydro operates as 'Britain's biggest battery'.

### **Time horizon**

Medium-term

### **Likelihood**

Very likely

### **Magnitude of impact**

Medium

### **Potential financial impact**

### **Explanation of financial impact**

The potential financial impact of this opportunity is difficult to determine. SSE's hydro generation assets are in a good position to take advantage of the impact of a decarbonised UK energy system because of their characteristics of being renewable and flexible. To support this, SSE is investing significantly in renewable energy and this includes its hydro generation assets. For example, SSE has been investing in its hydro generation assets to make them more efficient and provide flexible and renewable energy that takes advantage of a decarbonised energy system. SSE's capital investment plans for the next 5 years is expected to include around £200m on the maintenance and improvement of existing hydro assets. This investment in SSE's hydro generation assets is expected to deliver earning enhancements in the future.

### **Strategy to realize opportunity**

SSE's overall business strategy means SSE is well placed to take advantage of the opportunities of providing flexible generation to support an electricity grid with increasing volumes of variable renewable energy. SSE's strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. As part of this strategy, SSE is investing in a diversified generation portfolio of renewable and flexible generation assets.

### **Cost to realize opportunity**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities and major project investment processes. These costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, the majority of which was in renewable generation but which also includes maintenance of existing thermal plants and gas production. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable energy.

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### **Identifier**

Opp5

### **Where in the value chain does the opportunity occur?**

Direct operations

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

### **Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

### **Company- specific description**

Electrification of transport presenting opportunities for SSE's Wholesale, Networks and Enterprise businesses: Whilst the number of electric vehicles on SSEN's network is currently estimated to be 25,000, it is expected to grow rapidly in the coming years in response to ambitious targets set by the UK and Scottish Governments to phase out petrol and diesel

vehicles by 2040 and 2032 respectively. National Grid's 2018 Future Energy Scenarios (FES) report estimates a maximum potential for 38.5 million EVs in Britain by 2050, increasing significantly from 25 million estimated by the same year in its 2017 FES report. Increase in the uptake of EVs has the potential to provide opportunities for SSE's business: including: 1. As an electricity generator, there is the potential increase in energy consumption linked to the charging of EVs which has the potential to increase demand for electricity output from SSE's electricity generating assets which in turn will raise income for SSE's Wholesale business, 2. As a network operator, there is the opportunity to invest in, and develop the network infrastructure required to support the roll out of EVs. This includes smart energy systems, demand side response and distributed flexible and renewable energy. 3. SSE's Enterprise business has the potential to grow its business by developing EV infrastructure. For example, SSE Enterprise has already installed over 650 EV charging points across London, including a major electric bus charging facility at Waterloo Bus Depot, assisting the deployment of London's first large-scale, zero-emission, single deck bus fleet – the largest of its kind in Europe. It is also working with other organisations to solve the challenges of the transition to the electrification of transport, and in February 2018, an SSE Enterprise-led consortium won a major funding award to research how electric buses can help support the power network by using two directional charging. The 'Bus2Grid' project is being hailed as the first of its kind and will involve over 30 e-buses using smart technology to provide bi-directional charging that enables the e-bus batteries to interact with the energy system.

#### **Time horizon**

Medium-term

#### **Likelihood**

Likely

#### **Magnitude of impact**

Medium

#### **Potential financial impact**

#### **Explanation of financial impact**

The potential financial impact of this opportunity is difficult to determine. The financial implications of electrification of transport have the potential to be significant for SSE's Wholesale, Networks and Enterprise businesses. In 2017/18, SSE's capital and investment expenditure totalled £1.5bn, around 70% of this was in renewables and networks. Over the next five years to 31 March 2023, SSE expects its capital and investment expenditure to total around £6bn. Around £4.2bn of this is expected to be in renewables and networks. From this investment, SSE can support the uptake of EVs and deliver earning enhancements in future years to the business.

#### **Strategy to realize opportunity**

SSE's overall business strategy means SSE is well placed to take advantage of the opportunities presented by the electrification of transport. SSE's strategy is to create value for shareholders and society from developing, owning and

operating energy and related infrastructure and services in a sustainable way. SSE Wholesale comprises a unique portfolio of complementary, high quality businesses with assets and expertise that cannot be replicated in the market. It is well placed to respond to the trends of decarbonisation, electrification and infrastructure development. Its Energy Portfolio Management (EPM) business seeks to manage the impact of customer and infrastructure demand by maintaining a diverse and well balanced portfolio of contracts, trading positions and assets in the short-, medium- and long-term. SSE Networks (SSEN) is investing in flexible local electricity networks, enabling the growth of both decentralised electricity generation and the connection of high consuming demand customers, such as new electric vehicles being connected to local electricity networks. SSEN has a current forecast pipeline of investment in its Distribution business of around £800m in the next three years. SSE Enterprise continues to develop its expertise in delivering the infrastructure that supports EVs, and in February 2018, an SSE Enterprise-led consortium won a major funding award to research how electric buses can help support the power network by using two directional charging.

### **Cost to realize opportunity**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities and major project investment processes. These costs are low in comparison to the capital investment in SSE's pipeline of projects. During 2017/18, SSE's adjusted capital expenditure and investment in its Wholesale business was £458m, including thermal generation and gas production. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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### **Identifier**

Opp6

### **Where in the value chain does the opportunity occur?**

Direct operations

### **Opportunity type**

Products and services

### **Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

### **Type of financial impact driver**

Increased revenue through demand for lower emissions products and services

### **Company- specific description**

Decarbonisation of the heat sector presenting opportunities for SSE's Wholesale, Networks and Enterprise businesses: Decarbonisation of the heat sector has the potential to provide opportunities for SSE's business. There is potential growth in electric storage heating or ground source heat pumps, and more efficient use of gas heating, particularly at a district level. The decarbonisation of the heat sector provides many opportunities for SSE's businesses including: 1. For SSE's Wholesale business, higher demand for electricity to heat homes/ businesses results in an increase in the output from SSE's generation assets which has the potential to increase income for the Wholesale business. 2. For SSE's Networks business, there will be a requirement to transmit and distribute higher volumes of electricity to meet increased electricity demand to heat homes/ businesses. As the energy system is decarbonised more flexible and renewable electricity generation will provide opportunities for SSEN's business to invest further in infrastructure that supports this demand. 3. SSE's Enterprise business has the potential to grow and offer products that support a decarbonised heat system. For example, SSE's Enterprise business has expertise in heat networks and offers customers a range of technology options including combined heat and power (CHP), biomass boilers and heat pumps. At the heart of its offer is the district heating network which delivers heat to customers safely and efficiently. While the district heating industry in the UK remains niche, SSE has a small but growing district heat business where it designs, builds and operates district heating systems across the country. It now runs over a dozen district heating systems throughout the UK. This includes its district heating system installed in Glasgow's Wyndford Estate, which is one of the UK's largest retrofit district heating schemes and is estimated to save up to 7,000 tonnes of CO2 saved annually.

### **Time horizon**

Long-term

### **Likelihood**

Likely

### **Magnitude of impact**

Medium

### **Potential financial impact**

### **Explanation of financial impact**

The potential financial impact of this opportunity is difficult to determine. The financial implications of decarbonisation of the heat sector have the potential to be significant. In 2017/18, SSE's capital and investment expenditure totalled £1.5bn, around 70% of this was in renewables and networks. Over the next five years to 31 March 2023, SSE expects its capital and investment expenditure to total around £6bn. Around £4.2bn of this is expected to be in renewables and networks. From this

investment, SSE can support the decarbonisation of the heat sector and deliver earning enhancements in future years to the business.

### **Strategy to realize opportunity**

SSE's overall business strategy means SSE is well placed to take advantage of the opportunities presented by the electrification of transport. SSE's strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. SSE Wholesale comprises a unique portfolio of complementary, high quality businesses with assets and expertise that cannot be replicated in the market. It is well placed to respond to the trends of decarbonisation, electrification and infrastructure development. Its Energy Portfolio Management (EPM) business seeks to manage the impact of customer and infrastructure demand by maintaining a diverse and well balanced portfolio of contracts, trading positions and assets in the short-, medium- and long-term. SSE Networks (SSEN) is investing in flexible local electricity networks, enabling the growth of both decentralised electricity generation and the connection of high consuming demand customers, such as new electric vehicles being connected to local electricity networks. SSEN has a current forecast pipeline of investment in its Distribution business of around £800m in the next three years. SSE's Enterprise business continues to develop its expertise in delivering more efficient heat networks for its business customers. It increased its heat networks customers from over 6,500 at 31 March 2017, to over 9,400 at 31 March 2018.

### **Cost to realize opportunity**

0

### **Comment**

Costs are incorporated into ongoing stakeholder engagement activities and major project investment processes. These costs are low in comparison to the capital investment in SSE's pipeline of projects. SSE is continuing to undertake significant investment in assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.

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## **C2.5**

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### **(C2.5) Describe where and how the identified risks and opportunities have impacted your business.**

	<b>Impact</b>	<b>Description</b>
Products and services	Impacted	The most material way that SSE's products and services have been impacted by the risks and opportunities surrounding decarbonisation and the transition to a low-carbon economy, is the in the composition of its

	Impact	Description
		<p>portfolio of generation assets. Both the UK and Ireland have clear frameworks and targets around decarbonisation, which impact on SSE's investment decisions when it comes to the generation of electricity. Support for renewable energy has allowed SSE to invest in a strong portfolio of renewable generation assets – SSE is one of the largest renewable energy operators across the UK and Ireland and, at 31 March 2018, it has a renewable generation capacity of over 3.8GW, expecting this to increase to over 4.2GW by 2020. The general increase in renewable generation on the electricity grid in GB, has impacted the investment decisions of SSEN's transmission business. Projects such as Caithness-Moray transmission reinforcement, which is SSE's largest ever capital investment at £1.1bn, are necessary to transport the renewable energy generated in the north of Scotland down south to areas of higher demand. As this renewable energy is variable, SSE's thermal generation assets continue to play a key role in supporting the electricity grid in both the UK and Ireland. SSE's recently announced its £350m investment in Keadby 2 (in Lincolnshire, England), a new combined cycle gas-fired generation station with world-leading efficiency, is expected to decrease carbon emissions for the overall GB electricity system by reducing the need for less efficient, more carbon-intensive, gas plant. SSE's Enterprise business is also responding to the increasing demand for electric vehicle (EV) charging infrastructure. SSE Enterprise has installed over 650 EV charging points across London and, in February 2018, an SSE Enterprise-led consortium won a major funding award to research how electric buses can help support the power network by using two directional charging. The 'Bus2Grid' project is being hailed as the first of its kind and will involve over 30 e-buses using smart technology to provide bi-directional charging that enables the e-bus batteries to interact with the energy system.</p>
Supply chain and/or value chain	Impacted	<p>SSE's supply chain benefits from opportunities relating to decarbonisation and the transition to a low-carbon economy. SSE's continued investment in renewable energy projects and the infrastructure that supports it, means the majority of its spend with suppliers is on large capital projects, which enable the generation of low-carbon energy or the connection of low-carbon generation to the grid. Examples include SSE's investment in the 588MW Beatrice Offshore Windfarm Limited (BOWL) (a joint venture, owned by SSE (40%), Copenhagen Infrastructure Partners (CIP) (35%) and Red Rock Power Limited (25%)). At £2.6bn, BOWL is one of the largest ever private infrastructure investments in Scotland. Once fully operational in 2019, BOWL will consist of 84 wind turbines located approximately 13.5km off the Caithness coast, and will be able to generate enough clean wind powered electricity to power around 450,000 homes. SSE's Networks business has also invested £1.1bn in the Caithness-Moray transmission reinforcement, which is required to transport the renewable energy generated in the north of Scotland down south to areas of higher demand. In addition to this, SSE, in partnership with Siemens, is constructing a first-of-a-kind, high efficiency, gas-fired generation technology in the UK. At a £350m investment, Keadby 2 (an 840MW CCGT in Lincolnshire, England) will be the most efficient CCGT on the system, delivering large-scale capacity from the early 2020s onward. It will be able to provide the flexible generation needed to support the integration of large-scale renewables into the electricity grid.</p>
Adaptation and mitigation activities	Impacted	<p>Changes in climate and weather patterns across the UK and Ireland impact production of energy from renewable sources (Wholesale), the operation of electricity transmission and distribution businesses (Networks) and the amount of gas and electricity used by customers (Retail). The weather is an important</p>

	Impact	Description
		<p>contributor to business performance that is strongly interconnected to SSE's identified Principal Risks of Energy Affordability, Commodity Prices and Energy Infrastructure Failure. To help mitigate these impacts, SSE monitors short- and long-term weather conditions so it can manage and respond for the benefit of customers and to support the fulfilment of its business objectives. SSE's Wholesale business continues to invest in a diversified generation portfolio of renewable and thermal generation assets, to reduce the impact on any one element of its generation fleet. SSE also has crisis management and business continuity plans to deal with severe weather events that can damage energy infrastructure, and these were successfully implemented in February and March 2018 in response to the "Beast from the East" cold weather front that presented challenges for the UK's energy system. As well as these extreme weather events, general weather conditions in 2018 have impacted SSE's business – the temperature in the UK across the 3 months to 30 June was 1.5 degrees centigrade warmer than the thirty-year average, leading to average domestic gas demand being around 10% lower than plan. In addition to dry, still and warm weather, the financial year so far has been characterised by persistently high gas prices. This has resulted in a higher cost of energy, lower than expected output of electricity from renewable sources and lower volumes of energy consumption. This has negatively impacted on SSE's adjusted operating profit in Q1-18/19 by around £80m, compared with planned, and will potentially impact its full year results. SSE has also identified the risk of changes in climate on its Networks business, where extreme weather events pose risk to the resilience of the network. As a result, SSE continues to invest in maintenance and emergency response solutions, such as new technology that identifies faults on the lines, tree cutting along networks and resilience funds for local communities to support adaptation initiatives and emergency response procedures.</p>
Investment in R&D	Impacted	<p>SSE's business has been impacted by the risks and opportunities surrounding decarbonisation and the transition to a low-carbon economy, through the way it invests in research and development initiatives. SSE is involved in a range of innovative projects and programmes which are designed to progressively transform the energy system, many of which are focused on supporting the transition to a low-carbon economy. In the drive towards a smarter, more flexible electricity system, SSEN has been undertaking research to support a smooth transition. Announced in April 2018, SSEN has partnered with leading software company, Open Utility, to trial its new 'Piclo' platform, which helps DSOs procure flexible capacity from technologies such as batteries and demand-response aggregators to meet the needs of local electricity users. It is a matchmaking and trading platform for local energy which provides opportunities for customers, generators and other flexibility providers to register their availability and preferences, which the Piclo platform then matches with opportunities from the DSO. The platform will unlock new revenue streams for homes, businesses and communities, whilst supporting the continued journey to a low carbon, decarbonised energy system where there is an increased level of Distributed Energy Resources connected to the grid. SSEN is also undertaking its Smart EV project, funded by Ofgem's Network Innovation Allowance, alongside technology partners EA Technology and supported by GB distribution network operators. The project sets out to review and research charging solutions that will allow the uptake of EVs to take place with minimum disruption to customers and avoiding unnecessary network reinforcement. The EV revolution is also impacting on SSE's Enterprise business, which is similarly undertaking research to understand how it can support this transition.</p>

	Impact	Description
		In February 2018, an SSE Enterprise-led consortium won a major funding award to research how electric buses can help support the power network by using two directional charging. The 'Bus2Grid' project is being hailed as the first of its kind and will involve over 30 e-buses using smart technology to provide bi-directional charging that enables the e-bus batteries to interact with the energy system.
Operations	Impacted	SSEN's distribution business' operations can be impacted by severe weather events which cause damage to infrastructure and interruption to electricity supply for its customers. SSE also has crisis management and business continuity plans to deal with severe weather events that can damage energy infrastructure, and these were successfully implemented in February and March 2018 in response to the "Beast from the East" cold weather front that presented challenges for the UK's energy system. SSE continues to invest in maintenance and emergency response solutions, such as new technology that identifies faults on the lines, tree cutting along networks and resilience funds for local communities to support adaptation initiatives and emergency response procedures. Through monitoring of weather to inform strategic placing of employees and resources, SSEN ensures it is well prepared and resourced to respond promptly to any damage to its network.
Other, please specify	We have not identified any risks or opportunities	SSE has assessed the impact of different climate-related risks and opportunities and has not identified any other categories that have a significant impact on its business.

