Scottish & Southern Electricity Networks

TRANSMISSION

SSEN Transmission

Bingally 400 / 132 kV Substation

Environmental Appraisal

Volume 1

February 2025

Scottish & Southern Electricity Networks
TRANSMISSION

CONTENTS

OTHER VOLUMES

VOLUME 1 – VOLUNTARY ENVIRONMENTAL APPRAISAL
VOLUME 2 – ADDITIONAL FIGURES
VOLUME 3 – TECHNICAL APPENDICES

APPENDICES

APPENDIX P CLIMATE CHANGE RISK ASSESSMENT
APPENDIX Q IN-COMBINATION CLIMATE CHANGE IMPACT ASSESSMENT

14. CLIMATE CHANGE

14.1 Introduction

14.1.1 With reference to **Volume 1, Chapter 1 Introduction and Background, Section 1.1.10**, this Voluntary EA has been prepared based on the structure and assessment methodology of an EIA. This overall report, however, is a Voluntary EA Report and has not been carried out under the EIA Regulations.

14.1.2 This chapter sets out the methodology, baseline conditions, assessment of effects, and mitigation considerations for the Proposed Development in relation to climate change.

14.1.3 The climate assessment has been carried out in accordance with the Institute of Environmental Management and Assessment (IEMA) 'Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions[1] and Evaluating Resilience and Adaptation[2]. Consideration was given to three aspects of climate assessment identified below in **Table 14-1**.

Table 14-1 Definition of Climate Assessment Elements

Assessment Type	Definition
Greenhouse gas (GHG) assessment	Impact of GHG emissions arising from the Proposed Development on the climate, including how it will affect the UK and Scotland in meeting its national carbon budgets.
Climate Change Resilience Assessment (CCRA)	The Proposed Development's resilience to climate change impacts, including how the design will consider projected impacts of climate change.
In-combination climate change impact (ICCI) assessment	The combined impact of the Proposed Development and potential climate change on receptors in the receiving environment.

14.1.4 The chapter should be read in conjunction with the description of the Proposed Development in **Volume 1, Chapter 3 Description of the Proposed Development**. Other relevant topic chapters within **Volume 1** may include:

- **Chapter 8 Ecology;**
- **Chapter 11 Traffic and Transport;** and
- **Chapter 12 Hydrology, Geology, Hydrogeology and Peat.**

14.2 Legislation, Policy and Guidance

Legislation

14.2.1 Legislation which is relevant to the climate assessment is presented in **Table 14-2**.

[1] IEMA (2022) 'Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – second Edition.' Available at: https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance [Accessed 19 August 2024]

[2] IEMA (2020). 'Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation.' Available at: https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020 [Accessed 19 August 2024]

Table 14-2 Relevant Climate Change Legislation

Legislation	Legislation details
United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement[3]	The Paris Agreement is a legally binding agreement within the UNFCCC dealing with GHG emissions mitigation, adaptation, and finance, which started in 2016. It requires all signatories to strengthen their climate change mitigation efforts to keep global warming to well below 2°C this century and to pursue efforts to limit global warming to 1.5°C.
Climate Change Act 2008 and Climate Change Act (2050 Target Amendment)[4]	In June 2019, the Climate Change Act was amended, requiring the Government to reduce the UK's net GHG emissions of GHGs by 100% (net zero) relative to 1990 levels by 2050.
Carbon Budget Order 2021[5]	The Sixth Carbon Budget, the first to align with the amended carbon reduction target, was enshrined in law at the end of June 2021.
Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[6]	The Environmental Impact Assessment (EIA) Regulations state that an EIA (where relevant) must include: "*a description of the likely significant effects of the development on the environment resulting from… the impact of the project on climate (for example, the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change*".
Climate Change (Emissions Reduction Targets) (Scotland) Act 2024[7]	The Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 amends the original Climate Change (Scotland) Act 2009, introducing key updates to the legislative framework for GHG emissions reductions, with a clear commitment to achieving net-zero GHG emissions by 2045. The updates include the introduction of Scottish carbon budgets, shifting from annual and interim targets to multi-year budget targets, thereby aligning reporting with international best practices in carbon management. The Act requires Scottish Ministers to develop climate change plans through public consultations, enhancing transparency and accountability in setting and achieving emissions targets. Additionally, it includes provisions to assess the impact of major capital projects on these targets, ensuring that climate considerations are integrated into infrastructure planning and decision-making.

Policy

14.2.2 Policy which is relevant to the climate assessment is presented in **Table 14-3**.

[3] United Nations Framework Convention on Climate Change (UNFCCC) (2016) Paris Agreement UNFCC; Available at: https://unfccc.int/process-and-meetings/the-paris-agreement [Accessed 18/10/2024]

[4] HMSO (2019) The Climate Change Act 2008 (2050 Target Amendment) Order 2019: Available at: The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (legislation.gov.uk) [Accessed 18/10/2024]

[5] The Carbon Budget Order 2021. S2021/750. Available at: The Carbon Budget Order 2021 (legislation.gov.uk)The Carbon Budget Order 2021 (legislation.gov.uk) [Accessed 18/10/2024]

[6] Scottish Government (2017). The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (SSI 2017/102). Available at: https://www.legislation.gov.uk/ssi/2017/102/contents/made [Accessed 18/10/2024].

[7] Scottish Government (2024) Climate Change (Emissions Reduction Targets (Scotland) Act 2024. Available at: https://www.parliament.scot/bills-and-laws/bills/s6/climate-change-emissions-reduction-targets-scotland-bill [Accessed 11/11/2024]

Table 14-3 Relevant Climate Change Policy

Policy	Policy Detail
National Policy Statement (NPS) for Energy Infrastructure[8]	The NPS sets out the national policy for energy infrastructure required to ensure the UK can provide a secure, reliable and affordable energy supply.
Draft Energy Strategy and Just Transition Plan[9]	Scotland's draft Energy Strategy and Just Transition Plan aims to achieve a net-zero energy system by 2045. The plan includes goals such as adding 20 gigawatts (GW) of renewable electricity by 2030, accelerating industry, transport, and heat decarbonisation, and establishing a national public energy agency. The plan also focuses on ensuring a just transition by maximising employment, manufacturing, and export opportunities in the energy sector.
National Planning Framework 4 (NPF4)[10]	The Scottish Ministers adopted NPF4 on 13 February 2023. NPF4 sets out how the Scottish Government's planning and development approach will help achieve a net-zero, sustainable Scotland by 2045.
Update to the Climate Change Plan 2018 – 2032: Securing a Green Recovery on a Path to Net-Zero Securing a green recovery[11]	The Climate Change Plan has been updated to align with Scotland's goal of achieving net-zero GHG emissions by 2045. The plan considers Scotland's recovery from COVID-19 and acknowledges the opportunity to reshape the economy in a way that promotes a more sustainable, equitable, and fair society. Similar to the 2018 plan, the focus remains on the period leading up to 2032.
Scottish National Adaptation Plan 3[12]	The Scottish National Adaptation Plan 2024-2029 outlines Scotland's strategy to prepare for and adapt to the impacts of climate change. It focuses on building resilience across key sectors, including infrastructure, ecosystems, and communities, to mitigate risks from climate change-related events such as flooding and heatwaves. This plan is relevant to the CCRA, as it provides a framework for identifying vulnerabilities and implementing adaptation measures to enhance the resilience of developments like the Proposed Development.

Guidance and Tools

14.2.3 Guidance and tools which are relevant to the climate assessment are presented in **Table 14-4**.

[8] Department for Energy Security and Net-Zero (2023) National Policy Statements for energy infrastructure. Available at: https://www.gov.uk/government/collections/national-policy-statements-for-energy-infrastructure [Accessed 18/10/2024]

[9] Scottish Government (2023) Draft Energy Strategy and Just Transition Plan. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/01/draft-energy-strategy-transition-plan/documents/draft-energy-strategy-transition-plan/draft-energy-strategy-transition-plan/govscot%3Adocument/draft-energy-strategy-transition-plan.pdf [Accessed 18/10/2024]

[10] Scottish Government (2023) National Planning Framework 4. Available at: https://www.gov.scot/publications/national-planning-framework-4/ [Accessed 18/10/2024]

[11] Scottish Government (2020) Update to the Climate Change Plan 2018-2032. Available at: https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/ [Accessed 18/10/2024]

[12] Scottish Government (2024). Scottish National Adaptation Plan 2024-2029. Available at: https://www.gov.scot/publications/scottish-national-adaptation-plan-2024-2029-2/ [Accessed 18/10/2024]

