VOLUME 2: CHAPTER 6 – CLIMATE CHANGE AND CARBON BALANCE

Figures and Visualisations (Volume 3a and 3b of this EIA Report)

There are no figures or visualisations associated with this chapter.

Appendices (Volume 4 of this EIA Report)

Appendix 6.1: Carbon Calculator Data

6. CLIMATE CHANGE AND CARBON BALANCE

6.1 Introduction

This Chapter of the EIA Report evaluates three topics: (i) the effects of the Proposed Development on the climate and provides a Greenhouse Gas (GHG) assessment; (ii) the effect of climate change on environmental receptors impacted by the Proposed Development (ICCI); and (iii) the vulnerability of the Proposed Development to climate change (CCR).

6.1.1 Project Overview

The Proposed Development is located approximately 9.5 km north east of Bonar Bridge, and adjacent to the south western boundary of the existing 275 kV Loch Buidhe Substation. It is located within an area of commercial forestry, which has been partially felled. The Proposed Development comprises a new 400 kV substation on a levelled platform, access arrangements, security fencing, Sustainable Drainage Systems (SuDS), peat restoration, and landscape and ecological mitigation planting.

A detailed description of the Proposed Development is provided in **Volume 2 Chapter 2** Project Description within this EIA Report. A summary is also provided within the Non-Technical Summary (NTS) which constitutes **Volume 1** of this EIA Report.

The location of the Proposed Development has been determined by SSEN Transmission's site selection process, detailed in 'Substation Site Selection Procedures for Voltages at or above 132 kV'[1]. This process is described in more detail in **Volume 2 Chapter 3** The Site Selection Process and Alternatives within this EIA Report, but principally aims to balance technical and cost considerations with environmental considerations to select a site which is economically viable, technically feasible, minimises impacts on important resources or features of the environment and reduces disturbance to those living in it, working in it, visiting it or using it for recreational purposes. The main stages are iterative and increase in resolution and are referred to as 'initial site screening' and 'detailed site screening'. Of particular relevance to this EIA Chapter, peatland presence and potential peat excavation were environmental and engineering considerations included within the site screening process and were especially important when confirming the final site location.

The Proposed Development is required because renewable energy generation volumes (particularly from offshore wind) connecting to the SSEN Transmission licensed area are expected to increase towards the end of the decade and into the 2030s, in line with expected increased renewable generation, and measures to meet climate change targets. Most of this is likely to connect to the far north of the SSEN Transmission network, and as a result of this increase, there is a requirement for additional system capacity to the north of Beauly to meet this demand. This demonstrates the strategic importance of the Proposed Development as it is required to facilitate the transition to net zero, and aid the decarbonisation of Scotland, and the UK as a whole. The Proposed Development will therefore support renewable energy and decarbonisation targets at a local and national level and will have a beneficial impact on climate change despite not directly providing carbon savings.

6.1.2 Legislation, Policy, and Guidance

The assessment has been informed by the following legislation, policies, and published guidance:

International Legislation:

- The Paris Agreement, which builds upon the United Nations Framework Convention on Climate Change (UNFCCC)[2].

[1] Scottish and Southern Electricity Networks Transmission (2022) Substation Site Selection Guidelines for Voltages at or Above 132kV (Accessed 24/07/2024)

[2] United Nations (2016) Framework Convention on Climate Change. Adoption of the Paris Agreement, 21st Conference of the Parties, Paris. [Online] Available at: https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf (Accessed 24/07/2024)

National Legislation and Policy:

- National Planning Framework 4 (NPF4)[3];
- Climate Change Act 2008[4] (including the Climate Change Act 2008 (2050 Target Amendment) Order 2019[5]);
- The Carbon Budgets Order 2009[6];
- Climate Change (Emissions Reduction Targets) (Scotland) Act 2019[7]; and
- Climate Change Plan: Third Report on Proposals and Policies 2018 – 2031 (RPP3)[8].

Regional Policy:

- Net Zero Strategy[9].

National Guidance and Industry Standards:

- Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2nd Edition[10];
- IEMA EIA Guide to: Climate Change Resilience and Adaptation[11]; and
- British Standards Institute (BSI) PAS 2080:2023 Carbon Management in Buildings and Infrastructure[12].

Further details of these legislation, policy and guidance documents, and their relevance to the assessment completed in this Chapter are provided in **Table 6.1**.

Table 6.1 Legislation, Policy, and Guidance Considered in the Assessment and their Legislative Context

Legislation / Policy / Guidance	Legislative Context
The Paris Agreement	The Paris Agreement resulted from the twenty-first meeting of the Conference of the Parties (COP) held in 2015, which recognised that climate change represents an urgent and potentially irreversible threat to human societies and the planet, and therefore requires cooperation between all countries and significant reductions in global GHG emissions. It led to the creation of Nationally Determined Contributions (NDCs) – targets for each country to reduce their GHG emissions – with the overall aim to keep the increase in the global average temperature to below 2°C above pre-industrial levels, and ideally below 1.5°C above pre-industrial levels. These NDCs are the overriding targets that have informed national and regional GHG emissions reductions targets.

[3] Scottish Government (2023) National Planning Framework 4. [Online] Available at: https://www.gov.scot/publications/national-planning-framework-4/pages/3/ (Accessed 24/07/2024)
[4] UK Government (2008) Climate Change Act 2008. [Online] Available at: https://www.legislation.gov.uk/ukpga/2008/27/contents (Accessed 24/07/2024)
[5] UK Government (2019) Climate Change Act 2008 (2050 Target Amendment) Order 2019. [Online] Available at: https://www.legislation.gov.uk/uksi/2019/1056/article/2/made (Accessed 24/07/2024)
[6] UK Government (2009) The Carbon Budgets Order 2009. [Online] Available at: https://www.legislation.gov.uk/uksi/2009/1259/contents/made (Accessed 24/07/2024)
[7] UK Government (2019) Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. [Online] Available at: https://www.legislation.gov.uk/asp/2019/15 (Accessed 24/07/2024)
[8] Scottish Government (2018) Climate Change Plan: Third Report on Proposals and Policies 2018 – 2032 (RPP3). [Online] Available at: https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/ (Accessed 24/07/2024)
[9] The Highland Council (2023) Net Zero Strategy. [Online] Available at: https://www.highland.gov.uk/downloads/download/2297/net_zero_strategy (Accessed 24/07/2024)
[10] IEMA (2022) IEMA Guide: Assessing Greenhouse Gas Emissions and Evaluation their Significance, 2nd Edition. [Online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions (Accessed 24/07/2024)
[11] IEMA (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation. [Online] Available at: https://www.iema.net/download-document/237186 (Accessed 24/07/2024)
[12] BSI (2023) PAS 2080:2023 Carbon Management in Buildings and Infrastructure [Online] Available at: https://www.bsigroup.com/en-GB/insights-and-media/insights/brochures/pas-2080-carbon-management-in-infrastructure-and-built-environment/ (Accessed 24/07/2024)

Legislation / Policy / Guidance	Legislative Context
National Planning Framework 4	NPF4, adopted in 2023, has put more of an emphasis on climate change and high-carbon soils, with Policy 1 stating that; "When considering all development proposals significant weight will be given to the global climate and nature crises" and Policy 2 stating that; "a) Development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible. b) Development proposals will be sited and designed to adapt to current and future risks from climate change…". Policy 5 Soils also states the following: *"c) Development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for:* *i. Essential infrastructure and there is a specific locational need and no other suitable site;* *ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;…* *d) Where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify:* *i. the baseline depth, habitat condition, quality and stability of carbon rich soils;* *ii. the likely effects of the development on peatland, including on soil disturbance; and* *iii. the likely net effects of the development on climate emissions and loss of carbon."*
Climate Change Act 2008 (including the Climate Change Act 2008 (2050 Target Amendment) Order 2019)	This legislation established a legal requirement for an 80% reduction in the net GHG emissions of the UK economy by 2050 (against a 1990 baseline) and sets interim targets to ensure progress towards this target. In June 2019, the UK Government updated this commitment to net zero emissions by 2050 (the 'UK carbon target', often referred to as 'net zero'). This legislation also established an independent expert body, the Climate Change Committee (CCC), with responsibility for setting 5-year carbon budgets covering successive periods of emissions reduction to 2050.
Carbon Budgets Order 2009	This legislation implements the carbon budgets set out in the Climate Change Act 2008. The budgets place restrictions on the amount of GHG the UK can emit over a five-year period. The carbon budgets are: • First carbon budget, 2008 to 2012: 3,018 mega tonnes carbon dioxide equivalent ($MtCO_2e$) representing a 25% reduction below 1990 levels; • Second carbon budget, 2013 to 2017: 2,782 $MtCO_2e$ representing a 31% reduction below 1990 levels; • Third carbon budget, 2018 to 2022: 2,544 $MtCO_2e$ representing a 37% reduction below 1990 levels by 2020; • Fourth carbon budget, 2023 to 2027: 1,950 $MtCO_2e$ representing a 51% reduction below 1990 levels by 2025[13]; • Fifth carbon budget, 2028 to 2032: 1,725 $MtCO_2e$ representing a 57% reduction below 1990 levels by 2030[14]; and

