The Great Grid Upgrade

Sea Link

Sea Link

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Climate Change

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1.1 Introduction

1.1.1 This chapter of the Environmental Statement (ES) presents the assessment of the likely significant effects of the Proposed Project on the climate and climate change effects that effect the Proposed Project and surrounding environment (as described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**).

1.1.2 This chapter describes the methodology used for the climate change assessment, the datasets that have informed the assessment, baseline conditions, mitigation measures and the residual significant effects that could result from the Proposed Project.

1.1.3 The Order Limits, which illustrate the boundary of the Proposed Project, are shown on **Application Document 2.2.1 Overall Location Plan**. The Suffolk Onshore Scheme Boundary is illustrated on **Application Document 2.2.2 Suffolk Location Plan**, Kent Onshore Scheme Boundary is illustrated on **Application Document 2.2.3 Kent Location Plan** and the Offshore Scheme Boundary is illustrated on **Application Document 2.2.1 Overall Location Plan**.

1.1.4 This chapter should be read in conjunction with:

- **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**;
- **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**; and
- **Application Document 6.2.1.6 Part 1 Introduction Chapter 6 Scoping Opinion and EIA Consultation**.

1.1.5 This chapter is supported by the following application documents:

- **Application Document 7.5.3 Outline Onshore Construction Environmental Management Plan (CEMP)**;
- **Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice**;
- **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**;
- **Application Document 7.5.13 Greenhouse Gas Reduction Strategy**;
- **Application Document 6.2.2.4 Environmental Statement Part 2 Suffolk Chapter 4 Water Environment**; and
- **Application Document 6.2.3.4 Environmental Statement Part 3 Kent Chapter 4 Water Environment**.

1.2 Regulatory and Planning Context

1.2.1 This section sets out the legislation and planning policy that is relevant to the climate change effects assessment. A full review of compliance with relevant national and local planning policy is provided within the **Application Document 7.1 Planning Statement** submitted as part of the application for Development Consent.

1.2.2 Policy generally seeks to minimise climate change related effects both from and to the development and to avoid significant adverse effects. This applies particularly to reducing greenhouse gas (GHG) emissions and increasing resilience to climate change risks.

Legislation

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (HM Government, 2017)

1.2.3 This legislation requires a description of:

- the factors likely to be significantly affected by the development, including climate (for example greenhouse gas emissions and impacts relevant to adaptation) – see Schedule 4, paragraph 4(4);
- the likely significant effects of the development on the environment resulting from "*the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change*" – see Schedule 4, paragraph 5(f).

1.2.4 The likely significant effects of climate change with the embedded and good practice mitigation measures are presented in Section 1.9.

The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (HM Government, 2019)

1.2.5 This legislation revised the Climate Change Act (2008) to legislate for Net Zero emissions by 2050. This target is supported by a system of legally binding five-year 'carbon budgets' and an independent body to monitor progress, the Climate Change Committee (CCC). The United Kingdom (UK) carbon budgets restrict the amount of Greenhouse Gas (GHG) emissions the UK can legally emit in a defined five-year period.

1.2.6 The Act also requires infrastructure operators and public bodies to report on how they are addressing the impacts of climate change on their organisation under the Adaptation Reporting Power. The National Grid Climate Change Adaptation Report (National Grid Electricity Transmission, 2021) has been used to inform the Climate Change Resilience (CCR) assessment, including the methodology set out in Section 1.4.

The Carbon Budget Order 2021 (HM Government, 2021)

1.2.7 In December 2020, the 6th Carbon Budget for the 2033-2037 period was published by the CCC and is the first budget to reflect the amended trajectory to Net Zero by 2050.

National Policy

National Policy Statements

1.2.8 National Policy Statements (NPS) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Proposed Project would be considered. Table 1.1, Table 1.2 Table 1.3, below provide details of the elements of NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2023), NPS for Renewable Energy Infrastructure (EN-3) (Department for Energy Security & Net Zero (DESNZ), 2023), and NPS for Electricity Networks Infrastructure (EN-5) (Department for Energy and Climate Change, 2011) that are relevant to this chapter.

Table 1.1 NPS EN-1 requirements relevant to climate change

NPS EN-1 section	Where this is covered in the ES
Paragraphs 4.10.5 to 4.10.7 in relation to adverse effects and benefits	The climate change assessment considers both the adverse effects and the benefits of the Proposed Project during all its phases.
Paragraphs 4.10.8 to 4.10.12 in relation to adaptation measures in response to climate projections	The climate change resilience assessment assesses the Proposed Project's resilience to climate change, in accordance with the Institute of Environmental Management and Assessment (IEMA) climate change resilience and adaption guidance (Institute of Environmental Management and Assessment , 2020).
Paragraphs 4.10.13 to 4.10.19 in relation to climate projections and adaptive measures.	The climate change resilience assessment assesses and the Proposed Project's resilience to climate change, in accordance with IEMA climate change resilience and adaption guidance (Institute of Environmental Management and Assessment , 2020).
Paragraphs 2.2.1 to 2.2.2 in relation to UK carbon budgets and the need to reduce emissions to reach the 2050 net zero target.	The lifecycle GHG assessment included within this chapter assesses the Proposed Project's greenhouse gas emissions in the context of the legally binding greenhouse gas reduction targets and carbon budgets, in line with IEMA GHG assessment guidance (Institute of Environmental Management and Assessment , 2022).
Paragraphs 4.11.3 and 4.11.4 regarding the need to establish new electricity network infrastructure to meet the UK energy objectives and reduce the need for fossil fuels.	The lifecycle GHG assessment included within this chapter assesses if the Proposed Project aligns itself with reducing the UK's dependence on fossil

NPS EN-1 section	Where this is covered in the ES
	fuels, in line with IEMA GHG assessment guidance (Institute of Environmental Management and Assessment , 2022).
Paragraph 5.3.4 states all projects should include a GHG assessment.	The lifecycle GHG assessment included within this chapter assesses the Proposed Project's greenhouse gas emissions in the context of the legally binding greenhouse gas reduction targets and carbon budgets, in line with IEMA GHG assessment guidance (Institute of Environmental Management and Assessment , 2022).
Paragraphs 5.3.5 to 5.3.7 in relation to mitigation measures required to drive down GHG emissions.	The lifecycle GHG assessment included within this chapter considers the likely significant effects of the GHG emissions associated with relevant phases of the Proposed Project, as well as mitigation measures where appropriate to reduce the residual effects.

Table 1.2: NPS EN-3 requirements relevant to climate change

NPS EN-1 section	Where this is covered in the ES
Paragraphs 3.4.1 to 3.4.3 in relation to climate change adaptation and resilience	The climate change resilience assessment assesses the Proposed Project's impact on the climate and the Proposed Project's resilience to climate change, and extreme weather events such as flooding, in accordance with IEMA climate change resilience and adaption guidance (Institute of Environmental Management and Assessment , 2020).

Table 1.3 NPS EN-5 requirements relevant to climate change

NPS EN-5 section	Where this is covered in the ES
Paragraphs 2.3.1 to 2.3.3 in relation to climate change adaptation and resilience	The climate change resilience assessment assesses the Proposed Project's resilience to climate change, and extreme weather events such as flooding, in accordance with IEMA climate change resilience and adaption

NPS EN-5 section	Where this is covered in the ES
	guidance (Institute of Environmental Management and Assessment , 2020).

National Planning Policy Framework

1.2.9 The National Planning Policy Framework (NPPF) as revised in December 2024 (Ministry of Housing, Communities and Local Government, 2024) sets out national planning policies that reflect priorities of the Government for operation of the planning system and the economic, social, and environmental aspects of the development and use of land. The NPPF has a strong emphasis on sustainable development, with a presumption in favour of such development. The NPPF has the potential to be considered important and relevant to the Secretary of State (SoS) consideration of the Proposed Project.

1.2.10 Table 1.4 below provides details of the elements of the NPPF that are relevant to this chapter, and how and where they are covered in the ES.

Table 1.4 NPPF requirements relevant to climate change

NPPF section	Where this is covered in the ES
Paragraphs 8, 20 and 161 in relation to adaptation, mitigation and climate change resilience	The lifecycle GHG assessment included within this chapter considers the Proposed Project's greenhouse gas emissions in the context of the legally binding greenhouse gas reduction targets and carbon budgets, in line with IEMA GHG assessment guidance (Institute of Environmental Management and Assessment , 2022). Embedded and good practice adaptation measures have been identified in Section 1.8 of this chapter.
Paragraphs 170 to 182 in relation to flood risk and damage to property and people.	The climate change resilience assessment assesses the Proposed Project's impact on climate change and the Proposed Project's resilience to climate change, and extreme weather events such as flooding, in accordance with IEMA GHG assessment guidance (Institute of Environmental Management and Assessment , 2022) and IEMA climate change resilience and adaption (Institute of Environmental Management and Assessment , 2020). The approach outlined in the NPPF to decrease vulnerability to current and future impacts of climate change and flood risk have been applied using the

NPPF section	Where this is covered in the ES
	latest climate projections data from UKCP18, as identified in Section 1.4 of this chapter.