Table 14-4 Relevant Climate Change Guidance and Tools

Guidance and Tools	Guidance and Tools Detail
IEMA: Environment Impact Assessment Guide to: Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance[13] (hereby referred to as IEMA GHG Guidance)	The approach of assessing the significance of GHG emissions from the Proposed Development was undertaken in accordance with the IEMA GHG Guidance.
IEMA: Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation[14] (hereby referred to as IEMA CCRA Guidance)	The IEMA CCRA Guidance was followed to assess the significance of climate change risks to the Proposed Development.
The GHG Protocol[15]	The GHG Protocol is a widely used standard for measuring and managing GHG emissions. It provides guidance on identifying, measuring, reporting, and verifying GHG emissions from various sources, such as energy use, transportation, and waste.
Publicly Available Standard (PAS) 2080: 2023 Carbon Management in Buildings and Infrastructure[16]	PAS 2080:2023 provides guidance on managing GHG emissions and promoting sustainability in infrastructure projects. The standard outlines a framework for managing GHG emissions throughout the project life cycle, from planning and design to construction and operation.
British Standards	The British Standards Institution (BSI) BS EN ISO 14064-1:2019[17] and 14064-2:2019[18] (2019a and b, respectively) provides specifications for organisational level and project-level guidance for the quantification and reporting of GHG emissions and removals.
Scottish Government Windfarm Carbon Calculation Tool[19]	The Carbon Calculation Tool determines the GHG emissions emitted by wind farm developments in Scotland. For the GHG assessment, the peat calculator provided by SSEN for Accelerated Strategic Transmission Investment (ASTI) framework projects was used. The methodology aligned with the carbon calculator for wind farms on Scottish peatlands.
International Union for Conservation of Nature (IUCN) Peatland Code Carbon Calculator[20]	The IUCN Peatland Code Carbon Calculator estimates GHG emission savings from peat restoration projects. It considers factors such as model uncertainty, leakage, and risk buffers to calculate the net emissions reduction in tonnes of CO_2 equivalent (tCO_2e). Emission factors from the calculator were used to inform the ASTI Peat Calculator, which was used to determine the GHG impact of peat restoration within the Site.

[13] Institute of Environmental Management and Assessment (IEMA) (2022) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance [Accessed 18/10/2024]
[14] IEMA (2020); Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation, 2020. [Accessed 18/10/2024]
[15] World Resources Institute (WRI) & World Business Council for Sustainable Development (WBCSD), (2004) The GHG Protocol, A Corporate Accounting and Reporting Standard Available at: https://ghgprotocol.org/corporate-standard [Accessed 18/10/2024]
[16] British Standards Institution (BSI) (2023) PAS 2080 - Carbon management in infrastructure and built environment. Available at: https://www.bsigroup.com/en-GB/insights-and-media/insights/brochures/pas-2080-carbon-management-in-infrastructure-and-built-environment/ Date [Accessed 18/10/2024]
[17] International Organisation for Standardisation (ISO) (2019) ISO 14064-1:2018. Available at: https://www.iso.org/standard/66453.html [Accessed 18/10/2024]
[18] ISO (2019) ISO 14064-2:2019. Available at: https://www.iso.org/standard/66454.html [Accessed 18/10/2024]
[19] Scottish Government (2016) Carbon calculator for wind farms on Scottish Peatlands. Available at: https://www.gov.scot/publications/carbon-calculator-for-wind-farms-on-scottish-peatlands-factsheet/ [Accessed 18/10/2024]
[20] IUCN UK Peatland Programme, 2023. Peatland Code Carbon Calculator. [online] Available at: <https://www.iucn-uk-peatlandprogramme.org/peatland-code> [Accessed 21/10/2024].

Guidance and Tools	Guidance and Tools Detail
SSEN Transmission Carbon Calculator	The SSEN Transmission Carbon Calculator is an Excel-based GHG calculation tool built specifically to quantify the GHG emissions for energy infrastructure projects. The tool was used in the climate assessment to quantify the GHG emissions associated with the electrical assets used on-site.
Department for Energy Security and Net Zero Standards (DESNZ) Emissions Factors[21]	The DESNZ Emissions Factors are a set of factors developed by the UK Government to calculate GHG emissions from various sources, such as waste, electricity and fuel consumption. The factors consider the GHG emissions associated with the production and distribution of energy, as well as the GHG emissions associated with combustion, processing, disposing or use of the energy source.
Inventory of Carbon and Energy[22]	The Inventory of Carbon and Energy (ICE) provides embodied energy and carbon dioxide (CO_2) and GHG emissions data for a wide range of materials and building components. The ICE database enables calculation of the embodied energy and CO_2 and GHG emissions associated with a building or construction project, considering the materials used, manufacturing processes, and transportation.
Think Hazard[23]	Think Hazard is an online tool developed by the United Nations Office for Disaster Risk Reduction (UNDRR) that provides information on natural hazards such as floods, wildfire, and heatwaves.
Technical Guidance on Climate Proofing of Infrastructure in the Period 2021-2027[24]	The "Technical Guidance on Climate Proofing of Infrastructure in the Period 2021-2027," developed by the European Commission, aims to integrate climate resilience into EU-funded infrastructure projects across sectors like transport, energy, and water management. It outlines steps for climate risk assessment, adaptation measures, and implementation, with a focus on resilient designs, materials, and nature-based solutions. This guidance was used to inform the methodology for the CCRA, particularly in evaluating climate risks and selecting appropriate adaptation measures.
Royal Institute of Chartered Surveyors (RICS) Professional Statement Whole Life Carbon Assessment[25]	RICS Professional Statement Whole Life Carbon Assessment was used in the GHG emissions calculation methodology. The professional statement provides a consistent life cycle GHG assessment implementation plan and reporting structure for built projects in accordance with BS EN 15978: 2011: (Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method).

[21] DESNZ (2024) Greenhouse gas reporting: conversion factors 2024. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024 [Accessed 18/10/2024]

[22] Circular Ecology (2024). Inventory of Carbon and Energy V4.0 (ICE). Available at: https://circularecology.com/news/ice-database-v4-launched [Accessed 6/02/2025].

[23] Think Hazard (2023) Think Hazard – Scotland Available at: https://thinkhazard.org/en/report/40172-united-kingdom-scotland-highland [Accessed 18/10/2024]

[24] European Commission. (2021). Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027. Available at: https://ec.europa.eu/clima/sites/default/files/adaptation/what/docs/climate_proofing_infrastructure_en.pdf. [Accessed 18/10/2024]

[25] RICS (2023) Whole life carbon assessment for the built environment, 2nd edition. Available at https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment [Accessed 18/10/2024]

14.3 Assessment Methodology and Significance Criteria

Extent of the Study Area

GHG Assessment

14.3.1 The Study Area for the GHG assessment includes:

- Direct GHG emissions arising through works on the Site as a result of the construction and operation within the Site as shown on **Volume 2, Appendix A**, **Figure 3-1**; and
- Indirect GHG emissions occurring offsite encompass embodied carbon in materials, transportation, upstream activities (such as well-to-tank processes and transmission and distribution losses), as well as the processing and disposal of waste.

CCRA

14.3.2 The CCRA Study Area encompasses the works that make up the Site as shown on **Volume 2, Appendix A, Figure 3-1**.

ICCI Assessment

14.3.3 The Study Area for the ICCI assessment is determined by the EA topic assessments, as described in other chapters of this Voluntary EA and will be reported accordingly. Relevant topic chapters include:

- **Chapter 7 Landscape and Visual;**
- **Chapter 8 Ecology**
- **Chapter 9 Ornithology; and**
- **Chapter 12 Hydrology, Geology, Hydrogeology and Peat.**

Consultation Undertaken to Date

14.3.4 No consultation was undertaken in relation to the climate assessment.

Method of Baseline Data Collation

14.3.5 This section details the methodology undertaken to determine the baseline for the climate assessment. All necessary information was accessed from desk-based sources and no surveys were required for the climate assessment.

GHG Assessment

14.3.6 For the purposes of the GHG Assessment, the baseline conditions are a 'Business as Usual' scenario where the Proposed Development does not go ahead.

14.3.7 The baseline comprises of existing carbon stocks and sources of GHGs within the boundary of the existing Proposed Development. The methodology for calculating GHG emissions and removals was consistently used across the construction and operation of the Proposed Development.

CCRA

14.3.8 The current baseline for the CCRA was based on historic climate data obtained from the Met Office[32] recorded by the closest meteorological station to the Proposed Development (Fort Augustus), located approximately 20 km southeast of the Site for the period 1981-2010. As

part of the CCRA, this was compared to the future baseline throughout the life of the Proposed Development.

14.3.9 The future baseline for the CCRA was based on future UK Climate Projections 2018[26] (UKCP18). This projection data provides probabilistic indications of how global climate change is likely to affect areas of the UK using pre-defined climate variables and time periods.

14.3.10 For the purpose of the assessment, UKCP18 probabilistic projections for pre-defined 30-year periods for the following average climate variables have been obtained and are further analysed:

- Mean annual temperature;
- Mean summer temperature;
- Mean winter temperature;
- Maximum summer temperature;
- Minimum winter temperature;
- Mean annual precipitation;
- Mean summer precipitation; and
- Mean winter precipitation.

14.3.11 UKCP18 probabilistic projections have been analysed for the 25 km grid square within which the Proposed Development is located. These figures are expressed as temperature/precipitation anomalies in relation to the 1981-2010 baseline. This baseline was selected as it provides projections for 30-year time periods (e.g. 2020-2049) for the parameters analysed within the assessment compared to the 30-year land-based projections that would be generated from the 1981-2010 baseline.

