

The Lighthouse Green Fuels Order

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Abbreviations

Abbreviation	In full
CCC	Climate Change Committee
CH ₄	Methane
CHP	Combined Heat and Power
CO ₂	Carbon dioxide
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
EN-1	The Overarching National Policy Statement for Energy
EN-3	National Policy Statement for Renewable Energy Infrastructure
ES	Environmental Statement
fCEMP	Framework Construction Environmental Management Plan
fCTMP	Framework Construction Traffic Management Plan
fCWTP	Framework Construction Workers Travel Plan
FSC	Forest Stewardship Council
GHG	Greenhouse Gases
HFCs	Hydrofluorocarbons
IEMA	Institute of Environmental Management and Assessment
ISCC	International Sustainability and Carbon Certification
ISEP	Institute of Sustainability and Environmental Professionals
LGF	Lighthouse Green Fuels
MPS	Marine Policy Statement
N ₂ O	Nitrous oxide
NF ₃	Nitrogen trifluoride
NPPF	National Planning Policy Framework
NPS	National Policy Statement
PAS	Publicly Available Specification
PEFC	Programme for the Endorsement of Forest Certification
PEIR	Preliminary Environmental Information Report
PFCs	Perfluorocarbons
PINS	Planning Inspectorate
RCBC	Redcar and Cleveland Borough Council
RICS	Royal Institution of Chartered Surveyors
RTFO	Renewable Transport Fuel Obligations
SAF	Sustainable Aviation Fuel
SBP	Sustainable Biomass Program

SF ₆	Sulphur hexafluoride
STBC	Stockton-on-Tees Borough Council
tCO ₂ e	tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
WLCA	Whole Life Carbon Assessment

14 Greenhouse Gas Emissions

14.1 Introduction

14.1.1 This chapter of the Environmental Statement (ES) presents the assessment of likely significant effects on greenhouse gas (GHG) emissions arising from construction, operation and decommissioning of the Proposed Development. This chapter sets out the relevant legislation, policy, standards and guidance applied to the assessment process; consultation undertaken to inform the assessment; assessment methodology; the relevant baseline conditions upon which the assessment is based; embedded mitigation considered in place before the assessment is undertaken; the likely significant effects that may arise as a result of the Proposed Development considering embedded mitigation; further mitigation proposals to reduce or remove identified likely significant effects wherever possible; likely remaining residual effects following further mitigation; and any monitoring proposals. This chapter should be read in conjunction with **Chapter 4: Proposed Development (ES Volume I, Application Document Ref. 6.1))**.

14.1.2 This chapter is supported by **Appendix 14A: Greenhouse Gases Data and Assumptions (ES Volume III, Application Document Ref. 6.3)**.

14.2 Legislation and planning policy context

Overview

14.2.1 Table 14.1 lists the legislation and case law, policy and guidance relevant to GHG for the Proposed Development and specifies where in the ES information is provided in relation to these.

Table 14.1 Relevant legislation, case law, policy and guidance for GHG

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
Legislation and case law		
United Nations Framework Convention on Climate Change [Ref 1] The UK is a party to the United Nations Framework Convention on Climate Change ('UNFCCC') which provides a framework for international action on climate change. The Kyoto Protocol [Ref 2] was adopted in 1997 and operationalised the UNFCCC by committing industrialised countries, including the UK, to reduce and limit GHG emissions in accordance with agreed individual targets. The Paris Agreement (2015) was adopted under the UNFCCC. The UK has submitted nationally determined contributions under the Paris Agreement, including commitments to reduce GHG emissions.	The aviation sector is a significant contributor to global carbon emissions. Sustainable Aviation Fuel (SAF) presents a viable solution to reduce these carbon emissions. The Proposed Development will help the UK meet its ambitions of 10% SAF uptake by 2030.	This requirement is addressed in Section 14.6
The Climate Change Act 2008 [Ref 3] The Climate Change Act 2008 established a statutory target for an 80% reduction in the GHG emissions of the net UK carbon account by 2050 in comparison to the 1990 baseline. In June 2019 the UK Government amended this target to "at least 100%" reduction (net zero emissions) by 2050. This target is supported by a system of legally binding five-year "Carbon Budgets" that restrict the amount of GHG emissions the UK can legally emit. The fourth (2023-2027), fifth (2028-2032) and sixth (2033-2037) Carbon Budgets have been set and are legally binding for their respective periods. The Climate Change Committee (CCC) published its advice on the seventh Carbon Budget (2038-2042), which outlines the recommended emissions limits for that period [Ref 4]. However, this seventh budget is not yet set.	With the national net zero targets, it is important for the whole life GHG emissions of the Proposed Development to align with a net zero trajectory. The assessment considers the likely significant effects of GHG emissions in terms of alignment to this trajectory. As part of the assessment, estimated GHG emissions for the Proposed Development are contextualised against relevant Carbon Budgets. The Proposed Development construction phase is expected to start from 2028, with the plant targeting operation from Q4 2031, meaning effects on GHG would span across the fifth (2028-2032), sixth (2033-2037) and seventh (2038-2042) Carbon Budgets.	This requirement is addressed in Section 14.6.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
The CCC uses the Balanced Pathway as the core scenario when recommending the level of each Carbon Budget to the UK government. The Balanced Pathway is designed to align with the net zero target by 2050, as mandated by the 2019 amendment to the Climate Change Act 2008. It provides a detailed emissions trajectory that meets the requirements of each Carbon Budget period, including the sixth and proposed seventh Budgets.	Further Carbon Budgets are also expected to apply to the Proposed Development. The CCC has not yet published advice on these, however indicative eighth (2043-2047) and ninth (2048-2052) Carbon Budgets have been included in the contextualisation of the assessment results based on the CCC's Balanced Pathway.. The CCC's Balanced Pathway projections have been used to contextualise GHG emissions in the assessment alongside the Carbon Budgets. The CCC's Balanced Pathway projections for different transport modes (rail and bus) have also been incorporated into the calculations of transport emissions in the future.	
R (Finch on behalf of the Weald Action Group & Others) v. Surrey County Council (& Others) [2024] [Ref 5] Supreme Court judgement relating to Scope 3 (downstream) emissions in Greenhouse Gas assessments in Environmental Impact Assessment (EIA). While the Supreme Court's decision specifically concerned a fossil fuel project, it reinforces established EIA practice — requiring the assessment of direct and indirect significant effects where a clear causal connection exists — and may therefore influence other developments with foreseeable indirect effects.. The Court held that impacts which inevitably follow from a project are its effects, even if they occur off-site.	While the case related to a fossil fuels development, this interpretation of the EIA Regulations — requiring assessment of direct and indirect significant effects — may influence other developments with foreseeable indirect emissions. In line with this principle, the GHG assessment for the Proposed Development has scoped in Scope 3 emissions from the use of SAF.	These considerations are addressed in Sections 14.5 and 14.6.
Policy		