## C2.6

### (C2.6) Describe where and how the identified risks and opportunities have factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	Climate-related risks and opportunities surrounding decarbonisation and the transition to a low-carbon economy are factored into SSE's investment decisions, most notably in the investments made in its Wholesale and Networks businesses. Both the UK and Ireland have clear frameworks and targets around decarbonisation, which impact on SSE's investment decisions when it comes to the generation of electricity. Support for renewable energy has allowed SSE to invest in a strong portfolio of renewable generation assets – SSE is the largest renewable energy operators (by installed capacity) across the UK and Ireland and, at 31 March 2018, it has a renewable generation capacity of over 3.8GW, expecting this to increase to over 4.2GW by 2020. With the increase in renewable energy connecting to the electricity system in GB, SSEN's transmission business is investing in infrastructure to support the low-carbon transition and connect renewable generation projects to its network. SSEN continues to make progress with the delivery of its £1.1bn Caithness-Moray transmission reinforcement project, which is required to transport the renewable energy generated in the north of Scotland down south to areas of higher demand and remains on track for delivery by the end of 2018. SSEN's transmission business has

	Relevance	Description
		<p>projects with a forecast pipeline of investment of around £900m in the next three years, and is on track to increase the Transmission RAV to around £3.6bn by the end of the current Price Control period in 2021. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.</p>
Operating costs	Impacted for some suppliers, facilities, or product lines	<p>While the first response to the climate challenge must be to take action to mitigate it, the second response must be to adapt to changes in weather patterns in order to protect assets, systems and people. This is reflected in SSE's approach to risk management and seeking future business opportunities. Severe adverse weather that causes damage or interrupts energy supply or generation is identified as a material influencing factor on SSE's 'Energy Infrastructure Failure' Group Principal Risk. All of SSE's Group Principal Risks are taken into account in the financial planning process. SSE's distribution business' operations can be impacted by severe weather events which cause damage to infrastructure and interruption to electricity supply for its customers. SSE also has crisis management and business continuity plans to deal with severe weather events that can damage energy infrastructure, and these were successfully implemented in February and March 2018 in response to the "Beast from the East" cold weather front that presented challenges for the UK's energy system. SSE continues to invest in maintenance and emergency response solutions, such as new technology that identifies faults on the lines, tree cutting along networks and resilience funds for local communities to support adaptation initiatives and emergency response procedures. Through monitoring of weather to inform strategic placing of employees and resources, SSE ensures it is well prepared and resourced to respond promptly to any damage to its network.</p>
Capital expenditures / capital allocation	Impacted	<p>Climate-related risks and opportunities surrounding decarbonisation and the transition to a low-carbon economy are factored into SSE's investment decisions, most notably in the investments made in its Wholesale and Networks businesses. Both the UK and Ireland have clear frameworks and targets around decarbonisation, which impact on SSE's investment decisions when it comes to the generation of electricity. Support for renewable energy has allowed SSE to invest in a strong portfolio of renewable generation assets – SSE is one of the largest renewable energy operators across the UK and Ireland and, at 31 March 2018, it has a renewable generation capacity of over 3.8GW, expecting this to increase to over 4.2GW by 2020. With the increase in renewable energy connecting to the electricity system in GB, SSE's transmission business is investing in infrastructure to support the low-carbon transition and connect renewable generation projects to its network. SSE continues to make progress with the delivery of its £1.1bn Caithness-Moray transmission reinforcement project, which is required to transport the renewable energy generated in the north of Scotland down south to areas of higher demand and remains on track for delivery by the end of 2018. SSE's transmission business has projects with a forecast pipeline of investment of around £900m in the next three years, and is on track to increase the Transmission RAV to around £3.6bn by the end of the current Price Control period in 2021. Over the five years to March 2023, and based on existing plans, SSE expects its capital and investment expenditure</p>

	Relevance	Description
		to total around £6bn. Around 70% of the total capex and investment forecast is expected to be related to regulated electricity networks and renewable sources of energy.
Acquisitions and divestments	Impacted for some suppliers, facilities, or product lines	The opportunities and risks identified by SSE's financial planning process have identified acquisitions/divestments that have been impacted by climate-related aspects. One example in 2017/18 is that SSE completed the sale of 78MW of capacity at Clyde windfarm.
Access to capital	Impacted	An ability to raise funds at competitive rates is fundamental to the sustainable financing of projects in a low-carbon economy. In September 2017, SSE issued the biggest ever Green Bond by a UK company and the first of its kind issued by a UK-headquartered energy company. The Bond was almost three times oversubscribed and had significant interest from Green only funds, whilst also representing the lowest coupon ever achieved by SSE. The proceeds from SSE's eight-year €600m Green Bond have been allocated to refinancing of part of SSE's £1.1bn portfolio of eligible projects of onshore wind farms in the UK and Ireland, as listed in SSE's Green Bond Framework. The main criteria for a project to be eligible were that it must contribute to a positive environmental impact, support SSE's commitment to the ongoing reduction of the carbon intensity of its electricity generation and finally, support SDG 13 (take urgent action to combat climate change and its impacts).
Assets	Impacted	SSE is the leading renewable energy generator in the UK and Ireland. It develops, owns and operates a diverse and sustainable portfolio of renewable and generation plant. SSE is one of the largest renewable energy operators across the UK and Ireland and, at 31 March 2018, it has a renewable generation capacity of over 3.8GW, capable of generating around 12TWh of electricity per annum in a typical year, and expects this to increase to over 4.2GW by 2020. SSE's investment in renewable energy in the UK and Ireland totalled over £300m in 2017/18. Significant progress was made over the year increasing SSE's renewable energy portfolio, with the delivery of 534MW of onshore wind farm projects. A further 463MW of wind farm capacity is currently in construction: Stronelairg onshore wind farm (228MW) and the joint venture Beatrice offshore wind farm (SSE share: 235MW). Both of these projects are due for completion in calendar year 2019. SSE's onshore wind farm pipeline consists of around 800MW of potential new build projects and extensions, including the joint venture Viking wind farm located on Shetland and Strathy South wind farm. SSE has interests in three further offshore wind prospects in varying degrees of development: Dogger Bank and Seagreen in the UK and Arklow Bank in Ireland. Since 2013, SSEN's transmission business has invested around £2.3bn in building and reinforcing an expanded electricity network so that low-carbon, renewable electricity can get to the homes and business that need it. In 2017/18, it undertook a major investment programme totalling over £760m. This included ongoing construction of the Caithness-Moray electricity transmission link and the connection of projects including Aberdeen Offshore Windfarm (96MW) and SSE's Stronelairg wind farm (228MW), alongside continued upgrading of the electricity distribution network.
Liabilities	Impacted	Distribution networks are central to the fight against climate change – connecting clean energy, supporting electrification of transport and facilitating change as local 'system operators' – and require significant modernisation and reform. SSEN's distribution businesses in the north of Scotland and central

	Relevance	Description
		southern England are leading the industry through a number of high impact innovation and demonstration projects. The flexibility revolution that is beginning to emerge at the local distributed network level is exciting and will enable more local generation to connect, and with smart technology, it can be done in a way that avoids wholesale renewal of the network. SSEN believes this reform of its network is core to tackling climate change, keeping costs down for customers and to the future success of its business.
Other	We have not identified any risks or opportunities	SSE has assessed the impact of different climate related risks and opportunities and has not identified any other categories that have a significant impact on its financial planning processes.

### C3. Business Strategy

#### C3.1

**(C3.1) Are climate-related issues integrated into your business strategy?**

Yes

#### C3.1a

**(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?**

Yes, qualitative and quantitative

**C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b)**

**(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.**

Yes

#### C3.1c

**(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.**

Company-specific details of how business objectives/strategy have been influenced by climate-related issues:

SSE's vision is to be a leading provider of energy and related services in a low-carbon world. To achieve this, its strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. The main climate-related factor which has influenced SSE's strategy is government policy support for the transition to a low-carbon electricity system. In the UK, there is ongoing consensus to meet the ambitions of the Climate Change Act 2008, exemplified by the work of the UK Committee on Climate Change and by the content of the UK Government's Clean Growth Strategy. The Ireland Energy White Paper reaffirmed the Irish Government's commitment to decarbonising the energy mix through specific actions to achieve its 2050 target. These policies drive investment in low-carbon generation and infrastructure. These policies have influenced SSE's strategy, which at its heart is a commitment to contribute substantively to the transition to a low-carbon electricity system, by:

- Investing significantly in renewable energy, invested over £3.5bn in renewables since 2010 and has the largest renewable energy capacity across the UK & Ireland at around 3.8GW (inc. pumped storage).
- Moving from a portfolio weighted towards coal/gas, to one weighted towards renewables with complementary flexible thermal generation, in 2017/18 coal-fired generation contributed around 4%, renewable generation (inc. pumped storage) 28% and gas- and oil-fired generation 66% of SSE's total generation output.
- Enabling more renewable generation to connect to the electricity network, invested over £2.3bn since the Transmission price control period began in 2013 in new electricity transmission infrastructure.

Link between business strategy and emissions reductions target:

SSE's 2020 carbon intensity target was first met in 2017 and SSE has now set a longer term carbon intensity ambition to 2030. SSE's significant investment in renewable energy and strategy to move from a portfolio weighted towards coal/gas, to one weighted towards renewables with complementary flexible thermal generation is supporting the achievement of SSE's Group carbon intensity target.

Substantial business decisions influenced by climate-related issues:

SSE completed seven new onshore wind energy projects in the last 16 months, adding around 517MW of capacity to its renewables portfolio between 1 April 2017 and 31 March 2018. During 2017/18 SSE upgraded its electricity network to enable new renewable electricity that is generated to be delivered to customers. In 2017/18, SSE continued to make progress on Caithness-Moray transmission link. SSE has updated its strategy for the low carbon future as a result of climate change and its importance.

Climate issues that have influenced the strategy in the past year:

Climate change driven legislation and policies have impacted SSE's business decisions in the past year:

- Expanding SSE's renewable energy portfolio, with 34MW of new onshore wind farm capacity in 2016/17 and a further 992MW of on and off-shore capacity in construction.
- In total, including that connected at a distribution level, SSEN connected over 400MW of renewable electricity to its transmission network in 2017/18.
- Operating frameworks which include: minimum price for a

tonne of carbon in the UK; long term contracts for new low carbon sources; and maximum emissions for new generation have led to a change in the mix of SSE's generation portfolio.

Short-term strategy (current to next 10 years):

SSE continues to invest in new renewable energy and the infrastructure that supports it. SSE's investment and capital expenditure in 2017/18 was over £1.5bn, around 70% of this investment was in networks and renewables. Over the five years to 31 March 2023, SSE expects its capital and investment expenditure to total around £6bn, with again approximately 70% of this expected to be invested in regulated electricity networks and renewable sources of energy. SSE expects to increase its renewable capacity to over 4.2GW by 2020. SSE will also continue to invest in its internal energy efficiency projects to reduce energy use from our own operations and behaviour change programme and installation of AMR and smart meters. SSE has made a commitment to source electricity from renewable sources for all of its own operations by 2020.

Long-term strategy (2030 and beyond):

In the long-term, SSE will aim to continue to support the transition to a low-carbon economy. However, due to the uncertainty of long-term government policy, details of how this will be achieved have not yet been defined. SSE believes that putting a meaningful price on carbon emissions is a critical part of UK and Irish energy policy. SSE therefore continues to advocate for a carbon price floor. SSE has invested in new business activities in its contracting, energy solutions, and heat businesses to provide low carbon/energy efficiency products/ services. SSE has R&D programmes aimed at low carbon technologies and has long term initiatives to help customers reduce their own energy consumption by being more energy efficient.

Strategic advantage:

One of SSE's strategic advantages is that it maintains a balanced range of economically regulated and market-based energy businesses and assets, ranging from energy production and delivery to the provision of energy and complementary services, providing a diversified portfolio of business activities. These economically-regulated, lower-risk businesses provide relative predictability and stability for SSE and balance its activities in the market-based parts of the energy sector. This balanced mix of businesses make, and will continue to make, an important contribution to the transition to a low-carbon electricity system, and is core to SSE's strategy in the short, medium and long-term. SSE also has expertise in renewable energy.