[13] UK Government (2011) The Carbon Budget Order 2011. [Online] Available at: https://www.legislation.gov.uk/uksi/2011/1603/made (Accessed 24/07/2024)
[14] UK Government (2016) The Carbon Budget Order 2016. [Online] Available at: https://www.legislation.gov.uk/uksi/2016/785/made (Accessed 24/07/2024)

Legislation / Policy / Guidance	Legislative Context
	• Sixth carbon budget, 2033 to 2037: 965 $MtCO_2e$ representing a 78% reduction below 1990 levels by 2035[15].
Climate Change (Emissions Reductions Targets) (Scotland) Act 2019	The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 is an amendment to the Climate Change (Scotland) Act 2009[16], which sets targets for the reduction of GHG emissions in Scotland, in addition to detailing how the targets will be met and reported, with the aim for Scotland to contribute appropriately to the delivery of the commitments made in the Paris Agreement. This Act states that the 'net-zero emissions target year' will be 2045 (when GHG emissions are at least 100% lower than the baseline), and the following interim targets are provided: • 2020 is at least 56% lower than the baseline; • 2030 is at least 75% lower than the baseline; and • 2040 is at least 90% lower than the baseline. In April 2024, it was announced that the 2030 target of cutting emissions was out of reach, and therefore annual and interim targets were scrapped, although net-zero is still aimed for by 2045[17]. It is intended that emissions will instead be measured every five years, like the carbon budgets used by the UK Government.
Climate Change Plan: Third Report on Proposals and Policies 2018 – 2031 (RPP3)	The Third Report on Proposals and Policies details the plans made towards meeting GHG emissions reductions targets between 2018 to 2032, summarised as the Climate Change Plan, as required by the Climate Change (Scotland) Act 2009. The final Climate Change Plan comprises three parts which set out the context for the Scottish Government's climate change proposals and policies, the Scottish Government's statutory duties, and detailed information on the emissions envelopes and emissions reductions trajectories for each sector. It also provides details on Scotland's GHG emission reductions to date, and therefore is an essential document when reviewing Scotland's progress towards their emissions targets, and the plans and policies put in place for the future to reach these targets.
Net Zero Strategy	On a local scale, the Net Zero Strategy (2023) represents the Highland Council's approach to addressing the climate change emergency and contributing towards Scotland's emissions targets. The Strategy focusses on Council operations, with the need for sustainability and a just transition being a central aspect of the Strategy. The Highland Council declared a climate and ecological emergency in 2019, and while progress has been made to meet emissions targets, transformational change is required across the Council to integrate climate change mitigation, adaptation, and sustainability measures into all operations and service delivery.
IEMA Guidance	In the absence of specific climate change assessment guidance in Scotland, the IEMA guidance on assessing greenhouse gas emissions and climate change resilience and adaptation has been used to inform the methodology of the assessment completed within this EIA Chapter. The IEMA guidance on climate change resilience and adaptation builds on the EU Directive that dictates the requirement of EIA, which states that as climate change will continue to cause damage to the environment and compromise economic development, it is appropriate to assess the impact of projects on climate and their vulnerability to climate change. The guidance provides a framework for the

[15] UK Government (2021) The Carbon Budget Order 2021. [Online] Available at: https://www.legislation.gov.uk/uksi/2021/750/contents/made (Accessed 24/07/2024)
[16] UK Government (2009) Climate Change (Scotland) Act 2009 [Online] Available at: https://www.legislation.gov.uk/asp/2009/12/section/A1 (Accessed 24/07/2024)
[17] BBC News (2024) Scottish Government Scraps Climate Change Targets. [Online] Available at: https://www.bbc.co.uk/news/uk-scotland-68847434 (Accessed 24/07/2024)

Legislation / Policy / Guidance	Legislative Context
	effective consideration of climate change resilience and adaptation in the EIA Process. The IEMA guidance on assessing greenhouse gas emissions and evaluating their significance aims to assist practitioners with addressing GHG emissions assessment, mitigation and reporting within EIA. This complements the IEMA guidance on climate change resilience and adaptation.
BSI Carbon Management in Infrastructure and Built Environment – PAS 2080	PAS 2080 outlines a carbon management process that is applicable across both infrastructure and buildings. It provides a common process for the built environment value chain on how to manage whole life carbon in projects and aims to align projects to the net zero transition by or before 2050. With particular relevance to this assessment, PAS 2080 discusses maximising opportunities for whole life carbon reductions at all stages of the delivery process and selecting appropriate carbon emissions assessment methodologies.

6.2 Consultation and Engagement

Table 6.2 details the consultation and engagement undertaken with relevance to this Chapter.

Table 6.2 Consultation and Engagement of Relevance to the Climate Change Assessment

Consultee	Consideration	Response
The Highland Council, Scoping Opinion (24/00833/SCOP), May 2024	The EIA Report needs to address all relevant climatic factors which can greatly influence the impact range of many of the preceding factors on account of seasonal changes affecting, rainfall, sunlight, prevailing wind direction etc. From this base data information on the expected impacts of any development can then be founded recognising likely impacts for each phase of the development including construction, operation, and decommissioning.	All assessments within the EIA Report have assessed a worst-case scenario, and therefore if any seasonal changes occur, predicted effects should only improve from what is assessed in the EIA Report. Separately, where seasonal effects or the baseline climatic factors have the potential to be impacted by climate change, these effects are detailed in **Section 6.6.2** of this EIA Chapter.
SEPA, Scoping Opinion (24/00833/SCOP), May 2024	SEPA provided pre-application advice on 13th September 2023 to 23/04004/PREMAJ and they confirm their comments and requirements still apply with regards to peat. SEPA do not agree with the details of any potential off-site peat restoration required to mitigate the effects of the Proposed Development not being included in the EIA. If off-site peat restoration is required as a mitigation measure, SEPA need to be able to assess whether this mitigation is both possible and acceptable, otherwise the assessment of the impact on carbon rich soils cannot be accurately assessed. An Outline Habitat Management Plan will also be required within the EIA Report, which should detail the use of any excavated peat.	The proposed onsite peatland restoration is detailed in **Volume 2 Chapter 7** Ecology and Nature Conservation, and **Volume 4 Appendix 5.2** Outline Landscape and Ecological Management Plan.
SEPA, Letter provided in response to their request for	Following SEPA expressing concerns on the site selection for the Proposed Development, and requesting additional information, the Applicant	The site selection process (further detailed in **Volume 2 Chapter 3** The Site Selection

Consultee	Consideration	Response
further information, August 2024	submitted a letter (dated 2nd August 2024) providing detailed information regarding the specific location and positioning of the Proposed Development relative to peatland. It was explained that although alternative options would result in lower volumes of peat extraction, there would be a significant increase in the bulk excavation volumes as a result of the increase in slope gradients across those locations. This would not impact technical feasibility but would increase the risk of environmental impacts due to a prolonged earthworks programme. Additional engineering considerations related to overhead line connections and underground cable installation were also detailed and would result in increased health and safety risks for the alternative sites. It was therefore determined that the alternative sites were unfeasible. The proposed location also avoids impacts to nationally important soils as there is no Class 1 or 2 peat located onsite, and the existing peat is not present in a location which supports peat development due to forestry operations. SEPA responded to this letter stating that while disappointed that the preferred option will likely create twice the volume of excavated peat to one of the alternative options, they note the increased volumes of bulk waste materials the other options would produce. They advise that the final submission will need to adequately demonstrate how the peat will be reused.	Process and Alternatives within this EIA Report) and justification has been included in the embedded mitigation details provided in **Section 6.3** of this EIA Chapter. Peatland restoration and re-use are detailed in **Volume 4 Appendix 5.2**: Outline Landscape and Ecological Management Plan and **Volume 4 Appendix 10.2**: Outline Peat Management Plan.

6.3 Embedded Mitigation Measures

As detailed in **Volume 2 Chapter 2** Project Description, the Proposed Development's design has been driven, in part, by utilising the proximity to the existing Loch Buidhe Substation to keep connections short and clustering electrical infrastructure, while balancing environmental and technical constraints. **Table 6.3** details the mitigation that has been 'embedded' into the design of the Proposed Development and is relevant to this assessment of effects on the climate. It should be noted that embedded mitigation to reduce the potential impact of the Proposed Development on Strath Carnaig and Strath Fleet Moors Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) are addressed in **Volume 2 Chapter 7** Ecology and Nature Conservation, **Volume 2 Chapter 8** Ornithology, and **Volume 2 Chapter 9** Forestry, and embedded mitigation for other environmental considerations are detailed elsewhere in this EIA Report.