14.3.12 UKCP18 uses a range of possible scenarios, classified as Representative Concentration Pathways (RCPs)[27], to inform differing future emission trends. These RCPs '[…] specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels'. RCP8.5 is considered to be the worst-case global scenario with the greatest concentration of GHGs in the atmosphere and has been used as the purposes of this assessment as a worst-case scenario.

14.3.13 As part of this assessment, the increased frequency and severity of extreme weather events (such as heavy and/or prolonged precipitation, storm events, wildfires and heatwaves) was also assessed.

Assessment Modelling Methodology

14.3.14 This section sets out the scope and methodology for the assessment of the impacts of the Proposed Development on climate change.

GHG Assessment

14.3.15 To identify the magnitude of GHG impact over the life cycle of the Proposed Development, GHG emissions are calculated in line with GHG Protocol[15] and reported following the principles outlined in PAS 2080:2023 Guidance[16]. GHG emissions from construction activities, embodied carbon in materials, and the operation of the Proposed Development have been quantified in this Voluntary EA using a calculation-based, in line with the GHG Protocol[15]:

[26] Met Office. (2019). UK Climate Projections 2018. Available from https://www.metoffice.gov.uk/research/approach/collaboration/ukcp [Accessed 18/10/2024]

[27] Met Office. (2018) UKCP18 Guidance: Representative Concentration Pathways. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-guidance---representative-concentration-pathways.pdf [Accessed 18/10/2024].

Activity data x GHG emissions factor = GHG emissions values

14.3.16 Activity data is a quantifiable measure of activity, such as operating hours or volumes of fuels used. Emission factors convert the activity data into GHG emissions. Activity data was sourced from data provided by SSEN Transmission. Where specific data was not available, a mix of assumptions and industry benchmarks have been used to fill data gaps. Where this was not possible, then a qualitative approach to assessing the GHG impacts was followed, in line with the IEMA GHG Guidance[1].

14.3.17 Emission factors were sourced from the DESNZ 2024 emission factor database[21], and the Bath University Inventory of Carbon and Energy database[22], both publicly available sources.

14.3.18 The SSEN peat calculator used across ASTI framework projects was adopted to estimate the GHG emissions associated with peat excavation and restoration. The methodology from Scottish Government Windfarm Carbon Calculator[19] and IUCN Peatland Code Calculator[20] were followed to assess the GHG emissions associated with peat carbon sequestration and potential carbon losses from peat disturbance. The SSEN Transmission Carbon Calculator was used to inform the GHG Assessment of the electrical assets used on-site. Appropriate assumptions were sourced from the RICS Guidance for whole life GHG assessments[25], these are detailed below in **Table 14-15.**

14.3.19 In line with the GHG Protocol guidelines[15], the GHG assessment is reported as tonnes of carbon dioxide equivalent (tCO_2e) and has considered the seven Kyoto Protocol gases:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Sulphur hexafluoride (SF_6);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Nitrogen trifluoride (NF_3).

14.3.20 These gases are broadly referred to in this Voluntary EA under an encompassing definition of 'GHGs', with the unit of tCO_2e (tonnes CO_2 equivalent) or $MtCO_2e$ (mega tonnes of CO_2 equivalent).

14.3.21 **Table 14-5** summarises the key anticipated GHG emissions sources associated to the Proposed Development by life cycle stage, in line with PAS 2080:2023 Guidance[16]. Additionally, the RICS Guidance for whole life GHG assessments[25] have been integrated to inform the scope and reporting framework of the GHG assessment.

Table 14-5 Potential effects from the GHG Assessment of the Proposed Development.

Life cycle stage	PAS 2080:2023 Module	Activity	Primary emission sources
Product stage	A1-A3	Raw material extraction and manufacturing of products are required to build the equipment for the Proposed Development. Transportation of materials for such	Embodied GHG emissions from energy use in the extraction of materials and manufacture of components and equipment. GHG emissions from the transportation of products and materials during their processing and manufacture. Due to the nature of the equipment, this could require

Life cycle stage	PAS 2080:2023 Module	Activity	Primary emission sources
		processes/ manufacturing (where available).	shipment of certain aspects over significant distances.
Construction process stage	A4	Transportation of construction materials to the Proposed Development. Due to the nature of the equipment required, this could require shipment of certain aspects over significant distances.	Transport of construction materials is included under the construction process stage, where these are not included in embodied GHG emissions.
	A5	On-site construction activity. Transport of construction workers. Disposal of any waste generated during the construction processes. Land Clearance Enabling works	GHG emissions from energy (electricity, fuel, etc.) consumption for plant and vehicles, and generators on site. Fuel consumption from transport of materials to site (where these are not included in embodied GHG emissions). GHG emissions from fuel use for worker commuting. GHG emissions from disposal of waste. GHG emissions from fuel consumption for transportation of waste. Peat excavation during construction.
Operation stage	B1-B8	Energy use from the operation of the Proposed Development. Maintenance activities	Carbon sequestration associated with the restored peat. GHG emissions from this grid electricity use. GHG emissions associated with maintenance activities (e.g. replacement components and fuel use).

Determining magnitude of change

14.3.22 In line with IEMA GHG guidance, the Proposed Development GHG emissions were compared against existing carbon budgets for the UK and Scotland. The Proposed Development's impact on GHG emissions was assessed by comparing it to net-zero trajectories and evaluating its alignment with UK and Scottish decarbonisation policies.

14.3.23 The UK carbon budgets are in place to restrict the amount of GHG emissions the UK can legally emit in a five-year period. The UK is currently in the 4th Carbon Budget period, from 2023 to 2027, as detailed in Table 14-6. The 3rd, 4th and 5th Carbon Budgets reflect the

previous 80% reduction target by 2050. The 6th Carbon Budget is the first to align with the legislated UK Government 2050 net-zero commitment. The 7th Carbon Budget is currently being developed by the CCC and is expected to be presented to the UK Government in early 2025.

14.3.24 This GHG assessment, therefore, uses the IEMA GHG guidance1 to assess the significance of effects, with the UK Carbon Budgets and Scottish GHG reduction targets providing context to the GHG emissions as detailed in Table 14-6 and Table 14-7.

Table 14-6 UK Carbon Budgets and indicative carbon budgets based upon the Climate Change Committee balanced Net-Zero Pathway.

Carbon budget	Electricity Generation Carbon Budget based upon the Carbon Budget Delivery Plan ($MtCO_2e$)	UK Carbon Budget ($MtCO_2e$)	Indicative Carbon Budgets based upon the CCC's balanced Net-Zero Pathway ($MtCO_2e$)
3rd (2018-2022)	-	2,544	-
4th (2023-2027)	143	1,950	-
5th (2028-2032)	63	1,752	-
6th (2033-2037)	42	965	-
7th (2038-2042)	23	-	526
8th (2043-2047)	12.4	-	195
9th (2048-2050)	4	-	17

14.3.25 To illustrate the Proposed Development trajectory towards net zero by 2050, it is recommended that the CCC's[28] Balanced Net-Zero Pathway is utilised post-2037, in the absence of any nationally legally binding carbon budgets after the 6th carbon budget. Beyond 2050, the UK is expected to remain at net zero.

14.3.26 The CCC Balanced Net-Zero Pathway is recommended to be divided into 5-year periods post-2037 to align with the existing UK national carbon budgets time periods. The proposed carbon budget periods derived from the Net-Zero pathway encompass the 7th, 8th, and 9th indicative budget periods up to 2050 in line with the UK's 1.5-degree trajectory as detailed in **Table 14-6**.

14.3.27 However, it should be noted that the supplementary carbon budgets beyond 2037 have not been formally adopted by the UK government or ratified by Parliament and can only be used as an indicative measure to contextualise the Proposed Development's progress towards the national net-zero trajectory.

14.3.28 Besides the UK Government's carbon budgets, the Scottish Government has published annual GHG emission reduction targets that align with Scotland's legislated 2045 net-zero target[7], as detailed in **Table 14-7**. These targets are derived from annual percentage reductions relative to Scotland's 1990 GHG emissions baseline.

[28] CCC (2020); The Sixth Carbon Budget Dataset. Available at: https://www.theccc.org.uk/2021/02/01/the-numbers-behind-the-budget-six-ways-to-explore-the-sixth-carbon-budget-dataset/ [Accessed 18/10/2024]

Table 14-7 Scottish Government Annual Targets

Year	Scotland Annual Target ($MtCO_2e$)	Year	Scotland Annual Target ($MtCO_2e$)
2024	31	2035	14.9
2025	29.4	2036	13.6
2026	27.8	2037	12.3
2027	26.1	2038	11.1
2028	24.5	2039	9.8
2029	22.9	2040	8.5
2030	21.3	2041	6.8
2031	20	2042	5.1
2032	18.7	2043	3.4
2033	17.4	2044	1.7
2034	16.2	2045	0

14.3.29 As outlined in **Section 14.2**, the Scottish Government recently passed legislation abandoning the statutory 2030 GHG emissions reduction target and established a framework for developing specific carbon budgets for Scotland, similar to the approach used by the UK Government. However, at the time the climate assessment was conducted, the Scotland-specific carbon budgets had not yet been published by the CCC for adoption by the Scottish Government. As a result, the previous 2030 GHG emissions target was used to quantitatively assess the magnitude of GHG emissions associated with the Proposed Development.