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
Infrastructure Carbon Review, 2013 [Ref 6] In 2013, the UK government published the Infrastructure Carbon Review (HM Government, 2013), aiming to “release the value of lower carbon solutions and to make carbon reduction part of the DNA of infrastructure in the UK.” Major infrastructure owners, operators and developers across the communication, energy, transport, waste and water sectors were invited to endorse it, become signatories and make commitments under the Review. The Review provided increased emphasis on ‘capital carbon’ (GHG emissions associated with raw materials, activities and transport for construction, repairs, replacement, refurbishment and de-construction of infrastructure) while acknowledging that ‘operational carbon’ (associated with energy consumption for the operation, use and maintenance of infrastructure) will continue to dominate overall emission to 2050 and beyond. The Infrastructure Carbon Review highlighted the importance of assessing GHG emissions early in the lifecycle of an infrastructure scheme when there is the greatest carbon reduction potential. The Infrastructure Carbon Review also led to the publication of a Publicly Available Specification (PAS) on infrastructure carbon management; PAS2080:2016. An updated version of PAS2080 was released in 2023.	The assessment in this chapter evaluates the GHG emissions over the whole lifecycle of the Proposed Development. By considering the carbon emissions of a project in EIA, the emissions of the project are assessed early on. This ensures the greatest potential in carbon reductions can be achieved through relevant mitigation measures.	This requirement is addressed in Sections 14.5 and 14.6.
The Overarching National Policy Statement for Energy (EN-1) [Ref 7] The Overarching National Policy Statement (NPS) for Energy (EN-1) establishes the need for nationally significant energy infrastructure and sets out requirements for assessing environmental impacts. Section 5.3 acknowledges that while energy infrastructure is vital for the UK’s transition to net zero, it will inevitably produce GHG emissions during construction, operation and decommissioning. A whole-life GHG assessment must be provided as part of an ES,	EN-1 sets out the national policy framework for energy infrastructure and requires an ES to assess GHG emissions in line with the UK’s net zero objectives. It also requires the identification of measures to minimise and offset emissions through a GHG Reduction Strategy.	This requirement is addressed in Sections 14.5 and 14.6. The associated GHG Reduction Strategy is provided in Application Document Ref. 7.6.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
outlining emissions at each stage, the measures taken to minimise them, and any offsetting proposals. Paragraph 5.3.7 further states that steps taken to reduce emissions should be set out in a GHG Reduction Strategy. Paragraph 5.3.12 on Secretary of State decision making: “Operational emissions will be addressed in a managed, economy-wide manner, to ensure consistency with carbon budgets, net zero and our international climate commitments. The Secretary of State does not, therefore need to assess individual applications for planning consent against operational carbon emissions and their contribution to carbon budgets, net zero and our international climate commitments.” NPS EN-1 explains, in paragraphs 3.3.13–3.3.16, 3.3.57, 3.3.84 and 3.5.3, how the government’s Net Zero Strategy [Ref 8] and 2030 Clean Power Action Plan [Ref 9] informs the delivery of major low carbon energy infrastructure projects. These sections address projected electricity demand, the mix of generation sources, affordability considerations, national and sectoral decarbonisation, and the need for carbon capture and storage.		
National Policy Statement for Renewable Energy Infrastructure (EN-3) [Ref 10] The National Policy Statement for Renewable Energy Infrastructure (EN-3), to be read alongside EN-1, applies to nationally significant renewable projects and stresses the urgent need for renewable generation to meet net zero and carbon budgets. It requires applicants to assess GHG impacts in the ES, considering the full lifecycle of the project.	EN-3 sets out the national policy framework for renewable energy infrastructure and requires an ES to assess GHG emissions in line with the UK’s net zero objectives.	This requirement is addressed in Sections 14.5 and 14.6.
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines EN-4 [Ref 11] EN-4 applies to nationally significant gas and pipeline infrastructure and is to be read in conjunction with EN-1, noting that it “does not seek to repeat the material set out in EN-1.” It is partially relevant to the	EN-4 does not introduce any additional assessment requirements which are relevant to GHG emissions beyond those set out in EN-1.	This requirement is addressed in Sections 14.5 and 14.6.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
Proposed Development through associated CO ₂ pipeline elements. EN-4 requires that GHG emissions are assessed “in accordance with Section 5.3 of EN-1” and therefore does not introduce additional GHG-specific assessment requirements.		
National Policy Statement for Electricity Networks Infrastructure EN-5 [Ref 12] EN-5 applies to nationally significant electricity network infrastructure and is to be read in conjunction with EN-1, noting that it “does not seek to repeat the material set out in EN-1”. EN-5 does not have direct effect to the Proposed Development has some relevance for the substation and electrical connection elements that are below NSIP thresholds. EN-5 requires assessment to be undertaken in accordance with EN-1, including “the consideration of impacts as set out in Part 5 of EN-1”, and therefore does not introduce additional GHG-specific assessment requirements.	EN-5 does not introduce any additional assessment requirements which are relevant to GHG emissions beyond those set out in EN-1.	This requirement is addressed in Sections 14.5 and 14.6.
UK Marine Policy Statement [Ref 13] The Marine Policy Statement (MPS) provides the framework for marine planning and decision-making across UK waters. It requires that proposals consider the potential of a project to reduce GHG emissions and support the transition to a low-carbon economy.	The UK MPS sets out the national policy framework for marine planning and requires that proposals consider the potential of a project to reduce GHG emissions.	This requirement is addressed in Section 14.6.
The National Planning Policy Framework (NPPF) [Ref 14] Explains that achieving sustainable development requires the planning system to pursue three interdependent overarching objectives in mutually supportive ways, so that opportunities can be taken to secure net gains across all objectives. One of the three objectives is an environmental objective (with the other two being economic and social), which includes the objective of supporting efforts to mitigate and adapt to climate change, including moving to a low-carbon economy (Chapter 1, paragraph 17).	The Proposed Development will help the UK reduce the carbon emissions of the aviation sector by contributing to the production of SAF. With the national net zero targets, it is important for the whole life GHG emissions of the Proposed Development to align with a net zero trajectory. The assessment considers the likely significant effects of GHG emissions in terms of alignment to this trajectory.	These requirements are addressed in Sections 14.5 and 14.6.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
Chapter 5 of the NPPF has the objective of supporting the transition to net zero by 2050 and shaping places in ways that contribute to radical reductions in GHG emissions. The NPPF supports renewable and low carbon energy development. Policy W3 states that substantial weight should be given to the benefits of renewable and low carbon energy development for supporting economic development and the transition to a net zero future. The glossary of the NPPF also includes a definition on what is understood under 'renewable and low carbon energy': "energy for heating and cooling as well as generating electricity. Renewable energy covers those energy flows that occur naturally and repeatedly in the environment [...] including from biomass [...]. Low carbon technologies are those that can help reduce emissions (compared to conventional use of fossil fuels)."		
Industrial Decarbonisation Strategy, 2021 [Ref 15] This is the first strategy published by a major economy, which sets out how industry can decarbonise in line with net zero, while remaining competitive and without pushing emissions abroad. It builds on the Ten Point Plan and sets out the Government's vision for a prosperous, low-carbon UK industrial sector by 2050, and aims to provide industry with the long-term certainty it needs to invest in decarbonisation. Chapter 4 'Adopting low-regret technologies and building infrastructure' states: "To be on track to deliver net zero, we expect that the minimum, in all future scenarios, is 20 TWh per year of fossil fuel use replaced with low-carbon alternatives in 2030". It goes onto state that "Current evidence strongly suggests that, given limited sustainable biomass supply, we may need to prioritise the use of biomass where it can be combined with carbon capture and storage (BECCS), resulting in negative emissions".	The Proposed Development will use sustainably sourced biomass (which may include agricultural residues) to produce SAF. In the future, the carbon from the production process of the SAF may be captured in permanent carbon storage.	No requirements

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
Jet Zero Strategy, 2022 [Ref 16] The Strategy sets out the Government's vision for decarbonising aviation, focusing on the development of technologies in a way that maintains the benefits of air travel, especially post COVID 19, whilst maximising the opportunities that decarbonisation can bring for the UK. It includes a 5-year delivery plan, setting out how the Government will achieve net zero aviation by 2050.	SAF presents a viable solution to decarbonise the aviation sector. The Proposed Development supports the Jet Zero Strategy (DfT, 2022) by producing SAF to decarbonise aviation. The Proposed Development will help the UK meet its ambitions of 10% SAF uptake by 2030 and beyond.	No requirements
Sustainable Aviation Fuel (SAF) Mandate [Ref 17] The SAF Mandate is a UK Government policy initiative aimed at decarbonising the aviation sector by requiring a minimum proportion of jet fuel supplied in the UK to be derived from sustainable sources. The mandate came into force in 2025, with a target of 10% SAF by 2030 and 22% by 2040. It sets strict sustainability and lifecycle greenhouse gas emissions criteria for eligible fuels, promoting the use of waste-derived and advanced biofuels. The SAF Mandate is a key mechanism for delivering the UK's Jet Zero Strategy and supports investment in domestic SAF production infrastructure, such as the Proposed Development	The Proposed Development is expected to be the UK's first commercial scale, second-generation low-carbon SAF production facility. The plant would be one of the largest of its kind in Europe, converting over one million tonnes of biomass feedstock into approximately 180 million litres of low-carbon SAF and approximately 30 million litres of renewable naphtha per annum. The Proposed Development contributes directly to the UK's SAF Mandate targets, supporting domestic SAF production. The SAF Mandate aligns with the Renewable Energy Directive (RED II) [Ref 18] and Renewable Transport Fuel Obligation (RTFO) methodologies [Ref 19, Ref 20 and Ref 21], which treat emissions from fuel in use (combustion) as zero for biofuels. This principle is based on the fact that CO₂ released during combustion is offset by CO₂ absorbed during biomass growth. Therefore, lifecycle reporting excludes in use (combustion) emissions for SAF, reflecting its	This requirement is addressed in Section 14.6.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
	biogenic nature and alignment with these frameworks.	
Stockton-on-Tees Borough Council (STBC) Local Plan 2019 [Ref 22] Policy SD 5 states: “2 (h), Supporting proposals for renewable and low-carbon energy schemes including the generation and supply of decentralised energy.”	The Proposed Development will use sustainably sourced biomass (which may include agricultural residues) to produce SAF.	No requirements
Redcar and Cleveland Borough Council (RCBC) Local Plan 2018 [Ref 23] Policy SD 4 - General Development Principle states: “All development must be designed to a high standard. Development proposals will be expected to: be sustainable in design and construction, incorporating best practice in resource management, energy efficiency and climate change adaptation.”	The assessment considers the likely significant effects of the GHG emissions of the Proposed Development based on the embedded design mitigation.	These requirements are addressed in Section 14.5.
Net Zero Strategy for Tees Valley [Ref 24] Five local authorities (Darlington, Hartlepool, Middlesbrough, Stockton-on-Tees and Redcar & Cleveland) forms the regional Tees Valley Combined Authority. The Local Industrial Strategy sets an overarching ambition - “Tees Valley will be a global leader in clean energy, low-carbon and hydrogen. The area will achieve a net zero carbon industrial cluster by 2040, providing good jobs with long-term prospects that local people can access.”	With the net zero targets, it is important for the whole life GHG emissions of the Proposed Development to align with a net zero by 2040 trajectory. The assessment considers the likely significant effects of GHG emissions in terms of alignment to this trajectory.	This requirement is addressed in Section 14.6.
Guidance		

