sse Renewables

Net Zero Transition Plan

December 2023

About SSE Renewables

SSE Renewables is part of SSE plc (also referred to as "the SSE Group") and is a leading developer and operator of renewable energy, with a portfolio of around 4.5GW of onshore wind, offshore wind and hydro generation capacity. Its strategy is to drive the transition to a net zero future through the world-class development, construction and operation of renewable energy assets.

SSE Renewables is currently building more offshore wind than any other company in the world. It has set a goal to double its current renewable generation capacity to around 9GW by 2027 and an ambition of 16GW by 2032. This increase is expected to result in SSE Renewables generating at least 50TWh of renewable energy output by the end of the next decade, a fivefold increase from 2019 levels.

About this Report

With a strategy for ambitious growth in its home markets of the UK and Ireland, and overseas, SSE Renewables is putting sustainability at the core of how it will achieve its goals. This report comprises SSE Renewables' Net Zero Transition Plan, outlining the key carbon reduction targets and actions the business will undertake to decarbonise in alignment with climate science. Information and data reported relates to the period 1 April 2022 to 31 March 2023 unless otherwise stated.

Progress against carbon reduction targets will be included in future annual sustainability reports. Further reports will also be published to provide additional detail on how SSE Renewables will support climate resilence, a just transition, and a circular economy.

SSE Renewables welcomes and encourages feedback on this report and its approach to the net zero transition. You can get in touch with feedback and comments by emailing **SSERsustainabilityteam@sse.com.**

Contents

About SSE Renewables	**1**
About this Report	**1**
Foreword: Zero-ing in on our carbon footprint	**2**
Net Zero Transition Plan on a Page	**3**
The Big Picture	**5**
Our Approach to Net Zero	**7**
Setting Targets	8
Our Business Carbon Footprint	**9**
Scope 1 and 2 Emissions	12
Scope 3 Emissions	12
Tackling Our Operational Emissions	**13**
Crew Transfer Vessels (CTVs)	14
Sulphur Hexafluoride (SF_6)	15
Operational Vehicles and Company Mileage	16
Site Energy Consumption	16
Tackling Our Supply Chain Emissions	**17**
Sustainable Design	18
Sustainable Procurement	20
Construction Materials	22
Circularity	23
Marine Fuels	24
Biogenic Emissions and Carbon Removals	**25**
Carbon Removals	25
Emissions from Land Use Change	25
Beyond Value Chain Mitigation	26
Climate Resilience and Adaptation	**27**
Just Transition	**28**
Accountability and Transparency	**29**
Assurance and Verification	29
Digitalisation and Innovation	29
Policy Advocacy	29

Zero-ing in on our carbon footprint

Setting out a plan to 'walk the walk' to net zero.

Knowing what we need to do and knowing exactly how we do it can sometimes be quite different things. But that's not an excuse to not try – it's motivation to think differently.

The scale of renewable energy required to limit global warming to 1.5°C, and therefore avoid the worst impacts of climate change, is staggering. The industry is faced with the need to grow at an unprecedented pace, delivering the projects that will enable the reduction of carbon emissions to net zero. While this is an ambitious task in itself, it is fundamentally not enough. To be a real leader in the clean energy transition, we have to fully 'walk the walk' - developing and operating renewable energy infrastructure in a way that is truly sustainable for people and planet.

Through our Net Zero Acceleration Programme, we are proud to have a fully budgeted plan to double our net installed renewables capacity from 4.5GW today to around 9GW by 2027, and we have ambition to build on this further to at least 16GW by 2032.

However, we know this ambition will inevitably involve significant demand for resources such as steel, concrete, copper and aluminium, as well as large-scale transportation and reliance on marine vessels. Without new ways of doing things, the clean, green energy being produced by the renewables sector will be reliant on high-carbon activities and value chains. Concerted action is therefore needed to completely decouple the industry from carbon emissions, without slowing down the roll-out of renewables or increasing costs to unsustainable levels for consumers, especially those who can afford it least.

Our Net Zero Transition Plan outlines our approach to assessing and mitigating the carbon impacts of SSE Renewables' projected growth. It establishes the key targets and actions that will support our transition to a truly net zero business. And we know that any good target starts with a robust baseline, which is why we are publishing our current carbon footprint at the same time.

By committing to a plan which is ambitious and transparent, but with a healthy dose of realism for the challenges ahead, we are determined we can achieve net zero emissions across our direct operations by 2035, and across our value chain by 2050. Achieving these targets will require openness, innovation and, most importantly, collaboration - because we know we won't come up with all the answers alone. By working with our colleagues, partners, peers, customers, communities, civil society, policy-makers and - most critically - our supply chain, and through cross-industry initiatives like the Carbon Trust's Sustainability Joint Industry Partnership and the Powering Net Zero Pact, we are committed to being a leading voice in efforts to make sure net zero really means net zero.

Stephen Wheeler
Managing Director,
SSE Renewables

As with all of SSE Renewables' sustainability disclosures, feedback and engagement is warmly welcomed. Please get in touch with us by emailing **SSERsustainabilityteam@sse.com.**

Net Zero Transition Plan on a Page

SSE Renewables' shorter-, medium- and long-term carbon targets, plus key actions to achieve them.

TARGETS

2030

SHORTER-TERM TARGETS (TO 2030)

- Reduce the carbon intensity of scope 1 and 2 emissions by 66% by 2030 (tCO_2e/MWh) — S1, S2
- 90% of suppliers by spend to set a science-based carbon reduction target by 2030 — S3

2035

MEDIUM-TERM TARGETS (2030 - 2035)

- Net zero for scope 1 and 2 emissions by 2035 — S1, S2
- Reduce the carbon intensity of scope 3 emissions by 66% by 2035 (tCO_2e/MW in construction) — S3

2050

LONG-TERM TARGET (2035 - 2050)

- Net zero for remaining scope 3 emissions by 2050 — S3

S1 Scope 1
S2 Scope 2
S3 Scope 3

ACTIONS

SCOPES 1 AND 2 (pages 13-16)

1. Transition crew transfer vessels to low-carbon fuels
2. Reduce leakage and reliance on sulphur hexafluoride (SF_6) in switchgear
3. Switch operations vehicle fleet to ultra-low-emissions vehicles and roll out EV charging infrastructure
4. Replace back-up site diesel generators with low-carbon alternatives
5. Reduce operational site electricity consumption and ensure remainder is backed by renewable tariffs

SCOPE 3 (pages 17-24)

6. Implement sustainable design practices across all capital projects
7. Lead industry change through strategic collaboration
8. Source low-carbon construction materials and plant for capital projects
9. Adopt circular economy practices across the lifecycle of our assets
10. Contract high-efficiency vessels for offshore capital project delivery and support the transition to low-carbon marine fuels

BIOGENIC EMISSIONS AND GHG REMOVALS (pages 25-26)	Deliver restoration and enhancement of natural carbon sinks in accordance with best practice standards as part of commitments to Biodiversity Net Gain
CLIMATE ADAPTATION AND RESILIENCE (page 27)	Implement digital tools to enhance climate resilience for existing and new sites
JUST TRANSITION (page 28)	Deliver a Just Transition Plan outlining how SSE Renewables will embed SSE's 20 Principles throughout our net zero transition activities

Note:
Scope 1 and 2 – GHG emissions within our direct operational control
Scope 3 – GHG emissions in our value chain over which we have influence but not direct control

The Big Picture

Climate Science

Amidst the climate emergency, as observed through the continuous shattering of climate records and devastating natural events occurring across the world, it is evident that we are at a critical juncture. Human-caused global warming of 1.1°C has already impacted people and ecosystems – with those countries and communities historically least to blame for climate change, already impacted more severely than expected.

The Need for Urgent Action

There is more than a 50% chance that the global temperature rise will reach or surpass 1.5°C between 2021-2040; in a high emissions pathway it could be sooner (IPCC, AR6[1]). The window of opportunity to avoid the worst impacts of climate change, and limit global warming to a 1.5°C trajectory, is closing. Only though rapid and sustained decarbonisation, facilitated by a just transition from a high-carbon economy to one powered by renewable energy, can we keep 1.5°C alive and protect vulnerable communities to ensure a prosperous future.

Role of Renewables in a Net Zero Future

Renewable energy will be pivotal in achieving a net zero emissions future, and in 2022, wind and solar reached a record of 12% of global electricity generation[2]. It is recognised that for the world to stay on track for its climate targets, global electricity generation needs to be decarbonised by 2040 and total installed capacity of renewables will need to be eight times the 2022 level by 2050, as shown in figure 1[3].

While the scale-up of renewables is critical to addressing the climate crisis, renewable energy projects also have a carbon footprint. To be a truly sustainable solution, the industry must address this issue and work to not only reduce the carbon intensity of the assets themselves, but also undertake additional value chain mitigation work.

Global Ambition

The Paris Agreement and the associated Nationally Determined Contributions (NDCs) have driven forward global ambition and action on decarbonisation. As of November 2023, over 140 countries have adopted or are discussing net zero greenhouse gas (GHG) targets, covering nearly 90% of global emissions. This has resulted in the rapid expansion of renewable energy, with G20 leaders pledging support to triple renewable energy capacity globally by 2030, aligning with recommendations from the International Renewable Energy Agency (IRENA)[4].