National Planning Practice Guidance

1.2.11 The National Planning Policy Guidance on Climate Change (Department for Levelling up, Housing and Communities and the Ministry of Housing, Communities and Local Government, 2024) describes how to identify suitable mitigation and climate adaptation measures to incorporate into the planning process, stating that:

1.2.12 *"Effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases… Planning can also help increase resilience to climate change impact through the location, mix and design of development."*

Local Planning Policy

1.2.13 The Suffolk Onshore Scheme (refer to **Application Document 2.2.2 Suffolk Location Plan**) lies within the jurisdiction of Suffolk County Council. The following planning policies which are relevant to the study of climate change and has informed the assessment of effects in this chapter are as follows:

- Suffolk Coastal Local Plan (adopted in September 2020) (East Suffolk Council, 2020); and
- Suffolk County Council's Energy and Climate Adaptive Infrastructure Policy (16th May 2023) (Suffolk County Council, 2023).

1.2.14 The Kent Onshore Scheme (refer to **Application Document 2.2.3 Kent Location Plan**) lies within the jurisdiction of Kent County Council. County and District planning policy and guidance which is relevant to a study of climate change and has informed the assessment of effects in this chapter are as follows:

- Thanet Local Plan (Adopted 2020) (Thanet District Council, 2020);
- Dover District Council Core Strategy (2010) (Dover District Council, 2010);
- Dover District Local Plan (Dover District Council, 2024);
- Kent Environment Strategy – a strategy for environment, health and economy (March 2016) (Kent County Council, 2016); and
- Kent and Medway Energy and Low Emissions Strategy: Implementation Plan 2020-2023 (May 2021) (Kent County Council, 2016).

Local Plans

1.2.15 The Suffolk Onshore Scheme (refer to **Application Document 2.2.2 Suffolk Location Plan**) lies within the jurisdiction of East Suffolk Council. Local planning policy for East Suffolk Council consists of two parts; the Suffolk Coastal Local Plan (East Suffolk Council, 2020) and the Waveney Local Plan (East Suffolk Council, 2019).

1.2.16 The Suffolk Onshore Scheme lies within the boundary of the Suffolk Coastal Local Plan (adopted September 2020) (East Suffolk Council, 2020).

1.2.17 The Kent Onshore Scheme Boundary lies within the jurisdiction of Kent County Council, and within the boundary of Thanet District Council Local Plan (adopted July 2020) (Thanet District Council, 2020) and Dover District Local Plan (adopted October 2024).

1.2.18 Local Plan policies which are relevant to climate change matters and have informed the climate change assessment are detailed in Table 1.5.

Table 1.5 Local planning policies relevant to climate change

Policy	Where this is covered in the ES
Suffolk County Council's Energy and Climate Adaptive Infrastructure Policy	
"The Council wishes to ensure that Suffolk can fulfil this role, both to support the national and local response to climate change, and to maximise opportunities for new and existing businesses and technologies in Suffolk. Whilst recognising the importance of projects to deliver Net Zero and adapt to the changing climate, the Council considers it is essential that projects do not lead to avoidable, unmitigated, or uncompensated detriment to the communities and environment of Suffolk, and its existing businesses"	The lifecycle GHG assessment included within this chapter considers the Proposed Project's greenhouse gas emissions in the context of the legally binding greenhouse gas reduction targets and carbon budgets, in line with IEMA GHG assessment guidance. In addition, this climate chapter assesses the likely significant effects of the GHG emissions associated with relevant phases of the Proposed Project, as well as mitigation measures where appropriate to reduce the residual effects.
East Suffolk Council – Suffolk Coastal Local Plan	
East Suffolk Council – Suffolk Coastal Local Plan Policy SCLP9.1 – Low Carbon & Renewable Energy Policy SCLP9.2 – Sustainable Construction Policy SCLP9.3 – Coastal Change Management Area Policy SCLP9.4 – Coastal Change Rollback or Relocation Policy SCLP9.5 – Flood Risk Policy SCLP9.6 – Sustainable Drainage Systems Policy SCLP9.7 – Holistic Water Management	The lifecycle GHG assessment included within this chapter considers the impact of the Proposed Project's greenhouse gas emissions in the context of the legally binding greenhouse gas reduction targets and carbon budgets, in line with IEMA GHG assessment guidance. In addition, the climate chapter assesses the likely significant effects of the GHG emissions associated with relevant phases of the Proposed Project, as well as mitigation measures where appropriate to reduce the residual effects. The Proposed Project will reinforce the existing transmission network and build new electricity infrastructure to support new sources of renewable and low-carbon energy that are located along the Suffolk and Kent coastlines.

Policy	Where this is covered in the ES
Kent and Medway Energy and Low Emissions Strategy: Implementation Plan 2020-2023	
Action 3.1 Refresh the Kent Design Guide to reflect clean growth, net-zero targets and climate change adaptation.	The lifecycle GHG assessment included within this chapter considers the impact of the Proposed Project's greenhouse gas emissions in the context of the legally binding greenhouse gas reduction targets and carbon budgets, in line with IEMA GHG assessment guidance. In addition, the climate chapter assesses the likely significant effects of the GHG emissions associated with relevant phases of the Proposed Project, as well as mitigation measures where appropriate to reduce the residual effects. Furthermore, the Proposed Project will reinforce the existing transmission network and build new electricity infrastructure to support new sources of renewable and low-carbon energy that are located along the Suffolk and Kent coastlines.
Thanet District Council Local Plan	
Policy CC01 – Fluvial and Tidal Flooding Policy CC02 – Surface Water Management Policy CC03 – Coastal Development Policy CC04 – Renewable Energy Policy CC07 -- Richborough	The lifecycle GHG assessment included within this chapter assesses the likely significant effects of the GHG emissions associated with relevant phases of the Proposed Project, as well as mitigation measures where appropriate to reduce the residual effects. Furthermore, the Proposed Project will reinforce the existing transmission network and build new electricity infrastructure to support new sources of renewable and low-carbon energy that are located along the Suffolk and Kent coastlines.

1.3 Scoping Opinion and Consultation

Scoping

1.3.1 A Scoping Report (National Grid, 2022) for the Proposed Project was issued to the Planning Inspectorate (PINS) on 24 October 2022 (**Application Document 6.14 Environmental Scoping Report 2022**) and a Scoping Opinion was received from the SoS on 1 December 2022 (**Application Document 6.15 Scoping Opinion 2022**).Table

1.6 sets out the comments raised in the Scoping Opinion which are relevant to the climate change assessment and this ES chapter. The Scoping Opinion takes account of responses from prescribed consultees as appropriate. **Application Document 6.3.1.6.A ES Appendix 1.6.A Response to Scoping Opinion** provides responses to the comments made by the prescribed consultees at scoping stage and how each comment has been considered.

Table 1.6 Comments raised in the Scoping Opinion

ID	Inspectorate's comments	Response
6.1.1	**In-combination temperature change** The impact of future temperature changes on receptors in the surrounding environment as a result of climate change are not anticipated to be exacerbated by the Proposed Project in combination with future conditions. The Inspectorate agrees that this matter can be scoped out.	No further comment required
6.1.2	**In-combination sea level rise** The Impact of future sea level rise on receptors in the surrounding environment as a result of climate change is not anticipated to be exacerbated by the Proposed Project in combination with future conditions. The Inspectorate agrees that this matter can be scoped out.	No further comment required
6.1.3	**In-combination precipitation change** The impact of future precipitation changes on receptors in the surrounding environment as a result of climate change are not anticipated to be exacerbated by the Proposed Project in combination with future conditions. The Inspectorate agrees that this matter can be scoped out.	No further comment required
6.1.4	**In-combination wind** The impact of future wind conditions on receptors in the surrounding environment as a result of climate change is not anticipated to be exacerbated by the Proposed Project in combination with future conditions. The Inspectorate agrees that this matter can be scoped out.	No further comment required

Statutory Consultation

1.3.2 Statutory Consultation for the Proposed Project took place between 24 October and 18 December 2023. A furtherTargeted Consultation exercise on the main changes to the Proposed Project introduced after the 2023 statutory consultation, was undertaken between 8 July and 11 August 2024. In addition, a project update and a local engagement exercise took place between 22 November 2024 and 12 January 2025, focusing on design amendments made following Targeted Consultation. A summary of relevant feedback received during consultation relating to climate change is provided below. Further details on how consultation responses have informed the assessment can be found in **Application Document 5.1 Consultation Report** and **Application Document 5.1.6 Appendix E Statutory Consultation**.

1.3.3 Statutory consultation feedback specifically relating to climate change was received from the following stakeholders:

- Suffolk County Council;
- Essex County Council;
- Thanet District Council; and
- Environment Agency.

1.3.4 This feedback refers to the level of detail of the GHG assessment in the Preliminary Environmental Information Report (PEIR), and indicated the need for a more detailed GHG assessment. This was due to the level of detail available at the PEIR stage. This ES chapter includes a lifecycle GHG assessment to a greater level of detail, thereby addressing this feedback.

Summary of Scope of Assessment

1.3.5 This section details what aspects have been scoped in and scoped out of the assessment through the scoping process and consultation with stakeholders.