Table 6.3 Embedded Mitigation Measures of Relevance to the Climate Change Assessment

Embedded Mitigation Measure	Description	Benefit
SSEN Site Selection Process	As detailed in **Volume 2 Chapter 3** The Site Selection Process and Alternatives, the Applicant's site selection process involves a Multi-Criteria Analysis (MCA) that accounts for three key design elements: Engineering, Environmental/Consent, and Cost[1].	Environmental impacts, including carbon balance, were considered from the earliest stages of the Proposed Development, and influenced its siting by aiming to

Embedded Mitigation Measure	Description	Benefit
	Of particular relevance to this Chapter, is that initial estimates of the carbon footprint associated with each given design option were calculated and considered during the site selection process.	minimise significant environmental impacts.
Design Optimisation	Engineering design considerations have been used to reduce the overall footprint of the substation (and therefore reduce the scale of peat disturbance and the embodied carbon of materials used for construction).	A reduced substation footprint and cut and fill requirements reduce the amount of peatland disturbance and excavation, thereby reducing carbon emissions from this source.
Siting	Careful siting of the Proposed Development has been undertaken to consider alternative locations in local proximity that avoid areas of deep peat. The alternative locations require larger bulk excavations (greater disturbance) and present unacceptable health and safety risks in their construction, due to the steepness of slope (above a 20-degree gradient in excess of relevant British Standards [BS EN 6031] with regards to slope stability risk). Micro-siting of the Proposed Development will also be undertaken, where possible, during the construction phase to minimise environmental impacts.	Alternatives were considered to reduce the impact on deep peat. While these were not feasible, they demonstrate that consideration has been given to peatland disturbance and carbon balance throughout the design of the Proposed Development.
Outline Construction Environmental Management Plan	A Draft Construction Environmental Management Plan (CEMP) (**Volume 4 Appendix 2.2**) has been produced and will be continually reviewed up to and throughout construction. This will detail measures to be implemented to reduce GHG emissions during the construction phase. Goals to reduce embodied carbon in construction materials and encourage circular economy principles will be detailed in the Draft CEMP and will include (but are not limited to) promoting fuel and energy efficiency, utilising materials that can be recycled or re-used where possible, procuring recycled materials where possible, and designing out unsustainable materials where possible.	Reduced carbon impact across the construction phase of the Proposed Development.
Outline Peat Management Plan	For potential areas where peat cannot be avoided by the temporary works or permanent development elements of the Proposed Development, an outline Peat Management Plan (oPMP) (**Volume 4 Appendix 10.2**) details the measures to be employed to protect peat during handling, storage and reinstatement. The entire Site is being explored for peat re-use opportunities to ensure all peat is re-used on site.	Reduced environmental impact on peat during the construction phase.

Embedded Mitigation Measure	Description	Benefit
Peatland Restoration	A significant peat restoration proposal is being developed by the Applicant as part of the Proposed Development, which aims to provide habitat to support carbon sequestration. This restoration will be set out in a site-specific Landscape and Ecological Management Plan which has been developed to re-use the peat in close proximity to the Proposed Development and is targeting forest to bog restoration opportunities. This document will be reviewed and updated throughout the lifecycle of the Proposed Development.	Carbon sequestration (and associated carbon savings) and biodiversity enhancement.
Reduced Tree Felling	Extensive tree felling is required for both the construction of the substation and to facilitate peat restoration. Consideration has been given to minimise the felling required and liaison with the landowner will be undertaken to identify appropriate crop for felling.	Reduced environmental impact and carbon loss from forestry felling.
Biodiversity Net Gain	The peat restoration and associated tree felling could provide opportunities to create new habitats better suited to species associated with the Strath Fleet Moors SPA and SSSI (**Volume 2 Chapter 8** Ornithology). The target is a 10% biodiversity net gain achieved with the Proposed Development and is discussed in more detail in the Planning Statement which will accompany the application and this EIA Report.	Improved environmental impact.
Landscape and Visual Mitigation	Visual screening of the Proposed Development is being incorporated into the design and the landscape management plan to provide biodiversity opportunities.	Improved environmental and visual impact.
Sustainable Drainage Systems	Drainage ditches and retention ponds have been designed with sufficient allowance to account for climate change and to withstand extreme rainfall events.	Improved climate change resilience for the Proposed Development.

6.4 Assessment Methodology and Significance Criteria

6.4.1 Scope of the Assessment

To align with legislation and guidance detailed in **Section 6.1.2**, a climate change and GHG assessment has been completed as part of this EIA Report in order to assess the impact of the Proposed Development on the climate, in particular by assessing: (i) the carbon losses through peatland disturbance and forestry felling and (ii) the vulnerability of the Proposed Development to climate change.

There is currently no specific climate change assessment guidance in Scotland and, therefore, this Chapter provides a preliminary assessment of the potential climate impacts and effects from the construction and operation of the Proposed Development, following the methodology set out in the IEMA guidance[18].

The assessments detailed in **Table 6.4** are considered in terms of the Proposed Development within this Chapter, and details are provided regarding how they relate to the EIA Regulations.

Table 6.4 Assessments Considered within this EIA Chapter

Assessment	Description	Link to the EIA Regulations
Climate Change Resilience (CCR) assessment	The impact of climate change on the Proposed Development	Schedule 4, 5. (f) – *"A description of the likely significant effects of the development on the environment resulting from, inter alia: … the vulnerability of the project to climate change."*
In-Combination Climate Impacts (ICCI) assessment	A summary of the effects of climate change on environmental receptors assessed within this EIA Report	Schedule 4, 3. – *"A description of the relevant aspects of the current state of the environment (the "baseline scenario") and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of relevant information and scientific knowledge"* Climate change effects on receptors represent a potential future baseline, and therefore are assessed as required by the EIA Regulations to ensure impacts assessed within the EIA Report would not change in the future as a result of climate change.
GHG assessment	The influence of the Proposed Development on the climate	Schedule 4, 4. - *"A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: … climate (for example greenhouse gas emissions, impacts relevant to adaptation)"* Schedule 4, 5. (f) – *"A description of the likely significant effects of the development on the environment resulting from, inter alia: … the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions)"*

[18] IEMA (2022) IEMA Guide: Assessing Greenhouse Gas Emissions and Evaluation their Significance, 2nd Edition. [Online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions (Accessed 24/07/2024)

CCR: The CCR assessment considers the vulnerability of the Proposed Development to extreme weather and projected climate change. This is assessed because should the Proposed Development be affected by climate change, it may result in further likely significant environmental effects and the EIA Regulations require that the assessment includes consideration of expected effects arising from the vulnerability of the Proposed Development to risks (Part 1, 4, (4)). It should be noted, however, that after an initial review of the projected climate change trends (detailed in **Section 6.5**), it was determined that a detailed CCR assessment would not be required and was scoped out of further assessment (**Table 6.6**).

ICCI: The ICCI assessment is drawn together through a literature review of the predicted effects of climate change, and how these may impact environmental receptors throughout the lifetime of the Proposed Development. It will assess whether, without the Proposed Development, projected climate change will modify the future baseline sufficiently to change the results of the assessments undertaken in other chapters (which should be read in conjunction with this Chapter). Of the technical assessments included within this EIA Report, receptors within ecology, ornithology, geology and hydrology have been identified as having the potential for the baseline to be modified as a result of climate change and are included in this Chapter.

GHG: The assessment of the influence of the Proposed Development on the climate focusses on the overall balance of GHG emissions, as climate change is directly linked to these emissions. The overall balance is determined by the comparison of carbon savings associated with peatland restoration, or reforestation, and carbon losses associated with activities such as peatland disturbance, deforestation, vehicle emissions, and construction. No further analysis is undertaken of how climate parameters change in direct response to the overall balance of GHG emissions caused by the Proposed Development. The assessment focusses on the construction and operational stages of the Proposed Development. As per IEMA guidance, decommissioning impacts have not been considered due to the Proposed Development being in place for in perpetuity.

A summary of what has been scoped into and scoped out of further assessment is provided in **Tables 6.5** and **6.6** respectively.

Table 6.5 Considerations Scoped Into the Assessment

Assessment	Consideration Scoped Into Assessment	Justification
ICCI	Receptors identified within the ecology, ornithology, geology and hydrology technical assessments in this EIA Report.	These receptors have the potential for the baseline to be modified as a result of climate change.
GHG Assessment	Emissions associated with loss of carbon-fixing potential of peatland.	Due to the Proposed Development being constructed on peatland, it is envisaged that peat disturbance will result in carbon emissions.
	Emissions associated with loss of carbon stored in peatland.	Due to the Proposed Development being constructed on peatland, it is envisaged that peat disturbance will result in carbon emissions.
	Emissions associated with forestry felling.	Due to the Proposed Development requiring the felling of forestry, it is envisaged that the forestry clearance will result in carbon emissions and a loss of carbon-fixing potential.
	Emissions associated with peatland restoration.	It is assumed that the proposed peatland restoration will result in

Assessment	Consideration Scoped Into Assessment	Justification
		carbon savings for the Proposed Development.
	Emissions associated with construction traffic travelling to and from the Proposed Development.	It is envisaged that the traffic flow associated with the construction of the Proposed Development would result in carbon emissions, contributing the carbon balance of the Proposed Development.

