The Great Grid Upgrade

Eastern Green Link 5 (EGL 5)

Preliminary Environmental Information Report

Volume 1
Part 4
Chapter 26 Greenhouse Gases

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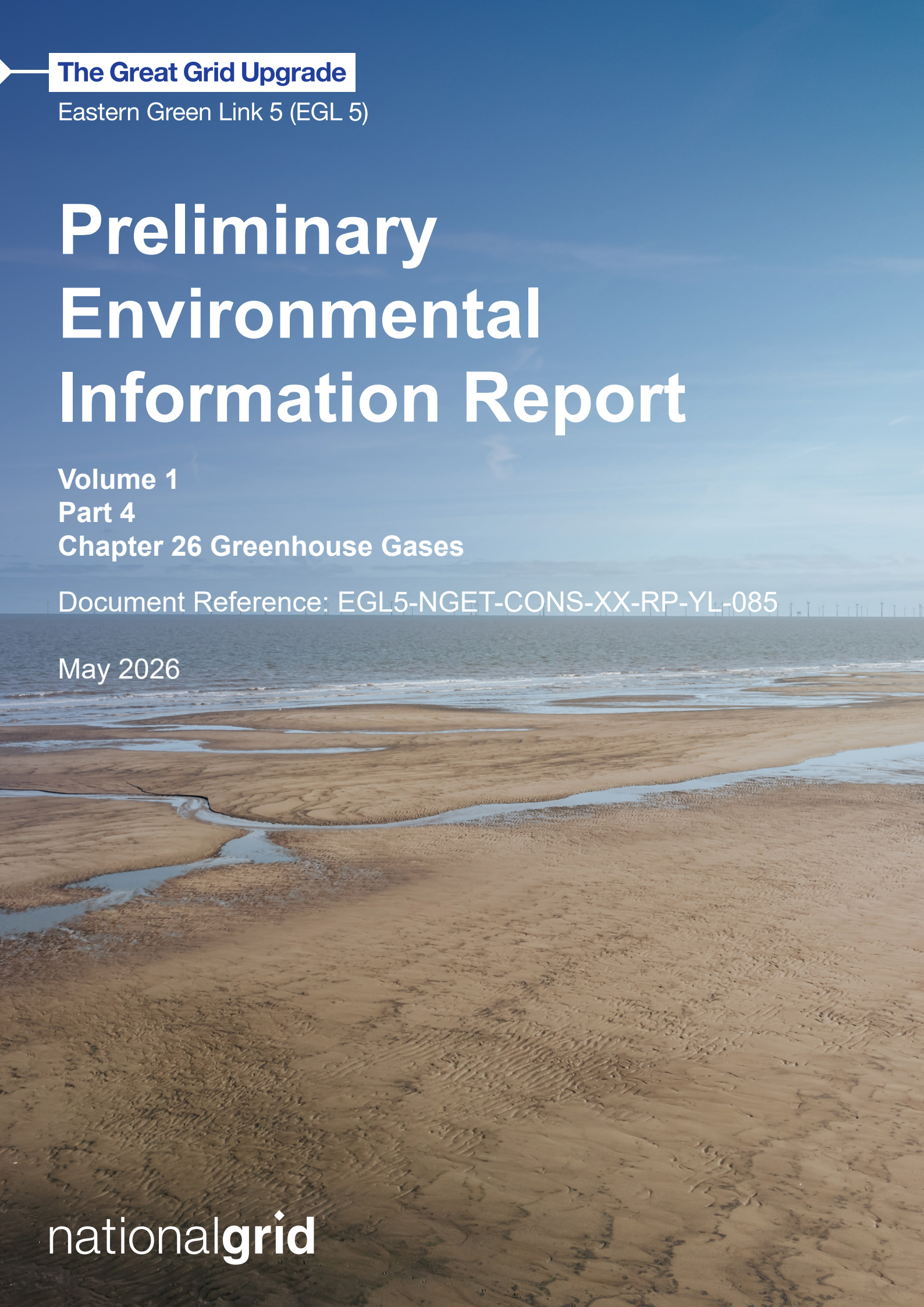

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Contents

26. Greenhouse Gas Emissions

26.1. Introduction

26.1.1. This chapter presents the preliminary findings of the Environmental Impact Assessment (EIA) undertaken to date for the Eastern Green Link (EGL) 5 English Onshore Scheme and English Offshore Scheme (termed collectively, the Project), with respect to Greenhouse Gas (GHG) emissions, including all relevant aspects of construction and operation. The preliminary assessment is based on information obtained to date.

26.1.2. This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, environmental measures, and the potential preliminary GHG effects that could result from the Project during the construction and operation (and maintenance) phases. The emissions from the decommissioning phase have not been considered in this PEIR as stated in **Table 26-7.**

26.1.3. This chapter should be notably read in conjunction and considered alongside the following technical aspect chapters found in **Volume 1:**

- **Part 1, Chapter 4: Description of the Project;**
- **Part 1, Chapter 5: PEIR Approach and Methodology;**
- **Part 2, Chapter 9: Water Environment** (due to the relationship between climate change impacts and flood risk); and
- **Part 2, Chapter 12: Traffic and Transport** (due to the potential for traffic/plant GHG emissions associated with the English Onshore Scheme).