Significance of Effects

14.3.30 The IEMA GHG Guidance[1] states that there are currently no agreed methods to evaluate quantified levels of GHG significance, that the application of the standard EIA significance criteria is not considered to be appropriate for climate change mitigation assessments, and that professional judgement is required to contextualise a project's GHG emission impacts. **Table 14-8** states the significance criteria that will be applied to the Proposed Development.

14.3.31 IEMA GHG Guidance[1] states mitigation should be considered from the outset and throughout the project's lifetime whilst also helping to deliver proportionate EIAs. Once the magnitude of GHG emissions is determined, mitigation measures should be proposed.

14.3.32 A project's impact can shift from significant adverse to non-significant effects by incorporating mitigation measures that substantially improve on business-as-usual and meet or exceed the science-based GHG emissions trajectory of ongoing but declining GHG emissions towards net zero.

Table 14-8 Definition of levels of Significance

Significance Level	Effects	Description	Example in the guidance
Significant	Major adverse	A project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the UK's Net-Zero trajectory or accepted aligned practice or area-based transition targets. It is down to the practitioner to differentiate between the 'level' of significant adverse effects e.g. 'moderate' or 'major' adverse effects.	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in GHG emissions and does not make a meaningful contribution to the UK's trajectory towards Net- Zero.
	Moderate adverse		The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net-zero.
Not significant	Minor adverse	A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of GHG emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that. It may have residual GHG emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035 and thereby potentially avoiding significant adverse effects.	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
	Negligible	A project that achieves GHG emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual GHG emissions. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net-zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory

Significance Level	Effects	Description	Example in the guidance
			towards net-zero and has minimal residual GHG emissions.
Significant	Beneficial	A project that causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net-zero requirements with a positive climate impact.

CCRA

14.3.33 The methodology for the CCRA has been developed in line with IEMA CCRA Guidance[2] and in accordance with the EU Technical Guidance on Climate Proofing Infrastructure[24].

14.3.34 The CCRA considered the impact of future climate change on the Proposed Development. The assessment uses UKCP18 projections[26] and the Think Hazard tool to identify potential climate hazards impacting the construction and operation of the Proposed Development over a 100-year period from 2020 to 2099.

14.3.35 Climate parameters considered in the CCRA include the following:

- Extreme weather events;
- Temperature change; and
- Precipitation change.

14.3.36 The following key terms and definitions relating to the CCRA will be used:

- Climate hazard – a weather or climate-related event which has the potential to do harm to environmental or community receptors or assets, for example, increased winter precipitation;
- Climate change impact – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose; and
- Consequence – any effect on the receptor or asset resulting from the climate hazard having an impact.

14.3.37 The CCRA is semi-qualitative and provides commentary on how the Proposed Development will be resilient to climate change within the context of current and predicted future climate conditions.

14.3.38 The CCRA identified potential climate change impacts and considered the likelihood of their occurrence and the potential consequence of their impact, taking account of the measures incorporated into the design of the Proposed Development.

14.3.39 UKCP18 projections[26], historical climate data[32] and other climate data such as the Think Hazard Tool[23] were assessed to understand the likelihood of the climate hazard occurring.

14.3.40 The likelihood of a climate impact occurring is then identified based on the likelihood of the hazard occurring combined with the vulnerability of the Proposed Development, using

professional judgment and in discussion with the design team. The criteria in **Table** 14-9 are applied to understand the likelihood of a climate impact occurring.

Table 14-9 Criteria for assessing the likelihood of a climate impact occurring

Likelihood Category	Qualitative description	Quantitative description (%)
Rare	Highly unlikely to occur	5
Unlikely	Unlikely to occur	20
Moderate	As likely to occur as not	50
Likely	Likely to occur	80
Almost certain	Very likely to occur	95

14.3.41 The consequences were assessed according to **Table 14-10** respectively. The categories and descriptions provided are based on the IEMA CCRA guidance[2] and EU Technical Guidance on Climate Proofing Infrastructure[24].

Table 14-10 Description of Consequences

Risk areas	Insignificant	Minor	Moderate	Major	Catastrophic
Asset damage / Engineering / Operational	Impact can be absorbed through normal activity	An adverse event that can be absorbed by taking business continuity actions	A serious event that requires additional emergency business continuity actions	A critical event that requires extraordinary / emergency business continuity actions	Disaster with the potential to lead to shut down or collapse or loss of the asset / network
Safety and Health	First aid case	Minor injury, medical treatment	Serious injury or lost work	Major or multiple injuries, permanent injury, or disability	Single or multiple fatalities
Environment	No impact on baseline environment. Localised in the source area. No recovery required	Localised within site boundaries. Recovery measurable within one month of impact	Moderate harm with possible wider effect. Recovery in one year	Significant harm with local effect. Recovery longer than one year. Failure to comply with environmental regulations / consent	Significant harm with widespread effect. Recovery longer than one year. Limited prospect of full recovery
Social	No negative social impact	Localised, temporary social impacts	Localised, long-term social impacts	Failure to protect poor or vulnerable groups (1). National, long-term social impacts	Loss of social licence to operate. Community protests
Financial (for single extreme event or annual	x % IRR (***) < 2 % of turnover	x % IRR 2-10 % of Turnover	x % IRR 10-25 % of turnover	x % IRR 25-50 % of turnover	x % IRR > 50 % of Turnover

Risk areas	Insignificant	Minor	Moderate	Major	Catastrophic
average impact) (**)					
Reputation	Localised, temporary impact on public opinion	Localised, short-term impact on public opinion	Local, long-term impact on public opinion with adverse local media coverage	National, short-term impact on public opinion; negative national media coverage	National, long-term impact with potential to affect the stability of the Government
Cultural Heritage and cultural premises	Insignificant impact	Short term impact. Recovery or repair.	Serious damage with wider impact to tourism industry	Significant damage with national and international impact	Permanent loss with resulting impact on society

(1) Including groups that depend on natural resources for their income/livelihoods and cultural heritage (even if not considered poor) and groups considered poor and vulnerable (and often that have less capacity to adapt) as well as persons with disabilities and older persons.

(*) The ratings and values suggested here are illustrative. The project promoter and climate-proofing manager may choose to modify them.

(**) Example indicators – other indicators that may be used including costs of immediate / long-term emergency measures; restoration of assets; environmental restoration; indirect costs on the economy, indirect social costs.

(***) Internal Rate of Return (IRR).

Significance of Effects

14.3.42 The likelihood and consequence of climate change impacts, as determined above, is combined to determine a risk rating. The significance of climate change impacts is determined by this risk rating. **Table 14-11** sets out how the significance was assessed. The assessment has considered confirmed design and adaptation measures.

Table 14-11 Significance of Effect Matrix (CCRA)

Likelihood	Consequence					
		Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
	Rare	Low (Not Significant)	Low (Not Significant)	Medium (Not Significant)	High (Significant)	Extreme (Significant)
	Unlikely	Low (Not Significant)	Low (Not Significant)	Medium (Not Significant)	High (Significant)	Extreme (Significant)
	Moderate	Low (Not Significant)	Medium (Not Significant)	High (Significant)	Extreme (Significant)	Extreme (Significant)
	Likely	Medium (Not Significant)	High (Significant)	High (Significant)	Extreme (Significant)	Extreme (Significant)
	Almost certain	High (Significant)	High (Significant)	Extreme (Significant)	Extreme (Significant)	Extreme (Significant)

ICCI Assessment

14.3.43 The ICCI assessment has considered the ways in which projected climate change will influence the significance of the impact of the Proposed Development on receptors in the surrounding environment.

14.3.44 The ICCI assessment considered the existing and projected future climate conditions for the geographical location and assessment timeframe to identify climate hazards. It then identified the extent to which receptors in the surrounding environment are potentially vulnerable to and affected by these climate impacts.

14.3.45 ICCIs have been identified and assessed in collaboration with the technical specialists responsible for preparing the applicable technical chapters as listed below:

- **Chapter 7 Landscape and Visual;**
- **Chapter 8 Ecology;**
- **Chapter 9 Ornithology; and**
- **Chapter 12 Hydrology, Geology, Hydrogeology and Peat.**

14.3.46 The technical specialists responsible for preparing the relevant technical chapters for the following topics have not identified any ICCIs:

- **Chapter 10 Cultural Heritage;**
- **Chapter 11 Traffic and Transport; and**
- **Chapter 13 Noise and Vibration.**

14.3.47 UKCP18 climate projections, historical climate data and other climate data such as Think Hazard are assessed to understand the likelihood of the climate hazard occurring.