Table 6.6 Considerations Scoped Out of the Assessment

Assessment	Consideration Scoped Out of Assessment	Justification
ICCI	Receptors identified within the landscape, forestry, traffic, cultural heritage, noise, and socio-economic technical assessments in this EIA Report.	These receptors are unlikely to be affected by climate change during the duration of the Proposed Development.
CCR	A detailed assessment of the vulnerability of the Proposed Development to climate change.	The baseline assessment (detailed in **Sections 6.4** and **6.5** below) identified no climate change trends that are likely to affect the Proposed Development. **Volume 2 Chapter 11** Hydrology and Hydrogeology also concluded that flooding is not expected to pose a significant risk to the operation of the Proposed Development.
GHG Assessment	Emissions associated with the extraction and manufacture of materials used in construction of the Proposed Development.	Data was unavailable at the time of the assessment and would not usually be available or confirmed until the construction phase. The CEMP will be updated accordingly once this information is available for the Proposed Development.
	Emissions associated with waste generated by the Proposed Development.	Data was unavailable at the time of the assessment and would not usually be available or confirmed until the construction phase. As detailed in the CEMP (**Volume 4 Appendix 2.2**) measures will be taken to minimise waste where possible, including (but not limited to) using recyclable and reuseable material, and procuring recycled materials.
	Emissions associated with operational traffic from workers travelling to and from the Proposed Development.	**Volume 2 Chapter 12** Traffic and Transport states that traffic generated during operation is expected to be minimal (approximately one trip per week),

Assessment	Consideration Scoped Out of Assessment	Justification
		and therefore the impact on GHG emissions would be negligible.
	Emissions associated with traffic travelling on the U3251 (from Bonar Bridge to the Proposed Development).	Lack of data on traffic flows that can be input into the Emissions Factor Toolkit.
	Carbon savings from compensatory forestry planting.	Although compensatory forestry planting has been committed to, it is not assessed within this EIA Report. Future tree re-planting would likely result in carbon savings.
	Emissions associated with the operational stage of the Proposed Development.	Emissions are estimated to be minimal.
	Emissions associated with the decommissioning stage of the Proposed Development.	It is assumed that the Proposed Development will be in place in perpetuity, and it is assumed that should the Proposed Development ever be decommissioned, emissions would be relatively small.

6.4.2 Extent of the Study Area

The assessment of the influence of the Proposed Development on the climate considers GHG emissions (current levels and targets) within the Scottish and UK spatial scales. Reference is made to the global context as appropriate.

For the ICCI assessment, the Study Area for the assessment on the future baseline for sensitive receptors is outlined within the relevant EIA chapters, and focus is given to the climate projections for the Proposed Development for both the ICCI and CCR assessments.

6.4.3 Method of Baseline Data Collation

CCR and ICCI Assessments

The CCR assessment assesses the vulnerability of the Proposed Development to climate change during the construction and operation stages against UK Climate Projections (UKCP). The ICCI assessment evaluates the potential additive impact that climate change may have on receptors identified by other environmental topics.

Climate trends and projections are published by the Met Office through the UKCP. The UK Climate Projections 2018 (UKCP18) provide future climate projections for land and marine regions, as well as past observed climate data for the UK. It provides the most up to date assessment of how the climate of the UK may change over this century. UKCP18 became available in November 2018 and was most recently updated in August 2022[19].

UKCP18 uses scenarios for future GHG emissions called Representative Concentration Pathways (RCPs). These are used by the Intergovernmental Panel on Climate Change (IPCC) and are the result of the Coupled Model Intercomparison Project (CMIP5). The RCPs are scenarios that include time series of emissions and concentrations of the full suite of GHGs, aerosols, and chemically active gases, as well as land use / land

[19] Met Office (2022) UK Climate Projections [Online] Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/about/project-news (Accessed 24/07/2024)

cover, and predict the global warming associated with those differing factors. Together, the four scenarios provide only one set of many possible scenarios that would lead to different levels of global warming but are the most commonly used scenarios as they are used within the IPCC Assessment Reports. The four RCPs attempt to capture a range of potential alternative futures and outcomes linked to global temperature increases and include a wide variety of assumptions on socio-economic development and commitment to emissions reductions. The sensitivity of the scenario responses is much more pronounced in the second half of the 21st century, where the responses diverge more rapidly than in the first half of the century. The four RCPs are as follows[20]:

- RCP2.6: assumes an increase in global mean surface temperature of 1.6°C (-0.9-2.3°C) by 2081-2100 (no change scenario);
- RCP4.5: assumes an increase in global mean surface temperature of 2.4°C (1.7-3.2°C) by 2081-2100 (low emissions scenario);
- RCP6.0: assumes an increase in global mean surface temperature of 2.8°C (2.0-3.7°C) by 2081-2100 (medium emissions scenario); and
- RCP8.5: assumes an increase in global mean surface temperature of 4.3°C (3.2-5.4°C) by 2081-2100 (high emissions scenario).

The Proposed Development is proposed to last in perpetuity, but few climate projections extend beyond 2100, and therefore these are the most suitable projections to use for the assessment. To reflect the Paris Climate Agreement[21], in which most countries including the UK pledged to reduce emissions by 2030, RCP6.0 is utilised to describe the future baseline, as this scenario assumes no further emission reductions after 2030 and allows for some increase in emissions. IEMA guidance suggests that RCP8.5 should also be used to describe the future baseline, as a worst-case scenario, and so this scenario is also considered.

Projections are reported for 20-year time periods through to 2100. To account for the proposed lifetime of the Proposed Development, and to provide a worst-case scenario, the 2081 – 2100 period is used for the assessment, as the impacts of climate change are anticipated to be more evident with time.

Projected climatic changes at the 50% probability level (central estimate) are utilised, unless otherwise indicated. This is the level where there is as much evidence pointing to a lower outcome as a higher one. There is substantial evidence that the actual climatic change outcome will be in the 10th to 90th percentile range, and this is also utilised for some assessment parameters. This percentile range consists of 80% of the data, with the range excluding the extreme highs and lows of the data. The 10th percentile marks the point where 10% of the data falls below that number, and likewise the 90th percentile marks the point where 90% of the data falls below that point.

Professional judgement is then used to assess whether the projected climate change trends have the potential to significantly impact the environmental receptors assessed elsewhere within this EIA Report or the Proposed Development itself. Reference is made to specific assessment chapters and where the baseline conditions and sensitive receptors are discussed, and assessments are not repeated.

GHG Assessment

This assessment seeks to quantify the effect of the Proposed Development on the climate. NPF4 does not make specific reference to using the Scottish Government's Carbon Calculator Tool[22] to assess carbon balance for developments. However, without further guidance, it is considered on the basis of professional judgement

[20] Met Office (2018) UKCP18 Guidance: Representative Concentration Pathways. [Online] Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-guidance---representative-concentration-pathways.pdf (Accessed 24/07/2024)

[21] United Nations (2016) Framework Convention on Climate Change. Adoption of the Paris Agreement, 21st Conference of the Parties, Paris. [Online] Available at: https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf (Accessed 24/07/2024)

[22] Scottish Government and SEPA (n.d.) Carbon Calculator Tool v1.8.1 [Online] Available at: https://informatics.sepa.org.uk/CarbonCalculator/ (Accessed 15/07/2024)

that this is the most appropriate tool to use for calculating carbon balance (subject to necessary adjustments). It should be noted that this carbon calculator has been developed for use for proposed wind farm developments on peatlands, and so the calculator has been adapted where required and where possible to better suit the Proposed Development. This adaptation, and the fact that the calculator has not been developed for infrastructure projects such as the Proposed Development, has led to some limitations and assumptions within the methodology, and these are discussed in more detail in **Section 6.4.6**.

To use the carbon calculator, input data has been sourced from the ground investigations (peat probing, water table depths, etc. detailed elsewhere in this EIA Report), planning drawings, and GIS (infrastructure dimensions, restoration areas), as well as general guidance and information provided by the Scottish Government to support the carbon calculator. The input data, including the data sources, are provided in **Volume 4 Appendix 6.1**, and are summarised as follows:

- No. of 'turbines' (a value of 1 has been used so the calculator assumes one foundation / hardstanding is present and used in the calculation);
- Duration of consent (years);
- Peatland characteristics, including type, average annual air temperature, average depth of peat, carbon content of dry peat, average extent of drainage around drainage features, average water table depth, and dry soil bulk density;
- Time required for regeneration of bog plants after restoration;
- Forestry plantation characteristics, including area of forestry plantation to be felled and average rate of carbon sequestration in timber;
- Average length and width of 'turbine' foundation and hardstanding;
- Average depth of peat removed from foundation and hardstanding;
- Volume of concrete used in the construction of the entire Site;
- Total length of access track;
- Excavated road width;
- Average depth of peat excavated from road;
- Length of any cable trench that does not follow access tracks and is lined with a permeable medium;
- Average depth of peat cut for cable trenches;
- Volume and area of additional peat excavated;
- Area of degraded bog to be improved;
- Water table depth in degraded bog before and after improvement; and
- Time required for hydrology and habitat of bog to return to its previous state on improvement.

Emissions from traffic (transport of materials and infrastructure during construction and movement of workers to / from the Proposed Development during operation) are not included in the carbon calculator due to the tool simply not considering these emissions, but they have been considered separately using the DEFRA Emissions Factor Toolkit[23].

6.4.4 Assessment Modelling

In the absence of published guidance regarding how to complete climate change and GHG assessments for energy infrastructure, the EIA carbon balance assessments for wind farms, which utilise the Scottish Government's Carbon Calculator Tool to assess the carbon losses (from peatland disturbance and forestry felling predominantly) and carbon savings associated with wind farm developments has been used as a guide.

[23] DEFRA (2023) Emissions Factors Toolkit. [Online] Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/ (Accessed 24/07/2024)

The latest version of the carbon calculator has been used (v1.8.1), and the Proposed Development's carbon calculator reference number is **NQIF-SX8K-ULZQ**, as detailed in **Volume 4 Appendix 6.1**.