Influence of Paris Agreement:

SSE supports the long-term objectives of the Paris Agreement set out by the UNFCCC. To contribute to these agreements, SSE is committed to:

- 50% reduction in carbon intensity by 2030 (baseline 2018);
- investing in low carbon energy networks that help the UK power sector to reduce carbon intensity;
- recognising the external cost of carbon dioxide emissions to society and the environment by internalising the cost of carbon where practical in investment appraisals;
- helping customers better control their electricity use, by helping them to reduce consumption and to consume at times of day when the carbon-intensity of electricity is lower.

Scenario analysis:

SSE has been collaborating with investors (eg Institutional Investors Group on Climate Change (IIGCC)) to respond to requests for more open/ transparent disclosure on climate change related risks/opportunities (Q3.1d SSE's carbon scenario report).

### C3.1d

#### (C3.1d) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios	Details
<p>Other, please specify (NG FES and internal energy/ company FES)</p>	<p>Note: FES refers to Future Energy Scenarios. The selection for other: UK National Grid FES and internal energy and company specific FES. In July 2017, SSE published its first carbon scenarios report, Post-Paris, assessing the resilience of its business model in GB against three climate change scenarios. The report focused on the material parts of SSE's business that are at most risk from the impact of market and policy changes associated with carbon reduction ambitions: SSE's Wholesale, Transmission and Distribution businesses. Three scenarios were established by using publicly available data from National Grid's Future Energy Scenarios. These scenarios have taken account of the whole energy system (electricity, heat and transport) to allow an understanding of what will feature in the GB generation portfolio to meet demand and how transmission and distribution will respond to the changes in demand and supply to deliver the different scenario end points. For each scenario, SSE assessed the resilience of its business across three time horizons: short term 0 to 3 years; medium term 4 to 12 years; and long term 13 to 30 years. These time horizons are aligned with SSE's other business practice time horizons and mirror the investment/capital and regulatory time horizons that govern our financial, operational and capital plans. The scenarios used were: 'Super Green' – a scenario where GB contributes its share of carbon reduction to limiting global temperature rises to a 1.5 degree centigrade warming scenario; 'Gone Green' -- a scenario where it contributes to a 2 degree centigrade warming scenario; and 'No Progress' – a business as usual scenario where emissions would be in line with a 3 to 4 degree centigrade warming scenario. It was also considered to be prudent to undertake a sensitivity analysis of low nuclear versions of each of these three scenarios. The results of the assessment showed that SSE's combination, and balanced range, of valuable distribution, transmission and generating assets are found to be vital to GB's electricity system over the three time horizons and in every climate scenario assessed. The report also found that the optionality of SSE's development pipeline is in an advantageous place to respond to new opportunities that climate change mitigation may bring. For example, investment of over £3.5bn in renewables since 2010, move from a portfolio weighted towards coal/gas to one weighted towards renewables/flexible thermal generation; and investment of over £2.3bn since 2013 in new electricity transmission infrastructure to support the low carbon transition. This scenario analysis and report reaffirms SSE's climate change and business strategy. SSE will continue to develop its scenario analysis by extending it to cover gas and bring more financial information into its disclosure. This will support SSE to understand the impact of climate change on future business strategy. In addition, SSEN's transmission business uses scenario planning (based on National Grid Future Energy Scenarios (FES)) to understand likely future network requirements. As a result of this work SSEN has recognised that developments on its transmission network in the north of Scotland do not fit a GB standard. To address this, SSEN is using more granular assumptions based on local knowledge to develop more relevant localised FES. This will enable SSEN to identify</p>

Climate-related scenarios	Details
	potential future requirements of its transmission network and inform business strategy and investments. In November 2017, SSE committed to meeting the Task Force on Climate-related Financial Disclosures (TCFD) recommendations in full by 2021. These recommendations focus on businesses' strategies to manage climate-related risks and low-carbon opportunities, with an emphasis on financial disclosure and the use of scenario analysis. SSE's initial response to the four themes of the TCFD recommendations is outlined in its Annual Report 2018.

## **C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e**

### **(C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e) Disclose details of your organization's low-carbon transition plan.**

SSE's vision is to be a leading provider of energy and related services in a low-carbon world. To achieve this, its strategy is to create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way. To bring about this strategic change the SSE Group has:

- Invested significantly in renewable energy – SSE has invested over £3.5bn in renewables since 2010 and has the largest renewable energy capacity across the UK and Ireland at around 3.8GW (inc. pumped storage);
- Moved from a portfolio weighted towards coal and gas, to one weighted towards renewables with complementary flexible thermal generation – in 2017/18 coal-fired generation contributed around 4%, renewable generation (inc. pumped storage) 28% and gas- and oil-fired generation 66% of SSE's total generation output; and
- Enabled more renewable generation to connect to the electricity network – SSE has invested over £2.3bn since the Transmission price control period began in 2013 in new electricity transmission infrastructure. In 2017/18, around 400MW of new renewable generation capacity was connected.

## **C4. Targets and performance**

### **C4.1**

#### **(C4.1) Did you have an emissions target that was active in the reporting year?**

Both absolute and intensity targets

#### **C4.1a**

#### **(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.**

Target reference number

Abs 1

**Scope**

Scope 2 (location-based)

**% emissions in Scope**

5

**% reduction from base year**

18

**Base year**

2012

**Start year**

2012

**Base year emissions covered by target (metric tons CO2e)**

100

**Target year**

2018

**Is this a science-based target?**

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative

**% achieved (emissions)**

100

**Target status**

Expired

**Please explain**

This target covers SSE's scope 1 gas consumption and SSE's scope 2 electricity consumption in its UK non-operational buildings (which covers: offices, depots and call centres). The target is to: Reduce carbon emissions from energy use in non-operational buildings by 18% by 2017/18 from a 2011/12 baseline. The original target was a 15% reduction in non-operational buildings carbon emissions by 2016/17 from a 2011/12 baseline. This is a science based target. It was assessed using the SBTi Sector Decarbonisation Approach methodology by SSE. SSE has a suite of targets which together meet the SBTi criteria.

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**Target reference number**

Abs 2

**Scope**

Scope 2 (location-based)

**% emissions in Scope**

5

**% reduction from base year**

20

**Base year**

2018

**Start year**

2018

**Base year emissions covered by target (metric tons CO2e)**

100

**Target year**

2030

**Is this a science-based target?**

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative

**% achieved (emissions)**

0

**Target status**

New

**Please explain**

This target covers SSE's scope 1 gas consumption and SSE's scope 2 electricity consumption in its UK non-operational buildings (which covers: offices, depots and call centres). The target is an: Absolute reduction in carbon emissions associated with the energy use in SSE's property portfolio by 20% by 2030, based on 2018 baseline. This is a science based target. It was assessed using the SBTi Sector Decarbonisation Approach methodology by SSE. SSE has a suite of targets which together meet the SBTi criteria.

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**C4.1b**

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**(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).**

**Target reference number**

Int 1

**Scope**

Scope 1

**% emissions in Scope**

99

**% reduction from baseline year**

50

**Metric**

Metric tons CO<sub>2</sub>e per megawatt hour (MWh)\*

**Base year**

2006

**Start year**

2009

**Normalized baseline year emissions covered by target (metric tons CO<sub>2</sub>e)**

600

**Target year**

2020

**Is this a science-based target?**

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

**% achieved (emissions)**

100

**Target status**

Replaced

**Please explain**

This target covers: SSE's carbon emissions that arise from the consumption of coal, oil, gas and biomass in SSE's thermal generation plant (including Power Purchase Agreements). The intensity ratio covers the total output from SSE's thermal (oil, gas, coal, multifuel) and renewable (wind, both onshore and offshore, hydro including pumped storage and biomass) electricity generation portfolio. Performance against the target: SSE's carbon emissions associated with its electricity generation increased by 27% between 2016/17 and 2017/18. This was a result of an increase in demand for electricity which resulted in an increase in SSE's total generation output by 26% in the same period. SSE's carbon intensity of its electricity generation increased from 302gCO<sub>2</sub>e/kWh to 305gCO<sub>2</sub>e/kWh between the two years. This means that SSE's 2020 target to

reduce the carbon intensity of its electricity generation by 50% compared to 2006 was met early for the second consecutive year. This is a science based target. The science based target was assessed using SSE's internal model based on the UK government's Climate Change Act 2008 ambitions. SSE has a suite of targets which together meet the SBTi criteria.

**% change anticipated in absolute Scope 1+2 emissions**

50

**% change anticipated in absolute Scope 3 emissions**

0

**Target reference number**

Int 2

**Scope**

Scope 1

**% emissions in Scope**

99

**% reduction from baseline year**

50

**Metric**

Metric tons CO<sub>2</sub>e per megawatt hour (MWh)\*

**Base year**

2018

**Start year**

2018

**Normalized baseline year emissions covered by target (metric tons CO<sub>2</sub>e)**

307

**Target year**

2030

**Is this a science-based target?**

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

**% achieved (emissions)**

0

**Target status**

New

**Please explain**

This target covers: SSE's carbon emissions that arise from the consumption of coal, oil, gas and biomass in SSE's thermal generation plant (including Power Purchase Agreements). The intensity ratio covers the total output from SSE's thermal (oil, gas, coal, multifuel) and renewable (wind, both onshore and offshore, hydro including pumped storage and biomass) electricity generation portfolio. Performance against the target: SSE is now setting a new, longer term ambition for the carbon intensity of the electricity it generates: to reduce the carbon intensity of the electricity it generates by 50% by 2030, based on 2018 levels. This means that SSE's electricity generation carbon intensity is now forecast to be around 150gCO<sub>2</sub>e/kWh by 2030, which represents a 75% cut based on its original 2006 baseline. This is a science based target. The science based target was assessed using SSE's internal model based on the UK government's Climate Change Act 2008 ambitions. In addition, this science based target was assessed using the SBTi Sector Decarbonisation Approach methodology by SSE. SSE has a suite of targets which together meet the SBTi criteria.

**% change anticipated in absolute Scope 1+2 emissions**

50

**% change anticipated in absolute Scope 3 emissions**

0

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## C4.2

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**(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.**

**Target**

Renewable energy consumption

**KPI – Metric numerator**

Commit to work towards buying renewable energy (that is certified) for SSE's own operations by 2020

**KPI – Metric denominator (intensity targets only)**

100%

**Base year**

2018

**Start year**

2018

**Target year**

2020

**KPI in baseline year**

0

**KPI in target year**

100

**% achieved in reporting year**

0

**Target Status**

New

**Please explain**

SSE has committed to work towards buying renewable energy that is certified for its own operations by 2020.

**Part of emissions target**

Not applicable.

**Is this target part of an overarching initiative?**

No, it's not part of an overarching initiative

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## C4.3

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**(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.**

Yes

### C4.3a

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**(C4.3a) Identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings.**

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	40	
To be implemented*	0	0
Implementation commenced*	2	248026
Implemented*	7	250600

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Not to be implemented	0	0

## C4.3b

**(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.**

### Activity type

Low-carbon energy installation

### Description of activity

Other, please specify (Offshore and onshore wind)

### Estimated annual CO2e savings (metric tonnes CO2e)

182504

### Scope

Scope 1

### Voluntary/Mandatory

Voluntary

### Annual monetary savings (unit currency – as specified in CC0.4)

### Investment required (unit currency – as specified in CC0.4)

1100000000

### Payback period

16-20 years

### Estimated lifetime of the initiative

21-30 years

### Comment

SSE completed seven new onshore wind energy projects in the last 16 months, adding around 517MW of capacity to its renewables portfolio between 1 April 2017 and 31 March 2018. SSE's renewable energy capacity, including conventional hydro and pumped storage, increased, to 3826MW from 3309MW between 1 April 2017 and 31 March 2018. This included Bhlaraidh in Scotland (110MW) and Leanamore (18MW) in Ireland. Investment in renewables is required by EU legislation with country targets set and legislation in place to support this. These projects support SSE's carbon intensity target by increasing the renewable energy capacity and output. SSE's total scope 1 carbon emissions are reduced by these projects. The column requesting 'annual monetary savings' is not applicable to these investments. The investment required column

refers to the continuing significant investment SSE is undertaking in its assets, with capital and investment expenditure of around £1.7bn planned for 2018/19, around two thirds of which relates to developing and maintaining economically-regulated electricity networks and renewable energy projects. The column requesting 'payback' is defined as the income earned and includes the cost of capital. For all major projects, SSE investigates the project and then if viable the project moves from under investigation to implementation commenced. This is why there are no projects currently in the 'to be implemented' section.

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**Activity type**

Energy efficiency: Building services

**Description of activity**

Other, please specify (Building controls, HVAC, Lighting)

**Estimated annual CO2e savings (metric tonnes CO2e)**

68096

**Scope**

Scope 2 (location-based)

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in CC0.4)**

**Investment required (unit currency – as specified in CC0.4)**

1400000000

**Payback period**

4 - 10 years

**Estimated lifetime of the initiative**

21-30 years

**Comment**

SSE has a six year programme with a budget of over £10 million for energy efficiency investments including: 1. A programme of large investments - such as replacement boilers, inverter speed drive controls, free cooling systems, solar PV installation) and a smaller scale programme for energy efficiency improvements (such as onsite energy audits, LED lighting and sub metering). 2. Behaviour change projects through SSE's Better Off campaign that involves: competitions and awareness raising programmes to reduce energy. These programmes are aimed at reducing energy consumption from SSE's property portfolio by 18% by 2018 (baseline 2012). Over the last six-year period, the non-operational building carbon footprint has

experienced a carbon reduction of 38%. During 2017/18 investments of £1.4 million designated as energy efficiency improvement work were delivered across the non-operational buildings estate. Projects included new free cooling systems at one of our largest call centres (Penner Road) utilising zero ozone depleting and low global warming potential refrigerants: solar PV systems and solar powered EV car charging points at our Perth HQ. This reduces SSE's scope 2 emissions. This initiative supports our absolute internal energy target. The programme directly aims to reduce the energy SSE uses to manage its assets and therefore the carbon emissions associated with running its operations. There are no projects that are in the 'to be implemented' category.