Limitations

26.1.4. Supporting information on technical details can be found in the following appendices in **Volume 2:**

- **Part 1, Appendix 2.A: Regulatory and Planning Context;**
- **Part 1, Appendix 5.A: Outline Register of Design Measures;**
- **Part 1, Appendix 5.B: Outline Code of Construction Practice (CoCP);** and
- **Part 1, Appendix 5.C: Outline Construction Environmental Management Plan (CEMP).**

26.1.5. The information provided in this Preliminary Environmental Information Report (PEIR) is preliminary; the final assessment of potential significant effects will be reported in the Environmental Statement (ES). The PEIR has been produced to fulfil National Grid Electricity Transmission plc (NGET) consultation duties in accordance with Section 42 of the PA2008 and enable consultees to develop an informed view of the preliminary potential significant effects of the Project.

26.1.6. At this early design stage (PEIR stage), design information is insufficient to allow any calculation of likely emissions, and therefore it is not possible to undertake the assessment of significance in line with the Institute of Sustainability and Environmental Professionals (ISEP[1]) guidance (Ref 27.1). Instead, a qualitative appraisal of likely significance has been undertaken at PEIR stage, and emissions hotspots have been identified in order to feed into the ongoing design to avoid and reduce expected emissions from construction and operation.

26.1.7. A full quantitative assessment of GHG emissions will be provided within the ES.

Preliminary significance conclusions

26.1.8. For ease of reference, a summary of the significant and potential significant effects from the preliminary GHG emissions assessment is provided in **Table 26-1**. All other effects in relation to GHG emissions have been assessed as not significant. Further details of the methodology behind the assessment and a detailed narrative of the assessment itself are provided within the sections below.

Table 26-1 Preliminary summary of significance of effects

Receptor and summary of predicted effects	Sensitivity / importance / value of receptor[2]	Magnitude of change[3]	Significance[4]	Summary rationale
Global environment	High	Medium	Minor adverse (not significant)	Construction activities will generate short term GHG emissions. Embedded mitigation measures in design can minimise these impacts.

26.2. Relevant Technical Guidance

26.2.1. The legislation and planning policy that informed the assessment of effects with respect to GHG emissions is provided within **Volume 2, Part 1, Appendix 2.A: Regulatory and Planning Context**. Further information on policies relevant to the Project is provided in **Volume 1, Part 1, Chapter 2: Regulatory and Policy Overview**. Relevant technical guidance, specific to GHG emissions, that has informed this PEIR and will inform the assessment within the ES is summarised below.

1 ISEP, formerly IEMA (Institute of Environmental Management & Assessment).

2 The sensitivity/importance/value of a receptor is defined using the criteria set out in Section 26.9 and is defined as [low, medium, high].

3 The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in Section 26.9 and is defined as [low, medium, high].

4 The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in Section 26.9.

Technical guidance

26.2.2. A summary of the technical guidance for GHG emissions is given in **Table 26-2**.

Table 26-2 Technical guidance relevant to the GHG emissions assessment

Technical guidance document	Context
ISEP[1] Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022) (Ref 26.1)	The aim of this guidance is to assist practitioners with addressing GHG emissions assessment and mitigation in statutory and non-statutory EIA. It complements ISEP's earlier guide on Climate Change Resilience and Adaptation and builds on the Climate Change Mitigation and EIA overarching principles. The requirement to consider this topic has resulted from the 2014 amendment to the EIA Directive.
Ministry of Housing Communities and Local Government (2024). Guidance on Climate Change (Ref 26.2)	The guidance highlights the importance of and advises how to identify suitable climate change mitigation and adaptation measures in the planning process. This would require the implementation of appropriate measures by the local planning authorities.
Overarching National Policy Statement for energy (EN-1) (Ref 26.3)	EN-1 sets the UK government's framework for planning and approving nationally significant energy infrastructure projects. It highlights the urgent need for large-scale energy development to meet net zero targets, ensure security of supply, and support economic growth.
National Policy Statement for electricity networks infrastructure (EN-5) (Ref 26.4)	EN-5 sets out the UK government's framework for planning and consenting nationally significant electricity network projects. It emphasizes the urgent need to expand and modernize transmission and distribution systems to meet rising electricity demand, enable clean power by 2030, and achieve net zero by 2050.
The Greenhouse Gas Protocol (Ref 26.5)	GHG Protocol establishes comprehensive global standardised frameworks to measure and manage GHG emissions from private and public sector operations, value chains and mitigation actions.
Publicly Available Standard (PAS) 2080 (2023) (Ref 26.6)	A standard for managing carbon in buildings and infrastructure. It looks at the whole value chain and aims to reduce carbon and cost through intelligent design, construction and use.

Technical guidance document	Context
Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (Ref 26.7)	The 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories was adopted and accepted during the 49th Session of the IPCC in 2019. It was prepared by the Task Force on National Greenhouse Gas Inventories (TFI) in accordance with the decision taken at the 44th Session of IPCC in Bangkok, Thailand, in 2016.
Royal Institution of Chartered Surveyors (RICS) Whole life carbon assessment for the built environment (Version 3, 2024) (Ref 26.8)	This standard addresses all element and component categories that make up a built asset, across every life cycle stage: from extracting the raw materials and manufacturing construction products, through construction and operation, to recovery or disposal at end of life. It also separately assesses the potential loads and benefits beyond the network boundary in the next life cycle.