The carbon assessment methodology used is consistent with that published by the Rural and Environment Research and Analysis Directorate of the Scottish Government entitled 'Calculating carbon savings from wind farms on Scottish peat lands – a new approach'[24]. This publication sets out the approach and assumptions that should be used to estimate potential carbon losses and savings from wind farms on Scottish peatlands, and has been used to modify the carbon calculator, where appropriate, to better fit the Proposed Development.

The calculation evaluates the carbon losses associated with the Proposed Development. Carbon savings achieved by peatland restoration have also been considered, in line with the restoration proposals shown in **Volume 3a Figure 2.1**. The GHG emissions considered within the assessment are detailed in **Table 6.5**.

The potential carbon losses assessed by the carbon calculator associated with the Proposed Development are as follows:

- Loss of carbon-fixing potential of peatland;
- Loss of carbon stored in peatland (by peat removal or changes in drainage); and
- Loss of carbon-fixing potential as a result of forestry clearance.

The carbon calculator provides results based on expected, minimum and maximum scenarios for the Proposed Development. The expected scenario is based on the current proposed layout of the Proposed Development. The maximum and minimum scenarios are generated by the carbon calculator and are based on varying assumptions regarding energy output, characteristics of peatland and development land-take. The maximum and minimum scenarios are more relevant for wind farm developments, rather than the Proposed Development, because they are linked with energy output. In particular, the maximum scenario uses the 'maximum' values inputted into the carbon calculator, giving the highest energy output of a wind farm, and the highest carbon losses due to a wind farm, whereas the minimum scenario uses the 'minimum' values inputted into the carbon calculator, giving the lowest energy output of a wind farm, with the lowest carbon losses. As the energy output is not relevant to the Proposed Development, the results of the 'expected' scenario are utilised for this assessment. These use input values reflecting the layout and characteristics of the Proposed Development and therefore provide realistic carbon losses.

The data sources and assumptions used in the carbon balance calculations are detailed in **Volume 4 Appendix 6.1**.

The calculated GHG emissions are finally compared with the annual UK emissions and UK carbon budgets to determine the significance of the emissions of the Proposed Development when compared against the emissions for the UK where the Proposed Development is not yet constructed and the UK targets for decarbonisation.

The DEFRA Emissions Factor Toolkit has been used to calculate the potential GHG emissions from traffic travelling to and from the Proposed Development during construction. This has utilised information provided in **Volume 2 Chapter 12** Traffic and Transport of this EIA Report, including Average Daily Traffic Counts, Heavy Good Vehicle (HGVs) percentages, and peak traffic flows caused by the Proposed Development. To align with **Volume 2 Chapter 12**, emissions have been calculated for the year 2026, a construction period of 60 months has been used and a worst-case scenario has been assessed by assuming the 'peak month' traffic flows will occur every month through the construction period.

[24] Scottish Government (2008) Calculating carbon savings from wind farms on Scottish peat lands: a new approach. [Online] Available at: https://www.gov.scot/publications/calculating-carbon-savings-wind-farms-scottish-peat-lands-new-approach/pages/13/ (Accessed 24/07/2024)

6.4.5 Determining Magnitude of Change and Sensitivity of Receptors

The significance of the potential effects of the Proposed Development has been classified by professional consideration of the sensitivity of the receptor and the magnitude of the potential effect.

Sensitivity of Receptors

The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Proposed Development or the sensitivity of potentially affected receptors, is assessed in line with best practice guidance, legislation, statutory designations and / or professional judgement.

Table 6.7 details the framework for determining the sensitivity of receptors.

Table 6.7 Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Effect

The magnitude of potential effects will be identified through consideration of the Proposed Development, the degree of change to baseline conditions predicted as a result of the Proposed Development, the duration and reversibility of an effect, and professional judgement, best practice guidance and legislation.

The criteria for assessing the magnitude of an effect are presented in **Table 6.8**.

Table 6.8 Framework for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

Significance of Effect

The sensitivity of the receptor and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to predict the significance of likely effects.

The IEMA guidelines[25] for Climate Change Impact Assessment state the following with regards to the assessment of significance for the ICCI assessment:

[25] IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2nd Edition. [Online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions (Accessed 24/07/2024)

> *"This guidance is not proposing changes to the significance criteria used in the EIA process. However, the susceptibility or resilience of the receptor to climate change must be considered as well as the value of the receptor.*
>
> *Therefore, a high-value receptor that has very little resilience to changes in climatic conditions should be considered more likely to be significantly affected than a high-value receptor that is very resilient to changes in climatic conditions.*
>
> *The uncertainty of the combined effect needs to be taken into account. If uncertainty about how a receptor will adapt to a changing climate is high, then it is recommended that a conservative threshold of significance is adopted within the evaluation."*

In terms of the GHG assessment, the GHG emissions associated with the Proposed Development are evaluated against current UK emissions, and national and regional targets for decarbonisation. The GHG emissions are compared to the UK carbon budgets, the UK carbon target of net zero by 2050, and the Scottish carbon target of net zero by 2045, in order to determine whether the Proposed Development would significantly contribute to reducing GHG emissions. This relates to the following guidance provided by IEMA:

> *"The crux of significance therefore is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2025."*

The significance of the impact would therefore depend on the Proposed Development's whole life GHG emissions and how these align with the UK's net zero compatible trajectory. A 'minor adverse' or 'negligible' non-significant effect conclusion does therefore not necessarily refer to the magnitude of GHG emissions being carbon neutral but refers to the effect of the specific project emissions on the baseline level of national emissions (and consequently, the impact of the project on the ability to meet net zero targets to avoid severe climate change).

Table 6.9 summarises the general guideline criteria for assessing the significance of effects for the ICCI assessment.

Table 6.9 Framework for Assessment of the Significance of Effects Relevant to the ICCI Assessment

		Sensitivity of Receptor / Receiving Environment to Change / Effect			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change / Effect	**High**	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Those predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations and are shaded in grey in **Tables 6.9** and **6.10**. It should be noted that the IEMA guidance indicates that all GHG emissions should be considered as 'significant' in EIA terms, due to their contribution to climate change, although the emissions impact needs to be contextualised on a project-by-project basis using professional judgement.

The categories of significance are described in **Table 6.10** for the ICCI assessment.

Table 6.10 Categories of Significance of Effect for the ICCI Assessment

Significance	Definition
Major	A fundamental change to location, environment, species, or sensitive receptor.
Moderate	A material, but non-fundamental change to a location, environment, species, or sensitive receptor.
Minor	A detectable but non-material change to a location, environment, species, or sensitive receptor.
Negligible	No detectable or material change to a location, environment, species or sensitive receptor.

Effects assessed can be positive, adverse, or neutral. Whilst receptors may be considered 'high value', a non-material magnitude of the impact would result in any effect being considered not significant.

The categories of significance relevant to GHG emissions are detailed in **Table 6.11** for the GHG assessment.

Table 6.11 Example Significance Criteria Relevant to GHG Emissions

Significance	Significance Criteria
Major adverse	The Proposed Development does not make a meaningful contribution to the UK Government meeting its carbon budgets / targets. Adverse GHG impacts are not mitigated / do-minimum and are not compliant with requirements of national, regional and local policy.
Moderate adverse	The Proposed Development falls short of fully contributing to the UK Government meeting its carbon budgets / targets. Adverse GHG impacts are partially mitigated and partially meet the requirements of national, regional and local policy.
Minor adverse	The Proposed Development is fully in line with the trajectory of the UK Government meeting its carbon budget / targets. Adverse GHG impacts are mitigated with good practice design standards and meet the requirements of national, regional and local policy.
Negligible	The Proposed Development has minimal residual GHG emissions and is 'ahead of the curve' for the trajectory of the UK Government meeting its carbon budgets / targets. GHG impacts are mitigated through measures that go beyond good practice design standards and the requirements of national, regional and local policy.
Beneficial	The Proposed Development has net GHG emissions below zero, causing a direct or indirect reduction in atmospheric GHG emissions which has a positive impact on the UK Government meeting its carbon budgets / targets.

6.4.6 Limitations and Assumptions

Climate Change Projections

The climate change projections are based on global models for a range of GHG emissions scenarios, and generally consider regional responses to climate change rather than local responses. This is based on best scientific knowledge at the time, judgements on datasets, and future socio-economic drivers.

Uncertainty arises within these projections due to uncertainty related to future GHG emissions scenarios, how the climate system will respond to different emissions scenarios, general climate variability (caused by natural external influences on climate such as volcanic eruptions, or changes in the energy received from the sun), incomplete understanding of Earth system processes, and simplified / imperfect representation of Earth system processes in climate models.

Downscaling adds another layer of uncertainty. There may be more detail, but the uncertainty of the science may be higher. As understanding of the climate system and the ability to model it improves, it is likely that future projections will be refined.

The probabilities presented and the estimated ranges are based on a set of modelling, statistical and dataset choices with expert judgement playing an important role. However, as some potential influences on future climate are not yet known some choices may change as the science develops.

The Carbon Calculator

The main limitation of this assessment relates to the fact that there are no easily accessible tools and limited guidance on how to assess carbon balance from substation developments. In light of this, the Scottish Government's Carbon Calculator Tool for Wind Farms has been identified as the most appropriate tool available to assess carbon balance for Scottish renewable and energy developments, with the added benefit that it is recognisable to the Local Planning Authority and consultees.