14.3.48 The likelihood of a climate impact occurring is then identified based on the likelihood of the hazard occurring combined with the vulnerability of the Proposed Development, using professional judgement and in discussion with the design team. The criteria in **Table 14-12** is applied to understand the likelihood of a climate impact occurring.

Table 14-12 Level of likelihood of the climate-related impact occurring

Level of likelihood	Definition of likelihood
Very unlikely	0-33% probability that the impact will occur during the life of the Proposed Development.
Unlikely	10-33% probability that the impact will occur during the life of the Proposed Development.
Possible	33-66% probability that the impact will occur during the life of the Proposed Development.
Likely	66-90% probability that the impact will occur during the life of the Proposed Development.
Very likely	90-100% probability that the impact will occur during the life of the Proposed Development.

14.3.49 Once the likelihood of the impact has been determined the following criteria set out in **Table 14-13** are used to determine the consequence of the impacts.

Table 14-13 Level of consequence of the climate-related impact occurring

Consequence rating	Consequence criteria
High	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/receptor, as defined by the topic, to increase from negligible, low, or moderate to major.
Medium	The climate change parameter in-combination with the effect of the Proposed Development causes the effect defined by the topic to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development, causes the significance of effect defined by the topic, to increase from negligible to low.
Very low	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

Significance of effects

14.3.50 The significance of effects has been determined using the matrix in **Table 14-14**. Where an impact has been identified as moderate or major, it has been deemed significant.

Table 14-14 ICCI significance criteria

		Likelihood				
		Very Unlikely	**Unlikely**	**Possible**	**Likely**	**Very Likely**
Consequence	**Very low**	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Low	Negligible (Not significant)	Negligible (Not significant)	Minor (Not significant)	Minor (Not significant)	Minor (Not significant)
	Medium	Negligible (Not significant)	Minor (Not significant)	Moderate (Significant)	Moderate (Significant)	Moderate (Significant)
	High	Negligible (Not significant)	Minor (Not significant)	Moderate (Significant)	Major (Significant)	Major (Significant)

Limitations and Assumptions

GHG Assessment

14.3.51 In cases where specific information about energy usage, materials, or the GHG emissions of important aspects of the assets is unavailable, assumptions are made. These assumptions are based on industry estimates, professional best practices, and estimates provided by SSEN Transmission.

14.3.52 Key assumptions applied in the GHG assessment are presented in **Table 14-15**. The life cycle modules are labelled in accordance with PAS 2080:2023 Guidance[16]. Key sources of assumptions include the RICS Guidance for whole life GHG assessments[25] and SSEN Transmission's Carbon Calculator.

Table 14-15 Key assumptions applied in the GHG Assessment

Life cycle module		Emission Source	Key assumptions
Baseline Conditions		Carbon sequestration of in-situ peat.	The assessment of GHG emissions from the loss of carbon storage was conducted using the peatland calculator adopted across the ASTI project framework, in line with SSEN methodology. Emission factors used to estimate the carbon sequestration potential of the peatland were derived from the SSEN Transmission ASTI Framework. For the proposed Bingally Substation, the peat was classified as modified pre-restoration, with restoration expected to result in a re-wetted modified bog. For the proposed access track, the peat was initially classified as near-natural pre-restoration, with restoration anticipated to transform it into a re-wetted modified bog. These classifications and assumptions have been validated by the technical team responsible for the Peat Management Plan (PMP) see (**Volume 3, Appendix I**).
A: Before Use Stage	A1-3 Product Stage	A1-3 Raw materials supply and manufacture	Embodied GHG emissions from the substation civils and access track were estimated using construction data provided by SSEN Transmission. To account for material waste, an uplift was applied to the data based on RICS waste assumptions. SSEN Transmission's Carbon Calculator was used to estimate the embodied GHG emissions from the on-site electrical equipment. A list of electrical equipment was obtained from design drawings provided by SSEN Transmission. This includes: • One busbar; • Four bus coupler bays; • Four bus section bays; • Four feeder bays; and • Two supergrid transformers.
	A4-5 Construction Process Stage	A4 Material transport	The RICS assumptions applied to material transport distances and transport modes. It was assumed that average-laden heavy goods vehicles (HGVs) were used to transport construction materials to the Site. The SSEN Transmission Carbon Calculator assumed that the electrical equipment was manufactured overseas and applied the following transport assumptions: 200 km by HGV and 10,000 km by container ship.
		Carbon Storage Loss (A5.1 Pre-construction demolition)	The GHG emissions from peat excavation for the Proposed Development were calculated using peat volume estimates based on peat probing data provided by SSEN Transmission. Since the Scottish Environmental Protection Agency (SEPA) Peat Carbon Tool was unavailable at the time of the GHG Assessment, the Scottish Government's Wind Farm Carbon Tool – Version 2.14.1[19] was used to assess the GHG impact of peat excavation. A 9% loss of peat during transposition to the restoration site was assumed and factored into the tool, representing a worst-case scenario.

Life cycle module		Emission Source	Key assumptions
		A5.2 Construction activities	GHG emissions from construction plant were estimated based on a construction plant list provided by SSEN Transmission, using indicative fuel consumption assumptions.
		A5.3 Waste	RICS wastage rates and assumptions applied for end-of-life scenarios per material type.
		A5.4 Worker transport	Assume an average 50 km round trip commute. One employee per average-sized car (fuel type unknown).
B: Use Stage	B1-8 Use Stage	B1 Use	The GHG emissions arising from the negative impact of peat excavation and relocation were determined using emission factors from the IUCN Peatland Code Carbon Calculator[20]. The reported GHG emissions reflect the difference between the pre-restoration and post-restoration states of the peat. It was assumed that the peat was in good condition before excavation and that the peat would be re-wetted as part of the restoration process.
		B2 Maintenance	RICS assumptions applied to estimate maintenance GHG emissions. Maintenance GHG emissions are estimated as 1% of A1-A5 GHG emissions.
		B3 Repair	RICS assumptions applied to estimate repair GHG emissions. Repair GHG emissions are assumed to be equivalent to 25% of B2 GHG emissions and 10% of A1–A3 GHG emissions for electrical equipment.

CCRA and ICCI Assessment

14.3.53 Climate change projections, by their very nature, are associated with a range of assumptions and limitations. There are inherent uncertainties associated with climate projections. Climate projections are not predictions of the future but are rather a projection based on the best available data and science.

14.3.54 To account for this uncertainty, a 'high' emissions scenario (RCP 8.5) has been used in this assessment, which is consistent with the precautionary principle.

14.4 Sensitive Receptors

GHG Assessment

14.4.1 The global climate was identified as the receptor for the purposes of the GHG assessment. The sensitivity of the climate to GHG emissions is 'high'. The rationale is as follows:

- GHG emission impacts could compromise the UK's Carbon Budget Delivery Plan[5] sector-specific electricity generation carbon budgets and Net-Zero Pathways and, therefore, the ability to meet its future carbon reduction trajectory;
- Any additional GHG impacts could compromise the UK's and Scotland's ability to reduce its GHG emissions and, therefore, the ability to meet its future legally binding carbon budgets;
- The extreme importance of limiting global warming to below 2°C above industrial levels, while pursuing efforts to limit such warming to 1.5°C as set out in the Paris Agreement[3] and a recent report by the Intergovernmental Panel on Climate Change (IPCC) highlighted the importance of limiting global warming below 1.5°C; and

- Disruption to global climate already has diverse and wide-ranging impacts on the environment, society, economic and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.

CCRA

14.4.2 The receptor for the CCRA is the Proposed Development itself, including workers, infrastructure, and visitors.

ICCI Assessment

14.4.3 The receptors for the ICCI assessment are those identified by the specialists in their individual topic chapters.

14.5 Baseline Conditions

GHG Assessment

Existing and Future Baseline

14.5.1 The existing and future baseline for the GHG assessment of the impact of the Proposed Development on climate is a 'business as usual' scenario where the Proposed Development is not constructed and operated. The baseline comprises of existing carbon stock and sources of GHG emissions within the Site.

14.5.1 The Site and surrounding area are predominantly characterised as upland moorland with vegetation including wet upland heath with heather, purple moor-grass, cross-leaved heath, and blanket bog situated on deep peat. The abundance of peat within and around the Site suggests a carbon sink potential.

14.5.2 The GHG emissions associated with peat carbon sequestration in the existing baseline were estimated based on the carbon storage potential and the annual GHG flux of the in-situ peat. As detailed in **Table 14-16,** the total carbon stored within the peat at the Site is estimated to be approximately 293,647 tCO_2e[29]. In addition, the annual carbon sequestration rate (carbon flux rate) is estimated to be 46 tCO_2e[30].

14.5.3 In addition to the existing baseline, a future baseline was developed to assess the GHG emissions sequestration by the in-situ peat over the 45-year reference period. As shown in **Table 14-16**, it was estimated that an additional 2,072 tCO_2e would be sequestrated during this timeframe.