26.3. Consultation and Engagement

Overview

26.3.1. The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 5.9** of **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**.

Scoping Opinion

26.3.2. The Scoping Report was submitted to the Planning Inspectorate on 02 September 2025. A Scoping Opinion was adopted by the Secretary of State, administered by the Planning Inspectorate, on 13 October 2025. A summary of the relevant responses received in the Scoping Opinion in relation to the GHG emissions, and confirmation of how these have been addressed within the assessment to date, is presented in **Table 26-3.**

Table 26-3 Summary of EIA scoping opinion responses for GHG emissions

Comment Ref	Sub-topic	Commentary	How addressed in this PEIR
5.1.1	Emissions from the disposal of waste during construction	The Scoping Report proposes to scope out this matter on the basis that emissions from the disposal of waste materials are not expected to give rise to significant effects, as the majority of waste generated is anticipated to be of an inert type. The Inspectorate agrees that this matter can be scoped out of further assessment. The	Emissions from disposal of waste during construction are scoped out of the assessment. Details on the management of non-inert waste will be included within the Outline Code of Construction Practice

Comment Ref	Sub-topic	Commentary	How addressed in this PEIR
		Inspectorate considers, however, that the ES or application documents should include details on the management of any non-inert i.e. non-hazardous or hazardous waste generated.	(CoCP) to be prepared alongside the ES.
5.1.2	Emissions from maintenance, repair, replacement and refurbishment during operation	The Inspectorate agrees that emissions from maintenance, repair, replacement and refurbishment of activities would be minimal and are unlikely to lead to significant effects. On this basis the Inspectorate agrees that this matter can be scoped out of further assessment.	Emissions from maintenance, repair, replacement and refurbishment during operation are scoped out of the assessment.
5.1.3	Emissions from operational energy use	The Inspectorate agrees that this matter can be scoped out of further assessment on the basis that the operational phase would require limited energy use as the operation is for the transmission of electricity.	Emissions from operational energy use are scoped out of the assessment.
5.1.4	Emissions from operational water use	The Inspectorate agrees that this matter can be scoped out of further assessment on the basis of the nature of the development meaning operational water use would be minimal.	Emissions from operational water use are scoped out of the assessment.
5.1.5	End user emissions during operation	The Inspectorate agrees that this matter can be scoped out on the basis the operational phase would require limited energy or other resource use as the operation is for the transmission of electricity.	End user emissions during operation are scoped out of the assessment.
5.1.6	Emissions during decommissioning and Transport and disposal of end-of-life materials	The Scoping Report proposes to scope out noting that the process of decommissioning is far in the future (60 years), and the specifics of decommissioning are not known in terms of material volume or available disposal routes. The Inspectorate agrees that this matter can be scoped out of the ES. The ES should however indicate how it is secured through the DCO that an assessment of decommissioning emissions at a later date will be undertaken.	Decommissioning stage emissions are scoped out of the assessment. Details will be included within the ES regarding how a future assessment of decommissioning emissions will be secured through the DCO.

26.3.3. A number of relevant responses in relation to climate change and GHG were also received during non-statutory consultations. A summary of how these responses are or will be addressed is provided in **Table 26-4**.

Table 26-4 Summary of EIA scoping (non-statutory) opinion responses for GHG emissions

Summary of matters raised	Respondent	How addressed in this PEIR
Criticism of net zero goals. Comments suggesting net zero is pointless or that the emissions make no difference.	Various	The Project forms part of ongoing efforts to reduce the carbon impact of the national electricity grid. The assessment of impacts focuses on the current Project. It does not comment on wider UK Government policy in reducing the UK's overall GHG emissions in line with international commitments made via the United Nations Framework Convention on Climate Change.
Concern about the carbon footprint of the Project. Comments referring to a full and detailed study is required to consider the future needs across the whole of the country and more thought given to climate change and nature.	Various	This chapter will provide a whole lifecycle view of forecast GHG emissions across the construction, operation, and future decommissioning of the Project. The assessment of potential impacts in the Climate Change topic is measured in the context of UK Carbon Budgets (**Table 26-8**) which considers the needs of the whole country in meeting its current internationally agreed targets for reducing GHG emissions. Separate chapters within this PEIR will consider potential impacts on the environment (onshore and offshore) and associated details regarding ecology and biodiversity.
Well Parish Council commented that the Government's commitment to net zero has led to a rapid expansion of renewables, often located far from where energy is needed, resulting in inefficiency, increased costs, and supply risks. It also highlighted that renewable projects require growing government subsidies to remain viable, while domestic gas production faces restrictions, pushing the UK to rely on expensive imported energy. Well Parish Council pointed out that proposed onshore and offshore grid upgrades, substations, and interconnectors would bring little local	Well Parish Council.	The GHG Assessment for the Project provides an evaluation of the potential impacts that may arise (in terms of the GHG emissions) across the lifetime of its existence (construction, operation and decommissioning). As with any form of DCO application, there is no requirement to consider the wider rationale or challenges / benefits of UK Government national Net Zero policies. Further details regarding the need for the Project are set out in **Volume 1, Part 1, Chapter 1: Introduction**. Details regarding economic activity and job creation arising from the Project will be provided in **Volume 1, Part 2,**

Summary of matters raised	Respondent	How addressed in this PEIR
benefit or jobs. It considered the Project would facilitate an expansion of largely uneconomic, taxpayer-subsidised renewables. Well Parish Council suggested alternatives, including connecting generation directly to areas of demand or using an integrated offshore grid, and called for regulatory reform to protect consumers from rising costs and export-driven price increases.		**Chapter 15: Socio-economics, Recreation and Tourism** within the ES.