Aspects scoped into the assessment

1.3.6 The scope of this assessment covers the climate change effects of the Proposed Project during construction, operation, and decommissioning.

1.3.7 This assessment consists of a lifecycle GHG impact assessment and a climate change resilience assessment, in accordance with the IEMA guidance for assessing climate change in Environmental Impact Assessments (EIAs) (Institute of Environmental Management and Assessment , 2022; Institute of Environmental Management and Assessment , 2020).

Aspects scoped out of the assessment

1.3.8 As set out in **Application Document 6.14 Environmental Scoping Report 2022** and Table 1.5 above, an In-Combination Climate Change Impact (ICCI) assessment has been scoped out of the climate change assessment. No other aspects have been scoped out of the assessment.

1.3.9 When interpreting the requirements of the EIA Regulations, we have also had regard to the recent judgment of the Supreme Court in R (on the application of Finch on behalf of the Weald Action Group) v Surrey County Council, with particular attention to potential upstream and downstream direct and indirect effects. The principles set out in Finch have been considered in the preparation of this Environmental Statement and the

proposed scope and methodology for each aspect, including (but not limited to) **Application Document 6.2.5.1 Part 5 Combined Chapter 1 Climate Change**. Finch was unusually a case in which the likely downstream impacts could be assessed, because it was inevitable that the oil produced would be refined and as an end product, would undergo combustion and that that combustion would produce greenhouse gases into the earth's atmosphere which could readily be calculated. On a macro level, the Proposed Project would increase capacity in the electricity network, meaning that, in theory, more electricity can be transported and used, increasing the potential for additional activities requiring electricity. It is not considered that the Proposed Project, as electricity transmission infrastructure, will be the direct or indirect cause of either upstream electricity generation or downstream electricity consumption. Rather, the Proposed Project will facilitate the transport of electricity on the network in response to an increase in electricity generation and in the demand for electricity. Hence, it will not be the direct or indirect cause of greenhouse gas emissions from upstream or downstream activities.

1.3.10 It is recognised, however, that following Finch there is some uncertainty as to what are to be regarded as the direct and indirect environmental effects of a project in relation to greenhouse gas emissions. Therefore, we have also considered the position where an increase in the capacity of the electricity network and in the potential for additional activities requiring electricity are treated as direct or indirect effects arising from the Proposed Project. Having considered various potential scenarios, we consider that in the case of Sea Link it is not possible to calculate the likely upstream or downstream direct or indirect effects. As stated, the Proposed Project would increase capacity in the electricity network, meaning that, in theory, more electricity can be transported and used, increasing the potential for additional activities requiring electricity. However, whilst information is available at a high level regarding the amount of electricity that could flow as a result of an enhanced transmission network, it is impossible to quantify the amount of either the increase, or more likely decrease, in greenhouse gases that could result from the use of that additional electricity capacity. This is because the transmission network, which is operated by NGET within England and Wales and which is provided as the connection point for electricity and demand, consists of a number of different elements including overhead lines, cables, substations and more recently, HVDC systems. NGET does not control which generators are generating electricity at any one time nor does it control which demand is connected to the system. As a result, NGET has no way of assessing where the power is generated (and by what means) or more significantly where the power is going (i.e. who will be the end user of or what the ultimate use of that electricity might be) and consequently, any related emissions arising from, or more likely being reduced, as a result of such use. This means that the end use of the electricity is unknown. It could be used in a way that reduces GHG emissions that would otherwise be emitted, for example when used to charge electric vehicles, or for powering heat pumps that replace gas central heating.

1.3.11 It is clear in these circumstances that, as a result of insufficient information, and the resultant uncertainty, no meaningful assessment of downstream or upstream impacts can be undertaken in relation to these matters. In these circumstances, any conclusion as to possible effects would be merely conjecture or speculation at best. On the basis that there is insufficient evidence available to found a reasoned conclusion that a possible effect is "likely", there is no requirement for that effect to be identified and assessed.

1.4 Approach and Methodology

1.4.1 **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** sets out the overarching approach which has been used in developing the ES. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the climate assessment.

1.4.2 Due to the nature of climate change, its effects are assessed differently to other environmental disciplines in an EIA. The IEMA guidance for assessing climate impacts (as set out in Section 1.4.3) is followed for this assessment and may result in deviations from the terminologies and methods set out in the overarching approach.

Guidance Specific to the Climate Change Assessment

1.4.3 The climate change assessment has been carried out in accordance with the following good practice guidance documents:

- Institute of Environmental Management and Assessment (IEMA) (2022). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (Institute of Environmental Management and Assessment , 2022);
- Institute of Environmental Management and Assessment (IEMA) (2020). Environmental Impact Assessment Guide to: Climate Chance Resilience and Adaptation (Institute of Environmental Management and Assessment , 2020); and
- The GHG Protocol (World Resources Institute and World Business Council for Sustainable Development (WRI & WBCSD)) (WRI & WBCSD, 2015).

Baseline Data Gathering and Forecasting Methods

Lifecycle GHG Impact Assessment

1.4.4 For the purposes of the GHG emissions impact assessment, the baseline conditions are also defined as a ‘Do Nothing’ scenario where the Proposed Project does not go ahead.

1.4.5 The baseline comprises of existing carbon stocks and sources of GHGs within the boundary of the existing Proposed Project. The methodology for calculating GHG emissions and removals is consistently used across the design, construction, and operational phases of the Proposed Project.

Climate Change Resilience Assessment

1.4.6 The current baseline for the CCR assessment is based on historic climate data obtained from the Met Office (Met Office, 2023) recorded by the closest meteorological stations to the Proposed Project (Walton-on-Naze (Codet2) (Essex), located on the coast approximately 40 km from the Suffolk landfall and 50 km from the Kent landfall) for the period 1981-2010. As part of the CCR assessment, this is compared to the future baseline throughout the life of the Proposed Project.

1.4.7 The future baseline for the CCR assessment is based on future UK Climate Projections 2018 (UKCP18) (Met Office, 2018). This projection data provides probabilistic

indications of how global climate change is likely to affect areas of the UK using pre-defined climate variables and time periods.

1.4.8 For the purpose of the assessment, UKCP18 probabilistic projections for pre-defined 20 year periods for the following average climate variables have been obtained and are further analysed:

- mean annual temperature;
- mean summer temperature;
- mean winter temperature;
- maximum summer temperature;
- minimum winter temperature;
- mean annual precipitation;
- mean summer precipitation;
- mean winter precipitation; and
- sea level rise.

1.4.9 UKCP18 probabilistic projections have been analysed for the two 25 km grid squares within which the Proposed Project is located. These figures are expressed as temperature/precipitation anomalies in relation to the 1981-2000 baseline. This baseline was selected as it provides projections for 20 year time periods (e.g. 2020-2039) for the parameters analysed within the assessment compared to the 30 year land-based projections that would be generated from the 1981 – 2010 baseline.

1.4.10 UKCP18 uses a range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to inform differing future emission trends. These RCPs '*[…] specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels*' (Met Office, 2018). RCP8.5 is considered to be the worst-case global scenario with the greatest concentration of GHGs in the atmosphere and has been used as the purposes of this assessment as a worst-case scenario.

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

Assessment Criteria

1.4.12 Due to the nature of climate change, its effects often need to be assessed differently to other environmental disciplines in an EIA. Therefore, the IEMA guidance for assessing climate change in EIAs (Institute of Environmental Management and Assessment , 2022; Institute of Environmental Management and Assessment , 2020) is followed for this assessment, and may result in deviations from the terminologies and criteria set out in the overarching approach in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 Approach and Methodology**. This is consistent with best practice for climate change assessment in EIAs.

Lifecycle GHG Impact Assessment

Sensitivity of climate change receptors

1.4.13 The sensitivity of the receptor (global climate) to increases in GHG emissions is always defined as high as any additional GHG impacts could compromise the UK's ability to reduce its GHG emissions and therefore meet its future 5-year carbon budgets. Also, the extreme importance of limiting global warming to below 2°C this century is broadly asserted by the International Paris Agreement (UNFCCC, 2015) and the Climate Science Community.

Magnitude of climate change effects

1.4.14 To identify the magnitude of GHG impact over the life of the Proposed Project, emissions are calculated in line with guidance provided in Publicly Available Specification – PAS 2080:2023 Carbon Management in Infrastructure (British Standards Institute (BSI), 2023) and with the principles for calculating greenhouse gas emissions set out in the Greenhouse Gas Protocol (WRI & WBCSD, 2015). GHG emissions arising from the construction and decommissioning activities, embodied carbon in materials and operational emissions of the Proposed Project, have been quantified in this ES using a calculation-based methodology as per the following equation, and aligned with the GHG Protocol:

Activity data x GHG emissions factor = GHG volume

1.4.15 Activity data is a quantifiable measure of activity, such as operating hours or volumes of fuels used. Emission factors convert the activity data into GHG volumes. Activity data is sourced from client data. Where specific data is not available, a mix of assumptions and industry benchmarks have been used to fill data gaps. Where this is not possible, then a qualitative approach to assessing the GHG impacts is followed, in line with the IEMA guidance (Institute of Environmental Management and Assessment , 2022).