14.5.4 These GHG emissions were calculated based on the peat volumes reported in the PMP (see **Volume 3, Appendix I**). For this assessment, it was assumed that the peat is in good condition, allowing for carbon sequestration. This assumption was confirmed by the technical specialists involved in developing the PMP.

[29] Carbon Storage refers to the process of capturing and holding carbon in natural reservoirs (i.e. peat).

[30] Carbon sequestration is the process of capturing and storing atmospheric CO_2, and GHG emissions are reported as negative when sequestration removes more CO_2 than is emitted, indicating a net reduction in emissions.

Table 14-16 GHG Emissions: Future and Existing Baseline

Carbon Value reported	Scenario	GHG emissions (tCO_2e)
Carbon Flux[31] rate (tCO_2e per year)	Existing Baseline	-46
Carbon Flux (45 years)	Future Baseline	-2,072

CCRA and ICCI Assessment

Existing Baseline

14.5.5 The existing baseline for the assessment of climate change risks to the Proposed Development (the CCRA) and combined risks to surrounding receptors (the ICCI assessment) were based on historical climate data obtained from the Met Office[32] recorded by the closest meteorological station to the Proposed Development (Fort Augustus, located approximately 20 km southeast of the Site), as summarised in **Table 14-17**.

Table 14-17 Historical Climate Data (Fort Augustus)

Climatic Variable	Baseline data 1981-2010
Mean Annual Max Temp (°C)	11.9
Mean Annual Min Temp (°C)	5.0
Mean summer maximum daily temp (°C)	17.9
Mean winter minimum daily temp (°C)	0.6
Warmest Month on Average (°C)	18.7
Warmest Month on Average (Month)	July
Coldest Month on Average (°C)	0.4
Coldest Month on Average (Month)	December
Frost days per annum	65
Mean Average Rainfall levels (mm)	1336.4
Mean summer rainfall (mm)	70.7
Mean winter rainfall (mm)	158.0
Wettest Month on Average (Month)	January
Driest Month on Average (mm)	62.6
Driest Month on Average (Month)	June

14.5.6 In addition to the historical climate data presented above, the following events are examples of extreme climatic conditions experienced across Scotland in the past:

[31] Carbon Flux refers to the rate at which carbon is exchanged between a peatland ecosystem and the atmosphere.

[32] Met Office (2020) UK Climate Averages – Fort Augustus Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gfhtjdb28 [Accessed 18/10/2024]

- Highest recorded temperature was 34.8°C on 19th July 2022[33];
- Lowest recorded temperature was -15.9°C on 29th December 1995[33];
- Highest 24-hour rainfall total for a rainfall day was 238 mm and was recorded on 17th January 1974[33;]
- The highest gust speed recorded was 142 mph and was recorded on 13th February 1989[33]; and
- Recent storm events in the west of Scotland, including Storms Babet[34], Jocelyn[35], and Kathleen[36], caused severe flooding, travel disruptions, and infrastructure damage.

Future Baseline

14.5.7 The future baseline for the CCRA and ICCI assessment are based on UKCP18 projection data. This projection data provides probabilistic indications of how global climate change is likely to affect areas of the UK using pre-defined climate variables and time periods. Projected climate data is presented in **Table 14-18** below.

[33] Met Office (2023) UK Climate Extremes. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-extremes [Accessed 18/10/2024].
[34] Met Office (2024) UK Storm Centre – Strom Babet. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2023/2023_08_storm_babet.pdf [Accessed 18/10/2024]
[35] Met Office (2024) UK Storm Centre – Storm Isha and Jocelyn. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024_02_storms_isha_jocelyn.pdf [Accessed 18/10/2024]
[36] Met Office (2024) UK Storm Centre – Storm Kathleen. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024_04_storm_kathleen.pdf [Accessed 18/10/2024]

Table 14-18 Climate Change Baseline and Projection Data

Climatic Variable	Baseline data	Projection (change)				Projected Trend	Source
	1981-2010	2020 - 2049	2040 - 2069	2070-2099	Beyond 2100		
Temperature							
Mean annual maximum daily temperature (°C)	11.9	+0.8°C (+0.2°C to +1.4°C)	+1.4°C (+0.5°C to +2.3°C)	+2.8°C (+1.3°C to +4.3°C)	No projection data is available beyond 2100, trend towards increasing temperatures is expected to continue.	↑	UKCP18
Mean summer maximum daily temperature (°C)	17.9	+0.8°C (+0.1°C to +1.6°C)	+1.3°C (+0.4°C to +2.5°C)	+3.5°C (+1.4°C to +5.7°C)		↑	UKCP18
Mean winter minimum daily temperature (°C)	0.6	+0.8°C (-0.1°C to +1.6°C)	+1.3°C (+0.1°C to +2.6°C)	+2.3°C (+0.4°C to +4.4°C)		↑	UKCP18
Number of days of air frost per annum	65	Reports have shown that the number of frost air and ground frost days have decreased since the 1960s. These long-term trends, combined with detailed studies, point to a long-term warming trend of the UK's climate and a reduction in cold events.				↓	Met Office
Highest average monthly temperature for baseline period (°C)	18.7 (July)	+0.8°C (-0.1°C to +1.7°C	+1.8°C (+0.5°C to +3.1°C)	+3.7°C (+1.1°C to +6.3°C)	No projection data is available beyond 2100, trend towards increasing temperatures is expected to continue.	↑	UKCP18
Lowest average monthly temperature for baseline period (°C)	0.4 (December)	+0.8°C (-0.1°C to +1.8°C)	+1.4°C (+0.1°C to +2.8°C)	+2.3°C (+0.4°C to +4.3°C)		↑	UKCP18
Precipitation							
Mean annual rainfall (mm)	1336.4	+0.1% (--4.1% to +4.3%)	-0.1% (-4.9% to +4.9%)	-1.4% (-6.7% to +4.1%)	No projection data is available beyond 2100. However, there is potential for a continued slight decrease in rainfall overall.	↓	UKCP18

Climatic Variable	Baseline data	Projection (change)				Projected Trend	Source
	1981-2010	2020 - 2049	2040 - 2069	2070-2099	Beyond 2100		
Mean summer rainfall (mm)	62.6	-3.1% (-16.9% to +11.2%)	-10.2% (-29.4% to +11.4%)	-23.7% (-47.1% to +5.3%)	No projection data is available beyond 2100. It is possible for the decrease in summer rainfall trend to continue.	↓	UKCP18
Mean winter rainfall (mm)	158.0	-0.4% (-8.5% to +8.6%)	+2.4% (-6.7% to +13.1%)	+2.8% (-10.6% to +19.6%)	No projection data is available beyond 2100. An increase in winter rainfall is possible.	↑	UKCP18
Wettest month on average (mm)	158.0 (January)	-1.0% (-16.2% to +14.0%)	+4.8% (-13.2% to +23.4%)	+9.9% (-17.3% to +39.4%)	No projection data is available beyond 2100. An increase in winter rainfall is possible.	↑	UKCP18
Driest month on average (mm)	62.8 (June)	+2.6% (-19.8% to +25.3%)	-4.6% (-31.6% to +24.0%)	-15.0% (-45.5% to +23.5%)	No projection data is available beyond 2100. A decrease in summer rainfall is possible.	↓	UKCP18
Other							
Droughts	The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a low one, however, it is the distribution of rainfall throughout the seasons that will determine UK drought risk.					↑	Met Office
Storms	The Met Office projects that climate change will likely lead to more frequent and intense winter storms in the UK, driven by factors such as rising sea surface temperatures and changes in the jet stream. While past data shows no clear trend in storm frequency or intensity, future projections indicate an increase in severe storms, particularly during winter, with stronger winds and heavier rainfall.					↑	Met Office
Wind	The Met Office reports no significant historical trend in maximum wind gusts in the UK, but future projections indicate increasing winter wind speeds in the 2nd half of the 21st century.					↑	Met Office
Wildfires	The wildfire hazard is classified as medium according to the information that is currently available in the Think Hazard[23] tool. This means there is between a 10% and 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk of life and property loss in any given year.					↑	Think Hazard

14.6 Issues Scoped Out

14.6.1 Sea-level rise has been scoped out as the Proposed Development is at an inland location that is located approximately 220 metres above sea level. The IPCC Sea Level Projection Tool[37] estimates a 0.6 m increase relative to a 1995 – 2014 baseline at the closest region of Ullapool for 2100 under RCP8.5.

14.6.2 Due to the nature of the Proposed Development, which supports the ongoing transmission of electricity in the wider area, it is treated as permanent. As such, decommissioning was not considered in the climate assessment.

14.6.3 Currently, there is no robust methodology for calculating A0 emissions[38]. However, they are expected to be minimal, contributing less than 1% to the total GHG emissions of the Proposed Development. According to the IEMA GHG Guidance, GHG emissions anticipated to be below 1% of the total project emissions can be excluded from the assessment. Therefore, emissions from A0 have been scoped out on this basis.