26.4. Data Gathering Methodology

26.4.1. The following information has been considered in drafting this PEIR and will be subject to further analysis during the EIA process for those matters which have been considered at this stage of the assessment (see **Table 26-6**).

Study area

26.4.2. The assessment of GHG emissions is not restricted by geographical area, instead focusing on any increase or decrease in emissions as a result of the Project, wherever that may be. This includes:

- Construction emissions from the Project's footprint but also relating to the transport of materials to and from the Site and their manufacture. This may be distant from the Project's location, for example, GHG emissions associated with the manufacture of concrete in terms of embodied carbon and energy in the production process.
- Operation emissions (increase or reduction) which result from the operation of the Project and any shifts in energy usage that may occur. In this case, GHG emissions include those for embodied emissions arising from materials and waste for the operation of the Project, operational energy and water use.
- Decommissioning emissions will be considered in the ES. This will include summary details regarding future sources of GHG emissions relating to decommissioning and how ongoing maintenance can support in minimising these emissions.

Desk study

26.4.3. The preliminary desk study assessment has reviewed the most up to date design details available at the time of writing the PEIR. Final design details will be assessed at ES.

Survey work

26.4.4. No survey work has been required in the preparation of this PEIR. It is not anticipated that any survey work specific to the GHG assessment will be required in preparation of the ES.

26.5. Overall Baseline

Current baseline

26.5.1. GHG emissions occur constantly and widely as a result of natural and human activity, including land use and land use change, energy consumption (e.g., fossil fuels, purchased energy from the grid and / or other sources) and industrial processes. The GHG assessment only considers the scenario in which the Project result in additional or avoided emissions in comparison to the baseline.

26.5.2. The latest summary of GHG emissions for Lincolnshire, East Midlands, and the UK for 2023 (Ref 26.9) are presented in **Table 26-5**. The emissions sources are a subset of the total emissions for each region, chosen for their relevance to the Project, with the grand total for all emissions sources provided. These emissions have only been provided for context and are not the current baseline emissions for this assessment.

Table 26-5 UK and regional GHG emissions (2023)

Emissions Source	Lincolnshire ($ktCO_2e$) *	East Midlands ($ktCO_2e$)	UK ($ktCO_2e$)
Industry Electricity	112	730	8,959
Industry Gas	101	1,151	12,571
Large Industrial Installations	12	3,460	24,931
Industry 'Other'	104	931	10,214
Industry Total	**328**	**6,272**	**56,675**
Commercial Electricity	155	1,043	15,762
Commercial Gas	89	906	11,270
Commercial 'Other'	24	189	2,559
Commercial Total	**267**	**2,138**	**29,590**
Public Sector Electricity	25	207	3,003
Public Sector Gas	55	448	6,151
Public Sector 'Other'	10	74	1,225
Public Sector Total	**90**	**729**	**10,380**
Domestic Electricity	216	1,262	17,625
Domestic Gas	510	3,892	50,657
Domestic 'Other'	182	513	8,615
Domestic Total	**908**	**5,667**	**76,897**
Road Transport (A-roads)	814	4,353	43,809

Emissions Source	Lincolnshire ($ktCO_2e$) *	East Midlands ($ktCO_2e$)	UK ($ktCO_2e$)
Road Transport (Motorways)	0	1,647	23,588
Road Transport (Minor roads)	489	3,582	40,977
Diesel Railways	35	210	1,703
Transport 'Other'	28	232	3,230
Transport Total	**1,366**	**10,025**	**113,307**
Landfill	119	1,244	14,450
Waste 'Other'	68	396	5,388
Waste Total	**188**	**1,639**	**19,838**
Other Total (LULUCF and Agriculture)**	**1,900**	**3,883**	**49,407**
Grand Total***	**5,048**	**30,353**	**356,094**

*" $ktCO_2e$ " stands for kilo tonnes of carbon dioxide equivalent. Carbon dioxide equivalent (CO_2e) is a metric measure used to compare the emissions of different greenhouse gases (GHGs) based on their global warming potential (GWP) relative to CO_2.

**Land Use, Land-Use Change and Forestry

***Note: individual emission entries have been rounded, so rounding errors may occur in combined totals.

26.5.3. Context for offshore emissions is provided through UK reported GHG emissions associated with domestic shipping. For inventory reporting purposes, domestic and international shipping emissions are defined by voyage start / destinations (i.e., a voyage from a UK port to a UK port is classed as UK domestic for reporting purposes), rather than by the vessel itself (e.g., UK registered vessels may conduct voyages to foreign ports). Automatic Identification System (AIS) data is used to enable fuel consumption estimates associated with different vessels. The latest available data (Ref 27.8) shows reportable UK domestic shipping emissions of 5,200 $ktCO_2e$. This is 5% of total UK domestic transport emissions in 2023.