1.4.16 Emission factors are sourced from publicly available sources, the Department for Energy Security and Net Zero (DESNZ) (DESNZ, 2023), and the Bath University Inventory of Carbon and Energy (Bath University Inventory of Carbon and Energy, 2019). Carbon emissions and sinks through land use change have been calculated by using the EU Commission's Guidelines for Land Carbon Stocks (EU Commission, 2010). Appropriate assumptions are sourced from the Royal Institution of Chartered Surveyors (RICS) Whole Life Carbon Assessment for the Built Environment, 2nd edition guidelines (Royal Insitution of Chartered Surveyors (RICS), 2023) and from National Grid's internal carbon factor database.

1.4.17 In line with the World Business Council for Sustainable Development and World Resources Institute GHG Protocol guidelines (WRI & WBCSD, 2015), the GHG assessment is reported as tonnes of carbon dioxide equivalent (tCO_2e) and has considered the seven Kyoto Protocol gases:

- carbon dioxide (CO_2);
- methane (CH_4);
- nitrous oxide (N_2O);
- sulphur hexafluoride (SF_6);
- hydrofluorocarbons (HFCs);

- perfluorocarbons (PFCs); and
- nitrogen trifluoride (NF_3).

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

Significance of effects

1.4.19 The significance of effect of GHG emissions on the climate has been determined in line with the criteria set out in IEMA Guidance (Institute of Environmental Management and Assessment , 2022).

1.4.20 As per IEMA guidance, any GHG emissions or reductions from a project might be considered to be significant, as all emissions contribute to climate change. The rationale for classification is as follows:

- any additional GHG impacts could compromise the UK's ability to reduce its GHGs and therefore the ability to meet its carbon budgets;
- the extreme importance of limiting global warming to below 2°C this century, as broadly asserted within the Paris Agreement, national legislation, and community support. Additionally, the 2018 Special Report by the IPCC (IPCC, 2018) highlighted the importance of limiting global warming below 1.5°C; and
- a disruption to global climate is already having diverse and wide-ranging impacts to the environment, society, economic and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.

1.4.21 IEMA guidance states that it is challenging to identify fixed numerical thresholds against which to identify the significance of a project regarding the net change in GHG emissions. Therefore, the GHG assessment should present context for the GHG emissions, and it is down to the practitioner's professional judgement on how best to contextualise a project's GHG impact.

1.4.22 The Climate Change Act 2008 (HM Government, 2019) established a system of five-yearly carbon budgets. Each carbon budget represents the total amount of GHG emissions that may be emitted by the UK during each 5-year period, measured in $MtCO_2e$. The carbon budgets are consistent with furthering the achievement of the UK climate objective and include all GHG emissions. Therefore, to contextualise the impact of the Proposed Project, GHG emissions for the Proposed Project are put into context of the UK's carbon budgets up to 2037 published by the CCC.

1.4.23 The level of significance of Proposed Project-related emissions is determined using IEMA's (Institute of Environmental Management and Assessment , 2022) five distinct levels of significance which are not solely based on whether a development emits GHG emissions alone, but how it makes a relative contribution towards achieving a science based 1.5°C aligned transition towards net zero. The definitions for IEMA's levels of significance are provided in Table 1.7.

Table 1.7 Significance of effects for GHGs Impact Assessment (adopted from the IEMA GHG Guidance)

Level of Significance	Effects	Description
Significant	Major adverse	The Proposed Project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make meaningful contribution to the UK's trajectory towards net zero.
	Moderate adverse	The Proposed Project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
Not significant	Minor adverse	The Proposed Project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
	Negligible	The Proposed Project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
Beneficial	Beneficial	The Proposed Project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

Climate Change Resilience Assessment

Sensitivity of climate change receptors

1.4.24 The CCR assessment considers the impacts of climate change on the Proposed Project over its lifetime by identifying likely changes to the climate and potential climate hazards. The receptor for the CCR review is the Proposed Project itself (during construction, operation and decommissioning) and associated users (e.g., construction and maintenance workers).

Magnitude of climate change effects

1.4.25 The magnitude of the impacts associated with climate change is determined by identifying the likelihood and consequence of a climate impact occurring on the Proposed Project (e.g., increased frequency and severity of extreme weather events) on the associated assets and users of the Proposed Project (e.g., construction and maintenance workers) has the potential to be high if no mitigation measures are in place.

1.4.26 In the CCR assessment, following identification of the climate impacts, likelihood of occurrence and impact of the consequences is assessed according to Table 1.8 and Table 1.9. The categories and descriptions provided below are based on the IEMA climate change resilience and adaptation guidance (Institute of Environmental Management and Assessment , 2020).

Table 1.8 Categories for the likelihood of the climate-related impact occurring

Likelihood category	Description
High	Likelihood of climate hazard occurring is high and impact is always/almost always going to occur.
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/almost always.
Low	Likelihood of climate hazard occurring is high but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/almost always.
Negligible	All other eventualities - highly unlikely but theoretically possible.

Table 1.9 Description of consequences

Consequence of impact	Description
High	Significant disruption to construction and operations, unable to deliver services, resulting in high financial losses.

Consequence of impact	Description
Moderate	Disruption to construction and operations and ability to deliver services, resulting in some financial losses/cost implications.
Low	Minor disruption to construction and operations but does not significantly impact ability to deliver services.
Negligible	Negligible disruption to construction and operations, does not impact ability to deliver services.

Significance of effects

1.4.27 The likelihood and consequence of climate change impacts, as determined above, is combined to determine a risk rating. The significance of climate change impacts is determined by this risk rating. Table 1.10 below sets out the how the significance is assessed.

Table 1.10 Significance of Climate Change Impact

		Likelihood of climate-related impact occurring			
		Negligible	**Low**	**Moderate**	**High**
Measure of consequence	**Negligible**	Low (Not Significant)	Low (Not Significant)	Medium (Not Significant)	Medium (Not Significant)
	Low	Low (Not Significant)	Low (Not Significant)	Medium (Not Significant)	High (Significant)
	Moderate	Low (Not Significant)	Medium (Not Significant)	High (Significant)	Extreme (Significant)
	High	Medium (Not Significant)	High (Significant)	High (Significant)	Extreme (Significant)

Assumptions and Limitations

Lifecycle GHG Impact Assessment

1.4.28 There is currently no specific carbon emissions threshold, which if exceeded, is considered significant. Assessment of significance of emissions therefore cannot be judged objectively.

1.4.29 To address this, the assessment has used a combination of approaches as determined using the latest version of IEMA guidance (Institute of Environmental Management and Assessment , 2022). The magnitude of GHG emissions are put into context using national carbon budgets. In addition to this, the significance of emissions has been assessed based on '*whether the Proposed Development contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*.'

1.4.30 Where detailed information is not available regarding energy use, types and quantities of materials used, or the embodied carbon of key features of the assets, assumptions are made based on industry approximations, professional best practice, and estimates provided by National Grid.

1.4.31 Key assumptions applied in the lifecycle GHG assessment are presented in Table 1.11. The lifecycle modules are labelled in accordance with PAS 2080:2023 guidelines (British Standards Institute (BSI), 2023). Key sources of assumptions include the Royal Institution of Chartered Surveyors (RICS) Whole Life Carbon Assessment for the Built Environment, 2nd edition guidelines (Royal Insitution of Chartered Surveyors (RICS), 2023) and National Grid's internal carbon factor and conversion factor database.

Table 1.11 Key assumptions applied in lifecycle GHG Impact

Lifecycle module		Emission Source	Key assumptions
A: Before Use Stage	A1-3 Product Stage	A1-3 Raw materials supply and manufacture	Estimated material quantities for cables, electrical equipment, steel, concrete, etc were obtained from an RFI and follow up discussions with the design team. Emission factors were obtained from the Bath University Inventory of Carbon and Energy (ICE) (Bath University Inventory of Carbon and Energy, 2019). Where appropriate ICE factors were not available, for example for converter station and substation equipment, conversion factors from National Grid's internal carbon database were used. Material quantities were uplifted by respective wastage rates for each material type, based on wastage rate assumptions from the Royal Institution of Chartered Surveyors (RICS) Whole Life Carbon Assessment for the Built Environment, 2nd edition guidelines (Royal Insitution of Chartered Surveyors (RICS), 2023).
	A4-5 Construction Process Stage	A4 Material transport	Distances of material transport to the construction site from the point of production, and mode of transport, have been assumed based on the RICS guidance. Emission factors from the Department for Energy Security and Net Zero (DESNZ) (DESNZ, 2023) have been used (Rigid HGV, Average Laden and Cargo Ship, Average Size). All cables and electrical equipment are assumed to be transported from Europe.
		A5.1 Pre-construction demolition	Material wastage rates and end-of-life scenarios were assumed based on RICS guidance.