In using the calculator for a substation development, however, certain limitations and assumptions have been introduced into the assessment, as certain aspects of the calculator for wind farms simply do not apply to a substation development. Care has been taken to include as much accurate information as possible to provide a robust assessment, but there are aspects of the calculator that have had to have been modified to suit the Proposed Development and may impact the accuracy of the final results. These are detailed as follows:

- Data relating to energy generation, such as 'turbine power rating', 'capacity factor', and 'fraction of output to backup' are not relevant to a substation development, and therefore the input values have been kept to a minimum value;
- The Proposed Development is seeking consent for operation in perpetuity, but the calculator has a 'duration of consent' limit of 100 years, which has been used in this assessment;
- The calculator has standard values for CO_2 emissions from wind turbine manufacture / lifetime, but these do not apply to a substation development, and as material quantities and manufacture-related emissions are uncertain at the time of writing, carbon losses from manufacture have not been included in the assessment;
- A borrow pit is not considered within the carbon calculator, as one is not proposed with this application. However, one may be needed in the future for the Proposed Development, and would need to be assessed at the time that it is proposed to take account of associated carbon losses;
- Substation compounds include numerous areas of foundations, all of which are different sizes, which would be difficult to input into the carbon calculator. To provide a worst-case scenario, it has been assumed the full substation compound area will occupy one large foundation; and
- The Proposed Development's layout is more complex than those of typical wind farm developments, and therefore some aspects such as drainage ditches, retention ponds, and other earthworks which may disturb peat may not have been fully quantified in the calculator.

GHG Assessment

Complete data on materials, proposed material quantities, and waste generation are not available at the planning stage or at the time of writing as these details only become clear at the procurement and construction phases. This means that GHG emissions associated with material extraction, manufacture, and waste have been scoped out of the assessment and are not considered further.

6.5 Baseline Conditions

6.5.1 Climate Change

The State of the UK Climate 2023[26] provides the latest report on observed climate data for the UK. Key findings are as follows:

[26] Kendon *et. all.* (2024). State of the UK Climate 2023. *International Journal of Climatology. Supplement: State of the UK Climate 2023.* 44 (S1) 1-117 [Online] Available at: https://rmets.onlinelibrary.wiley.com/doi/10.1002/joc.8553 (Accessed 24/07/2024)

- Recent decades in the UK have been warmer, wetter and sunnier than in the 20th century, with UK temperature extremes changing faster than the average temperature.
- 2023 was the second warmest year on record for the UK in the UK series from 1884 (with only 2022 warmer) – 0.83°C above the 1991-2020 average and 1.66°C above 1961-1990.
- Six years in the most recent decade (2014-2023) have been within the top ten warmest in the UK series from 1884, with all ten warmest years occurring in the 21st century.
- The most recent decade (2014-2023) has been on average 0.42°C warmer than the 1991-2020 average and 1.25°C warmer than 1961-1990. This is the warmest ten-year period in both the UK series from 1884 and Central England Temperature (CET) series from 1659.
- 2023 was the seventh wettest year on record for the UK in a series from 1836, with 113% of the 1991-2020 average.
- Five of the ten wettest years in the UK in a series from 1836 have occurred in the 21st century.
- The most recent decade (2014-2023) has been on average 2% wetter than 1991-2020 and 10% wetter than 1961-1990.
    - UK winters for the most recent decade have been 9% wetter than 1991-2020 and 24% wetter than 1961-1990.
    - Smaller increases were recorded in summer and autumn, and none in spring.

Climate projections show that the trends over the 21st century in the UK are towards warmer and wetter winters and hotter, drier summers, with an increase in frequency and intensity of extremes.

The climate parameters considered most relevant to the assessments referenced within this Chapter are temperature and precipitation.

Temperature

The UK mean temperature for 2023 was 9.97°C, and this was the second warmest year on record in the UK series from 1884, behind only 2022 (10.03°C mean temperature). This is 0.83°C above the 1991-2020 long-term average, and 1.66°C above the 1961-1990 long-term average. The year 2023 was the warmest year on record for Wales and Northern Ireland, second warmest for England, and third warmest for Scotland.

Eight of the 12 months of the year were warmer than average, with June being the warmest month of the year. Winter and spring temperatures were near average overall, but summer and autumn were notably warm.

The most recent decade (2014-2023) has been 0.42°C warmer than 1991-2020 and 1.25°C warmer than 1961-1990, with the most warming across England. In the series from 1884, the main period of warming for the UK has been from the 1980s onwards, at a rate of approximately 0.25°C per decade.

In the future, at a UK level, annual change in temperature from 1981-2000 to 2080-2099 under the RCP8.5 scenario (unmitigated scenario) is projected at +3.9°C (50% probability)[27]. Results for the 10th and 90th percentile range are between +2.3°C to +5.7°C. Key observations are that:

- Both winters and summers will be warmer, with more warming in summer; and
- In summer there is a pronounced north / south divide with greater increases in maximum summer temperatures over the southern UK compared to Scotland.

Precipitation

Rainfall patterns over the UK are not uniform and vary on regional (e.g. Highland-wide, or from coast to coast) and seasonal scales, which will continue in the future.

[27] Met Office (2018) UKCP18 Science Overview Report. [Online] Available at: https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf (Accessed 24/07/2024)

The 2023 UK rainfall total was 113% of the 1991-2020 average, and this was the 7th wettest year in the UK in the series from 1836. Rainfall totals were above average across the whole UK except western Scotland. Rainfall data shows large interannual variability, but the most recent decade (2014-2023) has been on average 2% wetter than 1991-2020 and 10% wetter than 1961-1990. In the year 2023 weather was generally wetter and more unsettled in the second half of the year, and although the UK seems to be getting wetter overall, the large annual and decadal variability in the UK's precipitation means it is difficult to interpret trends since averages can be strongly influenced by extreme years.

Future changes are uncertain, but projections generally point to wetter winters and drier summers. Drying in the summer will be strongest in the south of England, whilst Scotland is generally associated with increased precipitation in winter[28].

In general (without reference to regional or seasonal variations), across the UK, the changes to precipitation projected for 2080-2099 (compared to 1981-2000) for RCP8.5 (unmitigated scenario) are:

- Winter precipitation – increase of 18% (50% probability). Results for the 10th to 90th percentile range are between -1% and +41%.
- Summer precipitation – decrease of -29% (50% probability). Results for the 10th to 90th percentile range are between -53% and -6%.

6.5.2 GHG Current Baseline

At the time of writing (2024), the UK is within its fourth carbon budget (2023 to 2027) of 1,950 $MtCO_2e$ (a 51% reduction in emissions from 1990 levels). Given that the Proposed Development is likely to be constructed between 2025 and 2029, this is the carbon budget that the construction emissions will be assessed against, along with the fifth carbon budget (2028 to 2032). The change in GHG emissions throughout the lifetime of the Proposed Development will then be assessed against national and regional targets for decarbonisation which form the future baseline (**Section 6.5.3**). The current UK territorial emissions have been estimated at 384,000,000 t CO_2 equivalent (384 $MtCO_2e$)[29], and the GHG emissions associated with the Proposed Development will also be assessed against this value.

At the current time, the baseline for the Proposed Development is 'nil' in terms of GHG emissions as the current scenario is 'without the Project', because the Proposed Development has yet to be approved and constructed.

6.5.3 GHG Future Baseline

Into the future, the environmental baseline is likely to shift in line with potential climate change effects (**Section 6.5.1**). However, the aim is for GHG emissions to reduce in the future, in line with the UK and Scottish Government targets to reach net zero (in 2050 and 2045 respectively). Policy has been implemented at the national and regional scales to achieve these decarbonisation targets and are reflected in the UK carbon budgets. Over the lifetime of the Proposed Development, the fifth carbon budget (2028 to 2032) of 1,725 $MtCO_2e$, and the sixth carbon budget (2033 to 2037) of 965 $MtCO_2e$ will both be implemented. At the time of writing, carbon budgets beyond this date have not been set, but they will continue to decrease every five years until net zero is reached in 2050.

6.6 Assessment of Effects, Mitigation and Residual Effects

6.6.1 Embedded Mitigation

The embedded mitigation measures included with the Proposed Development are detailed in **Section 6.3**. Of these, the Applicant's site selection process, design optimisation, and siting have all sought to reduce the area

[28] Met Office (2018) UKCP18 Science Overview Report. [Online] Available at: https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf (Accessed 24/07/2024)

[29] Office for National Statistics (2024) Measuring UK greenhouse gas emissions. [Online] Available at: https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/measuringukgreenhousegasemissions (Accessed 24/07/2024)

of peat (and deep peat in particular) that may be impacted by the Proposed Development. The Draft CEMP and oPMP (**Volume 4**) will then be implemented to mitigate the impact to peat that is disturbed by the Proposed Development. Finally, proposed peatland restoration and further ecological and landscape mitigation and enhancements will contribute to carbon savings associated with the Proposed Development, compensating for any permanent loss of peatland onsite.

6.6.2 ICCI

The potential for environmental receptors to be impacted by the Proposed Development are assessed in **Volume 2 Chapters 5** and **7 – 14** of this EIA Report. Of these, ecological, ornithological, geological, and hydrological receptors are the most sensitive to climate change and are discussed further in **Table 6.12** below.