26.5.4. Since the Project contributes to wider action associated with UK national net zero targets, the current baseline is therefore viewed as existing UK carbon budgets and sectoral allocations as recommended by the Climate Change Committee (CCC).

26.5.5. On this basis, the current UK carbon budget (2023 – 2027) of 1,950 million tCO_2e and power sector allocation of 189 million tCO_2e (38 million tCO_2e average per year) form the current baseline. The change in GHG emissions associated with the Project is evaluated against national, regional and local targets for decarbonisation (the future baseline).

Future baseline

26.5.6. GHG emissions are required to reduce in the future to meet government targets. The UK Government has set a net zero target, which requires the UK to reduce GHG emissions by 100% below 1990 levels by 2050. Policy has been implemented at national, regional and local scales in order to achieve targets for decarbonisation. The future baseline considers relevant policy and a number of the UK carbon budgets (including sectoral allocations) over the lifetime of the Project: the fourth carbon budget (2023 to 2027) of 1,950 million tCO_2e, the fifth carbon budget (2028 to 2032) of 1,725 million tCO_2e, the sixth carbon budget (2033 to 2037) of 965 million tCO_2e and the seventh carbon budget (2038-2042) of 535 million tCO_2e[5].

26.5.7. It is recognised that there are a number of other proposed and committed developments within the surrounding area that could alter the future baseline in the absence of the Project. The potential for inter-project cumulative effects and intra-project cumulative effects will be considered according to the approach outlined within **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology** and **Volume 1, Part 4, Chapter 27: Cumulative Effects.**

26.5.8. Emissions from a 'no development' case in the future baseline is represented by the existing GHG emissions within the Site prior to construction and operation of the Project, or by the GHG emissions arising from an alternative project design and assumptions. Since there is no physical development and activity at the location of the Project in the no development scenario, the GHG emissions prior to construction and operation will be zero.

26.6. Environmental Measures

26.6.1. As set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**, the environmental measures are characterised as design measures or control and management measures. A range of environmental measures would be implemented as part of the English Onshore Scheme and the English Offshore Scheme and will be secured in the DCO as relevant.

26.6.2. **Table 26-6** outlines how these design and control measures will influence the GHG emissions assessment.

[5] It is noted that at the time of production of this report the UK Government has not formally set the 7th Carbon Budget. For the purposes of analysis, it is assumed that the UK Government will implement the recommendation of the Climate Change Committee (as is the case for all previous Carbon Budgets).

Table 26-6 Summary of the environmental measures

Receptor	Potential changes and effects	Environmental measures	Compliance mechanism	ID Reference
Construction				
Global environment	GHG emissions reduction	Applying the waste hierarchy to seek re-use and recycling or re-purposing of materials in preference to the use of virgin materials. Use of waste management protocols to segregate waste arisings and enable effective resource use.	Application of the waste hierarchy will be embedded in the Outline Code of Construction Practice (CoCP) secured via the DCO. A specific Site Waste Management Plan (SWMP) will be required for both onshore and offshore works.	GHG01 (C)
Global environment	GHG emissions reduction	Where possible, using more modern and efficient construction plant and delivery vehicles, and / or those powered by electricity from alternative / lower carbon fuels.	Outline CoCP secured via the DCO.	GHG02 (C)
Design and Operations				
Global environment	GHG emissions reduction	The Project will consider a range of design optimisation measures to reflect the carbon reduction hierarchy (detailed below and found in clause 6.1.4 of PAS 2080:2023): • reduce the number of elements required for the Project;	Approach embedded in rationale for design team.	GHG01 (D)

Receptor	Potential changes and effects	Environmental measures	Compliance mechanism	ID Reference
		• reduce the requirement for construction materials by smart design; • substitute-in and use alternative raw materials and resources with lower embodied carbon; and • efficient construction processes, such as embracing design for manufacture and assembly.		
Global environment	GHG emissions reduction	The Project will maximise the opportunity to use more sustainable materials by specifying, in procurement documentation, that materials and products with reduced embodied carbon emissions, and materials / resources featuring recycled content (where safe and of sufficient integrity for engineering).	Details are set out in NGET's Sustainable Procurement Policy. This is linked to a Supplier Code of Conduct and Environmental Policy.	GHG02 (D)
Global environment	GHG emissions reduction	Designing, specifying and constructing the Project with a view to maximising the operational lifespan and minimising the need for maintenance and refurbishment (and thus reducing the frequency of releasing associated GHG emissions.	Details are set out in NGET's Sustainable Procurement Policy. This is linked to a Supplier Code of Conduct and Environmental Policy.	GHG03 (D)
Global environment	GHG emissions reduction	The Project's ancillary infrastructure and equipment (such as lighting and telecommunications) will comply with the relevant design standard and specifications and will be selected for its durability and energy efficiency credentials.	General site management good practice will be set out in the Outline CoCP secured via the DCO.	GHG04 (D)
Global environment	GHG emissions reduction	All design decisions to be framed by the six principles of circular economy set out in BS8001:2017. Resource Efficiency targets will include diversion of 100% of avoidable waste streams from landfill and a minimum	Sustainable Procurement Policy.	GHG05 (D)