## C4.3c

### (C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Examples include, meeting EU ETS allocations, ECO targets and Electricity Market Reform requirements. A major programme of investment is under way in electricity transmission infrastructure in Great Britain to support the transition to lower carbon electricity generation, increase security of supply and promote economic growth. The requirement to connect large volumes of dispersed renewable generation, supported and incentivised by policy-makers at Scottish, UK and EU levels, represents a fundamental change from the historic role of SHE Transmission's network. Over 4.5GW of new renewable generation has been connected in the past decade in the north of Scotland. SHE Transmission's work to upgrade its network the largest capital project undertaken by SSE to support the connection of new renewable energy and customer needs: Caithness-Moray, an investment of £1.1 billion.
Dedicated budget for energy efficiency	We have an annual budget for energy efficiency investments in larger projects within our wider property budget. We also have a separate budget for smaller scale energy efficiency improvement works which is used following onsite energy audits.
Dedicated budget for low-carbon product R&D	SSE has research and development projects in energy efficiency, demand side management and low carbon products/ services. For example, SSE-Glen Dimplex partnership will install Smart Electric Thermal Storage Systems (SETS) in 300 plus homes in the counties of Clare, Cork, City of Dublin and Wexford. This will be done in partnership with Local Authorities, Housing Associations and community groups and aims to install innovative state of the art energy efficient space and water heating systems. In addition, SSE has secured £1.2 million of development funding for a cutting edge grid scale Lithium-ion Batter project at the SSE National Offshore Wind Turbine Test Facility at Hunterston.
Employee engagement	We have numerous employee engagement initiatives throughout the year focussing on sustainability and the environment, highlighting issues such as energy efficiency, business and commuter travel. Examples of this include our energy reduction initiatives, which involves SSE's Better Off campaign.

Method	Comment
Internal incentives/recognition programs	Our employee 'Innovation station' scheme was launched a few years ago now, and rewards financially, and through recognition, good business improving ideas which are submitted. Many ideas are linked with carbon reduction.
Partnering with governments on technology development	SSE works with governments and other partners to develop low carbon technologies. For example: Leading a series of major projects to provide a flexible and decarbonised electricity system including Thames Valley Vision (TVV) (low carbon technology project); Smart EV (an electric vehicles project collaborating with other DNOs, National Grid, BEIS and Ofgem); and the 'Northern Isles New Energy Solutions (NINES)' project (using load variation techniques such as demand side response and energy storage).

## C4.5

**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?**

Yes

### C4.5a

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.**

#### Level of aggregation

Company-wide

#### Description of product/Group of products

Support of low carbon energy infrastructure: In total, including that connected at a distribution level, SSEN connected around 400MW of renewable electricity to its transmission network in 2017/18. This reduces third party scope 2 emissions as it supports the decarbonisation of electricity generation and the carbon emissions associated with grid electricity mix.

#### Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

#### Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (Scope 2 - GHG Protocol)

#### % revenue from low carbon product(s) in the reporting year

#### Comment

The emissions saved by third parties are related to the scope 2 emissions. The amount of electricity consumed by a customer will be reduced as a result of a reduction in the carbon emission conversion factor which will be lowered because of a higher proportion of renewable electricity generation in the grid.

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**Level of aggregation**

Company-wide

**Description of product/Group of products**

Move to low carbon generation: SSE's long term strategy is to provide a sustainable energy product through a diverse generation portfolio. This is achieved through investment in renewable energy technology and a move from a portfolio weighted towards coal:renewables to one weighted towards gas:renewables. For all energy customers the high proportion of renewable energy in SSE's generation mix plays a role in helping its customers reduce scope 2 emissions as the carbon emissions associated with the grid electricity mix is lowered.

**Are these low-carbon product(s) or do they enable avoided emissions?**

Low-carbon product and avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify (Scope 2 - GHG Protocol)

**% revenue from low carbon product(s) in the reporting year****Comment**

The emissions saved by third parties are related to the scope 2 emissions. The amount of electricity consumed by a customer will be reduced as a result of a reduction in the carbon emission conversion factor which will be lowered because of a higher proportion of renewable electricity generation in the grid.

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**Level of aggregation**

Company-wide

**Description of product/Group of products**

Provision of education and energy efficiency measures – Using energy more efficiently should allow SSE's customers to avoid carbon emissions and reduce their scope 1 and 2 emissions from their use of gas and electricity. SSE supports energy efficiency programmes such as ECO and smart metering. For example, in 2018 SSE had installed more than 850,000 smart meters. SSE also continues to educate its customers and other third parties on the subject of sustainability, climate change and energy efficiency through various publications, educational programmes and presentations.

**Are these low-carbon product(s) or do they enable avoided emissions?**

Avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify (Scope 2 - GHG Protocol)

**% revenue from low carbon product(s) in the reporting year**

### **Comment**

The emissions saved by third parties are related to the scope 1 and scope 2 emissions. The carbon saved by a customer will depend on the energy saving initiatives implemented and the energy consumed.

---

### **Level of aggregation**

Company-wide

### **Description of product/Group of products**

SSE's Business Energy and Enterprise businesses provide energy and energy-related services to customers across the UK and Ireland. As well as providing tailored energy efficiency advice to its customers, SSE Business Energy offers a 100% renewable energy tariff – SSE Green. SSE Enterprise delivers smart energy and telecoms solutions to a broad client base of business customers and public sector organisations across the UK and Ireland. For example, SSE Enterprise has been addressing decarbonisation and infrastructure challenges across London through a diverse range of projects. Supporting the city to green its transport, SSE Enterprise Contracting has installed over 650 electric vehicle charging points across London, and a major electric bus charging facility at Waterloo Bus Depot, assisting the deployment of London's zero emission, single deck bus fleet.

### **Are these low-carbon product(s) or do they enable avoided emissions?**

Low-carbon product and avoided emissions

### **Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify (Scope 2 - GHG Protocol)

### **% revenue from low carbon product(s) in the reporting year**

### **Comment**

The emissions saved by third parties are related to the scope 2 emissions (indirect emissions: electricity consumption). For third party contracts that sign up to renewable energy contracts the renewable energy is zero carbon emissions and this will reduce the scope 2 carbon emissions associated with electricity consumption for that customer. Depending on the contract that is entered and the amount of electricity used will depend on the carbon saved by customers.

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## **C-EU4.6**

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**(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your electricity generation activities.**

### **C5. Emissions methodology**

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## C5.1

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**(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).**

### **Scope 1**

#### **Base year start**

April 1 2009

#### **Base year end**

March 31 2010

#### **Base year emissions (metric tons CO2e)**

22729962

#### **Comment**

### **Scope 2 (location-based)**

#### **Base year start**

April 1 2009

#### **Base year end**

March 31 2010

#### **Base year emissions (metric tons CO2e)**

1447056

#### **Comment**

The location based scope 2 figure is calculated using BEIS conversion factors.

### **Scope 2 (market-based)**

#### **Base year start**

April 1 2009

#### **Base year end**

March 31 2010

#### **Base year emissions (metric tons CO2e)**

1447056

#### **Comment**

The market based scope 2 figure is calculated using BEIS residual conversion factors and this is the same as the location based conversion factors.

## C5.2

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**(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.**

Defra Voluntary 2017 Reporting Guidelines

European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

**C6. Emissions data**

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**C6.1**

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**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?**

**Row 1**

**Gross global Scope 1 emissions (metric tons CO2e)**

10128193

**End-year of reporting period**

<Field Hidden>

**Comment**

Scope 1 emissions for the reporting period 1 April 2017 to 31 March 2018. Scope 1 comprises electricity generation, operational vehicles and fixed generation, sulphur hexafluoride emissions and gas consumption in buildings. Specifically, this covers: • Generation power stations – coal, oil and gas (biomass is excluded and reported in QC6.7) 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). In 2017/18, SSE's total carbon emissions (scope 1, 2 and 3) increased by 11% compared to the previous year. This was largely a result of a 27% rise in scope 1 emissions, which contribute 47% of SSE's total carbon emissions. Over 99% of scope 1 emissions are associated with SSE's electricity generation portfolio, these emissions increased by 27%, and this was a result of the increase in output from thermal generation during 2017/18 due to an increase in electricity demand.

**Row 2**

**Gross global Scope 1 emissions (metric tons CO2e)**

<Field Hidden>

**End-year of reporting period**

<Field Hidden>

**Comment**

<Field Hidden>

**Row 3**

**Gross global Scope 1 emissions (metric tons CO2e)**

<Field Hidden>

**End-year of reporting period**

<Field Hidden>

**Comment**

<Field Hidden>

**Row 4**

**Gross global Scope 1 emissions (metric tons CO2e)**

<Field Hidden>

**End-year of reporting period**

<Field Hidden>

**Comment**

<Field Hidden>

**C6.2**

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**(C6.2) Describe your organization's approach to reporting Scope 2 emissions.**

**Row 1**

**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We are reporting a Scope 2, market-based figure

**Comment**

Scope 2 emissions for the reporting period 1 April 2017 to 31 March 2018. Scope 2 comprises electricity distribution losses and electricity consumption in non-operational buildings and substations – transmission and distribution. Specifically, these 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 south of England (SEPD) transporting electricity to the customer. SSE reports scope 2 on a location and market based figures. SSE does not have any contracts with suppliers that include RECs or Guarantees of Origin. However, SSE has a target to work towards buying renewable energy (that is certified) for SSE’s own operations by 2020.

### **C6.3**

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#### **(C6.3) What were your organization’s gross global Scope 2 emissions in metric tons CO2e?**

##### **Row 1**

##### **Scope 2, location-based**

831819

##### **Scope 2, market-based (if applicable)**

831819

##### **End-year of reporting period**

<Field Hidden>

##### **Comment**

Scope 2 comprises electricity distribution losses and electricity consumption in non-operational buildings and substations – transmission and distribution. Specifically, these 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 south of England (SEPD) transporting electricity to the customer. Scope 2 emissions, which contribute only 4% of total carbon emissions, reduced by 20% mainly due to lower electricity losses on SSE’s electricity networks and changes in carbon emission factors due to decarbonisation of the UK grid. SSE reports scope 2 on a location and market based figures. The location and market based figures use BEIS residual conversion factors. SSE does not have any contracts with suppliers that include RECs or Guarantees of Origin. However, SSE has a target to work towards buying renewable energy (that is certified) for SSE’s own operations by 2020.

##### **Row 2**

##### **Scope 2, location-based**

<Field Hidden>

##### **Scope 2, market-based (if applicable)**

<Field Hidden>

**End-year of reporting period**

<Field Hidden>

**Comment**

<Field Hidden>

**Row 3**

**Scope 2, location-based**

<Field Hidden>

**Scope 2, market-based (if applicable)**

<Field Hidden>

**End-year of reporting period**

<Field Hidden>

**Comment**

<Field Hidden>

**Row 4**

**Scope 2, location-based**

<Field Hidden>

**Scope 2, market-based (if applicable)**

<Field Hidden>

**End-year of reporting period**

<Field Hidden>

**Comment**

<Field Hidden>

**C6.4**

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**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?**

Yes

**C6.4a**

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**(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.**

**Source**

Joint Ventures

**Relevance of Scope 1 emissions from this source**

Emissions are not relevant

**Relevance of location-based Scope 2 emissions from this source**

Emissions are not relevant

**Relevance of market-based Scope 2 emissions from this source (if applicable)**

Emissions are not relevant

**Explain why the source is excluded**

This report excludes any joint ventures in which SSE does not have operational control. Below is an example of the largest business unit 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. Scotia Gas Networks (SGN): SGN is a Joint Venture and SSE does not have operational control over these operations. Covering Scotland and the south of England, SGN is the gas network company distributing natural and green gas to 5.9 million homes and businesses through a network of 74,000km of mains and services. SSE has 33% shareholding. SGN reports its greenhouse gas emissions in its environmental reports annually. The percentage of total emissions contained within SGN's annual environment report represents less than 1% of SSE's total carbon emissions.

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**Source**

SSE Exploration and Production

**Relevance of Scope 1 emissions from this source**

Emissions are not relevant

**Relevance of location-based Scope 2 emissions from this source**

Emissions are not relevant

**Relevance of market-based Scope 2 emissions from this source (if applicable)**

Emissions are not relevant

**Explain why the source is excluded**

SSE E&P UK Ltd: SSE E&P UK Ltd is the way through which SSE has equity shareholding in gas producing assets but SSE does not operate these assets so this is excluded from the disclosure. Although this company is wholly owned by SSE, its stake in any gas producing assets is significantly below 50%.

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**C6.5**

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**(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.****Purchased goods and services****Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

11983125

**Emissions calculation methodology**

64 suppliers responded as part of the CDP supply chain programme to SSE's request for climate change data in 2016/17. Total scope 1 and 2 emissions for these suppliers was 11,983,125 tCO<sub>2e</sub>. The carbon emissions calculated covers all the scope 1 and 2 emissions reported by these 64 companies. SSE will be one of many customers for each of these suppliers. The emissions reported have not been allocated to SSE they are the total emissions reported by each of the supplier for scopes 1 and 2. These suppliers represent 13% of SSE's total procurement expenditure in 2016/17 (which was around £3 billion in 2016/17). These suppliers feature in SSE's top 250 and were selected based on the level relevance/ impact of climate change to the supplier as well as the level of spend in SSE's supplier programme. These suppliers support SSE's capital projects for renewable generation projects, transmission and distribution operations as well as IT, human resource and financial services. These suppliers provide capital goods (such as wind turbines and steel lattice towers) to SSE and therefore the second row of this table is included in this section of the response. This data has not been verified/ assured. This was the first year SSE has taken part in the CDP supply chain request and SSE is taking part in this programme in 2017/18.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

**Explanation**

The carbon emissions calculated covers all the scope 1 and 2 emissions reported by these 64 companies. SSE will be one of many customers for each of these suppliers. The emissions reported have not been allocated to SSE they are the total emissions reported by each of the supplier for scopes 1 and 2. SSE is working with its suppliers and CDP to understand how it can get a more accurate picture of its supplier carbon emissions in the future. 64 suppliers out of SSE's top 250 suppliers took part in the CDP supply chain survey in 2016/17 and responded to SSE's request for climate change data. 100% of the suppliers that SSE asked to respond to the CDP questionnaire reported their scope 1 and scope 2 figures. These 64 suppliers represented around 13% of SSE's total supply chain in terms of spend (which was around £3 billion in 2016/17).

**Capital goods****Evaluation status**

Not relevant, explanation provided

### **Metric tonnes CO<sub>2</sub>e**

#### **Emissions calculation methodology**

Capital goods are reported as part of the emissions reported in 'purchased goods and services' above. SSE has no other emissions associated with this category not already reported in the above category or in other categories.

#### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

#### **Explanation**

Capital goods are reported as part of the emissions reported in 'purchased goods and services' above. SSE has no other emissions associated with this category not already reported in the above category or in other categories.