Policy Support

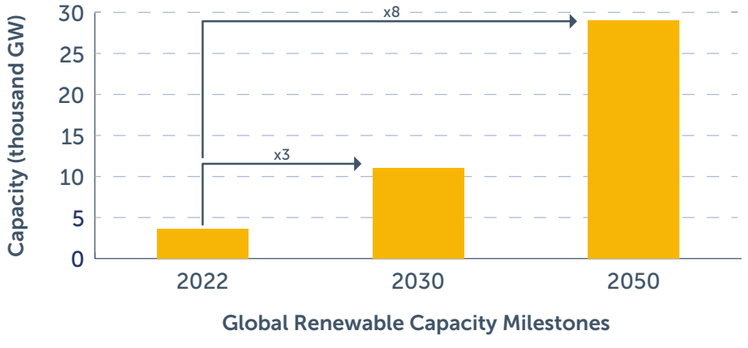
Governments around the world have introduced policies to support this ambition and attract green investment, most notably the European Commission Green Deal Industrial Plan and the US Inflation Reduction Act. Closer to home, the UK government published its 'Powering up Britain' plan which sets out how the UK will enhance energy security, seize economic opportunities of the green transition, and deliver on net zero commitments[5].

Industry Trends

To ensure that this growth in renewables is truly sustainable and supports a just transition, non-price criteria (assessing bids based on their sustainability metrics) are beginning to emerge in renewable energy auctions, notably in Denmark, Germany, Norway, and the Netherlands. A key component of this is the carbon intensity, or GHG footprint, of the proposed development. This, coupled with the urgency of the moment and increased questioning and assessment from investors on the environmental and wider sustainability impacts of our projects, is moving the industry to begin to compete not only on cost, but also sustainability.

In this context, we have set out this transition plan to outline the ambitious actions we will take to achieve net zero. This means prioritising the reduction of our own scope 1, 2 and 3 emissions to as close to zero as possible and neutralising any residual emissions.

Figure 1: Forecasted global installed renewables capacity, based on the International Energy Agency's Net Zero Emissions by 2050 Scenario.



1 Sixth Assessment Report — IPCC
2 Global Electricity Review 2023 | Ember (ember-climate.org)
3 Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach – Analysis - IEA
4 G20 Leaders Endorse IRENA Recommendations for Global Renewable Energy Adoption
5 Powering up Britain - GOV.UK (www.gov.uk)

SSE Group Ambitions

SSE Renewables is part of the SSE Group and is a leading developer and operator of renewable energy, headquartered in the UK, with a growing presence internationally. The SSE Group strategy is to create value for shareholders and society in a sustainable way by developing, building, operating, and investing in the electricity infrastructure and business needed in the transition to net zero. To support this strategy, the SSE Group has four core 2030 business goals aligned to the UN's Sustainable Development Goals (SDGs) most material to SSE's business activities (Climate Action, Providing Affordable and Clean Energy, Industry, Innovation and Infrastructure, and Decent Work and Economic Growth[6]). This is bolstered by its targets, approved by the Science-Based Targets initiative (SBTi)[7], to be net zero for scope 1 and 2 emissions by 2040, and net zero for all remaining scope 3 emissions by 2050. Full details of SSE's commitments to climate action can be found in the SSE plc Net Zero Transition Report[8].

6 Our strategy | SSE
7 The Corporate Net-Zero Standard - Science Based Targets
8 nztp-report-oct22-final.pdf (sse.com)

Our Approach to Net Zero

We are committed to ensuring that the transition to a renewable energy system is truly sustainable. To deliver on this we are committing to achieving net zero across our scope 1 and 2 activities by 2035, and scope 3 activities by 2050.

Governments and companies must take ambitious action to address climate change. This means achieving net zero as quickly as possible through deep and rapid GHG emission reductions, including the ramping up of renewable energy generation.

The primary challenge faced by SSE Renewables is the decoupling of GHG emissions growth from business growth. While renewable generation capacity needs to grow to meet national net zero targets, this growth makes our corporate net zero targets harder to achieve – this is the basis of the 'net zero infrastructure paradox'. To illustrate this point, Figure 2 shows the growth ambitions of our portfolio out to 2032 based on our NZAP Plus[9] capital investment programme and the estimated scope 1 and 2 GHG emissions this could produce under a 'business-as-usual' scenario where no further action is taken to address GHG emissions[10].

In terms of decarbonisation, scope 1 and 2 emissions are the result of activities under our direct control, while scope 3 emissions originate primarily from our supply chain. Achieving net zero in our scope 1 and 2 emissions will therefore form our shorter-term ambition. As we have influence over scope 3 emissions, but no direct control, significant collaboration across the entire value chain will be key to achieving net zero. We are keen to work with suppliers and peers to achieve our net zero ambition through refining scope 3 accounting and reporting methodologies and instilling supplier confidence by sending clear market signals.

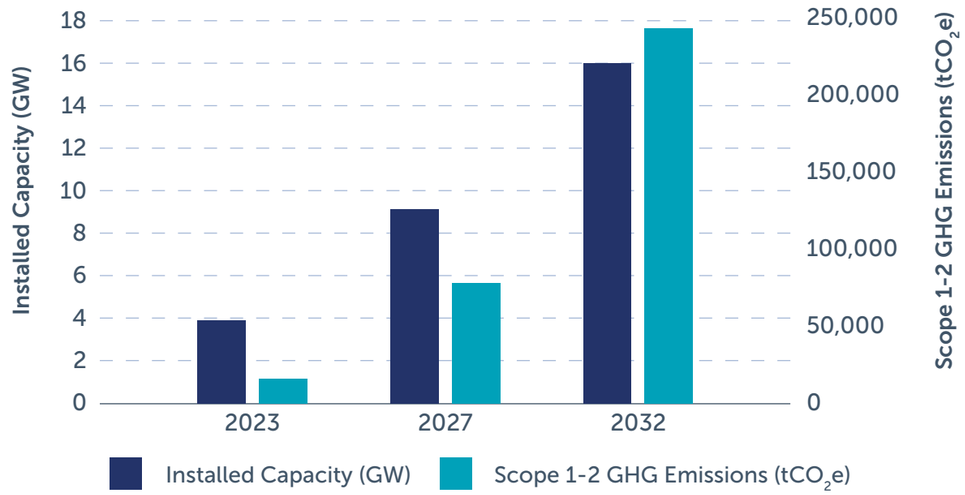
JARGON BUSTER

Net Zero:
A state in which the greenhouse gases going into the atmosphere are balanced by removal of greenhouse gases out of the atmosphere. In a corporate context this means reducing scope 1, 2, and 3 emissions to zero or near-zero and neutralising any residual emissions.

NZAP Plus:
SSE plc's Net Zero Acceleration Programme Plus (NZAP Plus) is a fully funded investment programme, which includes plans to deliver 9GW of net renewable capacity by 2027. The group has further ambitions to reach 16GW installed capacity by 2032.

9 nzap-plus.pdf (sse.com)
10 Based on operational data from financial year 2022/23 an operational intensity of 6.6 tCO_2e/GWh was used for offshore wind and 0.7 tCO_2e/GWh for all onshore technologies.

Figure 2: Installed capacity ambition for SSE Renewables based on the NZAP Plus, and the associated scope 1 and 2 emissions following a business-as-usual approach.



Setting Targets

SSE Renewables has set both scope 1 and 2 and scope 3 GHG emission intensity targets in alignment with guidance from the Science Based Targets Initiative (SBTi). Under the SBTi guidance and power sector specific pathway, electric utilities, including generators like SSE Renewables, must decarbonise at a faster rate than other industries due to the role that electrification will play in decarbonising other sectors like heating and transport. Following the SBTi's 'mitigation hierarchy', our priority is on addressing our operational and supply chain GHG emissions. We then aim to go further and explore carbon removals, focussing first on the enhancement of terrestrial, coastal, and marine carbon sinks that sit within the footprint of our operational assets, and then longer-term looking at mitigation outside our value chain.

While we have developed these targets following the SBTi guidance, they have not been submitted for approval as SSE Group already has targets verified by the SBTi. This is in alignment with the SBTi guidance that states preference for parent companies to include subsidiaries within their targets. Our targets shall guide us to make the necessary changes needed to ensure that the growth of our business does not result in an associated increases in emissions and shall support SSE Group to achieve its own science-based targets.

JARGON BUSTER

Science Based Target Initiative (SBTi): A global body that enables companies and financial institutions to set ambitious emission reduction targets in line with the latest climate science.

Our Business Carbon Footprint

Through the development, construction and operation of renewable energy assets, we are driving decarbonisation of the energy system and supporting society to reach net zero.

Renewable generation displaces – or avoids – GHG emissions by replacing carbon-intensive forms of generation such as oil, coal and gas. SSE Renewables' generation of 9,597GWh over financial year 2022/23 enabled the displacement of between 1.85-3.84 million tCO_2e from the GB and Ireland electricity grids. The range here reflects the uncertainty regarding whether it is displacing 'average grid' or combined cycle gas turbine (CCGT) plants[11]. Displaced carbon is a 'systemic benefit' as it is not attributable to any single player within the energy system but rather it comes through the interaction of multiple players including generators, network operators, energy markets and consumers. As such, it is not included in our GHG emissions as a means of offsetting.