Receptor	Potential changes and effects	Environmental measures	Compliance mechanism	ID Reference
		overall recycling rate of at least 80% as well as an average recycled content by value of 30% for applicable construction materials.		
Global environment	GHG emissions reduction as a result of Sulphur Hexafluoride (SF_6) leakage	To meet NGET's environmental commitment to a 50% reduction in SF_6 emissions from a 2018 - 2019 baseline by 2030, and environmental ambition to eliminate SF_6 equipment by 2050, the procurement of new SF_6 equipment is no longer acceptable. Instances where use of SF_6 equipment is unavoidable or where use of SF_6-free technology for a specific application is not technically viable or is commercially restrictive, a deviation shall be sought as an exceptional case.	As per NPS EN-5, the design of the Project needs to use non- SF_6 assets unless it can be demonstrated that this is not practicable. In unavoidable instances where any SF_6-reliant assets are proposed, the NARM framework meets ongoing requirements to monitor and control fugitive SF_6 emissions consistent with the Fluorinated gas (F-gas) Regulation and its successors.	GHG06 (D)

26.7. Scope of the Assessment

Spatial scope and study area

26.7.1. The assessment of GHG emissions is not restricted by geographical area, instead focusing on any increase or decrease in emissions as a result of the Project, wherever that may be. Section 26.4 above outlines what the GHG assessment includes.

Temporal scope

26.7.2. The temporal scope of the assessment of GHG emissions is consistent with the period over which the Project would be carried out. It covers the period of construction and the entire operational lifetime.

26.7.3. The life span of the Project is expected to be approximately 40 years. If decommissioning is required at this point in time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of two years, and with the removal of visible infrastructure, effects would reduce over the course of that period. Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, it is considered that the significance of effects relating to the construction phase assessment would be greater than the decommissioning phase and decommissioning effects are not discussed in detail in this chapter; however, **Table 4-19** in **Volume 1, Part 1, Chapter 4: Description of the Project** provides a high level summary assessment of the likely activities associated with decommissioning. Furthermore, should decommissioning take place, it is expected that an assessment in accordance with the legislation and guidance at the time of decommissioning would be undertaken.

Identification of receptors

26.7.4. The impacts of GHG emissions relate to their contribution to global warming and climate change. These impacts are global and cumulative in nature, with every tonne of GHG emissions contributing to impacts on natural and human systems. GHG emissions result in the same global effects wherever and whenever they occur, and, therefore, the sensitivity of different human and natural receptors is not considered.

Potential effects considered within this assessment

26.7.5. The PAS2080:2023 lifecycle stages describe the sources of activities that may give rise to GHG emissions. These apply to the Construction, Operational and Decommissioning stages of the Project.

26.7.6. With reference to all PAS 2080:2023 lifecycle stages, the impacts scoped in or out for GHGs are as follows:

Table 26-7 GHG emissions lifecycle stages scoped in or out for further assessment

Impacts	Phase	Scoped in	Scoped out	Justification
Product Stage (manufacture and transport of raw materials to suppliers) (A1-3)	Construction	✓		Raw materials required for the Project would result in embodied emissions that have the potential to be large.
Transport of Materials to Site (A4)	Construction	✓		Construction phase emissions from fuel / energy consumption due to the delivery of material to the site have the potential to be large.
Plant and Equipment Use during Construction (A5)	Construction	✓		Emissions from the plant and equipment used during the construction of the Project have the potential to be large.
Transport of Waste (A5)	Construction	✓		Emissions from fuel / energy consumption due to the transport of waste materials have the potential to be large.
Disposal of Waste (A5)	Construction		✓	Emissions from the disposal of waste materials is not expected to be large as it will predominantly comprise inert waste.
Land use, Land Use Change and Forestry (A5)	Construction	✓		Emissions from the change in land use from existing agricultural land may be significant.
Operation (B1)	Operation	✓		Leakage of Sulphur Hexafluoride (SF_6) from switchgear or circuit-breakers.
Maintenance, Repair, Replacement, Refurbishment (B2-5)	Operation		✓	The Project is not designed with the expectation of any significant plant maintenance and repair activities, or refurbishment being required, and therefore emissions due to these activities are expected to be minimal.

Impacts	Phase	Scoped in	Scoped out	Justification
Operational Energy Use (B6)	Operation		✓	The Project is not designed with the expectation of any significant operational energy use and therefore emissions due to these activities are expected to be minimal.
Operational Water Use (B7)	Operation		✓	The Project is not designed with the expectation of any significant operational water use and therefore emissions due to these activities are expected to be minimal.
Land Use, Land Use Change and Forestry (B8)	Operation	✓		The reduction in carbon sequestration due to the land use change from the Project may be significant.
End-user Emissions (B9/D)	Operation		✓	The Project is not designed with the expectation of any significant end user emissions and therefore emissions due to these activities are expected to be minimal.
Decommissioning Process (C1)	Decommissioning		✓	The potential effects of the decommissioning phase of the Project have been scoped out. This is due to uncertainties around the fate of infrastructure at this stage (40 years in future).
Transport and Disposal of Materials (C2-4)	Decommissioning		✓	The potential effects of the decommissioning phase of the Project have been scoped out. This is due to uncertainties around the fate of infrastructure at this stage (40 years in future).