Lifecycle module	Emission Source	Key assumptions
	A5.2 Construction activities	Terrestrial plant fuel use was estimated based on the average litres of diesel consumed per hour for each plant type, which was applied to the anticipated construction hours. The DESNZ (DESNZ, 2023) emissions factor for 'gas oil' was then applied. Construction activities relating to excavation and filling activities have been calculated from volumes of excavated and filled and materials provided in the RFI from the design team, using factors from the Civil Engineering Standard Method of Measurement (CESMM4) (CESMM4, 2013). GHG emissions associated with land use were estimated based on hectares of habitat type lost and gained due to the development. Land use emission factors were obtained from the EU Commission guidelines for the calculation of land carbon stocks (EU Commission, 2010).
	A5.3 Waste	Material wastage rates and end-of-life scenarios were assumed based on RICS guidance.
	A5.4 Worker transport	Emissions from transportation of workers to the work site (i.e., commuting) was calculated based on an estimate commute distance of 30km. Unless otherwise indicated, it was assumed workers commute via car with an occupancy rate of 1 per vehicle. The number of construction workers was obtained from the project schedule.
B: Use Stage	B2 Maintenance	Emissions from maintenance and repair activities have been assumed in line the RICS guidance. Based on asset lifetimes, no replacement is anticipated to occur before 40 years, and therefore no replacement emissions have been calculated for the 40-year reference period.
	B3 Repair	
	B6 Operational energy use	Transmission losses were estimated using a literature factor of 3% losses per 1,000 km (Gordonnat, 2020). It is assumed that no SF_6 equipment will be used in the Proposed Project, in accordance with National Grid policy. SF_6 alternatives such as C4 or G3 have a 99% lower global warming potential (GWP) than SF_6. Considering this reduced GWP to SF_6 leakage emissions on similar transmission projects, it is likely that any leakage emissions associated with the Proposed Project will be minimal in the context of the overall footprint and will not affect the outcome of this assessment.

Lifecycle module	Emission Source	Key assumptions
		These leakage emissions are therefore scoped out of the calculation.

Climate Change resilience assessment

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

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

Cumulative effects

1.4.34 Climate change is the result of cumulative impacts as it is the result of innumerable minor activities. A single activity may itself result in a minor or insignificant impact, but when combined with many other activities, the cumulative impact could be significant. The nature of GHGs is such that their impact on receptors (the global climate) is not affected by the location of their source. The GHG emissions assessment by its nature is a cumulative assessment and considers whether the Proposed Project would contribute significantly to emissions on a national level.

1.4.35 The global atmosphere is the receptor for climate change impacts and has the ability to hold GHG emissions. As noted in the third principle of considering the aspect of significance in the IEMA guidance, "*GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant*". While the impact of any individual project may be limited, it is the cumulative impact of many projects over time that could have a significant impact on climate change.

1.4.36 As such it is not possible to define a Study Area or Zone of Influence for the assessment of cumulative effects of GHG emissions nor to undertake a cumulative effects assessment, as the identified receptor is the global climate, and effects are therefore not geographically constrained. Consequently, consideration of the effects of the Proposed Project together with other developments on GHG emissions is not considered to be applicable.

1.4.37 It should also be noted that other major projects falling under the EIA Regulations will also need to consider climate change assessment within their own applications for development consent.

1.4.38 As the CCRA is focused solely on the assets of the Proposed Project and a broader consideration of existing interdependent infrastructure, a cumulative assessment is not required. This decision is justified by the fact that none of the nearby schemes have the potential to increase significant climate-related risks. The assessment has carefully considered the potential for combined effects with other developments in the area and has determined that these effects are negligible.

1.4.39 Consequently, in terms of climate change, the Proposed Project operates independently with no significant interdependencies that would necessitate a cumulative climate impact assessment.

1.5 Basis of Assessment

1.5.1 This section sets out the assumptions that have been made in respect of design flexibility maintained within the Proposed Project and the consideration that has been given to alternative scenarios and the sensitivity of the assessment to changes in the construction commencement year.

1.5.2 Details of the available flexibility and assessment scenarios are presented in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project** and **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**.

Flexibility Assumptions

1.5.3 The environmental assessments have been undertaken based on the description of the Proposed Project provided in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. To take account of the flexibility allowed in the Proposed Project, consideration has been given to the potential for effects to be of greater or different significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LoD) or Order Limits.

1.5.4 The assumptions made regarding the use of flexibility for the main assessment are set out in Table 1.12 and Table 1.13 below.

Table 1.12 Flexibility assumptions – Suffolk Onshore Scheme

Element of flexibility	How it has been considered within the assessment
Lateral LoD High Voltage Direct Current (HVDC) / High Voltage Alternating Current (HVAC) cables	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Lateral LoD Saxmundham Converter Station	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Vertical LoD Saxmundham Converter Station	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Lateral LoD Friston Substation	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this

Element of flexibility	How it has been considered within the assessment
	climate change assessment is relevant for all these elements of flexibility.
Lateral and Vertical LoD overhead line (where Friston Substation is built as part of the Proposed Project)	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Vertical LoD Friston Substation	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Order Limits – temporary construction works	The GHG emissions and climate change resilience of the Proposed Project will not be affected by changes to the order limits of any temporary construction work elements. Therefore, this climate change assessment is relevant for all these elements of flexibility.

Table 1.13 Flexibility assumptions – Kent Onshore Scheme

Element of flexibility	How it has been considered within the assessment
Lateral LoD HVDC cables	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Lateral LoD Minster Converter Station and Minster Substation	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Vertical LoD Minster Converter Station and Minster Substation	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.
Lateral LoD overhead line	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this

Element of flexibility	How it has been considered within the assessment
	climate change assessment is relevant for all these elements of flexibility.
Vertical LoD overhead line	The GHG emissions and climate change resilience of the Proposed Project will not be affected by moving any permanent or temporary infrastructure elements within the LoD. Therefore, this climate change assessment is relevant for all these elements of flexibility.

Consideration of Scenarios

1.5.5 For the Suffolk Onshore Scheme, the following scenarios with regards to Friston Substation have been considered in the assessment as explained in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**:

- Friston Substation is constructed under the development consent granted to Scottish Power Renewables (SPR), pursuant to 'The East Anglia ONE North (EA1N) Offshore Wind Farm Order 2022' and 'The East Anglia TWO (EA2) Offshore Wind Farm Order 2022'; or
- Friston Substation is built as part of the Proposed Project.

1.5.6 The selection of scenario does not affect the GHG assessment or CCR assessment. In either scenario, the Friston Substation is considered an asset within the assessment boundaries of the GHG assessment and CCR assessment. This climate change assessment is therefore relevant for both scenarios.

1.5.7 The following options with regards to the proposed bridge over the River Fromus have been considered in the assessment as described in Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project:

- Option 1 - A bridge height of up to 6 m (from the ground level at the abutment to the top of the parapet) with 62 m long approach ramps; and
- Option 2 - A bridge height of up to 4 m (from the ground level at the abutment to the top of the parapet) with 42 m long approach ramps.

1.5.8 The selection of any of these two design options does not affect the GHG or the CCR assessment as in either poptions, the bridge is considered an asset within the assessment boundaries. This climate change assessment is therefore relevant to both design options.

1.5.9 There is also optionality regarding the Saxmundham Converter Station construction compound location. Any one of the three areas of land included within the Order Limits (S02, SO3 and S04/05), as illustrated in **Application Document 2.14.1 Indicative General Arrangement Plans – Suffolk**, could be used for this purpose. The specific location of the construction compound does not affect the GHG assessment or the CCR assessment which has assumed that only one of the options would be used.

1.5.10 No alternative scenarios or options are relevant to the assessment of the Kent Onshore Scheme or the Offshore Scheme.

Sensitivity Test

1.5.11 It is likely that under the terms of the draft DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Consideration has been given to whether the effects reported would be any different if the works were to commence in any year up to year five. Where there is a difference, this is reported in Section 1.12.

1.6 Study Area

Lifecycle GHG Impact Assessment

1.6.1 The GHG Study Area includes all GHG emissions from within the proposed Order Limits as shown in **Application Document 2.2.1 Overall Location Plan** arising during all stages of the construction, operation and maintenance, and decommissioning of the Proposed Project. It also includes emissions arising from offsite activities which are directly related to the onsite activities, such as transport of waste, materials and workers, and treatment of materials and waste disposal.

Climate Change Resilience Assessment

1.6.2 The Study Area for the CCR review is the Proposed Project itself within the proposed Order Limits as shown in **Application Document 2.2.1 Overall Location Plan**.

1.7 Baseline Conditions

1.7.1 As discussed in Section 1.4, the receptor associated with in the lifecycle GHG assessment is the global climate, and the receptor associated with the CCR assessment is the Proposed Project itself (during construction, operation and decommissioning) and associated users (e.g. construction and maintenance workers). Value/importance levels of each receptor consistent with the terminology used in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** are not applicable to the baseline conditions of the climate change assessment. Rather, these receptors are contextualised in the baseline conditions described below.

Lifecycle GHG Impact Assessment

1.7.2 The current and future baseline for the GHG assessment of the impact of the Proposed Project on climate is a ‘business as usual’ scenario where the Proposed Project is not constructed and operated. The baseline comprises of existing carbon stock and sources of GHG emissions within the boundary of the existing site activities.