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance [Ref 25] The EIA Guidance published by the Institute of Sustainability and Environmental Professionals (ISEP) (formerly the Institute of Environmental Management and Assessment (IEMA)) in 2026 will be followed. This provides a framework for the consideration of GHG emissions in the EIA process, in line with the 2014 amendment to the EIA Directive (2014/52/EU) [Ref 26] and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [Ref 27]. The guidance sets out how to: • Identify the GHG emissions baseline in terms of GHG current and future emissions; • Identify key contributing GHG sources and establish the scope and methodology of the assessment; • Assess the impact of potential GHG emissions and evaluate their significance; and • Consider mitigation in accordance with the ISEP GHG management hierarchy (eliminate, reduce, substitute and remove).	The ISEP guidance provides the overarching framework for integrating GHG assessment into EIA, focusing on the principles of significance and mitigation. The 2026 update (Version 2.1) builds on the 2022 guidance by providing an introductory section with clarifications and supplementary guidance. It does not prescribe a specific calculation method but directs practitioners to established technical standards such as the GHG Protocol [Ref 28], PAS 2080 [Ref 29] and the Royal Institution of Chartered Surveyors (RICS) Professional Statement on Whole Life Carbon Assessments [Ref 30] for detailed quantification and lifecycle accounting. The updated ISEP GHG management hierarchy further emphasises the role of mitigation through eliminate, reduce, substitute and remove, with substitution being particularly relevant to the Proposed Development, as it involves the production of a lower-carbon fuel (SAF) that can displace conventional jet fuel at a system-wide level.	This guidance has informed the assessment methodology outlined in Section 14.3. The requirements of this guidance are addressed in Section 14.6.
The GHG Protocol [Ref 28] The GHG Protocol provides overarching guidance on developing GHG inventories and reporting standards.	The GHG Protocol provides internationally recognised principles for GHG accounting and reporting. It underpins the quantification of emissions by defining how activity data and emission factors should be applied to produce robust inventories. The ISEP guidance [Ref 25] references the GHG Protocol as a key technical standard for ensuring consistency with global best practice in GHG accounting.	This guidance has informed the assessment methodology outlined in Section 14.3.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
PAS2080: 2023 [Ref 29] PAS2080 is a specification for carbon management in buildings and infrastructure. It provides a framework for organisations to manage and reduce whole-life carbon emissions across the lifecycle of their projects. The main areas identified in PAS2080 are: • Whole-life carbon management emphasizes managing carbon emissions throughout the entire lifecycle of infrastructure, from planning to end-of-life; • Supply chain collaboration: encourages collaboration across the value chain involving all stakeholders in carbon reduction efforts; • Integrated decision-making: promotes integrated carbon management into decision-making processes to support sustainability goals; and • Decarbonisation principles: includes principles for setting targets, monitoring, and reporting on carbon emissions.	PAS 2080 sets out a framework for managing and reducing whole-life GHG emissions in infrastructure projects. It provides detailed requirements for data quality, carbon mitigation, and engagement across the value chain, including with designers and the supply chain. In the GHG assessment, PAS 2080 informs the approach to GHG mitigation application, and proportionality in assessment, ensuring that emissions are managed throughout design.	This guidance has informed the assessment methodology outlined in Section 14.3. The requirements of this guidance are addressed in Sections 14.5 and 14.6.
RICS Professional Standard – Whole Life Carbon Assessment [Ref 30] The RICS Whole Life Carbon Assessment (WLCA) framework sets out a detailed standard for evaluating carbon emissions throughout the full lifecycle of built assets. Its goal is to establish a uniform and reliable method for carbon accounting, supporting progress toward net-zero goals and reducing the effects of climate change. The framework applies to all types of buildings and infrastructure, assessing emissions from early design and construction through to decommissioning stages, including demolition and disposal.	The RICS Whole Life Carbon Assessment standard provides a structured methodology for evaluating carbon emissions across all lifecycle stages of built assets. The GHG assessment conducted in this chapter follows the modular, lifecycle approach outlined in RICS. In cases where project-specific data is unavailable, the standard supplies default scenarios and assumptions for various life cycle stages, including the transportation of construction materials, maintenance activities, and demolition processes.	This guidance has informed the assessment methodology outlined in Section 14.3, and the results of the GHG assessment in Section 14.6.

Legislation, case law, policy or guidance description	Relevance to assessment	Where in the ES this is addressed
EN 17472:2022 Sustainability of construction works [Ref 31] EN 17472 provides a standardized framework for assessing the sustainability of infrastructure and civil engineering works across their lifecycle. It supports consistent evaluation of environmental impacts, as well as those economic and social.	EN 17472 establishes a standardised framework for assessing the sustainability of infrastructure works, including lifecycle GHG emissions. While not referenced in the ISEP guidance [Ref 25], it complements the RICS standard [Ref 30] by supporting modular lifecycle assessment and consistent boundary definition. In the GHG assessment, EN 17472 helps ensure alignment with European standards and allows for comparability across different projects.	This guidance has informed the assessment methodology outlined in Section 14.3.

14.3 Assessment methodology and significance criteria

Overview

- 14.3.1 This section outlines the methodology followed to assess the likely significant effects of the Proposed Development in relation to GHG including:
- consultation and engagement;
 - effects scoped into the assessment;
 - study area;
 - criteria for determining likely significant effects; and
 - assessment of cumulative effects.
- 14.3.2 The project-wide approach to the assessment methodology is set out in **Chapter 2: Assessment Methodology (ES Volume I, Application Document Ref. 6.1)**.
- 14.3.3 The assessment methodology for the GHG emissions assessment follows the ISEP guidance [Ref 25], which states that GHG quantification within an EIA should follow the principles outlined in key documents such as the GHG Protocol [Ref 28] and PAS 2080 [Ref 29], and in doing so, enable the assessment to align with the principles of relevance, completeness, consistency, transparency and accuracy.

Consultation, engagement and scoping

Scoping opinion

- 14.3.4 The **EIA Scoping Report (Appendix 2B, ES Volume III, Application Document Ref. 6.3)** was issued to the Planning Inspectorate (PINS) on 1 October 2025. PINS provided its **EIA Scoping Opinion (EN0110025)** on 11 November 2025 (**Appendix 2C, ES Volume III, Application Document Ref. 6.3**), which included feedback from consultation bodies that it formally consulted.
- 14.3.5 Table 14.2 **Error! Reference source not found.** captures the key Scoping Opinion comments received from PINS relevant to the GHG assessment, along with the Applicant's response to these at this stage of the assessment. The full consultee comments on the EIA Scoping Report and responses to these are provided in **Appendix 2C (ES Volume III, Application Document Ref. 6.3)**.