#### **Fuel-and-energy-related activities (not included in Scope 1 or 2)**

#### **Evaluation status**

Relevant, calculated

### **Metric tonnes CO<sub>2</sub>e**

11536809

#### **Emissions calculation methodology**

Transmission and Distribution losses for electricity use in non-operational buildings: 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. As defined by DEFRA's reporting guidelines the transmission and distribution losses are included in this section instead of scope 2. Transmission and Distribution losses for electricity use in substations: 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. As defined by DEFRA's reporting guidelines the transmission and distribution losses are included in this section instead of scope 2. Well to tank emissions: 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. Power Purchase Agreements are reported as Scope 1 emissions as the energy generated from these facilities is 100% used by SSE. PwC assures this data.

#### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

#### **Explanation**

PwC assure this data.

### **Upstream transportation and distribution**

#### **Evaluation status**

Not relevant, explanation provided

#### **Metric tonnes CO<sub>2</sub>e**

#### **Emissions calculation methodology**

The Fuel and energy related scope 3 emissions cover this category and these are detailed in the above category. SSE has no other emissions associated with this category not already reported in the above category or in other categories.

#### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

#### **Explanation**

The Fuel and energy related scope 3 emissions cover this category and these are detailed in the above category. SSE has no other emissions associated with this category not already reported in the above category or in other categories.

### **Waste generated in operations**

#### **Evaluation status**

Not relevant, explanation provided

#### **Metric tonnes CO<sub>2</sub>e**

#### **Emissions calculation methodology**

#### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

#### **Explanation**

The carbon impact of our waste was less than 1% of the total carbon emissions and therefore it is not incorporated into our footprint.

### **Business travel**

#### **Evaluation status**

Not relevant, calculated

#### **Metric tonnes CO<sub>2</sub>e**

11075

#### **Emissions calculation methodology**

Km for flights (domestic, short haul, long haul and international), rail and company car travel are reported and relevant DECC/DEFRA conversion factors are applied to calculate CO<sub>2</sub>e for each type of travel. PwC assure this data.

#### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

#### **Explanation**

The carbon impact of SSE's business travel (flights and rail) is less than 1% of the total carbon emissions. SSE reports this data and PwC assures this data.

#### **Employee commuting**

##### **Evaluation status**

Not relevant, explanation provided

##### **Metric tonnes CO<sub>2</sub>e**

##### **Emissions calculation methodology**

##### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

##### **Explanation**

SSE has programmes in place to support our employees to make low carbon travel options when commuting, for example Bike to Work scheme. In comparison to our other scope 3 emissions these emission are not material (less than 1% of total scope 3 emissions) and the data quality would be based on employee commuting surveys and estimated mileage data from sample data sets.

#### **Upstream leased assets**

##### **Evaluation status**

Not relevant, explanation provided

##### **Metric tonnes CO<sub>2</sub>e**

##### **Emissions calculation methodology**

##### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

##### **Explanation**

SSE does not have any activities associated with this activity.

#### **Downstream transportation and distribution**

##### **Evaluation status**

Relevant, calculated

##### **Metric tonnes CO<sub>2</sub>e**

110004

##### **Emissions calculation methodology**

Transmission losses – the electricity lost in the Scottish Hydro Electric (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. When transferring power across the SHE Transmission System, some of the power is 'lost' known as 'Transmission Losses'. Figures for transmission losses 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 financial year 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 April 2016 to March 2017 the data will be based on the previous financial year April 2015 to March 2016. The data is verified by an independent third party, WSP, for National Grid. PwC assure this data.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

**Explanation**

When transferring power across the SHE Transmission System, some of the power is 'lost' known as 'Transmission Losses'. Figures for transmission losses 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 financial year 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 April 2016 to March 2017 the data will be based on the previous financial year April 2015 to March 2016. The data is verified by an independent third party, WSP, for National Grid. PwC assure this data.

**Processing of sold products**

**Evaluation status**

Not relevant, explanation provided

**Metric tonnes CO2e**

**Emissions calculation methodology**

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

**Explanation**

SSE does not have any activities associated with this activity.

**Use of sold products**

**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

9073590

**Emissions calculation methodology**

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>).

## **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

### **Explanation**

Gas volumes are based on settlements data published by Xoserve. SSE receive 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). 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. 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. PwC assure this data.

### **End of life treatment of sold products**

#### **Evaluation status**

Not relevant, explanation provided

#### **Metric tonnes CO<sub>2</sub>e**

#### **Emissions calculation methodology**

## **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

### **Explanation**

SSE does not have any activities associated with this activity. There is no end of life treatment of energy, once it has been used it has been used.

### **Downstream leased assets**

#### **Evaluation status**

Not relevant, explanation provided

#### **Metric tonnes CO<sub>2</sub>e**

#### **Emissions calculation methodology**

## **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

### **Explanation**

SSE does not have any activities associated with this activity.

### **Franchises**

#### **Evaluation status**

Not relevant, explanation provided

#### **Metric tonnes CO<sub>2</sub>e**

#### **Emissions calculation methodology**

## **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

**Explanation**

SSE does not have any activities associated with this activity.

**Investments****Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

2930741

**Emissions calculation methodology**

SSE has investments in a number of companies, the most significant in terms of climate change reporting is SSE's E&P business. SSE E&P UK Ltd is the way through which SSE has equity shareholding in gas producing assets. This company is wholly owned by SSE, however its stake in any gas producing asset is significantly below 50%. SSE does not operate any of the assets and therefore the carbon emissions associated with this are excluded from SSE's carbon inventory. Total output for SSE's E&P business in 2017/18 was 543 million therms. This figure is calculated by taking the total gas output (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>). This data has not been verified/ assured by PwC and therefore has not been publicly disclosed in SSE's annual reports. However, SSE has begun to understand the carbon emissions associated with these investments and SSE will continue to review the extent to which these investments contribute to the total carbon emissions inventory and assess whether these emissions should be included as part of the PwC assurance exercise in the future.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

**Explanation**

SSE's E&P business has a diverse equity share in over 15 producing fields across 17 licenses in three regions. Gas production currently produces enough gas to supply all of SSE's Business Energy customers as well as SSE Airtricity household customers in Ireland. SSE E&P Ltd is the way through which SSE has equity shareholding in gas producing assets. The company, SSE E&P Ltd, is wholly owned by SSE, but its stake in any gas producing assets is significantly below 50%. Total output from SSE's E&P business in 2017/18 was 543 million therms. SSE does not operate these assets and therefore SSE has excluded the carbon emissions associated with these assets from its carbon inventory.

**Other (upstream)****Evaluation status**

Not relevant, explanation provided

**Metric tonnes CO2e**

**Emissions calculation methodology**

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

**Explanation**

SSE does not have any activities associated with this activity.

**Other (downstream)**

**Evaluation status**

Not relevant, explanation provided

**Metric tonnes CO2e**

**Emissions calculation methodology**

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

**Explanation**

SSE does not have any activities associated with this activity.

**C6.7**

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**(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?**

Yes

**C6.7a**

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**(C6.7a) Provide the emissions from biologically sequestered carbon relevant to your organization in metric tons CO2.**

27259

**C6.10**

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**(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.**

**Intensity figure**

352

**Metric numerator (Gross global combined Scope 1 and 2 emissions)**

10987271

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

31226000000

**Scope 2 figure used**

Location-based

**% change from previous year**

13

**Direction of change**

Increased

**Reason for change**

SSE's scope 1 and 2 carbon emissions increased by nearly 22% between 2016/17 and 2017/18. Over 90% of emissions are associated with SSE's electricity generation assets and these increased by 27% in the same period. This increase was a result of a rise in SSE's total generation output which increased by 26% between 2016/17 and 2017/18. In addition, SSE's revenue increased by nearly 8% in the same period. The carbon intensity revenue ratio increased by 13% due to the rise in output and associated carbon emissions.

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**Intensity figure**

332

**Metric numerator (Gross global combined Scope 1 and 2 emissions)**

10987271

**Metric denominator**

megawatt hour generated (MWh)

**Metric denominator: Unit total**

33098000

**Scope 2 figure used**

Location-based

**% change from previous year**

3

**Direction of change**

Decreased

**Reason for change**

SSE's scope 1 and 2 carbon emissions increased by nearly 22% between 2016/17 and 2017/18. Over 90% of emissions are associated with SSE's electricity generation assets and these increased by 27% in the same period. This increase was a result of a rise in SSE's total generation output which increased by 26% between 2016/17 and 2017/18. However, despite the

increase in carbon emissions, the higher output resulted in the intensity ratio falling slightly by 3% between 2016/17 and 2017/18. The reason for the reduction in the carbon intensity per MWh is a result of SSE's strategy to reduce the carbon intensity of its electricity generation portfolio, by moving from a portfolio weighted towards coal/ gas to a lower carbon alternative weighted towards gas/ renewables. Therefore despite an increase in the output there has been an overall reduction in the carbon intensity per MWh generated as the higher carbon electricity generating assets are replaced by lower emitting or renewable generating assets.

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### **Intensity figure**

529

### **Metric numerator (Gross global combined Scope 1 and 2 emissions)**

10987271

### **Metric denominator**

full time equivalent (FTE) employee

### **Metric denominator: Unit total**

20785

### **Scope 2 figure used**

Location-based

### **% change from previous year**

24

### **Direction of change**

Increased

### **Reason for change**

SSE's scope 1 and 2 carbon emissions increased by nearly 22% between 2016/17 and 2017/18. Over 90% of emissions are associated with SSE's electricity generation assets and these increased by 27% in the same period. This increase was a result of a rise in SSE's total generation output which increased by 26% between 2016/17 and 2017/18. SSE's FTE numbers reduced marginally by nearly 2%. However, this intensity ratio increased because of the impact of SSE's electricity generation assets and the rise in total output.

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## **C7. Emissions breakdowns**

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### **C7.1**

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**(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?**

Yes

**C7.1a**

**(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).**

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	10100274	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	11419	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	16500	IPCC Fifth Assessment Report (AR5 – 100 year)

**C-EU7.1b**

**(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.**

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	11711	11711	Fugitive emissions – use of sulphur hexafluoride (SF6) in the transmission and distribution networks for conductivity (used in the switchgears and substations).
Combustion (Electric utilities)	10048641	11419	0	10060060	Generation power stations – coal, oil and gas consumed in SSE’s thermal power generation plant (including Power Purchase Agreements) to generate electricity. This excludes biomass as this is reported in C6.7.
Combustion (Gas utilities)	0	0	0	0	Not applicable.
Combustion (Other)	39922	0	0	39922	<ul style="list-style-type: none"> <li>Gas consumption in buildings – this is the gas consumed by SSE’s non-operational buildings (offices, depots, call centres) to maintain building temperatures.</li> <li>Distribution network fuel consumed – this includes diesel and gas oil used by generators and mobile generators to generate electricity to maintain the</li> </ul>

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Gross Scope 1 emissions (metric tons CO2e)	Comment
					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).
Emissions not elsewhere classified	16500	0	0	16500	Carbon dioxide emissions from Nitrogen Oxides produced in SSE’s power generation stations. Power generation stations: coal, oil and gas consumed in SSE’s thermal power generation plant (including Power Purchase Agreements) to generate electricity.

## C7.2

### (C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United Kingdom of Great Britain and Northern Ireland	9124434
Ireland	1003759

## C7.3

### (C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

#### C7.3c

### (C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Generation (excludes biomass)	10076560
Operational vehicles and plant	33290
Mobile plant - gas oil	4646

Activity	Scope 1 emissions (metric tons CO2e)
SF6 for transmission and distribution	11711
Fixed generation in distribution	539
Gas consumed in non-operational buildings	1447

### C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions, metric tons CO2e	Comment
Cement production activities	<Field Hidden>	<Field Hidden>	<Field Hidden>
Chemicals production activities	<Field Hidden>	<Field Hidden>	<Field Hidden>
Coal production activities	<Field Hidden>	<Field Hidden>	<Field Hidden>
Electric utility generation activities	10076560	<Field Hidden>	Excludes biomass.
Metals and mining production activities	<Field Hidden>	<Field Hidden>	<Field Hidden>
Oil and gas production activities (upstream)	<Field Hidden>	<Field Hidden>	<Field Hidden>
Oil and gas production activities (downstream)	<Field Hidden>	<Field Hidden>	<Field Hidden>
Steel production activities	<Field Hidden>	<Field Hidden>	<Field Hidden>
Transport OEM activities	<Field Hidden>	<Field Hidden>	<Field Hidden>
Transport services activities	<Field Hidden>	<Field Hidden>	<Field Hidden>

### C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United Kingdom of Great Britain and Northern Ireland	831270	831270	164383	164383
Ireland	549	549	1308	1308

## C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

## C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Electricity consumed in buildings	45341	45341
Electricity consumed by substations in the transmission and distribution networks	12990	12990
Losses in the distribution network in the north of Scotland and south of England	773488	773488

## C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

## C7.9a

**(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.**

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption		<Field Hidden>		
Other emissions reduction activities	250600	Decreased	2.7	In 2017/18 SSE's scope 1 and 2 emissions were 10,987 ktCO2e in comparison to 9,038 ktCO2e in the previous reporting period. The difference between the two years was 1,950 ktCO2e. SSE's scope 1 and 2 carbon emissions increased by nearly 21.5% between 2016/17 and 2017/18 (1950 ktCO2e divided by 9,038 ktCO2e carbon emissions in 2016/17 multiplied by 100). Over 90% of emissions are associated with SSE's electricity generation assets. SSE invested in seven new onshore wind energy projects in 2017/18 and energy efficiency projects in its own buildings/ operations. These projects brought about 250,600 tCO2e savings. These projects have reduced the increase in carbon emissions by 3%. This is calculated by: 250,660 tCO2e carbon savings from renewable energy and energy efficiency projects / 9,038,691 tCO2e total scope 1 and 2 carbon emissions in 2016/17 multiplied by 100 = 2.7%. SSE's biomass output is included in these calculations.
Divestment		<Field Hidden>		
Acquisitions		<Field Hidden>		
Mergers		<Field Hidden>		
Change in output	1949619	Increased	18.8	In 2017/18 SSE's scope 1 and 2 emissions were 10,987 ktCO2e in comparison to 9,038 ktCO2e in the previous reporting period. The difference between the two years was 1,950 ktCO2e. SSE's scope 1 and 2 carbon emissions increased by nearly 22% between 2016/17 and 2017/18. This was calculated by: 1,950 ktCO2e (change in carbon emissions between 2016/17 and 2017/18) / 9,038 ktCOe2 (carbon emissions 2016/17) multiplied by 100 = 21.6% increase. The increase in total scope 1 and 2 emissions was reduced as a result of the investment in other reduction initiatives which led to a total of 250,600 tCO2e saved. Therefore, the total increase in carbon emissions reported in the 'emissions value (percentage)' is reported by calculating: 1,950,000 tCO2e (change in