Table 6.12 Climate Change Effects on Environmental Receptors

EIA Report Chapter	Receptor	Climate Change Effect by 2081-2100[30] (RCP6.0)	Climate Change Effect by 2081-2100 (RCP8.5)	Effect on Receptors
8	Ornithology	Temperature: up to global mean of 2.2°C (1.0°C – 3.4°C) Shift to wetter winters and drier summers	Temperature: up to global mean of 3.1°C (1.6°C – 4.7°C) Shift to wetter winters and drier summers	A rise in temperature has the potential to impact on habitats, which in turn may affect the behaviour of birds. As noted above, uncertainties are high and the type and significance of ornithological effects identified within this EIA Report from the Proposed Development are not anticipated to alter as a result of climate change. It is possible that potential temperature and precipitation changes may impact the Strah Carnaig and Strath Fleet Moors SPA / SSSI due to peatland drying which could impact hen harrier populations, but the way peatland may respond to climate change is uncertain, so it is difficult to assess the significance of this change.
7	Ecology	Temperature: up to global mean of 2.2°C (1.0°C – 3.4°C) Shift to wetter winters and drier summers	Temperature: up to global mean of 3.1°C (1.6°C – 4.7°C) Shift to wetter winters and drier summers	While changes in temperature could affect composition and growth rates of plant communities and invertebrates, and hence protected species and habitats, the uncertainties are high, and it is not clear that the effect of the Proposed Development on those ecological receptors assessed within this EIA Report would alter substantially as result of climate change. **Volume 2 Chapter 7** Ecology states that no significant residual impacts are predicted as a result of the Proposed Development, and this is unlikely to change with projected climate change.
11 and 10	Hydrology and Hydrogeology; and, Geology, and Peat	Shift to wetter winters and drier summers.	Shift to wetter winters and drier summers.	Limited changes to future baseline and to the identified effects of the Proposed Development. Flood Risk is unlikely to increase for the Proposed Development,

[30] Met Office (2022) UKCP Headline Findings. Key Results Spreadsheet. [Online] Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/summaries/headline-findings (Accessed 24/07/2024)

EIA Report Chapter	Receptor	Climate Change Effect by 2081-2100[30] (RCP6.0)	Climate Change Effect by 2081-2100 (RCP8.5)	Effect on Receptors
		Temperature increases may cause drying of peatlands	Temperature increases may cause drying of peatlands	and peat drying may reduce the carbon sink potential of the Proposed Development.

Given the relatively limited magnitude of change in climate parameters predicted over the next 100 years, negligible changes to the baseline environmental receptors are anticipated during this period, although changes are uncertain due to the uncertain responses of habitats, plant communities, and species to projected climate change. This is incorporated into the assessments undertaken in other chapters of this EIA Report.

No additional significant effects to the baseline environmental receptors will occur as a result of climate change during the anticipated operational life of the Proposed Development, although it should be noted that there is high level of uncertainty due to the uncertainties listed in **Section 6.4.6** and uncertainties associated with the response of the environment to climate change. This conclusion is therefore drawn based on our current understanding of the climate projections, climate system and environmental responses, and could change in the future as our understanding changes.

6.6.3 GHG Assessment

The Scottish Government Carbon Calculator was used to the assess the carbon balance of the Proposed Development, and the full results can be seen on the tool's website, using the Reference Number **NQIF-SX8K-ULZQ**.

No electricity is being produced by the Proposed Development, so carbon savings from energy generation and payback periods are not assessed, and carbon losses related to peatland disturbance and forestry felling as a result of the Proposed Development are focussed on. Carbon losses associated with reduced carbon fixing potential and loss of soil organic matter occurred through drainage effects and excavation of peat for construction are also considered.

Organic soils (peatlands) in Scotland act as carbon sinks, whereby they absorb CO_2 and store it as carbon. This carbon can be released as CO_2 due to land use change, such as drainage for agriculture or the establishment of forestry. Developments on peatlands may result in a negative impact on these habitats if not appropriately considered during scheme design and development. Changes to the peatland habitat through development could result in a significant effect on its ability to store carbon, potentially resulting in carbon emissions and having an adverse impact on climate change.

Carbon losses for the expected scenario, outputted from the carbon calculator, are summarised in **Table 6.13**.

Table 6.13 Carbon Losses for the Proposed Development (Expected Scenario; carbon calculator output)

Losses	t CO_2 Equivalent (total for Proposed Development's duration of consent, entered as 100 years to the calculator)
Losses due to Proposed Development (e.g. manufacture, construction, decommissioning)	0 (N/A – material quantities and manufacture-related emissions uncertain at the time of writing so scoped out of assessment)
Losses due to back-up	0 (N/A – no electricity being produced or going to back-up)
Losses due to reduced carbon fixing potential	2,930
Losses from soil organic matter	20,434
Losses due to Dissolved Organic Carbon (DOC) and Particulate Organic Carbon (POC) leaching	0

Losses	t CO_2 Equivalent (total for Proposed Development's duration of consent, entered as 100 years to the calculator)
Losses due to forestry felling	87,226
TOTAL LOSSES OF CO_2	**110,590**

As stated above, these losses do not take into account emissions from the life cycle of the substation / infrastructure components, as material quantities are unclear at the time of writing. This likely means the calculated losses are underestimated compared to the emissions that would be generated in reality due to emissions associated with mineral extraction, manufacture, and waste. No back-up losses are included as there is no electricity being produced to back-up.

Carbon savings due to the proposed peatland restoration have been calculated in the assessment within the carbon calculator. No savings are anticipated in the 'expected' scenario, although the 'maximum' scenario does suggest a maximum saving of 44,566 tonnes CO_2 equivalent could be achieved by the proposed peatland restoration. As stated in **Section 6.4.4**, the 'maximum' scenario is not considered appropriate for the Proposed Development, however professional judgement suggests that with proposed peatland restoration, at least some carbon savings should be possible. As the 'expected' scenario did not quantify these savings, the 'maximum' scenario has been detailed here to give an indication of the possible savings that may be achieved from the proposed restoration. As these savings are only associated with the 'maximum' scenario from the carbon calculator, it is difficult to know the savings that will occur in reality with the Proposed Development. This uncertainty stems from it being unclear when the restored peatland will have matured enough to uptake and sequester carbon and therefore cause carbon savings, and how effective the restored habitat will be at taking up carbon. Due to this uncertainty, the carbon savings have not been included in the assessment of significance but will likely have at least a small to moderate mitigating effect during the operation of the Proposed Development on balancing the carbon losses detailed in **Table 6.13**. In addition to these savings associated with peatland restoration, any compensatory forestry planting and soil restoration will likely achieve future carbon savings that will offset some of the losses associated with the Proposed Development, but these have not been included in this assessment.

The assessment of traffic-related emissions during the construction phase of the Proposed Development suggests that over the 60-month (5 year) construction phase, 1,924.45 tonnes CO_2 would be released by construction traffic for the Proposed Development. This constitutes a worst-case scenario as it assumes the peak month traffic flow would occur throughout the construction phase, but it also does not take into account journeys made on the U3251 between Bonar Bridge and the Proposed Development.

The total predicted carbon emissions (outputted from the carbon calculator and taking into account traffic emissions) from the Proposed Development are presented in **Table 6.14**.

Table 6.14 Total Carbon Losses Associated with the Proposed Development

Source	Emissions (t CO_2 equivalent)
Losses due to reduced carbon fixing potential	2,930
Losses from soil organic matter	20,434
Losses due to forestry felling	87,226
Construction Traffic Emissions	1,924.45
Total	**112,514.45 (0.11 $MtCO_2e$)**

In 2023, the total UK territorial emissions (emissions that occur within the UK's borders and are used to track UK-wide progress to targets) was estimated at 384,000,000 t CO_2 equivalent (384 $MtCO_2e$)[31]. The emissions from the Proposed Development would therefore constitute approximately 0.03% of the UK's overall annual greenhouse gas emissions, and the impact would be of a negligible magnitude overall, even when considering the potential underestimation of the emissions related to the Proposed Development.

When considering future GHG emissions, the Proposed Development will contribute to UK and Scottish emissions as progress is made towards net zero. An evaluation of the carbon emissions from the Proposed Development against national and regional decarbonisation targets is provided in **Table 6.15**. The majority of the carbon emissions will take place during the construction phase of the Proposed Development, when forestry is felled, peat is first disturbed, and construction traffic is maximising predicted traffic flows. The construction period will occur within the periods for the fourth and fifth carbon budgets, and the GHG emissions from the Proposed Development would account for 0.0056% and 0.0064% respectively of these budgets. Operational emissions are considered to be negligible as there will be minimal commuting of staff, and energy consumption within the substation will be minimal. As the Proposed Development is proposed to remain in perpetuity, decommissioning emissions are not relevant to the assessment. Overall, while construction emissions will occur, their significance (which, as noted above, is based on the impact on future GHG emission goals) will be negligible.