In addition to this systemic benefit of renewables, at SSE Renewables we know we need to go further to assess and mitigate the GHG emissions associated with our operational and construction activities to ensure that our business growth is truly sustainable and aligned with a net zero emissions future. In previous years, SSE Renewables' business carbon footprint has been reported as part of the wider SSE plc carbon footprint. However, to provide a greater degree of transparency and to drive the right actions within the renewables industry, we are now reporting a 'renewables-specific' business carbon footprint covering scopes 1, 2 and 3 based on financial year 2022/23. This has allowed us to establish a baseline for our emissions which we can use to prioritise our decarbonisation actions and set ambitious climate action targets.

2022/23 Performance

Installed Capacity (SSE share)
3,915 MW

2022/23 Production (SSE share)
9,597GWh

Scope 1 GHG Emissions
13,074 tCO_2e

Scope 2 GHG Emissions
4,578 tCO_2e

Scope 3 GHG Emissions (Modelled)
2,450,316 tCO_2e

Scope 1 and 2 GHG Intensity
0.00184 tCO_2e/MWh

Supply chain (Scope 3) Emissions GHG Intensity
889 tCO_2e/MW
in construction

JARGON BUSTER

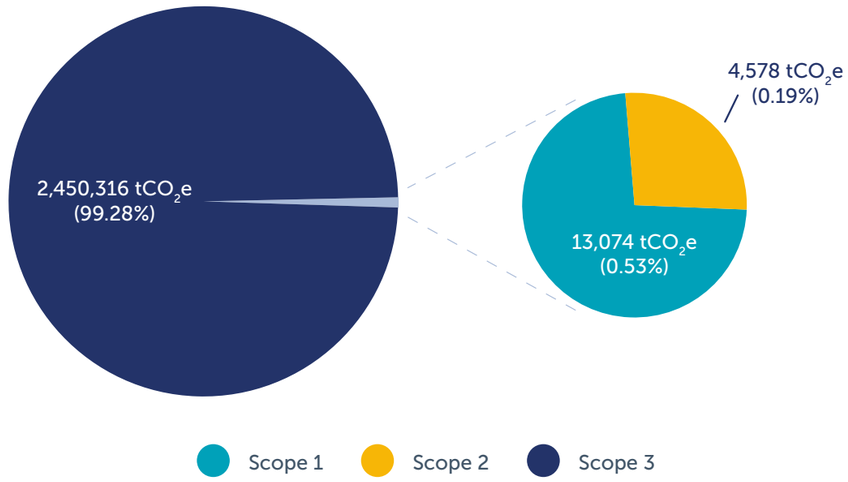
GHGs: Greenhouse Gases. These are gases that absorb and re-emit infrared radiation, trapping heat in the Earth's atmosphere. Includes carbon dioxide (CO_2), methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFC_s), Sulphur Hexafluoride (SF_6), and Nitrogen Trifluoride (NF_3).

tCO_2e: Metric tons of carbon dioxide equivalent. A unit of measurement used to express the 100 year equivalent of the seven main GHG in terms of their carbon dioxide equivalence.

Scopes: Defined by the GHG Protocol accounting standard, these are categories of emissions sources. They are divided into three categories: 1 – Direct emissions from sources owned or controlled by an organisation; 2 – Indirect emissions from purchased electricity, heat, or steam; 3 – Indirect emissions from sources not owned or controlled by the organisation.

11 Calculation based on displacing average grid intensity, assuming a UK Grid Intensity of 193 tCO_2e/GWh [Greenhouse gas reporting: conversion factors 2023 - GOV.UK (www.gov.uk)] an Irish Grid Intensity of 296 tCO_2e/GWh [Conversion Factors | SEAI Statistics | SEAI], and a CCGT Plant Intensity of 400 tCO_2e/GWh.

Figure 3: Overview of Scopes 1-3 for SSE Renewables based on FY 2022/23.



Our business carbon footprint for financial year 2022/23 has been calculated following the guidance set out in the Greenhouse Gas Protocol[12]. Scopes 1 and 2 have been calculated using a mix of primary and secondary datasets. Scope 3 has been modelled by mapping procurement categories to industrial sectors emission intensity dataset [13].

Scope	Definition	What does it mean for SSE Renewables?
1	Direct emissions from sources owned or controlled by an organisation	Emissions associated with our marine and land operational fleets, back-up diesel generation, gas used in heating, and fugitive SF_6
2	Indirect emissions from purchased electricity, heat, or steam	Electricity consumption
3	Indirect emissions from sources not owned or controlled by an organisation	Emissions associated with the material production, manufacture, transportation and construction of renewable assets

12 Corporate Standard | GHG Protocol
13 UK and England's carbon footprint to 2020 - GOV.UK (www.gov.uk)

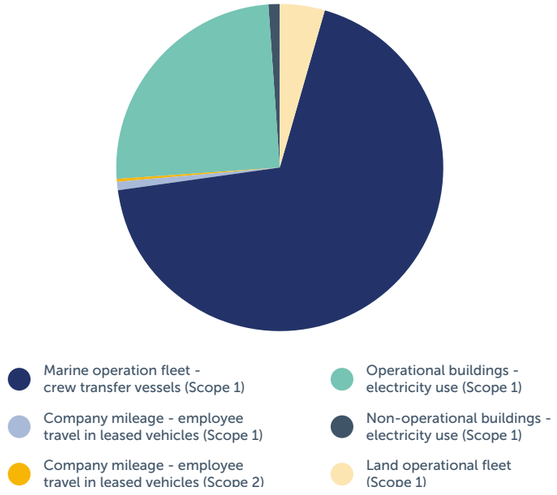
Scope 1 and 2 Emissions

Our scope 1 and 2 GHG emissions for financial year 2022/23 are calculated to be 17,652 tCO_2e, equivalent to an operational GHG intensity of 0.00184 tCO_2e/MWh. The main emission sources in this category come from crew transfer vessels (CTVs), site energy consumption, and operational travel (Figure 4). While fugitive SF_6 emissions weren't substantial in 2022/23, due to its potency as a GHG, they have potential to be significant, and are therefore also considered a key priority. How we intend to address these scope 1 and 2 emissions is addressed in the 'Tackling our Operational Emissions' section (pages 13-16).

Scope 3 Emissions

Our scope 3 emissions for financial year 2022/23 have been modelled to be 2,450,316 tCO_2e and make-up 99.28% of our business carbon footprint (Figure 3). These emissions primarily correspond to capital project delivery and so we have defined our scope 3 emission intensity as 'tCO_2e per megawatt in construction'. For 2022/23 this corresponds to 889 tCO_2e/MW in construction, primarily coming from the production and manufacturing of the steel, concrete, and other key materials used in our assets, and the marine vessel fuels used to transport components and install offshore wind farms. Scope 3 emissions represent emissions in our supply chain that are within our influence but not direct control. We therefore need to take a collaborative approach and work with a wide range of industry and policy stakeholders to address them. For details on how we intend to tackle our scope 3 emissions see the 'Tackling Our Supply Chain Emissions' section (pages 17-24).

Figure 4: Breakdown of Scopes 1 and 2 for SSE Renewables based on FY 2022/23.



Scope 1	FY22/23 Emissions (tCO_2e)	% of Scopes 1-2
Operational buildings - fuel use	0	0.0%
Non-operational buildings - fuel use	0	0.0%
Land operational fleet	793	4.5%
Marine operational fleet - crew transfer vessels	12,100	68.5%
Company mileage - employee travel in leased vehicles	132	0.7%
Diesel generators	47	0.3%
Fugitive emissions - SF_6	2	0.0%
Scope 2		
Operational buildings - electricity use	4,367	24.7%
Non-operational buildings - electricity use	194	1.1%
Company mileage - employee travel in leased vehicles	17	0.1%
Total Scope 1	**13,074**	**74.1%**
Total Scope 2	**4,578**	**25.9%**
Total Scopes 1-2	**17,652**	**100.0%**

CASE STUDY

Data Improvements

In alignment with the Greenhouse Gas Protocol Accounting and Reporting principles, we strive to continually improve our approach to ensure the relevance, completeness, consistency, transparency, and accuracy of reported emissions data. For example, our scope 3 emissions were modelled using a spend-based approach. While there are significant limitations to this approach, it is presently the most appropriate methodology given data availability. To improve our scope 3 data reporting going forward, we are working collaboratively with our supply chain partners to source more primary data relating to the goods and services they provide.

We are also taking action to expand the scope of our carbon accounting to include emissions from land use, land use change and forestry. In collaboration with the environmental consulting firm, WSP, we are developing a land carbon assessment tool to drive decision-making in the design phase of our projects, minimising the impact on natural carbon sinks and identifying options for habitat restoration or enhancement works which improve carbon storage and sequestration. For further details on our approach to land carbon and nature-based solutions, see the 'Biogenic Emissions and Carbon Removals' section (pages 25-26).

Tackling Our Operational Emissions

Our starting point for decarbonisation is on scopes 1 and 2. These are sources of emissions that are both well characterised and in our direct control.