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
				carbon emissions between 2016/17 and 2017/18) minus 250,600 tCO2e (carbon savings in 2017/18) / 9,038,000 tCO2e (scope 1 and 2 carbon emissions in 2016/17) multiplied by 100 = 18.8% increase. Over 90% of SSE's scope 1 and 2 carbon emissions are associated with SSE's electricity generation assets. SSE's output from its generation assets increased by 26% between 2016/17 and 2017/18. SSE's output increased as a result of an increase in the demand for electricity. The increase in output was across both renewable and thermal generation assets. SSE's renewable generation assets increased output by 19%. SSE's thermal generation assets increased output by 29%. However, the increase in thermal generation and associated carbon emissions outweighed the increase in renewable output. SSE's biomass output is included in these calculations.
Change in methodology		<Field Hidden>		
Change in boundary		<Field Hidden>		
Change in physical operating conditions		<Field Hidden>		
Unidentified		<Field Hidden>		
Other		<Field Hidden>		

## C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

## C8. Energy

### C8.1

---

**(C8.1) What percentage of your total operational spend in the reporting year was on energy?**

More than 0% but less than or equal to 5%

**C8.2**

---

**(C8.2) Select which energy-related activities your organization has undertaken.**

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

**C8.2a**

---

**(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.**

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	90000	23670000	23760090
Consumption of purchased or acquired electricity	<Field Hidden>	0	165691	165691
Consumption of purchased or acquired heat	<Field Hidden>	0	7857	7857
Consumption of purchased or acquired steam	<Field Hidden>	<Field Hidden>	<Field Hidden>	<Field Hidden>
Consumption of purchased or acquired cooling	<Field Hidden>	<Field Hidden>	<Field Hidden>	<Field Hidden>
Consumption of self-generated non-fuel renewable energy	<Field Hidden>	9338000	<Field Hidden>	9338000
Total energy consumption	<Field Hidden>	9428000	23843548	33271548

**C8.2b**

---

**(C8.2b) Select the applications of your organization's consumption of fuel.**

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

**C8.2c**

**(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.**

**Fuels (excluding feedstocks)**

Coal

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

1462000

**MWh fuel consumed for the self-generation of electricity**

146200

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Field Hidden>

**MWh fuel consumed for self-generation of cooling**

<Field Hidden>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

<Field Hidden>

**Fuels (excluding feedstocks)**

Natural Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

21892000

**MWh fuel consumed for the self-generation of electricity**

21892000

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Field Hidden>

**MWh fuel consumed for self-generation of cooling**

<Field Hidden>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

<Field Hidden>

---

**Fuels (excluding feedstocks)**

General Municipal Waste

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

316000

**MWh fuel consumed for the self-generation of electricity**

316000

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Field Hidden>

**MWh fuel consumed for self-generation of cooling**

<Field Hidden>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

<Field Hidden>

---

**Fuels (excluding feedstocks)**

Biomass Municipal Waste

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

90000

**MWh fuel consumed for the self-generation of electricity**

90000

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Field Hidden>

**MWh fuel consumed for self-generation of cooling**

<Field Hidden>

**MWh fuel consumed for self- cogeneration or self-trigeneration**

<Field Hidden>

---

**C8.2d**

**(C8.2d) List the average emission factors of the fuels reported in C8.2c.**

**Acetylene**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Agricultural Waste**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Alternative Kiln Fuel (Wastes)**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Animal Fat**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Animal/Bone Meal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Anthracite Coal****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Asphalt****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Aviation Gasoline****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Bagasse****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Bamboo**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Basic Oxygen Furnace Gas (LD Gas)**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Biodiesel**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Biodiesel Tallow**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Biodiesel Waste Cooking Oil****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Bioethanol****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Biogas****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Biogasoline**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Biomass Municipal Waste**

**Emission factor**

0.24

**Unit**

kg CO2e per MWh

**Emission factor source**

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.

**Comment**

**Biomethane**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Bitumen**

**Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Bituminous Coal****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Black Liquor****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Blast Furnace Gas****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Brown Coal Briquettes (BKB)**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Burning Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Butane**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Butylene**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Charcoal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Coal**

**Emission factor**

1.14

**Unit**

kg CO2e per MWh

**Emission factor source**

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.

**Comment**

**Coal Tar**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Coke**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Coke Oven Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Coking Coal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Compressed Natural Gas (CNG)**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Condensate**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Crude Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Crude Oil Extra Heavy**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Crude Oil Heavy**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Crude Oil Light**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Diesel**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Distillate Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Dried Sewage Sludge****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Ethane****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Ethylene****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Fuel Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Fuel Oil Number 1**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Fuel Oil Number 2**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Fuel Oil Number 4**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Fuel Oil Number 5**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Fuel Oil Number 6**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Gas Coke**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Gas Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Gas Works Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**GCI Coal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**General Municipal Waste**

**Emission factor**

0

**Unit**

kg CO2e per MWh

**Emission factor source**

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.

**Comment****Grass****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Hardwood****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Heavy Gas Oil****Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Hydrogen****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Industrial Wastes****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Isobutane****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Isobutylene****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Jet Gasoline**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Jet Kerosene**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Kerosene**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Landfill Gas**

**Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Light Distillate****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Lignite Coal****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Liquefied Natural Gas (LNG)****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Liquefied Petroleum Gas (LPG)**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Liquid Biofuel**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Lubricants**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Marine Fuel Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Marine Gas Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Metallurgical Coal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Methane**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Motor Gasoline**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Naphtha**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Natural Gas**

**Emission factor**

0.38

**Unit**

kg CO2e per MWh

**Emission factor source**

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.

**Comment**

**Natural Gas Liquids (NGL)**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Natural Gasoline**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Non-Biomass Municipal Waste**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Non-Biomass Waste**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Oil Sands**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Oil Shale**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Orimulsion**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Other Petroleum Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Paraffin Waxes**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Patent Fuel**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**PCI Coal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Peat**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Pentanes Plus**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Petrochemical Feedstocks**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Petrol**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Petroleum Coke**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Petroleum Products**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Pitch**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Plastics**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Primary Solid Biomass**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Propane Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Propane Liquid**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Propylene**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Refinery Feedstocks**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Refinery Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Refinery Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Residual Fuel Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Road Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**SBP**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Shale Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Sludge Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Softwood**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Solid Biomass Waste**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Special Naphtha**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Still Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Straw**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Subbituminous Coal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Sulphite Lyes**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Tar**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Tar Sands**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Thermal Coal**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Thermal Coal Commercial**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Thermal Coal Domestic**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Thermal Coal Industrial  
Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Tires**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Town Gas**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Unfinished Oils**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Vegetable Oil**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Waste Oils**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Waste Paper and Card**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Waste Plastics****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Waste Tires****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**White Spirit****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Wood****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Wood Chips**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Wood Logs**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Wood Pellets**

**Emission factor**

<Field Hidden>

**Unit**

<Field Hidden>

**Emission factor source**

<Field Hidden>

**Comment**

<Field Hidden>

**Wood Waste**

**Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**Other****Emission factor**

&lt;Field Hidden&gt;

**Unit**

&lt;Field Hidden&gt;

**Emission factor source**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**C8.2e**

**(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.**

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	11206000	165691	9428000	0
Heat	21892000	7857	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

**C-EU8.2e**

**(C-EU8.2e) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.**

**Coal – hard**

**Nameplate capacity (MW)**

1995

**Gross electricity generation (GWh)**

1462

**Net electricity generation (GWh)**

1462

**Absolute scope 1 emissions (metric tons CO2e)**

1671543

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

874

**Comment**

**Lignite**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Oil**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Gas**

**Nameplate capacity (MW)**

5305

**Gross electricity generation (GWh)**

21892

**Net electricity generation (GWh)**

21892

**Absolute scope 1 emissions (metric tons CO2e)**

8405017

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

384

**Comment**

**Biomass**

**Nameplate capacity (MW)**

37

**Gross electricity generation (GWh)**

90

**Net electricity generation (GWh)**

90

**Absolute scope 1 emissions (metric tons CO2e)**

27259

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

30

**Comment**

**Waste (non-biomass)**

**Nameplate capacity (MW)**

34

**Gross electricity generation (GWh)**

316

**Net electricity generation (GWh)**

316

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Nuclear**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Geothermal**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Hydroelectric**

**Nameplate capacity (MW)**

1450

**Gross electricity generation (GWh)**

3430

**Net electricity generation (GWh)**

3430

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Wind**

**Nameplate capacity (MW)**

2339

**Gross electricity generation (GWh)**

8405018

**Net electricity generation (GWh)**

8405018

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Solar**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Other renewable**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Other non-renewable**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Total**

**Nameplate capacity (MW)**

11160

**Gross electricity generation (GWh)**

33098000

**Net electricity generation (GWh)**

33098000

**Absolute scope 1 emissions (metric tons CO2e)**

10103819

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

307

**Comment**

**C8.2f**

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**(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.**

**Basis for applying a low-carbon emission factor**

No purchases or generation of low-carbon electricity, heat, steam or cooling accounted with a low-carbon emission factor

**Low-carbon technology type**

<Field Hidden>

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**

<Field Hidden>

**Emission factor (in units of metric tons CO2e per MWh)**

<Field Hidden>

**Comment**

SSE has committed to work towards buying renewable energy that is certified for its own operations by 2020.

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**C-EU8.4**

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**(C-EU8.4) Does your electric utility organization have a global transmission and distribution business?**

Yes

**C-EU8.4a**

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**(C-EU8.4a) Disclose the following information about your global transmission and distribution business.**

**Country/Region**

United Kingdom of Great Britain and Northern Ireland

**Voltage level**

Transmission (high voltage)

**Annual load (GWh)**

5170

**Scope 2 emissions (basis)**

Location-based

**Scope 2 emissions (metric tons CO2e)**

229640

**Annual energy losses (% of annual load)**

0.48

**Length of network (km)**

2746.3

**Number of connections**

100

**Area covered (km2)**

57347.7

**Comment**

SSE is the sole-owner of three economically-regulated electricity network licensees that are jointly operated under the brand of Scottish and Southern Electricity Networks (SSEN). The three networks are: 1. Scottish Hydro Electric Transmission plc which owns the high voltage network in the north of Scotland. 2. Scottish Hydro Electric Power Distribution plc which owns the low voltage network in the north of Scotland. 3. Southern Electric Power Distribution which owns the low voltage network in central southern England. This data refers to Scottish Hydro Electricity Transmission Plc. Scope 2 emissions cover: • Petrol and diesel used by SSE's vehicles. • Use of sulphur hexafluoride (SF6) in the transmission and distribution networks for conductivity (used in the switchgears and substations). • Electricity consumption in buildings and substations to manage the transmission electricity system. • Business travel (flights and rail). • 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 associated with the electricity consumed in buildings and substations and is separate to the transmission losses reported. Length of network is defined as the total route length. The total circuit length for SSE's transmission business is 4,838.4km.

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**Country/Region**

United Kingdom of Great Britain and Northern Ireland

**Voltage level**

Distribution (low voltage)

**Annual load (GWh)**

39190.4

**Scope 2 emissions (basis)**

Location-based

**Scope 2 emissions (metric tons CO2e)**

790297

**Annual energy losses (% of annual load)**

0.01

**Length of network (km)**

126640.86

**Number of connections**

48912

**Area covered (km2)**

79524.28

**Comment**

SSE is the sole-owner of three economically-regulated electricity network licensees that are jointly operated under the brand of Scottish and Southern Electricity Networks (SSEN). The three networks are: 1. Scottish Hydro Electric Transmission plc which owns the high voltage network in the north of Scotland. 2. Scottish Hydro Electric Power Distribution plc which owns the low voltage network in the north of Scotland. 3. Southern Electric Power Distribution which owns the low voltage network in central southern England. This data refers to the totals for Scottish Hydro Electric Power Distribution plc and Southern Electric Power Distribution. Data can be provided for each license area and this can be found in regulatory reports for these businesses. Scope 2 emissions cover: • Petrol and diesel used by SSE's vehicles. • Use of sulphur hexafluoride (SF6) in the transmission and distribution networks for conductivity (used in the switchgears and substations). • Electricity consumption in buildings and substations to manage the 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. • Business travel (flights and rail). • Transmission and distribution losses associated with the electricity consumed in buildings and substations and is separate to the transmission losses reported. Number of connections: Details both the total number of connections by DNO and by Third Parties on SSE's behalf and the Totals split by License Area as

these are the splits reported to OFGEM. The number of connections, 33,267, refers to the total number for both SHEPD (10,928) and SEPD (22,339) and excludes third parties. The total number of connections by third parties in SHEPD (600) and SEPD (15,045) is: 15,645.

## C9. Additional metrics

### C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

#### C-EU9.5a

(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
Wind	300000000	20	2018	In 2017/18, SSE's adjusted investment and capital expenditure totalled £1,503.0m. Economically regulated electricity networks accounted for 50.6% of this spend and renewable energy in support of government obligations and targets accounted for 20.1%. As a result of investment in 2017/18 and in previous years plus planned investment: • the RAV of SSE's networks, including its share of SGN, is currently £8.3bn and this is expected to grow to around £9bn by 2020 and to reach £10bn by 2023; and • the net capacity of SSE's energy from renewable sources, including pumped storage and biomass, is around 3.8GW and is expected to reach over 4.2GW by 2020, and to be capable of generating around 12TWh of electricity in a typical year. As an example, with an assumed power price of £45/MWh and a ROC price of £50/MWh, SSE estimates that this would deliver EBITDA of around £800m by 2020.