26.8. Key Parameters for Assessment

Realistic worst-case design scenario

26.8.1. The key activities that will cause GHG emissions within the Project relate to the quantities of materials used, the manufacture and transport of those materials to the sites and the construction of the Project (associated plant equipment and resource use).

26.8.2. Given the extensive design envelope, it is not considered useful to quantify projected GHG emissions at PEIR since the output figures will necessarily sit within a wide range. Quantified details will be presented within the ES.

26.8.3. Good practice design work, aligned with a PAS2080:2023 approach, will continue to look to minimise resource needs and, by extension, GHG emissions associated with the Project.

26.8.4. At ES stage, when a more developed design proposal is in place, a quantified assessment of significance will be undertaken including details on assessment of emissions from decommissioning stage. This will be a 'worst case' scenario since it will incorporate an estimated bill of quantities and model primary activities as set out in an indicative schedule.

Consideration of construction scenarios

26.8.5. As detailed in **Volume 1, Part 1, Chapter 4: Description of the Project**, the timing of construction activities set out within this PEIR is indicative. To allow for any unexpected circumstances and a realistic worst-case assessment, the impact assessment for the English Onshore Scheme and English Offshore Scheme considers the following construction scenario to ensure the worst-case scenario for GHG emissions can be identified and assessed.

26.8.6. Delivery of the concurrent scenario as described in **Volume 1, Part 1, Chapter 4: Description of the Project** will be used for the assessment. This represents a scenario where there is the most complexity in terms of programmes of works. This means potentially the largest challenge in managing GHG emissions associated with the transport of materials and workers, as well as use of plant and equipment in construction activities. This can therefore be considered a worst-case scenario.

26.9. Assessment Methodology

Overview

26.9.1. The generic project-wide approach to the assessment methodology is set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**. However, whilst this has informed the approach that has been used in this GHG emissions assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this GHG assessment. Details are provided below.

Approach

26.9.2. The assessment approach considers the likely magnitude of GHG emissions (or avoided emissions) in comparison to the baseline without the Project. It considers emissions throughout the lifecycle of the Project, addressing:

- Construction phase - e.g., embodied emissions associated with materials, transportation of materials to the Site and waste / arisings from the Site, and the construction process; and
- Operation phase - e.g., maintenance and replacement of original materials.

26.9.3. For all PAS 2080:2023 lifecycle stages and sub-stages of the Project that are scoped in, the assessment will include the following:

- Collection of available data / information on the scale of GHG emitting activities (e.g. Tonnes of concrete, litres of fuel, kilowatt hours (kWh electricity) and GHG capturing activities for the baseline and for the Project. In each case, this will cover the whole study period (design life of approximately 40 years); and
- Calculation of the GHG emissions by applying a suitable emissions factor (per unit of emissions generating or capturing activity).

26.9.4. Emissions calculations will focus on emissions annually and throughout the Project's lifecycle. Values will be reported as tonnes of CO_2 equivalents (tCO_2e).

26.9.5. The assessment of construction and operation impacts will be undertaken in line with the following guidance:

- PAS 2080:2023 (Ref 26.6);
- ISO 14064-1:2018 (Ref 26.11);
- GHG Protocol (Ref 26.5); and
- IPCC Guidelines for National Greenhouse Gas Inventories (Ref 27.7).

Magnitude of impact

26.9.6. Any magnitude of emitted or avoided GHG emissions makes a cumulative contribution to climate change (adverse or beneficial, respectively). There are currently no agreed thresholds for what level of GHG emissions is considered significant in the context of the EIA Regulations (Ref 26.12). Therefore, to contextualise the carbon emissions of the Project, these will be compared to the UK Carbon Budgets (Ref 26.13).

Significance of effect

26.9.7. Significance of GHG impacts is assessed in line with ISEP guidance (Ref 26.1): "*a development's emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible. The evaluation of significance should not just focus on GHG emissions, or the magnitude of those emissions, but whether the Proposed Developments contribute to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".*

26.9.8. The following terms are used to define the significance of the effects identified as set out in ISEP Guidance:

- Major adverse (significant): the 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 nor make a meaningful contribution to the UK's trajectory towards net zero.

- Moderate adverse (significant): the 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, falling short of fully contributing to the UK's trajectory towards net zero.
- Minor adverse (not significant): the GHG impacts are fully consistent with applicable existing and emerging policy requirements and good practice design standards; they are fully in line with measures necessary to achieve the UK's trajectory towards net zero.
- Negligible (not significant): the GHG impacts are 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.
- Positive (significant): the net GHG impacts are below zero, causing a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline, substantially exceeding net zero requirements with a beneficial climate impact.

Preliminary assessment of cumulative effects

26.9.9. The approach to cumulative effects assessment (CEA) for GHGs differs from that for many EIA topics. All global cumulative GHG sources are relevant to the effect on climate change, and this is considered in defining the receptor as being of 'high' sensitivity. Effects of GHG emissions from specific cumulative projects are not assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other. Additionally, the contextualisation of GHG emissions, by its nature, incorporates the cumulative contributions of other GHG sources which make up that context. Therefore, it is not necessary to carry out a separate CEA of GHG emissions as part of this EIA. This approach is in accordance with ISEP guidance.