1.7.3 The current land use within the Proposed Project boundary consists of predominantly arable land, and managed hedgerows and trees. Trees are present individually in some areas, as well as in rows and within small woodland areas. The abundance of vegetation within the Proposed Project boundary suggests a relatively high carbon sink potential. Also, current land use within the Proposed Project Order Limits has minor levels of associated GHG emissions as the land use is largely agricultural. Baseline agricultural GHG emissions are dependent on soil and vegetation types present, and fuel use for the operation of vehicles and machinery.

1.7.4 The lifecycle GHG emissions determined in this assessment are considered to be additional to this baseline, in accordance with the methodology described in Section 1.4. This represents the worst-case scenario and is in line with GHG assessment best practice.

Climate Change Resilience Assessment

1.7.5 The current baseline for the CCR assessment is based on historic climate data from the nearest weather station to the Proposed Project (Walton-on-Naze (Codet2) (Essex), located on the coast approximately 40 km from the northern landfall and 50 km from the southern landfall). Historic climate data (Met Office, 2023) is presented in Table 1.14 below.

Table 1.14 Baseline temperature and rainfall

Climate Variable	Baseline (1981-2010)
Mean annual maximum daily temperature (°C)	13.58
Mean summer maximum daily temperature (°C)	20.23
Mean winter minimum daily temperature (°C)	2.35
Highest temperature for baseline period (°C)	21.22 (July)
Lowest temperature for baseline period (°C)	2.05 (January)
Mean annual rainfall (mm)	45.73
Mean summer rainfall (mm)	44.36
Mean winter rainfall (mm)	48.12
Wettest month on average (mm)	57.77 (October)
Driest month on average (mm)	35.9 (April)
Mean monthly wind speed at 10m (knots)	10.40

1.7.6 The future baseline is based on future UK Climate Projections 2018 (UKCP18) (Met Office, 2018). This projection data provides probabilistic indications of how global

climate change is likely to affect areas of the UK using pre-defined climate variables and time periods. Projected climate data is presented in Table 1.15 below.

Table 1.15 Projected changes in temperature and precipitation variables, 50% probability (10% and 90% probability in parenthesis)

Climatic Parameter	Time Period		
	2010-2039	2040-2069	2070-2099
Mean annual air temperature anomaly at 1.5 m (°C)	+0.8 (+0.3 to +1.3)	+1.9 (+1.0 to +2.9)	+3.7 (+2.2 to +5.3)
Mean summer air temperature anomaly at 1.5 m (°C)	+1.0 (+0.4 to +1.6)	+2.4 (+1.1 to +3.8)	+4.8 (+2.4 to +7.1)
Mean winter air temperature anomaly at 1.5 m (°C)	+0.7 (+0.02 to +1.3)	+1.7 (+0.5 to +2.9)	+3.1 (+1.2 to +5.1)
Maximum summer air temperature anomaly at 1.5 m (°C)	+1.1 (+0.2 to +2.0)	+2.7 (+1.0 to +4.5)	+5.3 (+2.4 to +8.4)
Minimum winter air temperature anomaly at 1.5 m (°C)	+0.7 (-0.03 to +1.4)	+1.8 (+0.4 to +3.2)	+3.2 (+1.1 to +5.7)
Annual precipitation rate anomaly (%)	+0.5 (-5.1 to +5.9)	-11.6 (-3.6 to +4.1)	-2.6 (-13.7 to +8.5)
Summer precipitation rate anomaly (%)	-4.6 (-20.7 to +10.2)	-16.4 (-42.2 to +9.4)	-33.7 (-62.2 to +1.0)
Winter precipitation rate anomaly (%)	+4.0 (-4.3 to +12.9)	+7.9 (-3.9 to +21.5)	+18.5 (-1.1 to +41.8)

1.7.7 Under the worst-case RCP 8.5 climate change scenario, sea level rise may increase up to 17 cm (relative to the 1995-2014 baseline) by the time the Proposed Development operations start. Sea level rise is projected to increase up to 48 cm (relative to the 1955-2014 baseline) from 2060, which falls within the assumed 40-year operational lifetime of the Proposed Project. The ranges of projected sea level rise from the 1995-2014 baseline are detailed in Table 1.16.

Table 1.16 Projected 50% probability of sea level rise under RCP 8.5 relative to the 1995-2014 baseline period (10% and 90% probability in parenthesis)

	2030	2040	2050	2060

Sea level anomaly (m)	+0.12 (+0.07 to +0.17)	+0.18 (+0.11 to +0.26)	+0.26 (+0.16 to +0.36)	+0.33 (+0.21 to +0.48)

1.8 Proposed Project Design and Embedded Mitigation

1.8.1 The Proposed Project has been designed, as far as possible, following the mitigation hierarchy in order to, in the first instance, avoid or reduce climate change impacts and effects through the process of design development, and by embedding measures into the design of the Proposed Project.

1.8.2 As set out in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**, mitigation measures typically fall into one of three categories: embedded measures; control and management measures; and mitigation measures. Embedded, and control and management measures are set out below. Additional mitigation measures are discussed in Section 1.10.

Embedded Measures

1.8.3 Embedded measures have been integral in reducing, and where possible avoiding, the climate change effects of the Proposed Project. Measures that have been incorporated are:

- Sensitive routeing and siting of infrastructure and temporary works, to avoid or reduce climate change effects;
- The flood mitigation measures detailed in **Application Document 6.2.2.4 Environmental Statement Part 2 Suffolk Chapter 4 Water Environment** and **Application Document 6.2.3.4 Environmental Statement Part 3 Kent Chapter 4 Water Environment**;
- Commitments made within **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**;
- The use of materials with a low embodied carbon, including low-carbon concrete and steel;
- The use of SF_6-free switchgear;
- The use of low carbon construction techniques, including low-carbon plant, vehicles and equipment;
- Designing the Proposed Project to be resilient to any significant effects of climate change; and
- The GHG management process detailed in **Application Document 7.5.13 Greenhouse Gas Reduction Strategy**. The GHG Reduction Strategy sets out how the GHG emissions associated with the Proposed Project should be managed and reduced, including a framework for identifying and prioritising GHG reduction opportunities.

Control and Management Measures

1.8.4 Measures relevant to the control and management of impacts during construction have been included within **Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice**. The following measures have been taken into account in assessing the climate change effects of the Proposed Project:

- GG02: A Construction Environmental Management Plan (CEMP), Landscape and Ecological Management Plan (LEMP) and Construction Traffic Management and Travel Plan (CTMTP) will be produced and submitted to the relevant authority for approval prior to construction of the relevant stage of the Proposed Project to which it relates. The plan produced will be substantially In accordance with the outline versions submitted as part of the application for development consent. In accordance with the Requirement 6 of Schedule 3 of the draft DCO, the Contractor will need to comply with the approved plans(including any amendments to the plans subsequently approved).
- GG04: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works (ECoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The ECoW will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The ECoW will be supported as necessary by appropriate specialists, including ecologists, soil scientists and arboriculturists.
- GG05: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the project. Topics will include but not be limited to:
  - pollution prevention and pollution incident response;
  - dust management and control measures;
  - location and protection of sensitive environmental sites and features;
  - adherence to protected environmental areas around sensitive features;
  - working hours and noise and vibration reduction measures;
  - working with potentially contaminated materials;
  - waste management and storage;
  - flood risk response actions; and
  - agreed traffic routes and access points.
- GG12: …Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so.
- TT01: The Outline CTMTP's identify measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions.

- GM03: An offshore Construction Environmental Management Plan (CEMP) including an Emergency Spill Response Plan and Waste Management Plan, Marine Pollution Contingency Plan (MPCP), Shipboard Oil Pollution Emergency Plan (SOPEP) and a dropped objects procedure will be produced prior to installation.

1.8.5 **Application Document 7.5.13 Greenhouse Gas Reduction Strategy** sets out how GHG emissions are to be managed across the lifecycle of the Proposed Project. This strategy includes the identification of opportunities for reducing GHG emissions, GHG reduction targets, and allocating responsibilities for associated actions.

1.9 Assessment of Impacts and Likely Significant Effects

1.9.1 The assessment of the effects of the Proposed Project on climate change receptors described in this section considers the embedded, control and management measures described in Section 1.8 and mitigation measures described in Section 1.10.

Lifecycle GHG Assessment

1.9.2 This section presents the assessment of impacts and likely significant effects for the lifecycle GHG assessment. A more detailed breakdown of GHG emissions is provided in **Application Document 7.5.13 Greenhouse Gas Reduction Strategy**. The GHG Reduction Strategy also provides more detail on the GHG management process and GHG reduction opportunities.

1.9.3 Refer to Table 1.11 for key assumptions applied in the GHG lifecycle calculations.

Construction phase

1.9.4 For the purpose of the climate change assessment, the construction phase of the Proposed Project is assumed to be from 2026 to 2031.

1.9.5 The GHG emissions associated with the construction phase of the Proposed Project have been calculated subject to the methodology, assumptions and limitations detailed in Section 1.4. The results are provided in Table 1.17. The lifecycle modules are labelled in accordance with PAS 2080:2023 guidelines (British Standards Institute (BSI), 2023).