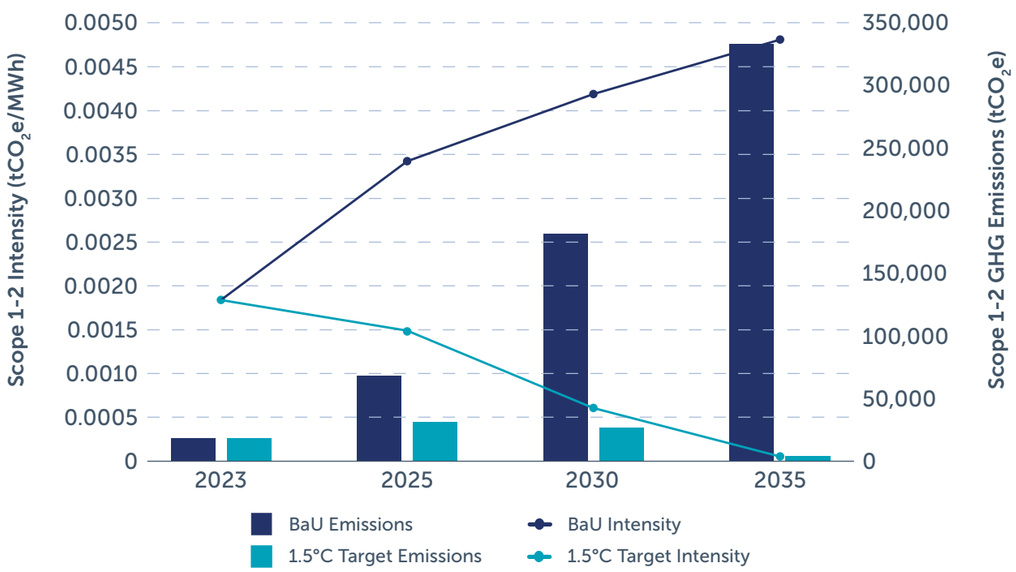
This section outlines the steps we are taking to address GHG emissions across key target areas to reach our shorter- and medium-term emissions targets. Achieving our 2035 net zero scope 1 and 2 target would result in the decoupling of renewable energy output and scope 1 and 2 GHG emissions, as demonstrated in Figure 5.

OPERATIONAL EMISSIONS TARGETS:

Reduce the carbon intensity of scope 1 and 2 emissions by 66% by 2030 (tCO_2e/MWh), and achieve net zero for scope 1 and 2 by 2035. To achieve this, we have identified four key target areas for action:

- Crew Transfer Vessels (CTVs)
- Sulphur Hexafluoride (SF_6)
- Operational Vehicles and Company Mileage
- Site Energy Consumption

Figure 5: Projected scope 1 and 2 emissions based on expected growth in renewables. In dark blue is the business as usual (BaU) pathway, and in teal is the 1.5°C aligned decarbonisation pathway.



Crew Transfer Vessels (CTVs)

12,100 tCO_2e

70% of Scope 1-2 GHG emissions

#1 **ACTION:** Transition crew transfer vessels to low-carbon fuels

These are the emissions from the CTVs used in the operation of our offshore wind farms. Marine vessels in general are recognised as a hard to abate sector with no widely available commercial solutions. In addition, the need for rapid turnaround and long operating hours further complicates the transition to low-carbon solutions.

In the shorter-term, our focus is on efficiencies, both in terms of the planning of operational activities and the vessel themselves. To minimise fuel consumption, alongside optimising our own operational logistics, we are working with vessel providers to ensure that the CTVs used to service offshore wind farms are as efficient as possible through improved hull design and propulsion systems.

We are also focused on the transition to e-fuel or electric powered CTVs (See the GreenTransit case study). To enable this transition, three key barriers must be overcome:

- Limited availability of e-fuelled or fully electric CTVs;
- Restricted supply of green hydrogen and associated e-fuel derivatives; and
- Limitations on battery energy density and lifespan

To achieve this, we are continuing to explore opportunities to demonstrate low-emission CTV technologies to de-risk and provide confidence in this sector. Through our sustainable procurement approach, we are also aiming to include costings for low-carbon vessels to be priced into all tenders and contracts.

CASE STUDY

GreenTransit hydrogen fuel CTV trial

SSE Renewables, in collaboration with the European Marine Energy Centre (EMEC), Wick Harbour and Simpson Oil recently completed a feasibility study, funded by the Department for Transport and Innovate UK. The project successfully demonstrated the feasibility of using green hydrogen to power a CTV to maintain Beatrice offshore wind farm. Replacement of a traditional CTV with a green hydrogen fuelled CTV saved approximately 3 tCO_2e/day alongside socio-economic benefits associated with a local hydrogen economy.

Decarbonising CTVs is critical in tackling our scope 1 emissions. To progress towards this goal, we are reviewing how we can take the learnings from the GreenTransit study and put them into practice. Currently there are two major barriers to implementing these innovations on a commercial scale, these are the availability of green hydrogen, and the immature market for hydrogen CTVs. By working collaboratively with ports and vessel suppliers, we aim to support the derisking of this sector, enabling progress to be made on these two barriers.

Sulphur Hexafluoride (SF_6)

2 tCO_2e

0.01% of Scope 1-2 GHG emissions

#2 **ACTION:** Reduce leakage and reliance on SF_6 in switchgear

Sulphur Hexafluoride (SF_6) is commonly used in electrical transmission and distribution equipment as an insulating gas. Despite not being a large contributor to our operational carbon footprint for financial year 2022/23, SF_6 has potential to be significant due to its high global warming potential.

In the shorter-term, assets that hold SF_6 shall continue to be regularly inspected, with any leakages reported. Due to the potency of SF_6 as a GHG there is strict reporting governance in place requiring that all leaks be reported within 30 minutes. Any leaks in SSE Renewables above 11kg undergo a full investigation with lessons learned and improvements fed back to SSE Group. To facilitate the phase-out of SF_6 across SSE Renewables' portfolio, we are updating our procurement processes to specify preference for SF_6 alternative equipment (where technically feasible). This approach will not only mitigate the potential for substantial GHG emissions associated with SF_6 leakage across the portfolio, but also positions us to adapt to upcoming EU F-gas regulations expected to be introduced over the coming decades.

CASE STUDY

Engaging with suppliers on SF_6 alternatives

The use of SF_6 as an insulating gas in electrical switchgear has increased over the last decade due to its excellent electric arc-quenching properties. However, as it is an extremely potent GHG, its use must be phased out. Viable technical alternatives to SF_6 insulated switchgear are available. One popular alternative is a gas mixture containing Novec-4710 which while still a GHG, has a much reduced potency compared to SF_6. Another alternative uses a "clean air" gas mix combined with a vacuum interrupter, which has no associated global warming potential.

To support the commercialisation and widespread deployment of the SF_6-alternatives, we have updated our approach to procurement to specify preference for SF_6-free electrical equipment from suppliers, and assess the potential GHG emissions that would be associated with expected operational leakage over a project lifetime. Where a supplier offers multiple "sustainability" options, this allows us to compare the carbon implications of each and make an informed decision to ensure we have maximum impact from a climate mitigation perspective.

Operational Vehicles and Company Mileage

940 tCO_2e

5% of Scope 1-2 GHG emissions

#3 **ACTION:** Switch operations vehicle fleet to ultra-low-emissions vehicles and roll out EV charging infrastructure

These emissions come from operational and company vehicles used to fulfil operational needs alongside daily business work. There is a clear pathway for the decarbonisation of cars via the uptake of electric vehicles (EVs), however, there are not yet commercially available solutions that fulfil the operational requirements to replace larger vehicles such as 4x4s and vans.

Our near-term focus is on continuing progress towards electrification of our vehicle fleet in line with SSE's commitments to the EV100 Initiative. To date, we have converted over 78% of our SSE Renewables car fleet (212 out of 271 vehicles) to EVs and remain on target to reach 100% by 2030. In addition, we are rolling out EV charging infrastructure across our operational sites and seek to do this as standard for all new sites.

Longer-term, we will take actions to adopt suitable low-emissions vehicles to replace our current fleet of 4x4s and vans. At present, only 2% of our van fleet is electric (5 out of 214 vehicles), however we are continuing to work towards our 50% by 2030 target with SSE Fleet Services to trial low-carbon solutions for vehicles with high payloads and off-road capability, as detailed in the case study below.

Site Energy Consumption

4,600 tCO_2e

25% of Scope 1-2 GHG emissions

#4 **ACTION:** Replace back-up site diesel generators with low-carbon alternatives

#5 **ACTION:** Reduce operational site electricity consumption and ensure remainder is backed by renewable tariffs

These emissions are from the electricity consumption of our operational and non-operational sites and the use of back-up diesel generation, with most emissions coming from operational site electricity consumption (Figure 4). In the shorter-term, we expect this emission source to increase due to the growth of our operational portfolio. Alongside energy efficiency measures, we are also committing to obtaining renewable energy certificates to cover all on-site electricity consumption. Over the next decade as the grid decarbonises due to increased renewable generation, the location-based emissions factor associated with electricity consumption will fall.

Diesel generators have a variety of applications across our portfolio. They are used in construction for welfare and testing, and during operations provide back-up power to turbines to protect blades and components from icing and high winds. This distributed and ad-hoc usage makes data collection of actual consumption challenging, and so the priority is to ensure we are accurately recording on-site diesel consumption to drive efficiencies and inform viable decarbonisation approaches.

Longer-term, we are exploring the role of biofuels and e-fuels to replace diesel alongside the transition to battery alternatives and electric construction plant. To deliver on this, we are committing to ensuring that all sites use a low-carbon alternative for any required back-up or micro-generation where viable.