Table 6.15 GHG Emissions from the Proposed Development Compared to UK GHG Emission Targets

Proposed Development Phase	GHG emissions per relevant carbon budget and net zero target				
	4th Carbon Budget	**5th Carbon Budget**	**6th Carbon Budget**	**2045 Scottish Net Zero Target**	**2050 UK Net Zero Target**
	(2023 to 2027)	**(2028 to 2032)**	**(2033 to 2037)**	**2045**	**2050**
Total UK Carbon Budget ($MtCO_2e$)	1,950	1,725	965	0	0
Construction GHG Emissions ($MtCO_2e$)	0.11	0.11	None – construction completed	None – construction completed	None – construction completed
Operational GHG Emissions ($MtCO_2e$)	None – not operational	Negligible	Negligible	Negligible	Negligible
Decommissioning GHG Emissions ($MtCO_2e$)	N/A	N/A	N/A	N/A	N/A
Total	0.11	0.11	Negligible	Negligible	Negligible
Total % of UK Carbon Budget	0.0056%	0.0064%	N/A	N/A	N/A

Given the challenge and international urgency of climate change, climate is considered to have a 'very high sensitivity' to changes in GHG emissions. IEMA Guidance also suggests that GHG emissions should be considered as significant due to their impact on climate change, although the emissions should be contextualised on a project-by-project basis. However, the emissions associated with the construction of the Proposed Development consist of a very small proportion of the UK carbon budgets in place for 2023 to 2027 and 2028 to 2032, and beyond these years the Proposed Development is anticipated to have a negligible impact on GHG emissions during operation. The Proposed Development is therefore assessed as having a **minor adverse** impact on climate change and GHG emissions, which is assessed as **not significant** under the EIA Regulations.

[31] Office for National Statistics (2024) Measuring UK greenhouse gas emissions. [Online] Available at: https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/measuringukgreenhousegasemissions (Accessed 24/07/2024)

It should also be noted that the purpose of the Proposed Development is to allow the connection into the grid, and the transmission of, energy generated from renewable sources which have associated carbon savings. Without infrastructure developments such as the Proposed Development, renewable energy would not be able to meet demand where it is needed, and its beneficial effects would not be realised, and therefore the Proposed Development is strategically important for decarbonisation targets. This is detailed further in the Planning Statement, which accompanies this EIA Report and the planning application.

By way of illustration, **Volume 3a Figure 4.1** in this EIA Report shows the cumulative developments within 25 km of the Proposed Development, many of which are wind farms either approved or going through the planning system. Not all of these developments will be consented or connect into the Proposed Development, but they will all need infrastructure like it to distribute the energy they generate to where it is needed. They will all also lead to carbon savings and have beneficial effects on climate change, and these savings would account for and exceed the losses associated with the Proposed Development, and other electricity infrastructure needed to connect these developments to the grid. **Table 6.16** details the carbon savings associated with the approved wind farms shown on **Volume 3a Figure 4.1**, and clearly demonstrates that over their operating lifetimes the carbon savings associated with them would account for the losses caused by the construction of any enabling infrastructure to facilitate connection to the grid, even when considering the carbon losses associated with their own construction and operation. As noted above, these are not wind farm projects that rely on the Proposed Development. However, this provides an illustration of the principle that while individually the Proposed Development may have an adverse impact on climate change, once associated with the renewable energy that it is being constructed to support, the losses are balanced by the savings associated with replacing conventional electricity generation with renewable sources.

Table 6.16 Illustrative Example - Carbon Savings per Year of Operation (versus grid-mix electricity generation) from Approved Wind Farms within 25 km of the Proposed Development

Wind Farm Development	Payback Time (years)[(a)]	Proposed Operational Lifetime (years)	Carbon Savings (t CO_2 yr^{-1})
Lairg II Wind Farm Re-Design	No Data Available	No Data Available	No Data Available
Coire Na Cloiche Wind Farm	No Data Available	No Data Available	No Data Available
Achany Extension Wind Farm[32]	3.2	50	53,490
Chleansaid Wind Farm[33]	1.3	35	74,638
Gordonbush Extension Wind Farm[34]	2.6	25	63,282
Strath Tirry Wind Farm[35]	3.3	30	9,934
TOTAL			201,344

(a) The Payback Time of a wind farm refers to the time taken for the carbon savings to offset the carbon losses associated with the wind farm. This is calculated by the carbon calculator and is typically reported based on a grid-mix of electricity generation (when the wind farm is replacing energy generation made up of a mix of non-renewable and renewable sources).

[32] Energy Consents Unit (2021) Application Number: ECU00001930. Environmental Impact Assessment Report Volume 2 Chapter 11: Geology and Carbon Balance. [Online] Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00001930 (Accessed 24/07/2024)

[33] Energy Consents Unit (2022) Application Number: ECU00002031. Environmental Impact Assessment Report Volume 1 Chapter 16: Climate Change Mitigation [Online] Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00002031 (Accessed 24/07/2024)

[34] Energy Consents Unit. (2015) Application Number: EC00003105. Environmental Statement Volume 2 Chapter 15: Other Issues [Online] Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=EC00003105 (Accessed 24/07/2024)

[35] The Highland Council (2020) Application Number: 20/05067/FUL. Environmental Statement Technical Appendix 3.3 Carbon Calculator. [Online] Available at: https://wam.highland.gov.uk/wam/applicationDetails.do?activeTab=documents&keyVal=QLJ6KUIHIDP00 (Accessed 24/07/2024)

6.6.4 Mitigation and Residual Effects

As detailed in **Section 6.6.3**, the Proposed Development is predicted to have a minor adverse impact on the climate through the carbon emissions associated with its construction and operation. However, this impact will be mitigated by the carbon savings associated with the renewable energy that will be able to be connected to, and distributed by, the grid once the Proposed Development is operational.

An oPMP and Draft CEMP have been produced, and both are provided in **Volume 4 Appendices 10.2** and **2.2** respectively. These detail the best practice guidance to be followed to minimise peatland disturbance. Methods for handling and storing excavated peat have been described in the oPMP to ensure its re-use potential is maximised and any carbon losses are minimised. The oPMP will be updated prior to construction once further site investigation data and detailed engineering designs are available. The updated PMP will include detailed method statements and phasing of works and will be agreed with SEPA and the planning authority prior to construction commencing.

6.7 Summary

There is limited guidance available to advise on how to complete climate change and carbon balance assessments for electricity infrastructure developments, and therefore professional judgement, informed by IEMA Guidance, the DEFRA Emissions Factor Toolkit, and the Scottish Government's Carbon Calculator, has been used to assess: (i) the potential impact of the Proposed Development on the climate (GHG assessment) ; (ii) the impact of climate change on environmental receptors assessed elsewhere in the EIA Report (ICCI assessment); and (iii) the vulnerability of the Proposed Development to climate change (CCR assessment).

Embedded mitigation

The Proposed Development has been designed (through the Applicant's site selection process, design optimisation, and siting) to avoid peat (and particularly deep peat) where possible and minimise forestry felling, in order to mitigate associated carbon losses. Where peat will be disturbed, a Draft CEMP and oPMP will be implemented to reduce potential impacts, and proposed peatland restoration and landscape and ecology mitigation will contribute to GHG savings in the future.

CCR

Following an initial review of current climate change projections and climate change trends, it was determined that no climate change trends are likely to affect the Proposed Development. A detailed Climate Change Resilience assessment was therefore scoped out of this EIA Chapter.

Changes to baseline (ICCI)

The proposed changes in baseline conditions associated with climate change projections are uncertain and relatively small over the next 100 years, reflecting the slow rate of climate change. This means environmental receptors assessed within this EIA Report are unlikely to be significantly affected by the change in climate, and no additional significant effects other than those already identified within the EIA Report will occur as a result of climate change through the lifetime of the Proposed Development based on our current understanding of climate change projections and environmental responses to climate change.

Effect of Proposed Development on climate (GHG)

In terms of carbon balance, the Proposed Development does not generate any electricity and, therefore, payback periods and carbon savings associated with energy generation are not included in the carbon calculator assessment. The GHG assessment therefore focuses on the carbon losses associated with the Proposed Development and compares these with the current UK GHG emissions and the future GHG emissions targets (UK carbon budgets and net zero). In that regard, it is concluded that the Proposed Development will result in carbon losses of approximately 112,514.45 t CO_2 equivalent, which equates to approximately 0.03% of the annual UK carbon emissions in 2023. This amount accounts for 0.0056% and 0.0064% respectively of the fourth (2023 to 2027) and fifth (2028 to 2032) carbon budgets. This constitutes a

negligible magnitude impact on a very highly sensitive receptor, resulting in a minor adverse impact on the climate, which is not significant under the EIA Regulations. However, by way of countervailing points, it is noted that:

- The proposed peatland restoration will contribute to the mitigation of this impact, as once established it will cause carbon savings by up-taking and storing carbon. The exact carbon savings associated with the proposed peatland restoration is uncertain, due to uncertainties relating to when the peatland will be matured enough to sequester carbon and how effective it will be at storing carbon. Nonetheless, and recognising those uncertainties, the carbon calculator results suggest a maximum saving of approximately 45,566 t CO_2 equivalent could be possible.
- In addition to the proposed peatland restoration, future compensatory forestry planting would likely also lead to carbon savings.
- The Proposed Development is strategically important as it will enable the connection, transmission and distribution of renewable energy to meet demand. As these renewable energy developments would save carbon emissions through replacing conventional electricity generation technologies, the emissions saved from these developments would easily balance and exceed the losses associated with the Proposed Development, thereby mitigating its impact on climate change.