Table 14.2 Key scoping feedback for GHG

Stakeholder	Scoping Comment	Applicant response
PINS	[Replacement and refurbishment] is proposed to be scoped out on the basis that significant replacement or refurbishment is not expected within the 30-year design life. The inspectorate is content to scope this matter out on this basis.	No response required.
PINS	[Emission sources] will include negative emissions from the use of SAF displacing hydrocarbons in the aviation fuel sector. The context of the aviation fuel sector should be clearly established, and any argument that the production of SAF would be displacing hydrocarbon-based fuel (as opposed to enabling a growth in the aviation sector) should be evidenced.	The ES assumes that SAF produced by the Proposed Development displaces conventional jet (A-1) fuel, and the magnitude of impact of this displacement is discussed in Section 14.6. This assumption reflects the UK Government's policy framework for aviation decarbonisation. The Jet Zero Strategy [Ref 16] sets out a pathway to achieve net zero in the aviation sector by 2050, identifying SAF as a critical lever. While Jet Zero anticipates continued growth in the aviation sector, it requires that this growth occurs along a decarbonising trajectory, supported by measures such as SAF uptake, efficiency improvements, and emerging technologies. The UK SAF Mandate [Ref 17], which came into force in January 2025, requires jet fuel suppliers to blend an increasing proportion of SAF into the UK aviation fuel mix—2% in 2025, 10% by 2030, and 22% by 2040. The mandate is designed to ensure SAF progressively replaces fossil-derived jet (A-1) fuel, even as overall demand for air travel is projected to increase.
PINS	Potential emissions sources include emissions associated with the transportation of the captured CO ₂ off-site to its end use (storage). CO ₂ collection, compression and export does not form part of the application. This discrepancy should be clarified.	The pure CO ₂ stream generated within the SAF production process is separated and will be compressed on-site and recycled to the gasification unit, as well as being vented. The application includes pipeline infrastructure to allow export of this compressed CO ₂ to the Northern Endurance Partnership (NEP) CO ₂ Gathering

Stakeholder	Scoping Comment	Applicant response
		Network once that network is constructed. Until access to CO₂ transport and storage infrastructure is available and agreed, surplus biogenic CO₂ will continue to be discharged to atmosphere via a vent. The Proposed Development is therefore not dependent on the NEP CO₂ Gathering Network being available or operational. The capture, compression and transport for storage of CO₂ from the combined heat and power (CHP) plant and thermal pretreatment does not form part of this application and is not covered by the GHG assessment. The possible application of this technology is discussed in Section 14.7.
PINS	Emissions from the end use (combustion) of SAF biofuels are considered zero because the CO₂ released during combustion is offset by the CO₂ absorbed during the growth of the sustainably sourced biomass feedstock, quoting Renewable Transport Fuel Obligations, Renewable Energy Directive (RED II), and SAF Mandate methodologies. The ES should explain the mechanisms which underpin this assumption and how the sustainability of the biofuel feedstock is secured.	In Section 14.3, paragraphs 14.3.39-14.3.40 explain how emissions from the end-use (combustion) of SAF biofuel can be assumed to be zero. The sustainability of the feedstock will be secured through compliance with the strict sustainability requirements set out in the SAF Mandate [Ref 17] and RTFO [Ref 19, Ref 20, Ref 21]. Compliance will be demonstrated through independent certification by recognised schemes such as Sustainable Biomass Programme (SBP), Programme for the Endorsement of Forest Certification (PEFC), Forest Stewardship Council (FSC), and International Sustainability and Carbon Certification (ISCC), which verify that feedstock sourcing meets criteria for GHG savings, traceability, and responsible land management. These certifications provide assurance that the SAF produced by the Proposed Development aligns with UK and EU sustainability standards.

Statutory consultation

- 14.3.6 Statutory consultation on the proposals for the Project was undertaken from 2 December 2025 to 13 January 2026. The responses are presented in the **Development Consent Order (DCO) Consultation Report (Application Document Ref. 5.1)**. Consultees included statutory bodies, local authorities, individuals with an interest in land affected by the Project, and members of the local community.
- 14.3.7 No statutory consultee responses raised concerns, objections or requests for clarification that affect the scope, methodology, assumptions or conclusions of the GHG assessment presented in the Preliminary Environmental Information Report (PEIR). In particular, no consultees requested additional modelling, alternative assumptions, or further contextual analysis beyond that already undertaken.
- 14.3.8 References to carbon and GHG-related matters made by consultees were either high-level expressions of support for regional decarbonisation objectives or related to matters outside the scope of this assessment. The responses do not raise any issues that require changes to the GHG assessment approach set out in this chapter of the ES.

Targeted consultation and ongoing engagement

- 14.3.9 Engagement relevant to the GHG assessment has been undertaken through the statutory consultation process. No consultees raised comments requiring further topic-specific engagement on GHG, and no additional engagement specific to the GHG assessment has been identified as necessary based on the nature of the responses received. The assessment has therefore been informed by the outcomes of statutory consultation and the design development process.

Effects scoped into the assessment

- 14.3.10 RICS Professional Standard [Ref 30] and BS EN 17472 [Ref 31] outline a modular, lifecycle approach for GHG emissions assessments, providing a framework to consider effects throughout a project's lifecycle. This approach has informed the scope of this assessment. The assessment includes both direct and indirect GHG emissions from the Proposed Development and includes benefits and loads beyond the system boundary.
- 14.3.11 Effects that are scoped in for the GHG emissions assessment relevant to the construction stage (Modules A1-A5) are:
- extraction, transportation and manufacturing of construction materials and products (A1-A3);
 - transport of construction materials and products to site (A4);

- construction and installation activities (A5);
 - construction waste and waste management (A5); and
 - construction worker transport (A5).
- 14.3.12 Effects that are scoped in for the GHG emissions assessment relevant to the operation stage (Modules B2-B3 and B6-B8) are:
- maintenance and repair (B2-B3);
 - operational energy use (B6);
 - operational water use (B7);
 - biomass cultivation, collection and transport to pellet production plant (B8);
 - pellet production and transport to LGF plant (B8);
 - materials, gases and chemicals utilised during LGF plant operation (B8);
 - transport, processing and disposal of operational waste from LGF plant (B8);
 - carbon dioxide released from chemical processes during LGF plant operation (B8);
 - transport and distribution of low-carbon SAF and naphtha produced at the LGF plant (B8); and
 - transport of workers to the LGF plant during operation (B8).
- 14.3.13 Effects that are scoped in for the GHG emissions assessment relevant to the decommissioning stage (Module C1-C4) are:
- deconstruction and demolition (C1); and
 - transport, waste processing and disposal of construction materials and products (C2-C4).
- 14.3.14 The beyond-system-boundary benefit in the magnitude of GHG emissions associated with the end-use of low-carbon SAF (D1) is also quantified in the assessment.
- 14.3.15 While the SAF lifecycle does result in GHG emissions, its overall lifecycle emissions are significantly lower than those of conventional jet fuel, making it a more environmentally sustainable option. The use of SAF therefore contributes to decarbonising the aviation sector and supports the UK's progress toward its net zero target. To illustrate this, the use (i.e., combustion) of the amount of low-carbon SAF produced by the Proposed

Development will be compared with the use of an equivalent amount of traditional jet fuel (Jet A-1 Kerosene). Although this comparison falls outside the defined lifecycle scope of the GHG assessment (as set out in paragraphs 14.3.11 to 14.3.13), it provides important additional context on the system-wide benefits of SAF in terms of avoided emissions, through substitution of conventional jet fuel for low carbon SAF. This reflects the “substitute” step in the ISEP GHG management hierarchy [Ref 25], whereby a lower-carbon alternative is used in place of a higher-carbon activity or – applicable at both project level and, crucially in this context, at a system-wide scale.

14.3.16 The following effects relating to GHG emissions from land use change have been scoped out due to the minimal existing vegetation within the study area:

- construction waste from land-use change (A5); and
- land use and forestry-based carbon removals (B1).

14.3.17 The Proposed Development is expected to utilise the proposed Northumbrian Water Long Sea Outfall (LSO) for the discharge of treated wastewater. The LSO is proposed to address wider wastewater management requirements across Teesside and is not being developed solely to facilitate the Proposed Development. Consequently, whilst a connection between the Proposed Development and the proposed LSO is acknowledged, the LSO is not considered to be a causally linked effect of the Proposed Development for the purposes of the GHG assessment. The GHG emissions associated with the construction and operation of the LSO have therefore not been included within the scope of this assessment.

Study area

14.3.18 The study area for the GHG assessment defines the physical location of emission sources associated with the Proposed Development, some of which are or will be within the Order Limits (e.g. fuel use associated with construction plant equipment) and some of which are outside of the Order Limits (e.g. extraction, manufacturing and production of construction materials). For the assessment of GHG emissions, the receptor is the global atmosphere as all emissions, regardless of where they occur, contribute to the concentration of GHGs in the atmosphere and associated global warming. Therefore, there is no defined physical study area with regard to the identification and assessment of impacts to the receptor.

Methodology

14.3.19 The GHG assessment methodology seeks to quantify the whole-life GHG emissions associated with the Proposed Development (absolute Proposed

Development emissions) and the difference in emissions between the Proposed Development and baseline scenario (net Proposed Development emissions). The assessment has been based on a reasonable worst-case scenario. Significance has been determined based on ISEP guidance [Ref 25] and professional judgement, balancing both quantitative and qualitative assessments of the whole-life GHG impact (construction, operation and decommissioning) of the Proposed Development. Significance is ultimately determined based on the Proposed Development's alignment with the UK's trajectory to net zero by 2050.