CASE STUDY

Munro Electric 4x4 Trial at Clyde Wind Farm

While the transition of cars to EV technology is achievable with commercially available solutions, other areas, such as on-site vehicles with high payloads are harder to electrify. To drive forward solutions in this area, in June 2023, SSE Renewables became the first UK company to trial a 4x4 zero-emissions utility vehicle built entirely in Scotland. This vehicle (The Munro) promises great off-road and load-hailing capabilities and was demonstrated to be fit for purpose on the rugged terrains of Clyde Wind Farm. Future trials are being planned to test its performance in harsh winter conditions. The successes of the trials to date have been the result of an 18-month long partnership between SSE Renewables and the Munro Vehicle Team, demonstrating how collaborating with suppliers is key to achieving our net zero ambitions.

Tackling Our Supply Chain Emissions

To deliver on our 2050 net zero ambition we need to address our scope 3 supply chain GHG emissions. Only through openness on the challenges ahead, innovation and close collaboration with our peers and strategic suppliers will we achieve this goal.

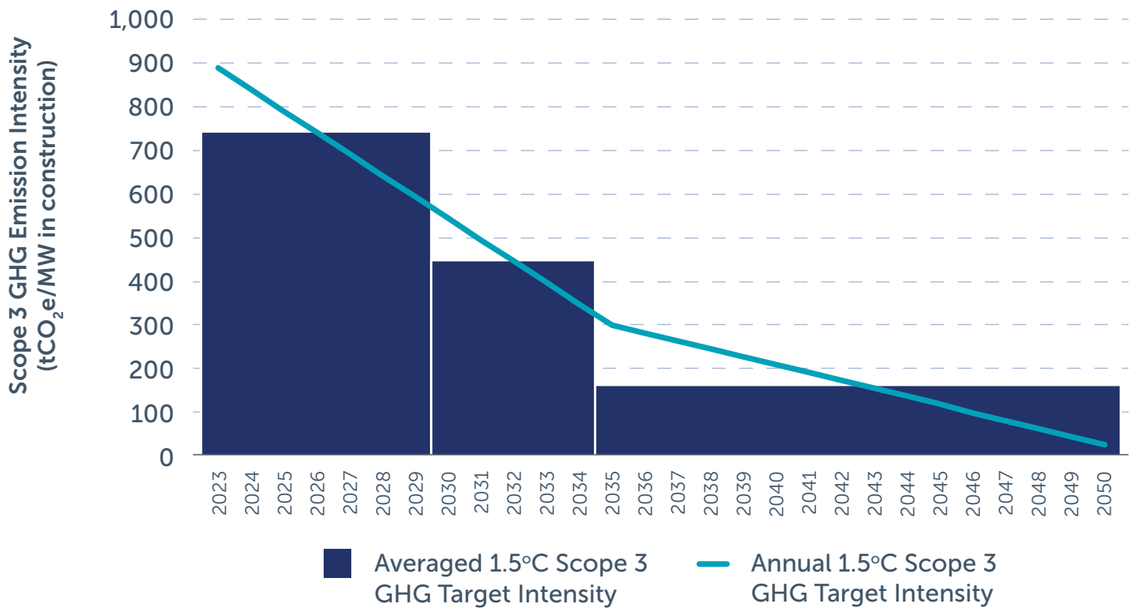
By reducing our scope 3 emission intensity, we can decouple the growth in renewables from a growth in emissions and overcome the net zero infrastructure paradox, as demonstrated in Figure 6. In the following sections we outline our action plan to accelerate the decarbonisation of the renewables industry.

SUPPLY CHAIN EMISSIONS TARGET:

To achieve our ambition of being net zero across our full value chain by 2050, we have set interim targets for 90% of our suppliers by spend to have set a science-based target by 2030, and to reduce our scope 3 GHG emission intensity of tCO_2e/MW in construction by 66% between 2023 and 2035. We have identified five key areas which are critical to achieve these ambitions:

- Sustainable Design
- Construction Materials
- Marine Fuels
- Sustainable Procurement
- Circularity

Figure 6: Modelled Scope 3 GHG emission intensity, following a 1.5°C aligned decarbonisation trajectory. In dark blue is the averaged intensity for the shorter-term (2023 - 2030), medium-term (2030 - 2035), and long-term (2035 - 2050).



Sustainable Design

#6 ACTION:
Implement sustainable design practices across all capital projects

Delivering ambitious carbon reduction targets means changing the way renewable energy projects are developed, designed, and delivered. In achieving our ambitious growth targets, we are committed to incorporating sustainable design and construction practices across all of its projects. To deliver on this, we have implemented a new process as part of our Large Capital Projects (LCP) governance framework. The Sustainability Assessment and Action Plan (SAAP) process requires project teams to consider key sustainability impacts at each Gate stage of a project and develop an action plan to mitigate risks and seize opportunities. For more details see the SAAP case study on page 19.

The early stages of project development are the most critical for building in and delivering low-carbon outcomes. Design decisions can 'lock-in' carbon impacts which are costlier to deal with in later stages. Factoring carbon, and other sustainability impacts, into design decisions requires appropriate processes and lifecycle assessment tools to help project designers, developers, and engineers weigh up the impacts of different design options and ultimately optimise towards a more sustainable final design. We are currently implementing and developing such tools in collaboration with industry partners (see Offshore Wind Sustainability JIP case study).

The benefits of factoring carbon into early optioneering and value engineering processes for project design are well-documented. As carbon emissions can be conceptualised as 'materials and energy', taking actions to design out carbon early-on can help produce leaner designs which enhance project cost performance. Furthermore, embedding low-carbon operational profiles from the start can significantly reduce the whole-life cost of a project.

CASE STUDY

The Carbon Trust's Offshore Wind Sustainability Joint Industry Partnership

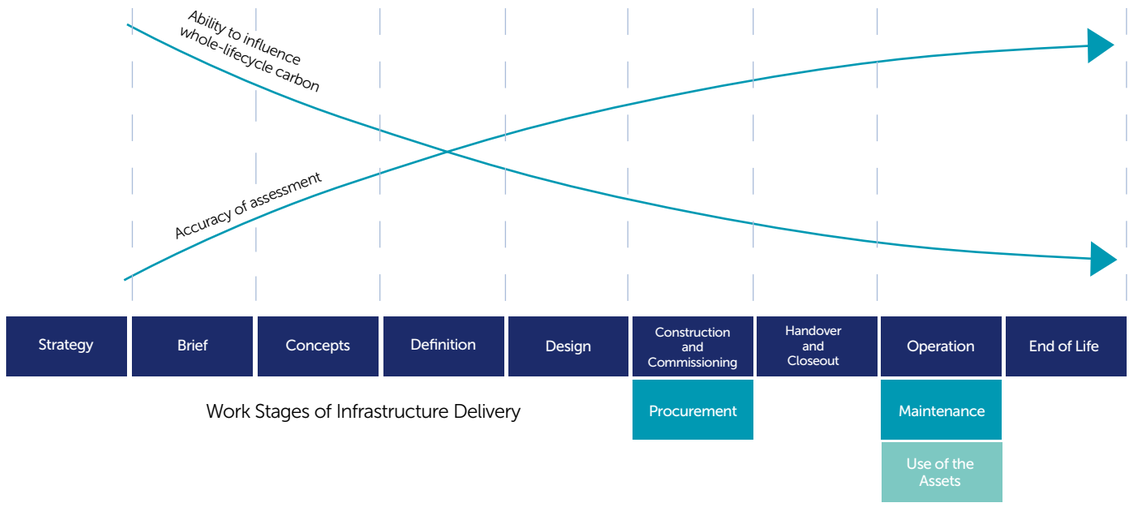
The decisions that we make during the design and development stages of our renewable energy projects will determine the intensity of GHG emissions associated with their construction, operations, and decommissioning.

To identify the most impactful actions for offshore wind, SSE Renewables became a founding partner of the Carbon Trust's Offshore Wind Sustainability Joint Industry Partnership (SusJIP). The SusJIP kicked off in January 2023 and brings together global offshore wind developers to jointly establish a shared methodology and guidance on how to measure and address carbon emissions associated with offshore wind farms across their lifecycle. This project is developing the first standardised approach to calculate lifecycle emissions of an offshore wind farm. This will not only identify the key carbon emissions drivers and hotspots for offshore wind but will also improve data quality, availability, and transparency across, and for, the wider supply chain.

We are excited to begin trialling this new approach on our developments in early 2024 and hope to share this methodology for use across the industry by the end of 2024.

CARBON TRUST

Figure 7: Carbon assessment across infrastructure project lifecycle stages (PAS 2080: Carbon management in buildings and infrastructure).



CASE STUDY

Embedding Sustainability into Large Capital Project Design and Delivery

The Sustainability Assessment and Action Plan (SAAP) process was established in April 2022 to ensure sustainability criteria and considerations are embedded in all stages of our Large Capital Projects (LCPs). They cover eight criteria which are aligned with investor requirements and link into our 2030 business goals and material United Nations Sustainable Development Goals (UN SDGs), as detailed in the table below.

Climate action (SDG 13)	Whole-life carbon
	Climate adaptation
	Contribution to net zero
Responsible consumption and production (SDG 12)	Circular economy and waste
Natural environment (SDGs 14 and 15)	Biodiversity and habitat protection
Decent work and economic growth (SDG 8)	Human rights and modern slavery
	Community impacts
	Just transition

To assess whole-life carbon impact, projects consider carbon emissions associated with construction, operation, and decommissioning. Opportunities to decarbonise individual projects are then explored from the get-go before high-carbon design choices are locked in. Some direct actions out of this process have been to explore low-carbon alternative materials and fuels, prioritising local content and optimising transport routes, and improving energy efficiencies in operational buildings.