#### C-EU9.5b

(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Other, please specify (Connections of renewable energy (wind) )	During 2017/18 SSE upgraded its electricity network to enable new renewable electricity that is generated to be delivered to customers in the UK. In 2017/18 SSE continued to make progress on Caithness-Moray transmission link in Scotland. This work enables more renewable electricity to be connected to the network. By enabling renewables to connect to the electricity system this supports the reduction of grid carbon emission factors. This in turn reduces scope 2 emissions for SSE and its domestic and business electricity customers. Upgrades to the network is required under legislation as part of being a regulated energy utility. Since April 2013 (the current price control period) SSE has totalled £2.3 billion in capital investment. In 2017/18, SSE's adjusted investment and capital expenditure totalled £1,503.0m. Economically regulated electricity networks accounted for 50.6% of this spend and renewable energy in support of government obligations and targets accounted for 20.1%	751000000	50	2018

### C-CO9.6/C-EU9.6/C-OG9.6

**(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.**

**Investment start date**

April 1 2017

**Investment end date**

March 31 2018

**Investment area**

R&D

**Technology area**

Energy storage

**Investment maturity**

Applied research and development

**Investment figure**

4592230

### Low-carbon investment percentage

100

#### Please explain

SSE has invested in low carbon products and services in relation to energy storage over the past year. For example, SSE Wholesale secured £46,000 of funding to carry out a feasibility study to explore the technical and commercial viability of large scale power to gas energy storage utilising Hydrogen as a Vector. Hydrogen would be produced using water electrolysis technology, stored and distributed for use in the transport and other sectors. In addition, SSE secured a grant for £1.7m for a first of a kind project that will involve over 30 e-buses using smart technology to provide bi-directional charging that enables the e-bus batteries to interact with the energy system. Specifically, the Bus2Grid, a Vehicle to Grid (V2G) project, will deploy electric buses which enables energy stored in an electric vehicle's battery to help manage the electricity network.

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## C10. Verification

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### C10.1

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**(C10.1) Indicate the verification/assurance status that applies to your reported emissions.**

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

### C10.1a

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**(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.**

#### Scope

Scope 1

#### Verification or assurance cycle in place

Annual process

#### Status in the current reporting year

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

[SSE plc's limited assurance report \(GHG and Water\) - FY18 - 29052018 - signed.pdf](#)

**Page/ section reference****Relevant standard**

ISAE3000

**Proportion of reported emissions verified (%)**

100

---

**Scope**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

[SSE plc's limited assurance report \(GHG and Water\) - FY18 - 29052018 - signed.pdf](#)

**Page/ section reference****Relevant standard**

ISAE3000

**Proportion of reported emissions verified (%)**

100

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**C10.1b**

---

**(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.**

**Scope**

Scope 3- all relevant categories

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Attach the statement**

[SSE plc's limited assurance report \(GHG and Water\) - FY18 - 29052018 - signed.pdf](#)

**Page/section reference**

**Relevant standard**

ISAE3000

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**C10.2**

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**(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?**

No, but we are actively considering verifying within the next two years

**C11. Carbon pricing**

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**C11.1**

---

**(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?**

Yes

**C11.1a**

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**(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.**

EU ETS

**C11.1b**

---

**(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.**

Alberta SGER

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Australia ERF Safeguard Mechanism**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**BC GGIRCA**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Beijing pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**California CaT**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**China national ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Chongqing pilot ETS****% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**EU ETS****% of Scope 1 emissions covered by the ETS**

100

**Period start date**

January 1 2017

**Period end date**

December 31 2017

**Allowances allocated**

0

**Allowances purchased**

3757000

**Verified emissions in metric tons CO2e**

9247704

**Details of ownership**

Facilities we own and operate

**Comment**

**Fujian pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Guangdong pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Hubei pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Kazakhstan ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Korea ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Massachusetts state ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**New Zealand ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Ontario CaT**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Québec CaT**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**RGGI**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Saitama ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Shanghai pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Shenzhen pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Switzerland ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Tianjin pilot ETS**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Tokyo CaT**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Washington CAR**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Other ETS, please specify**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Other ETS, please specify**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Other ETS, please specify**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Other ETS, please specify**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Other ETS, please specify**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

<Field Hidden>

**Allowances allocated**

<Field Hidden>

**Allowances purchased**

<Field Hidden>

**Verified emissions in metric tons CO2e**

<Field Hidden>

**Details of ownership**

<Field Hidden>

**Comment**

<Field Hidden>

**Other ETS, please specify**

**% of Scope 1 emissions covered by the ETS**

<Field Hidden>

**Period start date**

<Field Hidden>

**Period end date**

&lt;Field Hidden&gt;

**Allowances allocated**

&lt;Field Hidden&gt;

**Allowances purchased**

&lt;Field Hidden&gt;

**Verified emissions in metric tons CO2e**

&lt;Field Hidden&gt;

**Details of ownership**

&lt;Field Hidden&gt;

**Comment**

&lt;Field Hidden&gt;

**C11.1d**

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**(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?**

The EU ETS scheme applies to SSE's generation business, which has by far the greatest carbon emitting impact of our entire business. SSE's overall strategy is to seek to comply through a mix of allowance purchase, abatement and use of project credits. Emissions under the EU ETS are treated as a cost of generation, similar to fuel, for the purposes of managing our energy portfolio. Therefore the trading of emissions allowances is carried out in conjunction with trading associated commodities; electricity, gas and coal. In order to comply with targets SSE is constantly trying to improve the efficiency of its power stations and trialling various carbon abatement technologies.

**C11.2**

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**(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?**

No

**C11.3**

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**(C11.3) Does your organization use an internal price on carbon?**

Yes

**C11.3a**

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### **(C11.3a) Provide details of how your organization uses an internal price on carbon.**

#### **Objective for implementing an internal carbon price**

Navigate GHG regulations

Drive low-carbon investment

Stress test investments

Identify and seize low-carbon opportunities

#### **GHG Scope**

Scope 1

Scope 3

#### **Application**

Scope of emissions: The use of a carbon price impacts SSE's scope 1 (in particular generation emissions) and scope 3 (transmission and distribution losses) emission categories. Rationale for using a carbon price: The use of a carbon price is a key component of many of SSE's operational and capital investment decisions. The price of carbon is reflected in decisions to run generation plant and renewable generation technologies, the investments made in new and existing capital projects and how we perform in the energy markets.

#### **Actual price(s) used (Currency /metric ton)**

18

#### **Variance of price(s) used**

The UK's Carbon Price Floor sets the carbon price up to 2021. SSE believes it is a critical part of the UK's energy policy. SSE believes that the UK's Carbon Price Floor is one of the most important policy tools the government has to help industry continue to deliver reliable and lower carbon electricity cost-effectively.

#### **Type of internal carbon price**

Implicit price

#### **Impact & implication**

Where and how SSE uses a carbon price, for example: • SSE's Energy Portfolio Management team internalises the price of carbon in its energy market models, for example in 2017/18 ongoing 'low spark' spreads combined with the Carbon Price Support Rate resulted in greater use of gas-fired generation relative to coal. • SSE's capital investment decisions in future electricity generation are supported by the renewables obligation and in the future contracts for difference. These long term support mechanisms for low carbon generation influence the way in which SSE develops and invests in new renewable technologies. Actual price and process to determine the price: The UK's Carbon Price Floor sets the carbon price up to 2021. SSE believes it is a critical part of the UK's energy policy. SSE believes that the UK's Carbon Price Floor is one of the most

important policy tools the government has to help industry continue to deliver reliable and lower carbon electricity cost-effectively.

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## **C12. Engagement**

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### **C12.1**

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#### **(C12.1) Do you engage with your value chain on climate-related issues?**

Yes, our suppliers

Yes, our customers

#### **C12.1a**

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#### **(C12.1a) Provide details of your climate-related supplier engagement strategy.**

##### **Type of engagement**

Information collection (understanding supplier behavior)

##### **Details of engagement**

Collect climate change and carbon information at least annually from suppliers

##### **% of suppliers by number**

60

##### **% total procurement spend (direct and indirect)**

80

##### **% Scope 3 emissions as reported in C6.5**

100

##### **Rationale for the coverage of your engagement**

Providing energy brings challenges; SSE aims to meet them responsibly. The most material challenges that SSE must respond to in a sustainable way are: maintaining and developing a sustainable energy system that keeps the lights on; decarbonising electricity generation and ensuring the environmental impact of producing energy is minimised; and ensuring energy costs remain affordable. These challenges are fully integrated into SSE's strategy and business operating model. SSE also recognises that its impact extends well beyond this trilemma of issues and this is why it also seeks to make a positive difference to people's lives by being responsible in all that it does. To help people see more clearly how a sustainable approach is at the core of what SSE does, it has developed the 'Responsible House'. Six core areas have been identified which best demonstrate SSE's commitment to acting in a responsible way and to describe how it is doing this. This strategy

provides the framework for our approach to engagement, how we prioritise our engagements and how we measure success. In particular for customers, suppliers and other business partners. In 2016/17 SSE took part in CDP's supply chain programme. SSE asked 64 of its top 100 suppliers to respond to the CDP survey. All 64 suppliers responded to the CDP supply chain programme and SSE's request for climate change data in 2016/17. Total scope 1 and 2 emissions for these suppliers was 11,983,125 tCO<sub>2</sub>e. The emissions reported were not allocated to SSE. These suppliers represent 13% of SSE's total procurement expenditure in 2016/17 (which was around £3 billion in 2016/17). These suppliers feature in SSE's top 250 and were selected based on the level relevance/ impact of climate change to the supplier as well as the level of spend in SSE's supplier programme. These suppliers support SSE's capital projects for renewable generation projects, transmission and distribution operations as well as IT, human resource and financial services. These suppliers provide capital goods (such as wind turbines and steel lattice towers) to SSE and therefore the second row of this table is included in this section of the response.

### **Impact of engagement, including measures of success**

The impact of SSE's supplier engagement strategy is measured through a series of indicators including: 1. Number/ percentage of suppliers responding to the CDP request for data on climate change; 2. Number/ percentage of suppliers providing scope 1 and 2 emissions data; and 3. SSE's ability to improve its scope 3 data reporting to include suppliers. As a result of the 2016/17 CDP supply chain programme the impact of the engagement included: 1. 100% of SSE's suppliers responded; 2. On average SSE's suppliers scored a 'C' in the CDP rating system; 3. 100% of SSE's suppliers reported their scope 1 and scope 2 emissions enabling SSE to, for the first time, report its scope 3 emissions related to its suppliers. Although the emissions reported were not allocated to SSE; 4. 1 of the suppliers provided specific emissions related to SSE's products/ services; 5. 90% of SSE's responders reported having reduction targets, with 8 respondents reporting a Science Based Target and 17 reporting a renewable energy target; and 6. SSE has for the first time reported scope 3 carbon emissions data for its suppliers products and services, this was 11,983,125 tCO<sub>2</sub>e.

### **Comment**

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#### **Type of engagement**

Compliance & onboarding

#### **Details of engagement**

Included climate change in supplier selection / management mechanism

Code of conduct featuring climate change KPIs

Climate change is integrated into supplier evaluation processes

#### **% of suppliers by number**

60

**% total procurement spend (direct and indirect)**

80

**% Scope 3 emissions as reported in C6.5**

100

**Rationale for the coverage of your engagement**

SSE has developed a range of tools to encourage responsible business practices in its supply chain, including its Responsible Procurement Charter; responsibility dashboard, sustainability criteria in pre-qualification process; and introduction of clauses on topics in its standard contract forms for new suppliers. SSE also employs a Strategic Supplier Relationship Management programme which is aimed at SSE's top 10 to 15 suppliers. Our strategic suppliers are defined as those suppliers in the top 10 of SSE's procurement spend and provide an essential/ unique service to our business. SSE also reports on its strategic suppliers' emissions performance. In addition, the Strategic Supplier Relationship Management programme engages its suppliers through Joint Steering Groups held at Managing Director level. The groups discuss and initiate sustainability initiatives to drive better performance, product development and value engineered sustainable propositions. Examples include: the development and introduction of innovative and often disruptive technologies that reduce the carbon footprint of a product and improve carbon emissions performance.

**Impact of engagement, including measures of success**

SSE is developing the measures of success and will report on performance in the next reporting period.

**Comment**

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**C12.1b**

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**(C12.1b) Give details of your climate-related engagement strategy with your customers.**

**Type of engagement**

Education/information sharing

**Details of engagement**

Share information about your products and relevant certification schemes (i.e. Energy STAR)

**Size of engagement**

100

**% Scope 3 emissions as reported in C6.5**

85

**Please explain the rationale for selecting this group of customers and scope of engagement**

Material issues for energy customers include: affordable and accessible energy; quality customer service; responsiveness to vulnerability; efficient energy use; and the impact of industry change. SSE engages with customers daily through customer calls and social media activity using various channels, written, spoken and visual communication as well as social media. It engages at a deeper level through qualitative research and detailed surveys, and holds customer forums and consultation events to gain customer feedback. One area of engagement is energy efficiency which in turn helps to reduce customer carbon emissions. The roll out of smart meters is part of SSE's engagement with its domestic customers. For business customers, SSE has invested in new business activities in its contracting, energy solutions, and heat businesses (SSE Enterprise) to provide low carbon and energy efficiency products/ services to business customers and public sector organisations. Examples include: • SSE Enterprise has a dedicated heat team to build on its portfolio of district heating networks; and has an energy performance team responsible for securing, structuring and delivering Energy Performance Certificates. • SSE Business Energy offers a 100% renewable energy tariff – SSE Green. It supplies renewable electricity matched to Renewable Energy Guarantee of Origins (REGOs), certifying that the purchased electricity has been generated exclusively through a portfolio of wind and hydro assets.

#### **Impact of engagement, including measures of success**

The impact of these measures includes: • SSE Green: Between April 2017 and April 2018, the number of SSE Green customers increased by 173%. SSE's 100% renewable energy tariff allows organisations to report zero emissions for their purchased electricity. • Smart meters: Over 2017/18, SSE connected 474,850 domestic smart meters in customers' homes, bringing SSE's total smart meters on supply to more than 850,000. • Customer forums: In 2017/18, SSE senior managers met regularly with customers in SSE's Customer Forums and the company has engaged with over 60,000 consumers through a programme of research which includes its 3,000-strong online Customer Connect community.