Baseline

- 14.3.20 The assessment considers the likely evolution of the baseline without the implementation of the Proposed Development. This is termed the future baseline, and for the GHG assessment, is defined by the GHG emissions arising from the study area in the absence of the Proposed Development.
- 14.3.21 The future baseline for the GHG emissions assessment assumes that the study area would continue to operate in its existing configuration for the duration of the study period (i.e. construction, operation and decommissioning).

Criteria for the assessment of significance

- 14.3.22 The methodology for assessing effects is based on the principle that the environmental effects of the Proposed Development, in relation to a receptor, should be determined by identifying the receptor's sensitivity, assessing the magnitude of impact the Proposed Development would have on the receptor's sensitivity and then combining these two elements to identify the significance of effect.

Assessment of sensitivity

- 14.3.23 For the GHG assessment, emissions are not geographically limited and have a global effect rather than directly affecting local receptors. As per the ISEP [Ref 25] guidance, the receptor is the global atmosphere. The receptor has a high sensitivity, given the severe consequences of global climate change and the cumulative contributions of all GHG emission sources.

Magnitude of impact

- 14.3.24 The approach used to assess the magnitude of impact on the global climate considers the nature and magnitude of impact in GHG emissions as a result of the Proposed Development. In line with applicable guidelines from the GHG Protocol [Ref 28], GHG emissions are reported as tonnes of carbon dioxide equivalent (tCO₂e) and consider the seven Kyoto Protocol gases:

- carbon dioxide (CO₂);
- methane (CH₄);
- nitrous oxide (N₂O);
- hydrofluorocarbons (HFCs);
- perfluorocarbons (PFCs);
- sulphur hexafluoride (SF₆); and
- nitrogen trifluoride (NF₃).

14.3.25 These GHGs are broadly referred to in this chapter under an encompassing definition of ‘GHG emissions’. GHG emissions have been assessed using a calculation-based methodology as per the below equation:

Activity data × GHG factor = GHG emissions or removals.

Where:

Activity data – a measure of the quantity of an activity; and

GHG factor – a measure of the GHG emissions per unit of activity

14.3.26 The activity data used to inform this assessment has been provided by the Applicant. Where data was unavailable from the Applicant, appropriate industry-recognised assumptions and benchmarks have been used.

14.3.27 **Appendix 14A (ES Volume III, Application Document Ref. 6.3)** contains a detailed account of the data sources, limitations and assumptions of the GHG assessment.

14.3.28 For the reporting of GHG emissions in this assessment, a 30-year operational study period is considered (2031-2060). The 30-year operational study period, in this case, is considered to reflect the minimum design life of the Proposed Development. Construction of the Proposed Development is assumed to take place over three to four years between 2028 and 2031. Decommissioning activities are assumed to take place in the final year of the design life of the Proposed Development (2061).

14.3.29 A 30-year operational study period has been adopted as a reasonable worst-case scenario. This approach helps ensure that the estimated avoided emissions resulting from the displacement of fossil fuel-based jet fuel with the low-carbon SAF produced by the Proposed Development are not overstated. For a detailed analysis of these avoided emissions, refer to Section 14.6, beginning at paragraph 14.6.22.

Significance of effect

- 14.3.30 The ISEP guidance [Ref 25] defines the overall approach to assessing the impacts and significance of effects of GHG emissions from projects. There is no quantifiable threshold above or below which the significance of GHG emissions can be based on. The guidance directs that emissions must be contextualised as part of the assessment process, including, but not exclusively, against national Carbon Budgets and decarbonisation trajectories.
- 14.3.31 The guidance restates the principles that:
- GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect; and
 - The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive (e.g. human health, biodiversity, water, land use, air quality).
- 14.3.32 The current ISEP guidance [Ref 25] provides a more nuanced approach to the appraisal of significance of changes in GHG emissions arising from a project than was set out in the 2017 version of the ISEP guidance. The former version of the guidance concluded that all GHG emissions, regardless of scale or extent of mitigation, were significant. The 2017 guidance was updated in 2022, and an additional supplementary version was published in 2026. The latest guidance reiterates that some projects will lead to increases in emissions but that this alone does not represent a significant effect. Instead, it is the role of the competent professional carrying out the assessment to consider the scale of changes in emissions and the context within which these are expected to occur. This includes consideration of the mitigation undertaken to minimise negative impacts, and the extent to which the Proposed Development aligns with (or supports) the UK's decarbonisation trajectory and net zero targets. The application of the ISEP GHG management hierarchy (eliminate, reduce, substitute and remove) [Ref 23] is therefore an integral part of identifying and evaluating mitigation measures.
- 14.3.33 In determining significance, the indirect impacts of the Proposed Development will be considered where appropriate. For example, the relative GHG benefit of the end-use of SAF compared to conventional jet fuel.
- 14.3.34 The GHG emissions of the Proposed Development have been contextualised against the following Carbon Budgets and UK emission trajectory:

- UK Carbon Budgets; and
- The Climate Change Committee's (CCC) Balanced Pathway [Ref 4] (see Section 14.6).

14.3.35 It should be noted that the UK Carbon Budgets are set in secondary legislation and provide legally binding limits on the total amount of GHG which can be emitted over a defined period. Although the CCC's Balanced Pathway is non-statutory, it does provide an indicative pathway to net zero by 2050 at a national level and at industry level. The approach to the assessment of significance draws on guidance set out in the ISEP guidance and is summarised in Table 14.3.

Table 14.3 Significance categories

Significance category	Significance	Descriptor
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 and does not 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, 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.
Beneficial	Significant	The 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, substantially exceeding net zero requirements with a positive climate impact.

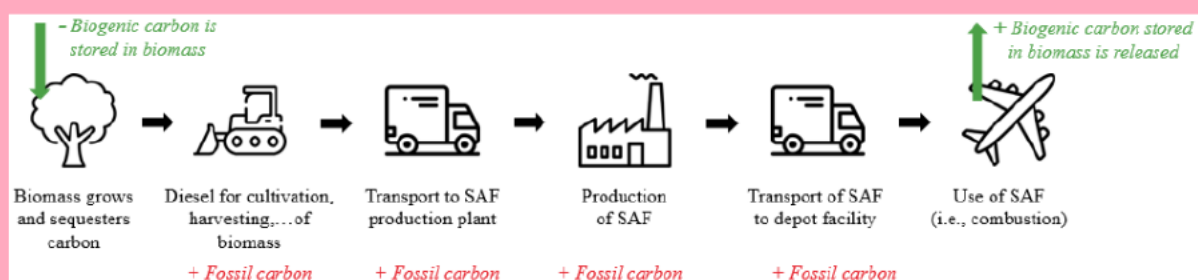
14.3.36 Significance has been determined based on ISEP guidance and professional judgement, balancing both quantitative and qualitative assessments of the whole-life GHG impact (construction, operation and decommissioning) of the Proposed Development. The determination of significance has considered whether the Proposed Development is in line

with existing and emerging best practice and policy requirements for GHG emissions reduction (see Table 14.1). In applying this approach, regard has been given to the purpose of the infrastructure – namely, the production of SAF to displace conventional fossil-derived jet fuel – given its role in enabling decarbonisation of the aviation sector (see Section 14.6).

- 14.3.37 Therefore, an assessment has been made, based on professional judgement, as to whether GHG emissions from the Proposed Development will have a material impact on the ability of the UK Government to meet its GHG emissions reduction targets (and would, therefore, potentially be significant).
- 14.3.38 For the initial assessment of significance within this preliminary assessment, the assessment of effects has assumed that 'embedded design mitigation' and 'standard good practice mitigation' relevant to the GHG assessment are in place (these measures are presented in Section 14.5).

Biogenic carbon neutrality

- 14.3.39 The treatment of emissions from the use (or “combustion”) of SAF follows established government-approved methodologies for biofuels [Ref 17, Ref 18, Ref 19, Ref 20, Ref 21]. These methodologies are based on the principle of biogenic carbon neutrality, which is explained below.
- 14.3.40 Biomass used to produce SAF absorbs carbon dioxide during growth, a process referred to as biogenic carbon uptake. When SAF is combusted, this biogenic carbon is released back into the atmosphere. These removals and emissions are considered to balance each other out, meaning combustion emissions are treated as ‘neutral’ or zero. This principle is illustrated in Inset 14.1. It is important to note that carbon neutrality applies only to biogenic carbon; GHG emissions from processes such as harvesting, transport, and SAF production are still accounted for in the lifecycle assessment.



Inset 14.1 Biogenic and fossil carbon emissions occurring over the lifecycle of biomass-based SAF.