These workshops bring together SSE Renewables' in-house sustainability experts and project teams to drill down into each of the key sustainability areas to enable to enable us to deliver on our commitments to sustainability in the most cost-effective way. This marks the beginning of our journey as to how we embed sustainability into LCPs. Over time this will mature, and it is our ambition in SSE Renewables to build on the SAAP process to align it with the PAS 2080 industry standard to ensure that our approach to project design, development, and construction reflects industry best practice.

Between April 2022 and November 2023, SSE Renewables has created Sustainability Assessment and Action Plans for 20 Large Capital Projects:

5 hydro

8 onshore wind

5 offshore wind

1 battery

1 solar

Sustainable Procurement

#7 **ACTION:**
Lead industry change through strategic collaboration

Sustainable procurement is central to the success of our decarbonisation ambitions. What we buy, and who we buy from, ultimately underpins the embodied carbon in our assets and constitutes the majority of our scope 3 emissions. Furthermore, reducing scope 3 emissions is a common challenge, one shared by our supply chain partners, and therefore effective collaboration is key to addressing it. We are taking a leading position on this through initiatives like the Powering Net Zero Pact (see case study on page 21) and our partnership with the Supply Chain Sustainability School.

We are also taking action across SSE plc to embed sustainability criteria into our procurement processes, in alignment with ISO 20400. This includes:

- Utilising weighted sustainability questions as part of our tender process to drive procurement decisions towards lower-carbon options.
- Asking suppliers to provide alternative, more sustainable, offerings to be considered by procurement and project teams.
- Incorporating Sustainability Works Information into our tender documentation and contracts to ensure that there is a contractual obligation to deliver specific sustainability requirements on our projects.
- Incorporating contractual requirements that are aligned with policy, enhanced reporting, and due diligence, and which include significant monetary consequences for non-compliance.
- Undertaking dedicated sustainability engagement sessions with strategic suppliers to identify and take action on areas of mutual benefit.
- Working with project teams through the SAAP process to identify project-specific innovations that can be incorporated into project delivery activities by suppliers (see SAAP case study on page 19).
- Implementing a sustainability data reporting system with a mandatory requirement for suppliers to report into this system for all new projects.

We will build on these solid foundations and aim to incorporate costings for low-carbon materials and vessels into all tenders and contracts to help deliver on our longer-term net zero scope 3 ambition.

Through collaboration with our supply chain partners we will continue to improve the quality of our scope 3 emissions data, identify new opportunities to deliver carbon reductions and develop industry best practice. The Powering Net Zero Pact is central to achieving this, (for more information see the case study on the following page). Furthermore, SSE Renewables is also supporting SSE Group to implement a Sustainable Procurement Code and by 2030 aims to have:

- 90% of suppliers by spend to set their own Science Based Targets.
- 90% of suppliers by spend to submit embodied sustainability data of the products they offer.
- 90% of suppliers by spend to disclose their carbon emissions.

CASE STUDY

Collaborating with our supply chain on scope 3 emissions

POWERING NET ZERO PACT

COLLABORATION FOR A JUST ENERGY TRANSITION TO NET ZERO

As a legacy of COP26, the Powering Net Zero Pact ("the Pact") was created by SSE plc alongside 10 other founding partners (nine of which are SSE Renewables strategic suppliers). The Pact brings together companies across all tiers of the global power sector. Combined, the signatories of the Pact operate across >120 countries, have a combined turnover of >£75 billion and work with >170,000 suppliers, and so together can generate the momentum needed to drive change in the industry to reach the ambitious goal to decarbonise the power sector.

The Pact has 5 areas of ambition that are underpinned by a shared strategic approach:

- Achieve net zero carbon emissions
- Protect and enhance the natural environment
- Transition to a circular economy
- Guarantee fair work and sustainable jobs
- Add value to local communities

As scope 3 emissions originate from complex supply chains and activities that extend beyond a single organisations control, the Pact is targeting scope 3 GHG emissions. By working together with partners from across the power sector we are identifying opportunities to collectively minimise GHG emissions, drive innovation, and achieve decarbonisation targets, ultimately contributing to a more significant and effective global effort to combat climate change than would be achieved in isolation.

PARTNERS:

TOGETHER PACT COMPANIES:

Employee **>350,000** people globally

Work with **>170,000** suppliers

Have operations in **>120** countries

Have combined annual turnover last year of **>£75BN**

Find out more at: **www.sse.com/pnzp**

Construction Materials

#8 **ACTION:** Source low-carbon construction materials and plant for capital projects

The GHG emissions produced from the extraction and processing of materials used in the construction of our assets – referred to as 'embodied carbon' – represents our largest stand-alone source of scope 3 emissions, and the largest source of emissions from a whole-life perspective. For an offshore wind farm, embodied carbon in construction materials is estimated to comprise >70% of the whole-life-cycle carbon emissions . The largest contributors to embodied carbon come from the production of steel, copper, aluminium, concrete and composite materials (Figure 8).

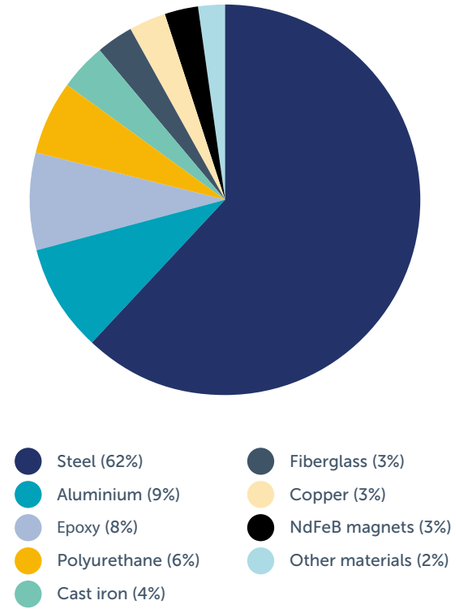
Addressing embodied carbon in these materials is a major global challenge given that material value chains comprise around 20% of global GHG emissions[17]. These sectors are generally referred to as 'hard-to-abate' as they require significant investment in new production plant to enable lower-carbon production. Given the costs and timescales involved in decarbonising material production, it is likely that demand for lower-carbon materials will outstrip supply for several years to come.

In the near-term, we are incorporating carbon assessments into our project development processes to identify technically and commercially viable low-carbon materials (see SAAP case study on page 19). To support the acceleration of the availability of these low-carbon materials through the investment and development of sustainable and local supply chains, we are participating in several industry working groups to identify and remove barriers to the uptake of low-carbon production methods for key materials like steel and concrete.

With the introduction of new legislation, such as the Carbon Border Adjustment Mechanism (CBAM) in the EU and commitment from the UK Government to implement an equivalent, the drive towards increasing the cost competitiveness of lower-carbon options relative to higher carbon options can accelerate market change and support a level playing field on decarbonisation for renewables developers.

Material	Carbon Factor ($kgCO_2e/kg$)
Steel	2.46[14]
Stainless Steel	6.15[14]
Aluminium	13.2[14]
Copper	4.38[15]
Concrete	0.912[14]
HDPE	2.52[14]

Figure 8: Breakdown of the global warming contribution of the materials that comprise an offshore wind farm[16].



CASE STUDY

NKT Low-carbon Copper

The world's first high-voltage direct current (HVDC) power cables using low-carbon copper produced by NKT are being used on Dogger Bank offshore wind farm. The copper used in these cables has been sourced from the Boliden Atik mine in Northern Sweden. At this mine, vehicles and smelters are all powered by green electricity. The copper is then transported from the mine to the NKT manufacturing site via an electric train running on 100% renewable energy> Finally, the cables will be installed at Dogger Bank by NKT Victoria, one of the world's most fuel-efficient cable laying vessels.

This initiative has resulted in a reduction of >23,000 tCO_2e of the embodied carbon of the HVDC power cables and demonstrated that low-carbon materials can be delivered commercially at scale on the world's largest offshore wind farm.

14 Embodied Carbon Footprint Database - Circular Ecology
15 Data (environdec.com)
16 EPD; SG 8.0-167 DD siemens-gamesa-environmental-product-declaration-epd-sg-8-0-167.pdf (siemensgamesa.com)
17 www.mckinsey.com/industries/metals-and-mining/our-insights/capturing-the-green-premium-value-from-sustainable-materials

CASE STUDY

Innovative techniques to lower costs and emissions

The first-ever electron beam welded section of a wind turbine was incorporated into a monopile for Dogger Bank offshore wind farm. This pioneering £2.5m project, co-funded by Innovate UK, was led by SSE Renewables in collaboration with Sif, Cambridge Vacuum Engineering and TWI, and created a new, more productive, and sustainable manufacturing process for the welding of large steel structures for offshore wind. This development opens the potential to apply electron beam welding on other large structures to reduce carbon emissions and costs, while enhancing productivity. The technology has been shown to weld monopiles at least 25 times faster than current methods, while using 90% less energy, costing 88% less, and producing 97% less emissions.

Circularity

#9 **ACTION:**
Adopt circular economy practices across the lifecycle of our assets

We are is adopting circular economy practices in how in how we design, build, operate, and decommission our renewable assets with the aim of reducing our consumption of carbon-intensive construction materials which form the bulk of our scope 3 emissions. Circular economy approaches are integral to the decarbonisation of hard-to-abate sectors like cement, steel and aluminium production and are thus a critical part of global efforts to reach net zero. Circularity is therefore one of the core priority areas for progress in our sustainability strategy, and we are committed to providing detailed disclosures on our developing approach, including ambitions and actions, in 2024.