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## **C12.3**

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### **(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?**

Direct engagement with policy makers

Trade associations

Other

#### **C12.3a**

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### **(C12.3a) On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
<p>Other, please specify (Mandatory carbon reporting/ cap and trad)  <i>Mandatory carbon reporting/Cap and trade/ carbon tax/ energy efficiency/ clean energy generation/ adaptation resilience/ climate finance</i></p>	<p>Support with minor exceptions</p>	<p>SSE is supportive of the broad policy framework in place within the UK to enable investment in low carbon electricity generation. In particular, the combination of the Contracts for Difference (CfD) and the Carbon Price Floor in the UK. SSE has welcomed the UK government's commitment as part of the Clean Growth Plan to run future CfD auctions with a budget of £557m. SSE has advocated for onshore wind to be allowed to compete for a CfD on a revenue stabilisation basis. SSE also highlighted the importance of repowering onshore wind sites from the 2020s and beyond to ensure that existing renewable capacity is not lost. SSE has also been closely engaged with the Scottish government on its planning policy and Energy Strategy to increase renewable energy and decarbonise the economy, which SSE fully supports and is a part of delivering.</p>	<p>SSE supports the current legislation in place as SSE believes the Contracts for Difference (CfD) to be a viable, long term support mechanism for low carbon generation. SSE has provided input to the Scottish Government and Parliament in response to its consultation on how to improve planning legislation with a view to improving the prospects of building new and repowered onshore wind.</p>
<p>Cap and trade</p>	<p>Support with minor exceptions</p>	<p>Reform of the EU Emissions Trading Scheme (EU ETS) – SSE engaged with the relevant departments in the UK and Irish Governments, European Commission, MEPs in the European Parliament and through other stakeholders including the Scottish Government, as well as through our trade associations on the introduction of the Market Stability Reserve (MSR) in 2015 for the EU ETS and the continued reform of the EU ETS for Phase IV (Post 2020) that has now concluded. SSE actively lobbied against an amendment on the Aviation ETS Directive which could have marked UK allowances from January 2018. Marked allowances would not have been eligible for compliance within ETS rules. It was agreed that UK allowances would not be marked in 2018 in recognition of the Government changing its compliance date for prior to Brexit day. It is unclear beyond 2018 what the UK's relationship will be with the EU ETS. SSE continues to advocate the UK</p>	<p>Phase IV of the EU ETS has now been agreed SSE supported the reforms to double the Market Stability Reserve to reduce excess allowances, and the reform to reduce the Linear Reduction Factor annually by 2.2%, SSE supported these reforms which will help bring the market back to scarcity, and drive cost-effective carbon abatements through a robust carbon price signal. SSE supported Eurelectric's lobbying efforts on these issues. SSE's main focus for the ETS Directive has been on ensuring the legislation in "Post-Paris Ready", by incorporating the UNFCCC five-year review mechanism so that the EU can consider raising its ambition for 2030, at UNFCC INDC (Intended Nationally Determined Contributions) discussions in 2020. SSE is now focused on getting clarity at the earliest possible moment on the UK's future participation in the ETS. The UK Government has stated it is its intention to remain in the ETS during Phase III although this has currently not been agreed</p>

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
		remaining in the ETS at least until the end of Phase III, and preferably until the end of Phase IV (2030).	as part of the transitional period. SSE's preference is for the UK to remain as a participant in the ETS during Phase IV, and continues to engage with government officials promoting the benefits of a collaborative long-term UK-EU energy relationship.
Cap and trade	Support with minor exceptions	SSE supports the maintenance of the Carbon Floor Price (CFP), which has played a major part in reducing the UK's carbon emissions by triggering fuel switching in the electricity market from coal to gas. Carbon pricing provides stability and predictability to low carbon investment. SSE has engaged closely with the UK government to provide pragmatic and constructive advice on maintaining a strong carbon price signal. SSE will continue to make the case for carbon pricing to remain part of the UK's energy policy.	SSE welcomed the UK government's commitment at Budget 2017 to keep a carbon price at the current level until unabated coal generation closes. In the event that the UK leaves the EU ETS, SSE advocates for use of the Carbon Price Floor to ensure a strong carbon price signal remains.
Cap and trade	Support	Climate Change Act and the 5th Carbon Budget – The 5th Carbon Budget for the period 2028 to 2032 has been adopted and sets out the trajectory for the UK to meet its legally binding 2050 carbon target under the Climate Change Act. The Clean Growth Plan has also been published by BEIS. SSE continues to engage directly with the CCC and the Government on the 5th Carbon Budget and its implications, and support its analysis to ensure a cost-efficient pathway for the decarbonisation of the UK economy.	SSE welcomed publication of the UK government's Clean Growth Plan and will continue to engage with government on how to meet its objectives.
Energy efficiency	Support	Energy Efficiency Directive (EED) and other energy efficiency legislation – The EED is the main EU energy efficiency legislation to meet the EU energy efficiency targets for 2020 and 2030. The European Commission has brought forward its revised EED to ensure that the 2030 energy efficiency targets can be met. SSE has been engaging with the relevant departments in the European Commission and trade associations on this Directive in the 2030 Package,	SSE has been supportive of energy efficiency targets, and supports a bottom up approach that expands upon and tightens existing legislation to develop a bottom up approach to achieving all available cost effective energy efficiency measures for the economy.

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
		<p>and has tried to create a wider support with the energy industry towards energy efficiency to help vulnerable customers. SSE has similar engagement on other EU energy efficiency legislation aimed at meeting the 2030 target including the Energy Performance in Buildings Directive (EPBD) and the Ecodesign Directive.</p>	
Energy efficiency	Support with minor exceptions	<p>Energy Company Obligation (ECO) – focuses on energy efficient solutions, reducing carbon emissions and helping people out of fuel poverty. There have been two iterations of ECO so far – ECO1 and ECO2. ECO2 was extended for eighteen months beyond its initial end date. The extension scheme is due to finish at the end of September 2018. A new scheme, ECO3, will be introduced in October 2018. SSE is working closely with the UK Government and other stakeholders on the design of the successor scheme and on ways to improve energy efficiency schemes more broadly. SSE believes that energy efficiency policy must be designed to ensure cost effectiveness. Past schemes have been overly complex and therefore did not represent value for money for the customers that pay for them. The government made welcome changes to ECO2 for the extension period, with the aim of reducing administrative complexity. There is a strong case for the cost to be funded progressively by taking into account an individuals ability to pay. General taxation has the advantage of being means-tested, proportionate to earnings and hence socially progressive.</p>	<p>SSE supports the overall aim of ECO. SSE believes that energy efficiency measures are the best approach for consumers to minimise their energy bills. SSE however believes that the way in which energy efficiency measures are implemented and funded should be reviewed, so they facilitate cost effective delivery.</p>
Other, please specify (Low-carbon networks)	Support	<p>SSE has a networks business, SSEN, that owns and operates transmission &amp; distribution networks across GB. SSEN has engaged directly with OFGEM as part of the current RIIO-1 price control and discussions on the next set of price controls in the 2020s. SSEN has also provided BEIS with evidence from demonstration</p>	<p>SSEN fully supports the low carbon networks programmes. In a recent publication Supporting a Smarter Electricity System, SSEN set out a vision to transition from a DNO to a DSO, which acts as a neutral facilitator of new technologies. An example of SSEN supporting new technologies is the My Electric</p>

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
		projects into best practice for delivering low carbon networks. SSEN has recently issued tenders as part of business-as-usual to procure flexibility as an alternative to network reinforcement in constrained areas. For example SSEN can provide incentives to energy efficiency projects that reduce peak demand.	Avenue project, which investigated the impact of Electric Vehicle (EV) clusters on the electricity network. Following on from the findings of this project a new project called 'Smart EV' is collaboration with other Network Operators, Government, Ofgem and representatives from automobile and digital industries. One of the key objectives is to agree standards for EV charging.
Clean energy generation	Support	Renewable Energy Directive (RED) – Contains the legal backing for the 2020 renewable energy target. As part of the EU's Clean Energy Package, the European Commission has proposed revisions to the RED and will contain the EU wide binding target agreed in October 2014, for at least 27% of final energy to come from renewable energy by 2030. SSE has been engaging with the relevant departments in the European Commission and trade associations on the consultation to update the RED. In particular, we have been assessing how strategic projects such as how the North Sea Grid could enable greater offshore wind deployment to be developed to help the EU meet its targets. SSE will engage with the European Parliament and the Council of the EU (Member States) as the legislation goes through legislative scrutiny. SSE has been engaging with the relevant departments in the European Commission and trade associations.	SSE supports an EU wide renewable energy target for 2030 as it provides the long-term certainty for investment in the necessary infrastructure to decarbonise the UK and Irish economies in a cost effective way. SSE joined an alliance supporting an increase in ambition for the renewables target to 35% by 2030. SSE views that offshore wind as part of a more integrated North Sea grid could enable the cost-effective exploitation of a key strategic resource.

### C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

### C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Eurelectric (members via Energy UK, Energy Networks Association and Electricity Association of Ireland)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Eurelectric's major objectives are to deliver carbon neutral electricity in Europe by 2050, ensuring a cost-effective, reliable supply through an integrated market and developing energy efficiency and the electrification of the demand side to mitigate climate change.

**How have you, or are you attempting to, influence the position?**

As a member of national trade associations, SSE has strongly advocated that Eurelectric supports low carbon investment and efforts to improve energy efficiency. From June 2014, SSE's Chief Executive will be the Vice President for Eurelectric for a term of 2 years which was extended for an additional year in May 2017. One of the main topics for the Presidency was the international climate talks in Paris and their implementation in to the ETS, as well as the role of a robust carbon price signal in electricity market design and the electrification of heat and transport.

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**Trade association**

Energy UK and Energy Association of Ireland

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Energy UK fully support the scientific consensus behind climate change, and as such recognise the need to decarbonise the economy, and that the energy sector is crucial to this.

**How have you, or are you attempting to, influence the position?**

As a member of these organisations, SSE has strongly advocated that Energy UK and Energy Association of Ireland supports low carbon investment and efforts to improve energy efficiency.

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**Trade association**

Confederation of British Industry (CBI) (in Northern Ireland only)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

CBI supports energy efficiency, future proofing business against climate threats and moving businesses towards carbon neutrality by enabling the market to develop the solutions that are needed to achieve these goals.

**How have you, or are you attempting to, influence the position?**

SSE advocates that the CBI supports low carbon investment, policy on carbon targets/ EU ETS/ energy efficiency.

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**Trade association**

International Emissions Trading Association (IETA)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

International Emissions Trading Association advocates emissions trading globally and the EU ETS.

**How have you, or are you attempting to, influence the position?**

As a member of this organisation, SSE has strongly advocated for emissions trading globally and reform of the EU ETS.

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**Trade association**

Carbon Capture and Storage Association (CCSA)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

The CCSA works to raise awareness, both in the UK and internationally, of the benefits of CCS as a viable climate change mitigation option, and the role of CCS in moving the UK towards a low-carbon economy.

**How have you, or are you attempting to, influence the position?**

SSE supports the commercial demonstration of CCS technology with a view to CCS contributing to a future decarbonised energy system, alongside other low carbon sources.

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**C12.3e**

**(C12.3e) Provide details of the other engagement activities that you undertake.**

We have done ad hoc communications with energy companies and environmental NGOs around carbon pricing. For example, SSE joined with other energy companies and civil society organisations to write open letters to the government to highlight how this market-based approach to pricing carbon can provide an efficiency and cost-effective policy framework to meet UK environmental goals.

**C12.3f**

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**(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

SSE's business strategy and sustainability value (one of six of its core values) guides its overall approach on environment and climate change issues. SSE has policy and public affairs specialists based in Glasgow, Edinburgh, London, Belfast and Dublin who engage openly and constructively with legislators, officials and other policy makers on all aspects of environment (including water) and climate change policy. All communications across the business are managed by these experts and processes are in place to ensure consistency, quality and accuracy of communications across SSE. SSE has a commitment to responsible political engagement and this is communicated through its political engagement policy. This policy is in place for all employees and is consistently applied across the SSE Group and governs both SSE's policies in this area – for example its policy on political contributions - and serves as a guide to how employees should conduct themselves when representing SSE to government or other institutions. SSE has also signed up to the voluntary membership of the Chartered Institute of Public Relations' UK Lobbying Register. Alongside the SSE Group policy, employees are governed by its Code of Conduct. SSE also participates in mandatory registration for political engagement where such register exist (e.g. SSE's European Declaration).

## **C12.4**

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**(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

**Publication**

In mainstream reports, in accordance with TCFD recommendation AND in line with CDSB framework

**Status**

Complete

**Attach the document**

[SSE-plc-Annual-Report-2018.pdf](#)

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

---

**Publication**

In voluntary communications

**Status**

Complete

**Attach the document**

[Sustainability Report 2018 .pdf](#)

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

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**Publication**

In voluntary communications

**Status**

Complete

**Attach the document**

[Sustainability Report 2018 .pdf](#)

**Content elements**

Other, please specify (Articles published on sse.com in 2017/18)

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**Publication**

In voluntary communications

**Status**

Complete

**Attach the document**

[Half Year Sustainability Statement 6-11-17.pdf](#)

**Content elements**

Governance

Strategy

Risks & opportunities  
Emissions figures  
Emission targets

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## C14. Signoff

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### C-FI

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(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

#### C14.1

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(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Finance Director	Chief Financial Officer (CFO)

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## SC. Supply chain module

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### SC0.0

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(SC0.0) If you would like to do so, please provide a separate introduction to this module.

#### SC0.1

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(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	3122600000

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#### SC0.2

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(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

Please select

#### SC1.1

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**(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.**

**SC1.2**

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**(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).**

**SC1.3**

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**(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?**

Allocation challenges	Please explain what would help you overcome these challenges
Customer base is too large and diverse to accurately track emissions to the customer level	The knowledge of sustainability data and information tends to be managed in different areas to the management of contracts and relationships. With large and diverse numbers of customers it is difficult to understand data requirements and then respond appropriately.

**SC1.4**

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**(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?**

Yes

**SC1.4a**

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**(SC1.4a) Describe how you plan to develop your capabilities.**

Strong links between customer facing teams and sustainability teams are already being created. The next step is to understand customer requirements and then allocate resources to help provide this information and data.

**SC2.1**

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**(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.**

**SC2.2**

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**(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?**

No

### SC3.1

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(SC3.1) Do you want to enroll in the 2018-2019 CDP Action Exchange initiative?

Yes

### SC3.1a

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(SC3.1a) Identify which member(s), if any, have motivated you to take part in Action Exchange this year.

Please select

### SC3.1b

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(SC3.1b) Select the types of emissions reduction activities that your company would like support in analyzing or in implementing in the next reporting year.

Fugitive emissions reductions

Transportation: fleet

### SC3.1c

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(SC3.1c) As part of Action Exchange, would you like facility level analysis?

Yes

### SC3.2

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(SC3.2) Is your company a participating supplier in CDP's 2017-2018 Action Exchange initiative?

No

### SC4.1

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(SC4.1) Are you providing product level data for your organization's goods or services, if so, what functionality will you be using?

No, I am not providing data

### SC4.2d

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(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?

No