14.7 Assessment of Effects, Mitigation and Residual Effects

Mitigation Measures

14.7.1 Embedded measures have been integral in reducing, and where possible avoiding, the impact of the Proposed Development on the climate. Measures that have been incorporated are:

- Sensitive routeing and siting of infrastructure and temporary works;
- BNG Strategy (refer to **Volume 3, Appendix E**);
- Aggregates used in the construction of the Proposed Development will be site-won, reducing the need for transporting aggregate from off-site locations;
- A Construction Traffic Management Plan has been developed, incorporating measures to reduce HGV movements where possible during construction refer to **Volume 1, Chapter 11 Traffic and Transport**;
- Development of a Construction Environment Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP) to manage the Proposed Development's impact on the climate;
- A PMP has been developed and is included as part of the Voluntary EA (refer to **Volume 3, Appendix I**). The PMP details measures to mitigate the impact of peat loss and damage in line with industry best practice. Measures include relocating excavated peat to temporary and permanent storage facilities to minimise the release of GHG emissions.
- The use of materials with a low embodied carbon in accordance with SSEN Transmission's Sustainability Strategy[39]; and
- The use of low-carbon construction techniques.

14.7.2 Embedded measures have been integral in reducing, and where possible avoiding, the climate change impacts on the Proposed Development. Adaptation measures that have been incorporated are:

- Development of a CEMP and an OEMP to manage the Proposed Development's resilience to climate change;

[37] IPCC (2021) Sea Level Projection Tool. Available at: https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool [Accessed 18/10/2024].

[38] A0 emissions refer to non-physical pre-construction activities, such as business travel, surveys and design work.

[39] SSEN (2023) SSEN Distribution Sustainability Strategy. Available at: https://www.ssen-transmission.co.uk/globalassets/documents/new-sustainability-documents-2024/strategies/ssen-transmission-sustainability-strategy-2024 [Accessed 11/11/2024]

- Designing the Proposed Development to be resilient to any significant impacts of climate change;
- The transformers will be designed in line with the Operator standards to operate between +40°C and -25°C;
- A Flood Risk Assessment (FRA) and Drainage Impact Assessment (DIA) have been undertaken part of the planning application to avoid any flood risk in the first instance and have been conducted in line with SEPA guidance; and
- All drainage generated within the Site will be drained using Sustainable Drainage Systems (SuDS) principles to manage the runoff in a controlled manner as per the pre-development condition and will be adhered to during the design with the following:
  - Natural run-off collection and diversion (where required);
  - Platform surface water run-off drainage collection and routing; and
  - SuDS basins, cut-off drains & ditches for treatment and attenuation.

GHG Assessment

Construction Phase

14.7.3 For the purposed of the climate assessment, the construction phase of the Proposed Development is assumed to be from 2026 to 2029.

14.7.4 The GHG emissions associated with the construction phase of the Proposed Development have been calculated in line with the methodology, assumptions and limitations detailed in **Section 14.3**. The results are provided in **Table 14-19**. The life cycle modules are labelled in accordance with PAS 2080:2023 guidelines[16].

Table 14-19 Construction phase GHG emissions

Life cycle Module		Emission Source	GHG Emissions (tCO_2e)
A: Before Use Stage	A1-3 Product Stage	A1-3 Raw materials supply and manufacture	**15,368**
	A4-5 Construction Process Stage	A4 Material transport	**11,218**
		A5.2 Construction activities	**7,304**
		A5.3 Waste	**99**
		A5.4 Worker transport	**4,968**
Total tCO_2e over the Construction period (excluding biogenic carbon)			**38,957**
Total Carbon Storage Loss (Biogenic Carbon) (A5.1)[40]			**29,013**
Total tCO_2e over the Construction phase (including biogenic carbon)			**67,970**

14.7.5 The total GHG emissions attributed to the construction phase of the Proposed Development are estimated to be 67,970 tCO_2e, as detailed in **Table 14-19**. The largest contributor to these GHG emissions was peat loss, estimated at 29,013 tCO_2e, resulting from excavation and relocation. As a worst-case scenario, the GHG assessment assumes that 9% of the peat would be displaced. The second largest contributor is the embodied carbon in raw materials used for the construction of the proposed access track, substation, and associated electrical

[40] In accordance with the RICS Guidance, biogenic carbon (GHG emissions associated with peatland excavation and restoration) has been reported separately from other GHG emissions. However, for the purposes of the Voluntary EA, these GHG emissions have been contextualised against the carbon budgets to inform the significance assessment.

equipment. Additional GHG emission sources include material transport, construction activities, worker transport, and waste.

14.7.6 To contextualise this impact, these construction GHG emissions are compared to the UK carbon budgets, which coincide with the construction phase. This comparison is presented in **Table 14-20**. For additional context, the Proposed Development has also been contextualised against the Scottish GHG reduction targets. These are presented in **Table 14-21.**

14.7.7 The potential construction GHG emissions of the Proposed Development are estimated to contribute less than 0.024% of any carbon budget or GHG reduction target reported below. For this comparison, the construction GHG emissions are assumed to be distributed evenly across the years of the construction period.

Table 14-20 Comparison of construction phase GHG emissions with UK carbon budgets

UK Carbon Budget Period	UK Carbon Budget (tCO_2e)	Construction GHG Emissions (tCO_2e)	Construction GHG Emissions as a proportion of UK Carbon Budget
4th (2023 – 2027)	1,950,000,000	45,313	0.00232%
5th (2028 – 2032)	1,725,000,000	22,657	0.00128%

Table 14-21 Scottish GHG reduction targets relevant to the construction period

Relevant GHG Reduction Period	GHG Reduction Allowance (tCO_2e)	Estimated total (tCO_2e) over carbon reduction period	% of GHG reduction period
2021-2030	285,641,192	67,970	0.02380%

Operational phase

14.7.8 For the purposes of the climate assessment a reference operational period of 45 years was assumed, in accordance with asset lifespans.

14.7.9 GHG emissions associated with the operational phase of the Proposed Development have been calculated in line with the methodology, assumptions and limitations detailed in **Section 14.3**. The results are provided in **Table 14-22**. The life cycle modules are labelled in accordance with PAS 2080:2023 Guidance[16].

Table 14-22 Operation phase GHG emissions

Life cycle Module	Emission Source	GHG Emissions (tCO_2e)
B: Use Stage	B2 Maintenance	390
	B3 Repair	451
Total tCO_2e over the Operational phase (B2 and B3) (tCO_2e)		**840**
Net Carbon Flux[41] During Operation (Biogenic Carbon) (B1 Use)[42] (tCO_2e)		**-1,508**

14.7.10 The total GHG emissions associated with the Proposed Development in the operational phase are estimated to be 840 tCO_2e, as detailed in **Table 14-22**. These emissions arise from

[41] Carbon Storage is expected to remain unaffected after construction. However, it is anticipated that there will be an impact on the carbon flux, which is why this is reported in Table 14-22.

[42] In accordance with the RICS Guidance, biogenic carbon (GHG emissions associated with peatland excavation and restoration) has been reported separately from other GHG emissions. However, as a worst-case scenario, these GHG emissions have not been contextualised against the carbon budgets to inform the significance assessment.

maintenance and repair activities. Additionally, the net CO_2 sequestered over the 45-year service life of the Proposed Development amount to 1,508 tCO_2e when compared to the future baseline. While peat loss during construction reduces the overall sequestration capacity, restoration efforts will enhance the quality of the restored peat, improving its ability to store carbon over time.

14.7.11 No data was available to quantify the GHG emissions from energy use during the operation of the Proposed Development. However, energy consumption is expected to be minimal as the primary function is to facilitate the transmission of electricity rather than consume it. Operational energy use is limited to powering control systems and auxiliary services such as lighting when required, all of which are highly efficient and consume only a minimal amount of electricity. These GHG emissions are anticipated to be negligible due to the continued decarbonisation of the electricity grid, and therefore are not expected to have a material impact on the overall GHG emissions of the Proposed Development.

14.7.12 To contextualise this impact, these operational GHG emissions are compared to the UK carbon budgets which coincide with the operational phase. This comparison is presented in **Table 14-23**. For additional context, the Proposed Development has also been contextualised against the relevant Scottish GHG reduction targets and sector-specific electricity generation carbon budgets. These are presented in

14.7.13 **Table** 14-24 and **Table 14-25**.

14.7.14 The potential operation GHG emissions of the Proposed Development are estimated to contribute less than 0.0014% of any respective carbon budget or GHG reduction target reported below. For this comparison, the operational GHG emissions are assumed to be distributed evenly across the years of the operational period. As discussed in **Section 14.3**, the UK and Scotland are expected to remain net zero after 2045 and 2050, respectively.

Table 14-23 Comparison of operational phase GHG emissions with UK carbon budgets.