JARGON BUSTER

Circularity
A circular economy is a sustainable economic model, in which products and materials are designed in such a way that they can be reused, remanufactured, recycled or recovered and thus maintained in the economy for as long as possible, reducing waste and GHG emissions from the extraction of virgin materials.

CASE STUDY

Establishing an industry coalition for circularity

To support the acceleration of a circular economy for the wind sector based in the UK, this year SSE Renewables, the University of Strathclyde, the National Manufacturing Institute Scotland and Scottish-based SME Renewable Parts Ltd joined forces to launch CWIC, the Coalition for Wind Industry Circularity. CWIC aims to create a supply chain for circular options for the wind industry in the UK, stimulating collaboration between industry peers, suppliers, academia, innovation bodies and government agencies to unlock and deliver the economic, social, and environmental opportunities of a circular economy. There are immediate opportunities in the repair and maintenance of existing wind assets, and a longer-term prize through the design of future wind technology both onshore and offshore. Since launching in March 2023, CWIC membership has grown to around 50 organisations, with a full CWIC 'greenprint' of plans and priorities to be published in early 2024.

Marine Fuels

#10 **ACTION:**
Contract high-efficiency vessels for offshore capital project delivery and support the transition to low-carbon marine fuels

GHG emissions from the combustion of marine fuels represent the second largest stand-alone source of emissions within our scope 3 inventory. The bulk of these emissions are from the vessels we contract to support the construction and operation of offshore wind farms – principally Turbine Installation Vessels (TIVs), Cable Laying Vessels (CLVs) and Service Operation Vessels (SOVs).

The marine shipping sector is also considered 'hard-to-abate' as decarbonisation will require the development of new vessels and infrastructure with significant investment costs. While industry change is progressing, with several manufacturers developing vessels fuelled by hydrogen, green methanol, green ammonia, or batteries, it will take time for these to become commercially available at the scale needed to fully decarbonise offshore wind construction and operation.

In the near-term, we are putting into place measures as part of our sustainable procurement approach to specify vessels with high-efficiency, low-carbon intensity ratings, and we are also working with vessel owners to optimise routes and performance to reduce fuel consumption. Where possible, we will look to specify vessels with 'upgradeability' to take alternative fuels once the supply chain is available.

In the longer-term we recognise that decarbonising the maritime sector will require cross-industry collaboration and partnerships across the value chain. We will engage in global partnerships and work with vessel owners with the aim of delivering our offshore developments with 100% low-carbon fuelled vessels by 2050.

CASE STUDY

Edda Brint at Seagreen

Seagreen offshore wind farm, which became fully operational in 2023 as Scotland's largest wind farm, is being serviced by a new state-of-the-art service operational vessel (SOV). Edda Brint is an innovative new vessel, produced in 2022 by Norwegian offshore wind service vessel company Edda Wind.

To avoid time, cost, and carbon intensive transits between the offshore wind farm and operations and maintenance base, Edda Brint will operate as an offshore platform from which technicians can perform operational maintenance of Seagreen's offshore wind turbines. This vessel will reduce GHG emissions associated with lengthy CTV transits and with its hybrid-hydrogen power capability will be able to deliver low-carbon operation and maintenance work for decades to come.

Biogenic Emissions and Carbon Removals

In alignment with the SBTi Net Zero Standard "mitigation hierarchy", our primary focus is on reducing our scope 1, 2 and 3 emissions to as low as possible. However, as outlined by the IPCC Special Report on 1.5°C, even if all GHG emission targets pledged under the Paris Agreement were met, GHG removals would still be necessary to limit global warming to 1.5°C by 2100. This stark conclusion demonstrates the necessity to protect and restore natural carbon sinks and develop carbon removal methods alongside abatement.

Carbon Removals

Carbon removals refer to the mechanisms and processes for capturing and storing CO_2 from the atmosphere and are often categorised into two main groups:

- Nature Based Solutions (NBS) – includes activities such as afforestation, peatland restoration and seagrass meadow restoration.
- Technological Solutions – includes activities such as direct air capture and enhanced weathering.

To deliver on our net zero ambitions, we aim to develop a portfolio of carbon removal mechanisms which will support us in neutralising any residual emissions after all efforts to reduce emissions as far as possible have been undertaken- and potentially enable us to mitigate emissions beyond our value chain too.

While our near-term focus is on the restoration of terrestrial carbon sinks, our longer-term ambition is to restore and enhance natural carbon sinks in marine habitats and support the development of alternative carbon removal mechanisms. This is a fast-evolving area, and we will continue to ensure that our approach is guided by credible international standards and best practice. Through collaboration with key stakeholders we also aim to adopt or support the development of the appropriate methodologies and tools to enable accurate measurement, verification and assurance of carbon removal mechanisms.

Emissions from Land Use Change

We are taking a hierarchy-based approach to carbon removals, with our immediate focus on understanding and implementing best practice for carbon removal mechanisms which are closest to our operational activities and for which the carbon accounting principles are better established.

We have been a pioneer in rolling out Biodiversity Net Gain (BNG) across our onshore projects and has a sector leading target to achieve BNG across all new onshore sites that gain consent from 2025[18]. BNG is an approach to development that aims to leave the natural environment in a measurably better state than it was pre-development. It focuses on the change in the biodiversity value of a site, comparing the pre- and post-construction biodiversity values to ensure a positive impact overall. We have published two BNG Toolkits and a user guide in the spirit of collaboration to develop a common approach across the sector.

As part of our BNG approach, we are in the process of updating our toolkits and user guide to account for the GHG emissions arising from land use change associated with new developments. These updates will allow us to quantify the 'before and after' impacts of our developments on the carbon storage and sequestration potential of natural carbon sinks – like forestry and peatland – and adapt our habitat management plans accordingly.

Our vision is to deliver a net enhancement in the carbon storage and sequestration potential of the site alongside a BNG by restoring or enhancing natural carbon sinks and leaving them in a better state than they were pre-development. However we know that there are complexities and site-specific considerations which we will need to take into account. Alongside sequestering carbon, these restoration works can also support adaptation to the impacts of climate change by enhancing the resilience of natural habitats to risks such as wildfires and flooding.

18 Biodiversity Net Gain | SSE Renewables

JARGON BUSTER

Beyond Value Chain Mitigation (BVCM): Investment into mitigation action that falls outside of SSE Renewables' value chain that leads to an avoidance, reduction or removal and storage of GHG emissions.

Biogenic Emissions: GHG emissions caused by disruption to natural land, coastal, or marine carbon sinks.

Nature Based Solutions (NBS): Ecosystem conservation, management, or restoration works that result in measurable climate mitigation benefits, alongside wider sustainability and biodiversity co-benefits.

Neutralisation: Measures that remove residual carbon from the atmosphere and permanently store it to counterbalance the impact of emissions that remain unabated.

Land Use, Land Use Change, and Forestry (LULUCF): A category used in GHG accounting to track emissions and removals of GHGs resulting in human activities related to land use and land cover changes, afforestation, reforestation, and forest management. Another similar term is FLAG (Forest, Land, and Agriculture) emissions.

Beyond Value Chain Mitigation

Longer-term we aim to build a broader portfolio of carbon removal measures that generate co-benefits for nature and communities by participating in the research and development of credible verification frameworks for less well-established carbon removal mechanisms. We will prioritise mechanisms that are closely associated with our projects and anticipate much of our focus being on the restoration, enhancement, or creation of natural carbon sinks on land, and in the coastal and marine habitats in the regions we operate in.

We are exploring opportunities for 'blue carbon' removal projects which utilise the carbon sequestration and storage potential of marine ecosystems. To achieve this, we will collaborate with a range of stakeholders, including academia and regulatory bodies, to advance scientific understanding and industry best practice on both measuring the carbon emissions associated with seabed disturbance and the opportunities for sequestration through blue carbon mechanisms such as seagrass meadow restoration.

We will continue to follow the best available science and frameworks to identify other carbon removal mechanisms beyond our value chain. The critical element in doing this successfully and credibly will be to ensure that any carbon removal mechanisms are independently verified, permanent, additional, and appropriate in a broader sustainability context.

CASE STUDY

Peatland Restoration at Viking Wind Farm

Over the last decade due to a combination of commercial forestry, drainage, burning, and overgrazing, there has been major decline in the extent and quality of the UK's largest terrestrial carbon store, peatland. More than a fifth of Scotland is peatland which corresponds to a carbon stock of approximately 4.5 billion tonnes.

We are currently managing and restoring 3,680 hectares of peatland across our operational onshore wind portfolio. At Viking wind farm, located in Shetland, a huge peatland restoration project is being undertaken. On this site alone, we have committed to restore over 260 hectares of peatland. These restoration works not only lead to enhanced sequestration of carbon, but also have additional co-benefits for the community by involving local businesses in the restoration works and enhancing biodiversity on the island.

Over the operational lifetime of the wind farm, the success of these restoration works will be monitored to improve understanding of both the biodiversity and carbon sequestration impacts.

Climate Resilience and Adaptation

Our Net Zero Transition Plan is focused on actions to mitigate climate change through the reduction of GHG emissions. However, we are also taking action to ensure the resilience of our assets and the ability of our operations to adapt to the impacts of climate change.