26.10. Preliminary Assessment of GHG Effects

26.10.1. In terms of the English Offshore Scheme, sources of GHG emissions to be minimised in design relate to:

- Construction: Routeing of the High Voltage Direct Current (HVDC) cables and the associated embodied carbon associated with the production of the cables. Efficient routeing will minimise the length of cables required and the associated GHG emissions.
- Construction: Laying of the cables. Cable installation will be carried out by specialist marine vessels. The associated fuel use by the vessels will result in GHG emissions. The means of cable installation (displacement of existing seabed material and / or encapsulation of cabling) will determine the quantities of any additional materials required.
- Operation: Maintenance and repair of cables. The associated fibre optic cabling enables remote monitoring of the cables, reducing the need for inspection by a marine vessel. Repair and replacement of cable sections will be carried out in a similar manner to installation.

26.10.2. In terms of the English Onshore Scheme, sources of GHG emissions to be minimised in design relate to:

- Construction: Embodied carbon associated with installed assets (converter station equipment, HVDC and High Voltage Alternating Current (HVAC) cables, substation equipment and materials in works on existing 400 kilovolt (kV) overhead lines). Avoiding use of SF6 in switchgear where practical.
- Construction: Fuel use in plant equipment used in construction works. Protocols set out in **Volume 2, Part 1, Appendix 5.B: Outline Code of Construction Practice** (CoCP) and **Volume 2, Part 1, Appendix 5.C: Outline Construction Environmental Management Plan** (CEMP) regarding equipment specifications, use of lower carbon alternative fuels to diesel and idling regimes when not in use, all contribute to minimising impacts.
- Construction: Traffic management in relation to the movement of materials and staff to the site. Efficient logistics and site travel management plans can minimise GHG impacts through promoting the use of low emission vehicles.
- Operation: Maintenance activities associated with operating assets.

26.10.3. Given the existing embedded measures identified in **Table 26-6** and associated Outline CEMP and CoCP, an initial assessment of the potential impacts of the Project is that it will give rise to a potential minor adverse (not significant) effect. This is on the basis of comparison against existing UK and sectoral carbon budget targets (**Table 26-8**).

Table 26-8 Context for assessment of significance: UK Carbon Budgets

Carbon Budget (tCO_2e)	4th (2023-2027)	5th (2028-2032)	6th (2033-2037)	7th (2038-2042)
Total UK Carbon Budget	1,950,000,000	1,725,000,000	965,000,000	535,000,000
CCC Sector Budget	189,160,000	92,570,000	35,740,000	23,200,000[6]

26.10.4. Construction works for the Project will fall within the 5th and 6th Carbon Budget periods. Whilst a quantitative assessment has not been carried out for this PEIR, it is possible to use the territorial emissions reported in **Table 26-5** as a means of evaluating the scale of GHG emissions that would constitute significant. If, for example, Construction emissions amounted to 1% of the 5th UK Carbon Budget, this would translate as 17,250 $ktCO_2e$. In territorial GHG emission terms, this would amount to approximately half of the total GHG emissions of Lincolnshire and East Midlands combined (35,401 $ktCO_2e$ in 2023). Embedded good design and construction practice means that the actual impacts will be much lower.

[6] The 7th CCC Sector Budget is not yet a legal budget and is likely to be laid down by June 2026.

26.10.5. Operation stage emissions will be much lower than the Construction stage, given minimal maintenance / repair requirements and no significant fuel or water requirements in operation. This is reflected in the Scoping Opinion response and the agreement to scope out a number of lifecycle stages in Operation (as summarised in **Table 26-3**).

26.10.6. In summary, while there will be GHG emissions arising from the Construction and Operation of the Project, these emissions are not considered to be of a sufficient scale to impact the overall trajectory of the UK's net zero targets.

26.11. Transboundary Effects

26.11.1. The assessment methodology includes contextualisation of Project emissions against the UK and Scottish carbon budgets and net zero targets, recognising that greenhouse gas emissions contribute to global and cumulative climate change. Emissions of GHGs to the atmosphere have the potential to contribute to climate change regardless of where they arise. On that basis no specific localised transboundary impacts are identified.

26.12. Further Work to be Undertaken

26.12.1. The information provided in this PEIR is preliminary; the final assessment of potential significant effects will be reported in the ES.

26.12.2. Details included in the analysis in the ES will relate to all elements of the Project as set out in **Volume 1, Part 1, Chapter 4: Description of the Project**.

26.12.3. In terms of Construction, analysis will quantify potential impacts in relation to those lifecycle stages scoped into the assessment. Specifically:

- Raw materials – Embodied carbon associated with selected materials [Lifecycle stage - A1-3];
- Movement of raw materials - Transport of Materials to Site [Lifecycle stage - A4];
- Plant and Equipment Use during Construction [Lifecycle stage – A5];
- Transport of Waste to suitable disposal sites [Lifecycle stage – A5]; and
- Land use, Land Use Change and Forestry – any residual impacts in terms of carbon sinks within the sites [Lifecycle stage – A5].

26.12.4. In terms of Operation, analysis will quantify potential impacts in relation to those lifecycle stages scoped into the assessment. Specifically:

- Leakage of Sulphur Hexafluoride (SF_6) from switchgear or circuit-breakers [Lifecycle stage – B1]; and
- Land use, Land Use Change and Forestry – The reduction in carbon sequestration due to the land use change from the Project [Lifecycle stage – B8].

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