Table 1.17 Construction phase GHG emissions

			GHG Emissions (tCO_2e)			
Lifecycle Module		**Emission Source**	**Suffolk**	**Kent**	**Offshore**	**TOTAL**
A: Before Use Stage	A1-3 Product Stage	A1-3 Raw materials supply and manufacture	80,975	71,453	27,935	**180,363**
	A4-5 Construction Process Stage	A4 Material transport	6,932	15,786	16,178	**38,897**
		A5.1 Pre-construction demolition	0.03	0.31	0	**0.35**
		A5.2 Construction activities	4,883	3,018	14,730	**22,631**

Lifecycle Module	Emission Source	GHG Emissions (tCO_2e) Suffolk	Kent	Offshore	TOTAL
	A5.3 Waste	511	116	124	**750**
	A5.4 Worker transport	1,759	1,450	-	**3,209**
	Total tCO_2e over Construction period	**95,061**	**91,823**	**58,966**	**245,850**

1.9.6 It is evident in Table 1.17 that the total GHG emissions associated with the Proposed Project in the construction phase are 245,850 tCO_2e. The majority of construction phase GHG emissions are attributed to embodied emissions in raw materials. The main contributors to embodied carbon are buildings and electrical equipment at converter stations and substations. Other emission sources include emissions from material transport, construction activities, worker transport, waste, and pre-construction demolition.

1.9.7 A more detailed breakdown of emissions is provided in **Application Document 7.5.13 Greenhouse Gas Reduction Strategy**. In particular, this provides a breakdown of A1-3 emissions by element of works and material category.

1.9.8 A1-3 (product stage) emissions are a key contributor to construction phase emissions, contributing 73% to construction phase emissions. Breaking down A1-3 emissions by element of works, converter stations account for 50% of A1-3 emissions. This can be attributed to the size of these converter stations, as well as the buildings and electrical equipment at these stations which are relatively emission intensive in terms of embodied carbon. Enabling works account for 17% of A1-3 emissions, which can be attributed to the bridges and haul roads constructed as part of enabling works. The marine HVDC cable contributes 15% to A1-3 emissions.

1.9.9 Breaking down A1-3 emissions by material category, electrical equipment in the converter stations and substations is the material category which contributes the most (30%) to A1-3 emissions. This is followed by buildings at the converter stations and substations (28%). Concrete (used in enabling works and across various other elements) accounts for 13% of A1-3 emissions and cables (including the marine HVDC cable) account for 13%.

1.9.10 To contextualise this impact, these construction emissions are compared to the respective UK carbon budgets which coincide with the construction period. This comparison is presented in Table 1.18. For the sake of this comparison, the construction emissions are assumed to be distributed evenly across the years of the construction period.

Table 1.18 Comparison of construction phase GHG emissions with UK carbon budgets

UK Carbon Budget Period	UK Carbon Budget $MtCO_2e$	Construction Emissions (tCO_2e)	Percentage Contribution of Potential Construction Emissions to the UK Carbon Budget
4th (2023-2027)	1,950	98,340	0.005%
5th (2028-2032)	1,725	147,510	0.009%

Operation phase

1.9.11 For the purposes of the climate change assessment, the operational phase of the Proposed Project is assumed to begin in 2031. A reference operational period of 40 years is assumed, in accordance with asset lifespans.

1.9.12 The GHG emissions associated with the operational phase of the Proposed Project have been calculated subject to the methodology, assumptions and limitations detailed in Section 1.4. The results are provided in Table 1.19. The lifecycle modules are labelled in accordance with PAS 2080:2023 guidelines (British Standards Institute (BSI), 2023).

Table 1.19 Operation phase GHG emissions

			GHG Emissions (tCO_2e)			
Lifecycle Module		**Emission Source**	**Suffolk**	**Kent**	**Offshore**	**TOTAL**
B: Use Stage		B2 Maintenance	951	918	590	**2,458**
		B3 Repair	3,251	2,959	2,084	**8,294**
		B6 Operational energy use	5	5	10,066	**10,075**
		Total tCO_2e over Operational period	**4,206**	**3,882**	**12,739**	**20,827**

1.9.13 It is evident in Table 1.19 that the total GHG emissions associated with the Proposed Project in the operational phase are 20,827 tCO_2e. The majority of operational phase GHG emissions are attributed to transmission losses, accounting for 48% of operational phase emissions. This is followed by GHG emissions associated with repair, which account for 40% of operational phase emissions. Other operational emission sources include emissions from maintenance and lighting.

1.9.14 To contextualise this impact, these operational emissions are compared to the respective UK carbon budgets which coincide with the operational period. This

comparison is presented in Table 1.20. For the sake of this comparison, the operational emissions are assumed to be distributed evenly across the years of the operational period.

Table 1.20 Comparison of operation phase GHG emissions with UK carbon budgets

UK Carbon Budget Period	UK Carbon Budget $MtCO_2e$	Operational Emissions (tCO_2e)	Percentage Contribution of Potential Operational Emissions to the UK Carbon Budget
5th (2028-2032)	1,725	1,562	0.0001%
6th (2033-2037)	965	2,603	0.0003%

Decommissioning phase

1.9.15 If the Proposed Project is required to be decommissioned, activities associated with the decommissioning phase will likely result in GHG emissions, including on-site equipment, transport, and waste disposal. However, emissions from the decommissioning process at the end of the design life are very difficult to estimate due to the substantial uncertainty surrounding decommissioning methodologies and approaches so far into the future. Therefore these emissions are not able to be meaningfully quantified at this time.

1.9.16 In contrast to the construction emissions, there will be no materials required (i.e., concrete, stone, etc.) during the decommissioning phase, which would typically account for the majority of construction phase emissions. Emission factors for the disposal, recycling or recovery of wastes are typically significantly lower than the emission factors for the production of the same materials (the embodied carbon). Decommissioning activities are also envisaged to take place over a much shorter period of time compared to the construction phase.

1.9.17 Decommissioning activities requiring the use of plant and machinery will emit GHGs, but the emissions are expected to be significantly less than those calculated for the construction phase given the rationale above. As shown in Table 1.18, construction phase emissions are less than 0.01% of any respective UK carbon budget, meaning that emissions from decommissioning would contribute significantly less than this. The impacts from decommissioning are therefore not likely to be significant in terms of the UK's national GHG inventory or the ability of the UK to meet its carbon budgets.

Overall

1.9.18 Considering the estimated GHG emissions for construction and operation together, the overall estimated GHG emissions of the Proposed Project are contextualised in terms of the UK carbon budgets in Table 1.21.

Table 1.21 Comparison of total Proposed Project GHG emissions with UK carbon budgets.

UK Carbon Budget Period	UK Carbon Budget $MtCO_2e$	Potential Proposed Project Emissions (tCO_2e)	Percentage Contribution of Potential Proposed Project Emissions to the UK Carbon Budget
4th (2023-2027)	1,950	98,340	0.005%
5th (2028-2032)	1,725	149,072	0.009%
6th (2033-2037)	965	2,603	0.0003%

1.9.19 The potential GHG emissions of the Proposed Project are estimated to contribute less than 0.01% of any respective UK carbon budget.

1.9.20 Although the Proposed Project will result in increased GHG emissions, when considering the significance of the effect of the Proposed Project on the climate, consideration needs to be given on its role in wider UK policy to decarbonise the electricity grid. Over its lifetime the Proposed Project will be a key scheme for the UK to fulfil its net zero policy and transition away from fossil fuels. By reinforcing the electricity transmission network, the Proposed Project will facilitate the connection of new renewable and low carbon energy generation and interconnectors.

1.9.21 In accordance with the IEMA guidance (see Section 1.4) the effect of GHG emissions associated with the Proposed Project is deemed to be **not significant**, because the Proposed Project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with 'not significant' effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero. The Proposed Project is part of UK policy to decarbonise the electricity grid and transition to net zero by 2050.

1.9.22 Lifecycle GHG **sequestrations** due to land use are estimated at approximately 5,595 tCO_2e over the 40-year reference period. However, as per PAS 2080 guidance, these sequestrations cannot be accounted for within lifecycle modules A-D and should be reported separately. Therefore these sequestrations are not accounted for the lifecycle assessment above, but are noted here for completion's sake.

Climate Change Resilience Assessment

1.9.23 Table 1.22 below presents a summary of the climate change risks, and their significance, for the Proposed Development. Embedded mitigation associated with each climate hazard is also detailed.

1.9.24 The likelihood, magnitude and significance of these climate change risks has been evaluated assuming the embedded mitigation measures are successfully implemented into the design.