Assessment of cumulative effects

- 14.3.41 All global GHG sources are relevant to the effect on climate change, therefore effects of GHG emissions from other developments should not be individually assessed, as there is no basis for selecting any particular cumulative projects that emit GHG for assessment over any other. This is in line with ISEP guidance [Ref 25]. Instead, it is necessary for EIA to consider GHG emissions in the context of the UK's net-zero trajectory, using benchmarks such as the UK Carbon Budgets. These benchmarks are inherently cumulative as they consider emissions from all sources across the economy including future emissions from new developments. The contextualisation of the GHG emissions against Carbon Budgets, and the significance criteria adopted for the assessment (see Section 14.6) account for the alignment of the Proposed Development with a net-zero trajectory, and therefore, considers the potential cumulative effect of GHG emissions on the atmospheric concentration of GHG emissions. Therefore, no separate cumulative GHG assessment with other developments is required.

14.4 Baseline conditions

Overview

- 14.4.1 To provide an assessment of the likely effect of the Proposed Development, it is necessary to identify and understand the baseline conditions in the study area. This provides a reference point against which potential changes in GHG emissions can be assessed.

Current baseline

- 14.4.2 The current baseline represents the environmental conditions at the time of the assessment (2026) for the ES. The existing baseline is not relevant to the assessment of GHG emissions across the lifecycle of the Proposed Development. Instead, the future baseline is the reference point against which the GHG impact of the Proposed Development can be compared and assessed.

Future baseline

- 14.4.3 The assessment has considered the likely evolution of the baseline without the implementation of the Proposed Development. This is termed the future baseline, and for the GHG assessment, is defined by the predicted GHG emissions arising from the study area in the absence of the Proposed Development.
- 14.4.4 The Site is located in an industrial area including brownfield and greenfield land as well as existing development and utilities. The Main Site predominantly comprises concrete hardstanding with limited areas of vegetation, much of which is sparse and low in ecological value. The western portion of the Main Site includes an historic landfill which accepted industrial and commercial waste between 1973 and approximately 1985; this area is now vegetated.
- 14.4.5 The future baseline for the GHG emissions assessment assumes that the study area would continue to operate in its existing configuration for the duration of the study period (i.e. construction, operation and decommissioning), where:
- existing site land uses remain the same; and
 - no construction of any new assets is assumed.
- 14.4.6 Therefore, for the purposes of the GHG assessment, the future baseline is assumed to be zero. Assuming the future baseline is zero allows the assessment to reflect a reasonable worst case net change in GHG emissions between the future baseline and the Proposed Development.

14.5 Development design and impact avoidance

Overview

- 14.5.1 Embedded design mitigation and standard good practice measures are included throughout the lifecycle phases of the Proposed Development to limit the potential for environmental effects. The identification and integration of these measures has been guided by the updated ISEP GHG management hierarchy [Ref 25], ensuring that opportunities to eliminate, reduce and substitute emissions have been prioritised from the earliest design stages. An overview of these measures is provided in this section and in the **Greenhouse Gas Reduction Strategy (Application Document Ref. 7.6)**.

Construction

- 14.5.2 The design of the Proposed Development and the associated construction strategy have evolved through the design process, with consideration given throughout to opportunities to minimise GHG emissions. While detailed

construction logistics will ultimately be refined by the appointed contractor, the construction approach assessed reflects the established design parameters and construction principles of the Proposed Development. Accordingly, the GHG assessment has been undertaken on the basis of the embedded mitigation measures incorporated within the design, as set out in this section.

14.5.3 Key embedded mitigation measures included in the ES assessment include:

- use of a brownfield site, reducing the need for extensive demolition and associated emissions; and
- use of modular and prefabricated construction approaches to reduce on-site energy use and waste generation.

14.5.4 These embedded measures reflect the ‘eliminate’ and ‘reduce’ stages of the ISEP GHG management hierarchy [Ref 25]. They are intended to ensure that construction emissions are minimised as far as practicable, supporting the Proposed Development’s alignment with the UK’s net zero trajectory.

Framework Construction Environmental Management Plan

14.5.5 The development and implementation of a Framework Construction Environmental Management Plan (fCEMP) is a key measure proposed by the Applicant to assist in reducing GHG emissions during the construction phase. The fCEMP sets out how construction activities will be controlled through relevant regulations, industry good practice, and specific mitigation measures.

14.5.6 The fCEMP will be submitted as part of the DCO application. The appointed contractor(s) will be required to implement the final fCEMP during construction.

14.5.7 The fCEMP includes measures to manage and reduce GHG emissions during construction, such as:

- reusing suitable infrastructure and resources already available within the Site, where practicable, to minimise the use of natural resources and unnecessary materials (for example, reusing excavating soil for fill requirements or storing, preserving and restoring top soil where present);
- encouraging the use of construction materials with lower embodied carbon (such as higher recycled content);
- increasing recyclability by segregating construction waste to be re-used and recycled, where reasonably practicable;

- the prohibition of on-site burning of waste materials;
 - conducting regular planned maintenance of the construction plant and machinery to optimise efficiency;
 - the preparation and implementation of a Site Waste Management Plan to minimise waste generation and promote reuse and recycling; and
 - the implementation of construction transport measures, including a **Framework Construction Traffic Management Plan** (fCTMP) and a **Framework Construction Workers Travel Plan** (fCWTP) (**Appendix 18D and Appendix C to Appendix 18A respectively, ES Volume III, Application Document Ref. 6.3**), to minimise vehicle movements and promote sustainable transport options (e.g. shared transport and encouraging cycling).
- 14.5.8 These measures sit primarily within the ‘reduce’ and ‘substitute’ stages of the ISEP hierarchy, complementing the earlier design-stage actions that address embodied carbon.

Operation

- 14.5.9 The Proposed Development is inherently designed to reduce lifecycle greenhouse gas emissions in the aviation sector. As the UK’s first commercial-scale, second-generation low-carbon SAF production facility, it will convert over one million tonnes of sustainably sourced biomass into approximately 180 million litres of advanced SAF and 30 million litres of renewable naphtha per annum. This represents a significant embedded (albeit indirect) mitigation measure, as the use of low-carbon SAF results in substantially lower lifecycle emissions compared to conventional jet fuel, while renewable naphtha can displace fossil-derived feedstocks in the chemicals sector.
- 14.5.10 In addition to the decarbonisation benefits of the products themselves, the Proposed Development incorporates embedded design features to minimise operational emissions. These include:
- on-site generation of low-carbon electricity and steam via a CHP plant;
 - use of sustainably sourced feedstocks in line with SAF Mandate [Ref 17] criteria; and
 - efficient logistics and transport strategies to reduce emissions from feedstock and product movement.
- 14.5.11 These embedded measures align with the ISEP GHG management hierarchy [Ref 25], particularly the ‘substitute’ and ‘reduce’ stages, by prioritising low-carbon energy inputs, efficient processes and the

displacement of higher-carbon fuels, supporting the UK's Net Zero Strategy [Ref 8] and Jet Zero ambitions [Ref 16].

Decommissioning

- 14.5.12 To ensure alignment with national climate targets and DCO requirements, a Decommissioning Environmental Management Plan (DEMP) will be prepared at the time of decommissioning. The DEMP will set out best practice measures to minimise GHG emissions, including:
- reuse and recycling of plant, equipment and materials;
 - sustainable waste management practices; and
 - low-emission demolition and transport methods.
- 14.5.13 These measures reflect the 'eliminate' and 'reduce' stages of the ISEP GHG management hierarchy, ensuring that decommissioning activities minimise emissions through reuse, recycling and low-carbon demolition practices.
- 14.5.14 The scope and content of the DEMP will be informed by additional survey and assessment work and will reflect best practice guidance available at the time. As such, the embedded mitigation measures described here are indicative and subject to refinement in the DEMP.

14.6 Likely impact and effects of the Proposed Development

Overview

- 14.6.1 This chapter assesses the GHG emissions arising from the Proposed Development. The first section of the chapter explains the important parameters, assumptions and limitations for the GHG assessment, while a second section discusses the emissions for the different lifecycle phases of the Proposed Development.

Project parameters, assumptions and limitations

- 14.6.2 This section identifies the assumptions and limitations made for the GHG assessment, including those related to the availability of data to inform the assessment and assumptions used in the methodology.

Construction

- Construction material quantities, such as volumes of concrete and steel, are based on an early design stage bill of quantities provided by the Applicant. The quantity of imported soil is based on the information presented in **Chapter 16: Materials and Waste (ES Volume I, Application Document Ref. 6.1)**. For the quay walls, material quantities have been provided by the Arup Marine Engineering team. The considered material quantities are assumed to cover all assets

constructed within the draft Order Limits. An appropriate level of contingency has been included to account for known and currently unknown exclusions at this stage of design; further detail is provided in Appendix 14A.