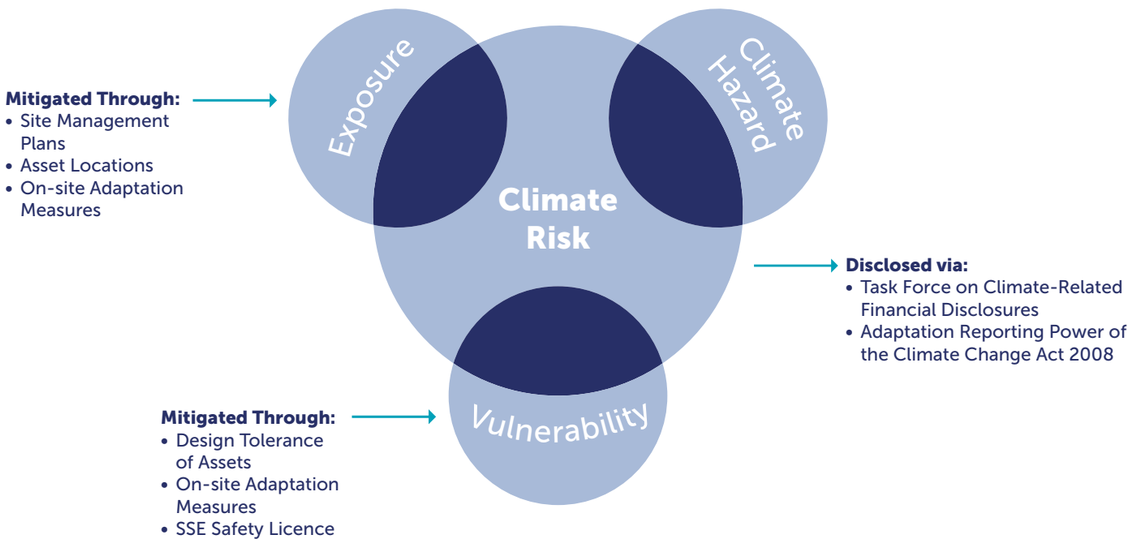
In alignment with the Paris Agreement and SDG 13 on Climate Action, we are committed to enhancing our adaptive capacity and resilience to reduce vulnerability against, and exposure to, the impacts of climate change.

Climate change presents both 'physical' and 'transition' risks to our business and assets. Physical risks arise from the climate impacts of higher average temperatures, while transition risks arise from changes in technology, markets, policy, regulation, and consumer sentiment, as we transition to net zero. Physical risks may be acute (e.g., higher frequency or severity of weather-related events like storms, floods, wildfires) or chronic (e.g., longer-term changes to weather patterns, sea level rise, hot or cold waves and droughts).

To manage physical risk, at a Group level, SSE assesses and discloses the potential financial impacts of key climate-related opportunities and risks facing the business through the annual Task Force on Climate-Related Financial Disclosures (TCFD) assessment. In addition to this, SSE continues to review climate projections using the Met Office UK Climate Projection (UKCP18) tool for the coming decades. This enables SSE to understand the climate hazards presented to an asset or portfolio. Combining this with an understanding of exposure and vulnerability, the climate risk can be characterised. This process supports the UK Government's assessment of critical infrastructure which takes place every five years.

At a business unit level, considerations around the impacts of climate change are factored into the design and delivery of our capital projects and into longer-term operational planning. Key risks and opportunities for large capital projects are also reviewed as part of the SAAP process (see case study on page 19). Furthermore, we are working to reduce the vulnerability, and enhance the natural resilience, of the local environment through our habitat management plans.

Figure 9: Schematic overview of how climate hazards, vulnerability, and exposure interact to define climate risk, and how SSE plc are working to mitigate and disclose this risk.



Just Transition

In delivering our Net Zero Transition Plan, we have a responsibility to influence the social impacts on people affected – employees, consumers, communities, suppliers, and wider society – in a way that helps share the benefits and prevents costs falling disproportionately on those that can afford it least. This is the essence of a 'just transition'.

A just transition to net zero helps ensure that the actions and investments required to decarbonise energy systems attract long-term public and social legitimacy. This includes seizing the opportunities to increase value and share economic prosperity through investment in supply chains and the creation of new low-carbon jobs. A just transition also requires minimising negative impacts from the switch to cleaner energy, including the loss of jobs in carbon-intensive sectors and the impacts on people from the demand for materials required to build renewable technologies.

In November 2020, SSE became the first company in the world to publish a Just Transition Strategy. A framework of 20 principles is outlined in the strategy, and in the graphic below, helping to guide our decision-making and influence greater fairness for those impacted by the decline of high-carbon economic activity and increase the opportunities of climate action. SSE has also committed to publishing progress reports where we can demonstrate action and hold ourselves accountable to these principles, with the first progress report issued in April 2023.

We aim to deliver our Net Zero Transition Plan in accordance with SSE's 20 principles for a just transition. As a responsible developer of renewable energy, we are working in collaboration with suppliers and other stakeholders to understand and address just transition issues in the supply chain. This includes ensuring there are social safeguards and robust human rights due diligence in the supply chains for the raw materials and critical minerals needed for renewable technologies.

SSE'S 20 PRINCIPLES FOR A JUST TRANSITION

TRANSITIONING INTO A NET-ZERO WORLD			TRANSITIONING OUT OF A HIGH-CARBON WORLD	
SSE'S PRINCIPLES FOR GOOD, GREEN JOBS	SSE'S PRINCIPLES FOR CONSUMER FAIRNESS	SSE'S PRINCIPLES FOR BUILDING AND OPERATING NEW ASSETS	SSE'S PRINCIPLES FOR PEOPLE IN HIGH-CARBON JOBS	SSE'S PRINCIPLES FOR SUPPORTING COMMUNITIES
1. Guarantee fair and decent work	5. Co-create with stakeholders	9. Support competitive domestic supply chains	13. Re-purpose thermal generators for a net-zero world	17. Deliver robust stakeholder consultation
2. Attract and grow talent	6. Factor-in whole-system costs and benefits	10. Set social safeguards	14. Establish and maintain trust	18. Form partnerships across sectors
3. Value employee voice	7. Make transparent, evidence-based decisions	11. Share value with communities	15. Provide forward notice of change	19. Promote further industrial development
4. Boost inclusion and diversity	8. Advocate for fairness	12. Implement responsible developer standards	16. Prioritise retraining and redeployment	20. Respect and record cultural heritage

Accountability and Transparency

Delivering our Net Zero Transition Plan will require not only concerted action but an ability to demonstrate accountability and transparency. We are establishing strong foundations that will enable us to: report on our carbon reduction progress with rigour and credibility; work with partners to drive low-carbon innovation; and use our influence to advocate for meaningful decarbonisation policy at national and international levels.

Assurance and Verification

In the course of delivering our Net Zero Transition Plan, we commit to ensuring the accuracy of disclosed data by:

- Publicly reporting on our annual business carbon footprint, carbon reduction performance and any relevant developments.
- Undertaking carbon accounting and reporting in alignment with credible standards (e.g. GHG Protocol, ISO 14064, Science Based Target Initiative).
- Ensuring published carbon emissions data is subject to external third-party assurance.
- Annually reviewing the scope and scale of our targets and actions in line with the latest climate science and decarbonisation policy.

Where accounting and reporting methodologies for some types of emissions are not yet fully developed (e.g. biogenic emissions and carbon removals), contribute towards efforts to define and implement best practice.

Digitalisation and Innovation

Net zero is in many ways a data challenge. Being able to make meaningful decisions around carbon reduction requires the right tools and processes to measure it in the first place. Through our approach to digitalisation we will embed carbon measurement and quantification throughout our project development, procurement and wider processes.
Through collaboration with partners across the industry, including suppliers and academia, we aim to drive the research, development and uptake of low-carbon innovations which will enhance our collective response to the net zero challenge.

Policy Advocacy

Meaningful action to deliver more sustainable renewable energy projects cannot take place in a vacuum and is beyond the ability of individual companies to change independently. Without the right policy and regulatory frameworks to value sustainability, there will be a 'race to the bottom' and a loss of opportunities to deliver projects which have wider societal benefit. We will continue to engage with key stakeholders to influence the policy and regulatory landscape to accelerate decarbonisation.

CASE STUDY

Policy Advocacy on Non-Price Criteria in Renewable Energy Auctions

In June 2023, SSE Renewables published a position paper calling on governments and regulators across Europe and internationally to make greater use of non-price criteria in offshore wind energy auctions, whether for seabed leasing or for contracts for difference (CfD).

The paper outlines how the use of non-price criteria in auctions is important to deliver renewables projects which are deliverable, on time and on budget, and provide long-term value to society and the environment. This would require criteria related to the track record and deliverability of projects, sustainability (decarbonisation, circularity, workforce and skills, ecological protection and enhancement) and supply chain development.

Following the publication of the position paper, we have been engaging constructively in discussions on this topic at a UK, European and global level through organisations such as Wind Europe, Global Wind Energy Council (GWEC), and the Global Offshore Wind Alliance; as well as directly with governments and regulators.

For further information about SSE Renewables, please contact:

SSE Renewables
Sustainability
Inveralmond House
200 Dunkeld Road
Perth PH1 3AQ
UK
+44 (0)1738 456000
info@sse.com
Registered in Scotland No. 117119

sserenewables.com
Follow the latest news from SSE Renewables

 **x.com/sserenewables**

 **linkedin.com/company/sse-renewables**

 **instagram.com/sserenewables**

 **facebook.com**