1.9.25 Refer to the methodology in Section 1.4 for an explanation of how risks have been identified.

Table 1.22 Climate Change Risk Assessment

Potential Climate Hazards	Potential Impacts on the Development	Embedded Mitigation Measures	Likelihood	Measure of Consequence	Risk Rating (Likelihood x Consequence)	Significance Level
Construction						
Increased winter precipitation	Flooding of site access routes, damage to onshore building foundations due to increased soil moisture	Flood mitigation measures are detailed in **Application Document 6.2.2.4 Part 2 Suffolk Chapter 4 Water Environment** and **Application Document 6.2.3.4 Part 3 Kent Chapter 4 Water Environment**.	Low	Moderate	Medium	**Not Significant**
Increased annual/summer mean temperatures	Damage to construction plant and equipment, delays to construction schedule	Contractor to monitor weather reports and schedule work accordingly. Further details are provided in **Application Document 7.5.3.1 CEMP Appendix A**	Low	Negligible	Low	**Not Significant**

Potential Climate Hazards	Potential Impacts on the Development	Embedded Mitigation Measures	Likelihood	Measure of Consequence	Risk Rating (Likelihood x Consequence)	Significance Level
		Outline Code of Construction Practice.				
Increased frequency/severity of heatwaves	Delays to construction schedule to do unsafe work conditions	Contractor to monitor weather reports and schedule work accordingly. Further details are provided in **Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice**.	Low	Negligible	Low	**Not Significant**
Extreme Precipitation Events	Increased moisture within materials Increased runoff from material storage	**Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice** details methods for appropriate storage of hazardous and non-hazardous materials.	Low	Low	Low	**Not Significant**

Potential Climate Hazards	Potential Impacts on the Development	Embedded Mitigation Measures	Likelihood	Measure of Consequence	Risk Rating (Likelihood x Consequence)	Significance Level
Operation						
Increased summer/annual mean temperatures	Overheating of electrical equipment Increased demand for air-conditioning at onshore facilities	Conduct thermal modelling of building interiors to ensure manageable operational temperatures.	Negligible	Low	Low	**Not Significant**
Increased frequency and severity of extreme weather events (storms)	Storm surge flooding of onshore facilities Damage to cables due to increased wave activity	Flood mitigation measures are detailed in **Application Document 6.2.2.4 Part 2 Suffolk Chapter 4 Water Environment** and **Application Document 6.2.3.4 Part 3 Kent Chapter 4 Water Environment**. Use of resilient, sustainable materials.	Low	Moderate	Medium	**Not Significant**

Potential Climate Hazards	Potential Impacts on the Development	Embedded Mitigation Measures	Likelihood	Measure of Consequence	Risk Rating (Likelihood x Consequence)	Significance Level
Increase in high wind events	Damage to infrastructure, safety of workers	Avoid maintenance during high wind conditions.	Low	Low	Low	**Not Significant**
Increase in winter precipitation	Flooding of onshore facilities	Flood mitigation measures are detailed in **Application Document 6.2.2.4 Part 2 Suffolk Chapter 4 Water Environment** and **Application Document 6.2.3.4 Part 3 Kent Chapter 4 Water Environment**.	Low	Low	Low	**Not Significant**
Sea level rise	Long-term sea level rise can create increased occurrences of coastal flooding, sea inundation, and coastal erosion at onshore facilities near the coast	Flood mitigation measures are detailed in **Application Document 6.2.2.4 Part 2 Suffolk Chapter 4 Water Environment** and **Application Document**	Low	Moderate	Medium	**Not Significant**

Potential Climate Hazards	Potential Impacts on the Development	Embedded Mitigation Measures	Likelihood	Measure of Consequence	Risk Rating (Likelihood x Consequence)	Significance Level
		6.2.3.4 Part 3 Kent Chapter 4 Water Environment.				
Drought	Drought conditions can cause soil surrounding terrestrial underground cables to dry out and shrink, leading to increased thermal resistivity, reduced heat transfer from cable to surrounding soil/backfill, reduced current carrying capacity, and damage to joint bays	Underground cables and cable surround designed to be resilient to temperature variations.	Low	Low	Low	**Not Significant**

1.9.26 The climate change risk assessment identified ten risks associated with the Proposed Project, four related to construction and six related to operation. Table 1.23 summarises the climate change risk profile of the Proposed Project.

Table 1.23 Climate change risk profile of the Proposed Project

Risk rating (Likelihood x Consequence)	Significance Level	Number of risks
Low	Not Significant	7
Medium	Not Significant	3
High	Significant	0
Extreme	Significant	0

1.9.27 The three 'Medium' risks relate to an increase in winter precipitation over the construction phase and an increase in frequency and severity of extreme storms together with sea level rise over the operational phase, which pose the risks of damage to onshore assets and endangering the health and safety of people on site. The rest of the risks are of a relatively lower likelihood and consequence and are therefore rated as 'Low'.

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

1.9.29 The effect of climate change risk on the Proposed Project is therefore deemed to be **not significant**.

1.10 Additional Mitigation and Enhancement Measures

1.10.1 Additional topic and site-specific mitigation measures that have been applied to mitigate or offset any likely significant effects are included in **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**.

1.10.2 The climate change effects associated with the Proposed Project are deemed **not significant**. Therefore, no additional mitigation and enhancement measures are specifically proposed with regards to climate change.

1.11 Residual Effects and Conclusions

1.11.1 Table 1.24 and Table 1.25 summarise the residual effects of the Proposed Project on climate change receptors. Since the climate change effects associated with the Proposed Project are deemed **not significant**, no additional mitigation measures are proposed and the residual effects are therefore the same as the effects described in Section 1.9.

Table 1.24 Summary of residual climate change effects (Lifecycle GHG Assessment)

Receptor	Sensitivity	Description of Impact	Likely Significant Effect		Additional Mitigation Measures	Residual Effect	
			Magnitude	Significance		Magnitude	Significance
Global climate	The sensitivity of the receptor (global climate) to increases in GHG emissions is always defined as high as any additional GHG impacts could compromise the UK's ability to reduce its GHG emissions and therefore meet its future 5-year carbon budgets.	Initial increase of GHG emissions as a result of construction and operation however, over its lifetime, the Proposed Project will be key for the UK to fulfil its net zero policy and move away from fossil fuels.	Construction and operation of the Proposed Project will result in GHG emissions. There will be embodied carbon in the materials used for the construction of the Proposed Project while fuel use during construction will result in GHG emissions. There will be GHG emissions arising during the operation of the Proposed Project. In accordance with the IEMA guidance (see Section 1.4) the	Since the effect is deemed to be minor adverse it is deemed to be **not significant**, because the Proposed Project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory	Since the likely significant effects are deemed not significant, no additional mitigation measures are proposed.	The magnitude of residual effects is the same as described under 'Likely Significant Effect', as no additional mitigation measures are proposed.	The significance of residual effects is the same as described under 'Likely Significant Effect' (i.e. **not significant**), as no additional mitigation measures are proposed.

Receptor	Sensitivity	Description of Impact	Likely Significant Effect		Additional Mitigation Measures	Residual Effect	
			Magnitude	Significance		Magnitude	Significance
			effect is deemed to be **minor adverse.**	towards net zero. The Proposed Project is part of UK policy to decarbonise the electricity grid and transition to net zero by 2050.			

Table 1.25 Summary of residual climate change effects (Climate Change Resilience Assessment)

Receptor	Sensitivity	Description of Impact	Likely Significant Effect		Additional Mitigation Measures	Residual Effect	
			Magnitude	Significance		Magnitude	Significance
The Prosed Project (during both construction and operation)	The receptor for the CCR review is the Proposed Project itself (during construction and operation) and associated users (e.g., construction and maintenance workers).	The increase of extreme weather events in the UK could lead to detrimental impacts on the Proposed Project.	While there may be impacts on the Proposed Project as a result of climate change it is anticipated the magnitude of these impacts will be managed as necessary	Due to the magnitude of the effect, the significance of the effect is likely to be **not significant**.	Since the likely significant effects are deemed not significant, no additional mitigation measures are proposed.	The magnitude of residual effects is the same as described under 'Likely Significant Effect', as no additional mitigation measures are proposed.	The significance of residual effects is the same as described under 'Likely Significant Effect' (i.e. **not significant**), as no additional mitigation measures are proposed.

Receptor	Sensitivity	Description of Impact	Likely Significant Effect		Additional Mitigation Measures	Residual Effect	
			Magnitude	Significance		Magnitude	Significance
			through embedded mitigation measures. The magnitude of the impact of climate change on the Proposed Project is anticipated to be **low** to **medium**.				

1.11.2 The assessment concludes that the effects on the global climate by the Proposed Project are likely to be **not significant** because the Proposed Project's GHG impacts are fully consistent with applicable existing and emerging policy requirements set by the government to support them in reaching their net zero target and move away from the use of fossil fuels.

1.11.3 The assessment also concludes that the effect of climate change impacts on the Proposed Project is anticipated to be **not significant**. Where any climate change impacts are identified they will be managed through the appropriate mitigation.

1.12 Sensitivity Testing

1.12.1 Under the terms of the DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026.

1.12.2 The grid emission factor is forecast to reduce over this period as the grid decarbonises, meaning that operational emissions associated with electricity may decrease if the Proposed Project is constructed in later years. However, this effect is unlikely to materially impact the significance of the emissions profile of the Proposed Project, and will not affect the conclusions above. Furthermore, this timescale is too short to effect the climate change risk profile of the Proposed Project. Therefore, the effects reported above are not likely to be materially different if the works were to commence in any year up to year five.

1.12.3 Due to the nature of climate change and how it is assessed in the EIA context, transboundary effects are not applicable to climate change. This is due to climate change not being geographically constrained and no significant interdependencies in terms of climate change, as explained in paragraphs 1.4.34 to 1.4.39.

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