- Default transport scenarios defined by the RICS Professional Standard [Ref 24] are used to derive distances for transporting the construction materials to the site (Module A4).
- The impact of construction activities (Module A5) is based on the estimated fuel and electricity consumption during construction, derived from the types of plant and machinery used and their operating durations.
- Construction waste materials and quantities (Module A5) are based on the information presented in **Chapter 16: Materials and Waste (ES Volume I, Application Document Ref. 6.1)**.
- Transport modes and distances for construction workforce travel (Module A5) are based on average transport trends from nearby town centres.

Operation

- To assess the GHG emissions related to maintenance (Module B2) and repair (Module B3), the default assumptions outlined in the RICS Professional Standard [Ref 24] are followed. These assumptions consider a fixed percentage impact based on the total Module A1-A5 emissions.
- Data for the operational energy use (Module B6), operational water use (Module B7) and activities related to the production and distribution of low-carbon SAF and the naphtha by-product (Module B8) are based on indicative figures provided by the Applicant. The SAF produced by the Proposed Development will in any event need to comply with the requirements of the Renewable Transport Fuel Obligations (RTFO) Order guidance [Ref 19, Ref 20, Ref 21] and European Parliament and Council (2018) Directive (EU) RED III [Ref 18].
- The electricity used by the LGF plant (Module B6) (e.g., lighting, kitchens, electrical equipment/machinery) is assumed be supplied by the waste wood and biomass fuelled CHP plant. Therefore, GHG emissions associated with Module B6 are upstream emissions related to the harvesting, processing and transport of the required biomass and waste wood. During the start-up phase (i.e. before the CHP plant is able to meet the electricity demand for normal operation), grid electricity will

be required. However, these emissions are expected to be relatively limited compared to those associated with CHP-supplied electricity and are therefore assumed to be accounted for within the contingency factor applied to this life cycle stage. Transport modes and distances for the operational transport of staff (Module B8) are based on average transport trends from nearby town centres.

Decommissioning

- GHG emissions for the deconstruction and demolition (Module C1) of the Proposed Development are based on the general scenario defined by the RICS Professional Standard [Ref 24]. These assumptions consider a fixed impact per m² of the Proposed Development.
- Demolition waste materials and quantities (Module C2-4) are in line with the information provided in **Chapter 16: Materials and Waste (ES Volume I, Application Document Ref. 6.1)**. As the quay walls have a design life exceeding the assumed 30-year operational period, their decommissioning has not been included within the assessment. For a more complete list of data assumptions and limitations related to the GHG assessment see **Appendix 14A: Greenhouse Gases Data and Assumptions (ES Volume III, Application Document Ref. 6.3)**.

Assessment of likely significant effects

- 14.6.3 This section reports the assessment of effects on the global climate as a result of the estimated GHG emissions associated with the Proposed Development prior to the application of additional mitigation measures. As noted, assessments reported within this ES chapter are considered a reasonable 'worst case' as a precautionary approach has been taken.
- 14.6.4 As reported in Section 14.4, the GHG emissions in the future baseline scenario are assumed to be zero. Because the future baseline assumes zero emissions, all GHGs produced by the Proposed Development are considered additional. This means that the net change in GHG emissions from the future baseline to the Proposed Development is equivalent to the total lifecycle emissions estimated for the Proposed Development.
- 14.6.5 A breakdown of the GHG emissions according to the different life cycle phases of the Proposed Development is provided in Table 14.4 and Inset 14.2.

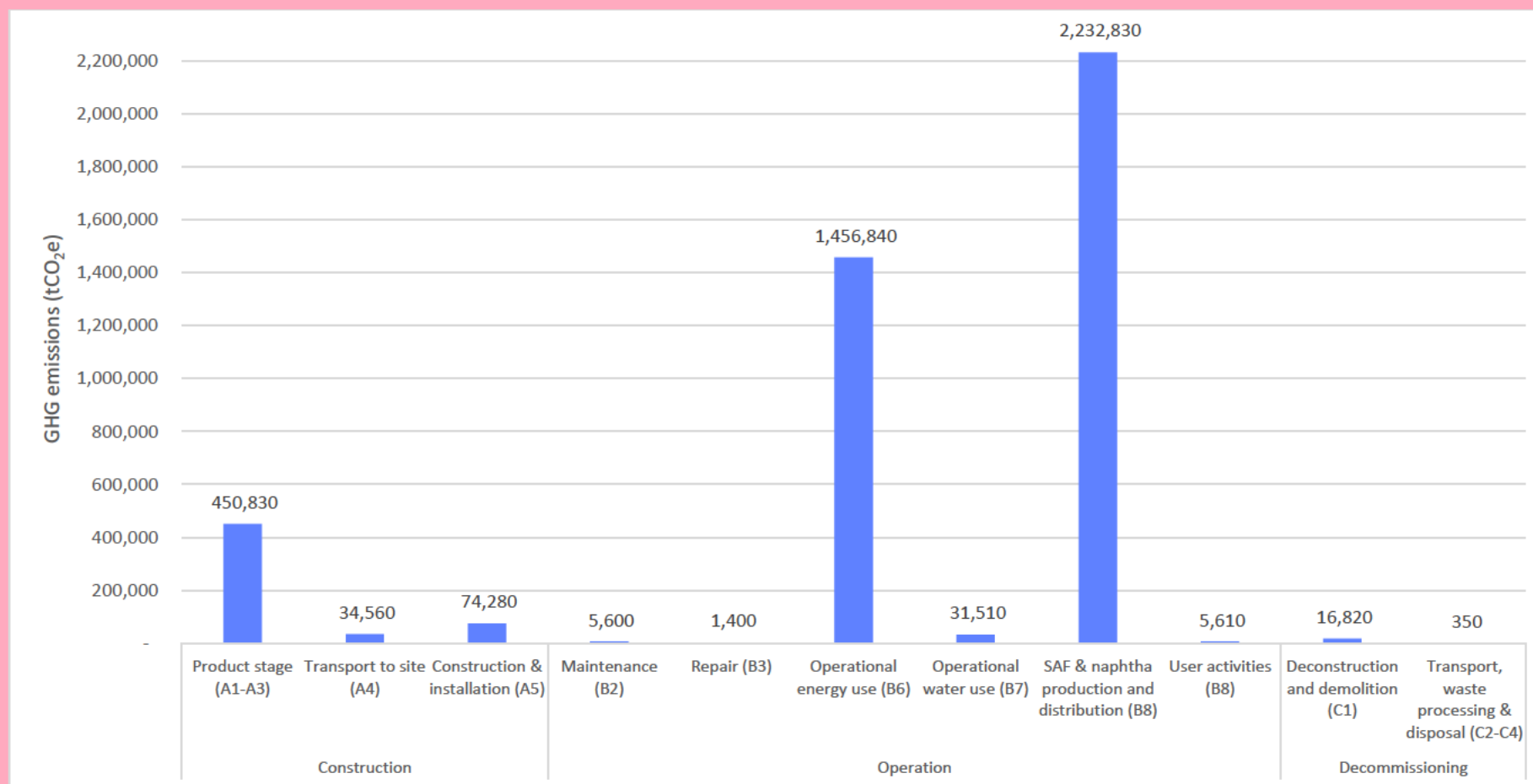
Table 14.4 GHG emissions per lifecycle phase of the Proposed Development

Lifecycle module	Source of emissions	GHG emissions (tCO ₂ e) ⁱ
A1-A3 Product stage	Extraction, transportation and manufacture of construction materials	450,830
A4 Transport to site	Transport of construction materials to site	34,560
A5 Construction and installation	Construction activities including demolition	71,520
	Transport and disposal of construction waste	260
	Worker transport	2,500
B2 Maintenance	Maintenance activities	5,600
B3 Repair	Repair activities	1,400
B6 Operational energy use	Energy use associated with the operation of the Proposed Development	1,456,840
B7 Operational water use	Raw water	31,510
B8 Other activities associated with low-carbon SAF and naphtha production and distribution	Biomass cultivation, collection and transport to production plant	968,860
	Pellet production and transport to LGF plant	1,009,430
	Materials, gases and chemicals utilised during LGF plant operation	87,270
	Transport, processing and disposal of operational waste from LGF plant	29,090
	Carbon dioxide released from chemical processes during LGF plant operation	67,880
	Transport and distribution of low-carbon SAF and naphtha produced at the LGF plant	70,300
B8 User transport	Operational transport of staff	5,610
C1 Deconstruction/demolition	Deconstruction and demolition activities	16,820
C2 Transport	Transport, processing and disposal of demolition waste	350
C3 Waste processing for reuse, recycling or recovery		
C4 Disposal		
Total Construction (Module A)		559,670
Total Operation (Module B)		3,733,790

ⁱ Figures are rounded to the nearest 10. As a result, totals may not precisely match the sum of individual lifecycle modules.