UK Carbon Budget Period	UK Carbon Budget (tCO_2e)	Operational GHG Emissions (tCO_2e)	Operation GHG Emissions as a proportion of the UK Carbon Budget
5th (2028 – 2032)	1,725,000,000	75	0.000004%
6th (2033 – 2037)	965,000,000	93	0.00001%
7th (2038 – 2042)	526,000,000	93	0.00002%
8th (2043 – 2047)	195,000,000	93	0.00005%
9th (2048 – 2050)	17,000,000	56	0.00033%

Table 14-24 Scottish GHG reduction targets relevant to the operational period.

Relevant GHG Reduction Period	GHG Reduction Allowance (tCO_2e)	Estimated total (tCO_2e) over carbon reduction period	% of GHG reduction period
2021-2030	285,641,192	37	0.00001%
2031-2040	142,607,749	187	0.00013%
2041-2044[43]	17,027,791	75	0.00044%

[43] Excludes 2045 as no GHG emissions can be emitted from 2045 onwards.

Table 14-25 Sector specific electricity generation carbon budgets relevant to the operational period.

Relevant UK Carbon Budget	Annualised UK Carbon Budget (tCO_2e)	Estimated total (tCO_2e) over the carbon budget period	% of Sectoral Budget for Electricity Generation.
5th (2028 – 2032)	92,567,000	75	0.00008%
6th (2033 – 2037)	35,740,000	93	0.00026%
7th (2038 – 2042)	23,330,000	93	0.00040%
8th (2043 – 2047)	12,360,000	93	0.00076%
9th (2048 – 2050)	4,030,000	56	0.00139%

Overall GHG Impact

14.7.15 Although the Proposed Development will result in increased GHG emissions, it's important to consider the Proposed Development's role in wider UK and Scottish policy to decarbonise the electricity grid. This consideration is crucial when assessing its impact on the climate.

14.7.16 The Proposed Development will support the ongoing expansion of renewable energy generation within the UK energy system by providing the necessary infrastructure to support the increased transmission of low-carbon electricity. This will contribute to the decarbonisation of the electricity generation sector as renewables increasingly replace higher-carbon energy sources. This aligns with the UK Government's goal of achieving a fossil fuel-independent electricity system by 2035.

14.7.17 Embedded mitigation measures, such as the PMP, CEMP, OEMP and other relevant controls, will provide appropriate measures to limit GHG emissions. These controls are aligned with relevant existing and emerging policy requirements and adhere to best practice design standards for minimising the GHG impact.

14.7.18 As discussed in **Sections 14.7.6** and **14.7.12**, the Proposed Development's GHG impact during construction and operation has been quantitatively assessed against the relevant carbon budgets and net-zero targets. The Proposed Development is in line with the UK and Scotland's policies to decarbonise the electricity grid and transition to net zero by 2045 and 2050, respectively. The Proposed Development's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. Therefore, in accordance with IEMA guidance (see **Section 14.3**), the GHG emissions associated with the Proposed Development's construction and operation are assessed as **Minor Adverse** and **Not Significant**. A project with 'not significant' effects is fully in line with measures necessary to achieve the UK and Scotland's trajectory towards net zero.

14.7.19 In addition, SSEN Transmission's commitment to the Science-Based Targets initiative (SBTi) provides effective management of minor residual GHG emissions, aligning with policy requirements and supporting the project's contribution to the net-zero transition. SSEN Transmission's Sustainability Strategy[39] further aligns with the UK and Scotland's net-zero targets by setting clear goals to reduce SSEN Transmission's GHG emissions in line with the 1.5°C target of the Paris Agreement[3]. This includes a commitment to engage with suppliers to adopt science-based targets (SBTs) by 2026, with 35% of suppliers expected to align with SBTs.

Construction Phase

14.7.20 The climate change risk assessment CCRA identified 12 risks in related to construction. The complete list of climate change risks can be found in the risk register presented in **Volume 3**, **Appendix P Climate Change Risk Assessment.**

14.7.21 **Table 14-26** highlights the risk profile for both the initial and residual risks for the Proposed Development during construction. Residual risk represents the risk profile resulting from the implementation of adaptation measures. The residual risk rating is contingent on the identified adaptation measures being implemented as part of the Proposed Development.

Table 14-26 Construction Climate Change risk profile of the Proposed Development.

Risk rating	Number of initial risks identified	Number of residual risks identified	Significance Level
Low	4	12	Not Significant
Medium	8	0	Not Significant
High	0	0	Significant
Extreme	0	0	Significant

14.7.22 The eight 'Medium' risks relate to an increase in winter precipitation, risk of extreme cold weather, and an increase in frequency and severity of extreme storm events over the construction period. These risks pose a risk of damage to the Proposed Development and has the potential to endanger the health and safety of people on the Site. The rest of the risks are of a relatively lower likelihood and consequence and are therefore rated as 'Low'.

14.7.23 This assessment has found there are no significant residual climate risks to the Proposed development, assuming the embedded mitigation measures are successfully implemented into the design.

14.7.24 The effect of climate change risk on the Proposed Development during the construction phase is therefore deemed to be **Not Significant.**

Operational Phase

14.7.25 The climate change risk assessment CCRA identified 14 risks related to operation of the Proposed Development. The complete list of climate change risks can be found in the risk register presented in **Volume 3, Appendix P Climate Change Risk Assessment.**

14.7.26 **Table 14-27** highlights the risk profile for both the initial and residual risks for the Proposed Development during the operation. The residual risk rating is contingent on the identified adaptation measures being implemented as part of the Proposed Development.

Table 14-27 Operation: Climate Change risk profile of the Proposed Development.

Risk rating	Number of initial risks identified	Number of residual risks identified	Significance Level
Low	9	9	Not Significant
Medium	4	5	Not Significant
High	1	0	Significant
Extreme	0	0	Significant

14.7.27 The one 'High' risk identified pertains to a major risk of injury or fatality during a wildfire event. However, with appropriate adaptation measures and health and safety plans in place, the residual risk associated with this climate-related hazard has been reduced to 'Medium'.

14.7.28 The four 'Medium' risks involve an increased likelihood of flooding due to projected rises in winter precipitation during the operational phase. Additional risks include the potential impacts from extreme cold weather and the increased frequency and severity of extreme storm events. These conditions pose a threat of damage to the Proposed Development and could endanger the health and safety of onsite personnel. All remaining risks have a lower likelihood and consequence and are therefore rated as 'Low'.

14.7.29 This assessment has found there are no significant residual climate change risks to the Proposed development, assuming the embedded mitigation measures are successfully implemented into the design.

14.7.30 The effect of climate change risk on the Proposed Development during the construction phase is therefore deemed to be **Not Significant.**

ICCI Assessment

14.7.31 Taking into account the mitigation measures as detailed in **Section 14.7**, the potential impacts and effects of the Proposed Development combined with climate change on receptors in the surrounding environment have been assessed using the methodology as detailed in **Section 14.3** of this Chapter.

14.7.32 The technical disciplines that identified ICCIs are detailed in Volume 3, Appendix Q In-Combination Climate Change Impact Assessment.

14.7.33 As there are only low and negligible effects identified in the ICCI assessment, it can be concluded that the risk posed to sensitive surrounding receptors is **Not Significant**, and therefore no additional mitigation or enhancement measures are required.

Cumulative Effects

14.7.34 IEMA GHG Guidance[1] states that the concentration of GHG emissions in the atmosphere and their impact on climate change are influenced by all sources and sinks globally, whether they are human-caused or not. Unlike many topics that only focus on project impacts within a specific geographical area, GHG emissions and their effects are global in nature. As a result, it is not appropriate to select projects from a defined geographical area to undertake a cumulative assessment.

14.7.35 The GHG assessment in this chapter is considered inherently cumulative. It shows the impact of the Proposed Development in relation to the UK carbon budgets, Scotland's GHG reduction targets, and sector-specific electricity generation carbon budgets. These are used to represent the main sensitive receptor, which is the global atmosphere. This includes the provision of legally binding limits of GHG emissions that can be emitted by UK and Scotland if it is to meet its net-zero targets by 2045 and 2050 respectively. This assessment is considered comprehensive and includes a worst-case within the defined assessment parameters.

14.7.36 As the CCRA is only concerned with the assets of the Proposed Development and a broader consideration of existing interdependent infrastructure, a cumulative assessment is not required.

14.7.37 The ICCI assessment, by nature, should be considered cumulatively in line with each discipline's assessment. The identified effects are detailed in **Volume 3**, **Appendix Q In-Combination Climate Change Impact Assessment**.

14.8 Summary

14.8.1 Overall, the GHG impact of the Proposed Development will be **Minor Adverse** and **Not Significant**. The Proposed Development will bring long-term benefits to the UK and Scotland by upgrading energy-related infrastructure. This is essential for integrating new sources of renewable power and increasing the electricity grid's capacity to facilitate the electrification of the broader economy. This, in turn, will support the transition away from fossil fuels and help achieve net-zero GHG emissions across the UK and Scotland.

14.8.2 The CCRA and ICCI assessment have identified no significant impacts, and these are therefore considered **Not Significant**. The control measures and embedded adaptation outlined in **Section 14.7** are considered sufficient to manage the Proposed Development's exposure to climate risks.