Lifecycle module	Source of emissions	GHG emissions (tCO ₂ e) ⁱ
Total Decommissioning (Module C)		17,180
Total Lifecycle (Modules A-C)		4,310,640

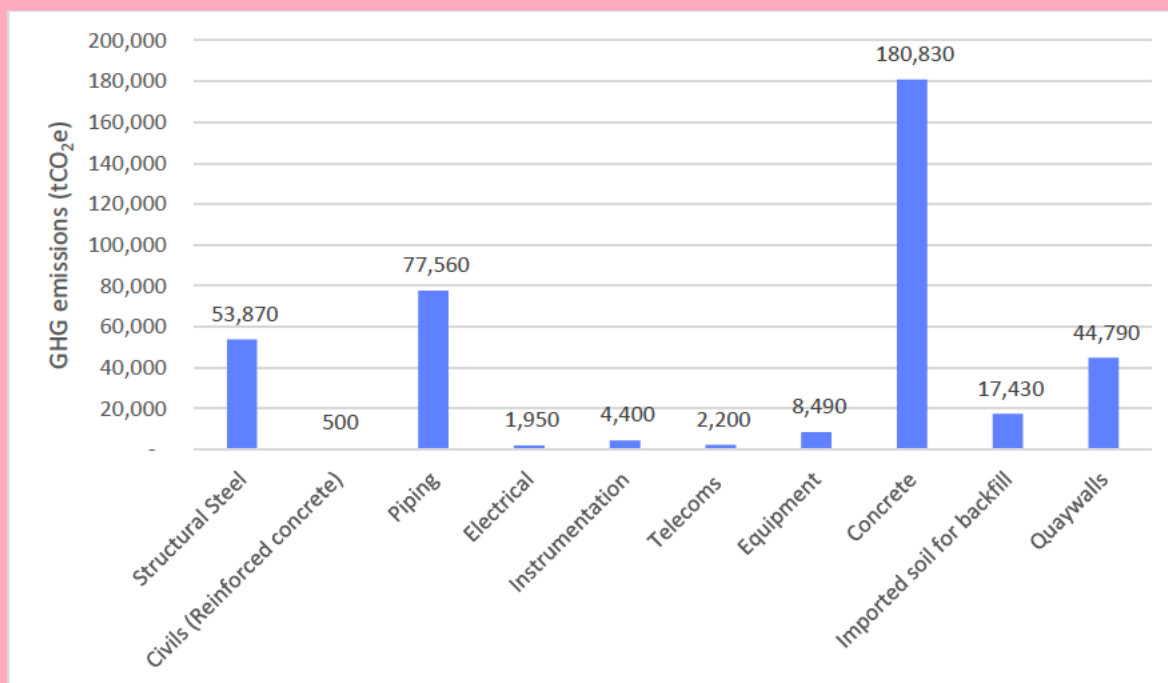
- 14.6.6 The breakdown of the GHG emissions of the Proposed Development shows that the vast majority is related to its operational phase, accounting for approximately 87% of the total footprint. This is followed by its construction phase, which accounts for approximately 13%, and finally its decommissioning phase, which contributes less than 1% of total emissions.



Inset 14.2 GHG emissions for the lifecycle phases of the Proposed Development

Construction

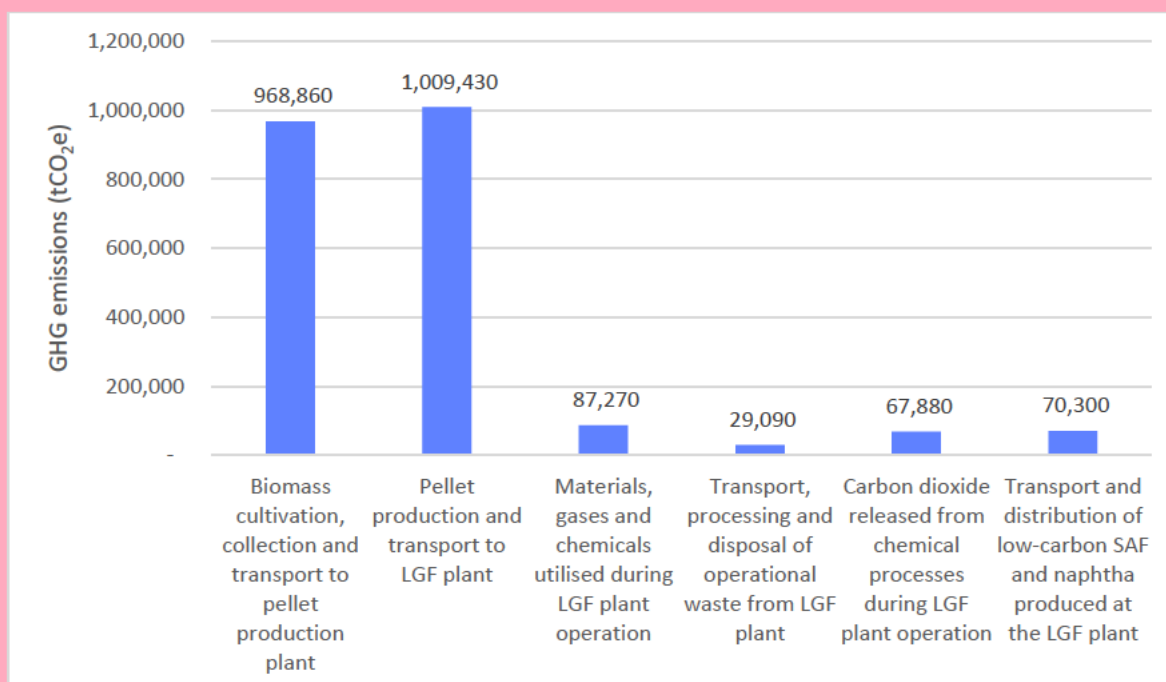
- 14.6.7 The construction phase of the Proposed Development is estimated to result in 0.56MtCO₂e, equivalent to approximately 13% of the total lifecycle emissions. Within the construction phase, the production of the construction materials (module A1-A3) is estimated to have the highest contribution (81%). Inset 14.3 shows the production impact for the main components of the Proposed Development.



Inset 14.3 GHG emissions related to the production (Module A1-3) of the main components of the Proposed Development

Operation

- 14.6.8 The operational phase of the Proposed Development is estimated to result in 3.73MtCO₂e. This is equivalent to approximately 87% of the total lifecycle emissions associated with the Proposed Development. Within this phase, activities associated with low-carbon SAF and naphtha production and distribution (Module B8) represent the largest contribution, accounting for approximately 60% of total emissions within the operational phase, followed by operational energy use (Module B6) at 39%.
- 14.6.9 As shown in Table 14.4, the Module B8 activities can be further subdivided into submodules representing the various steps of low-carbon SAF and naphtha production and distribution. Inset 14.4 shows the GHG emissions associated with each of these submodules.



Inset 14.4 GHG emissions associated with each of submodules of Module B8 user activities related to low-carbon SAF and naphtha production.

Decommissioning

- 14.6.10 The decommissioning of the Proposed Development is estimated to result in 17,180 tCO₂e, corresponding to less than 1% of the lifecycle emissions associated with the Proposed Development. It is anticipated that emissions from the decommissioning phase will in reality be less than estimated at the time of this assessment due to future decarbonisation of surface transport, for example.

Significance of effects

Contextualisation of GHG emissions

- 14.6.11 Table 14.5 presents the estimated absolute GHG emissions from the Proposed Development, grouped according to the five-year UK Carbon Budget periods [Ref 4] during which they are expected to occur. This includes the 7th Carbon Budget period, which has not yet been formally adopted by the UK Government. Since the Proposed Development will be operational beyond 2042, the last year of the 7th Carbon Budget, indicative 8th and 9th Carbon Budgets based on the CCC's Balanced Net Zero Pathway have been included. The table also illustrates the relative contribution of the Proposed Development's estimated GHG emissions to each relevant Carbon Budget.

Table 14.5 Proposed Development's GHG emissions contextualised against the UK Carbon Budgets

Carbon Budget period	Carbon Budget Limit (tCO ₂ e)	Indicative Carbon Budgets based on the CCC's Balanced Net Zero Pathway (tCO ₂ e)	Proposed Development emissions within Carbon Budget period (tCO ₂ e)	Total as percentage of CCC Carbon Budget (%)
4th Carbon Budget (2025 to 2027)	1,950,000,000		0	0%
5th Carbon Budget (2028 to 2032)	1,725,000,000		715,350	0.04%
6th Carbon Budget (2033 to 2037)	965,000,000		622,510	0.06%
7th Carbon Budget (2038 to 2042)	535,000,000		622,320	0.1%
8th Carbon Budget (2043 to 2047)		219,000,000	622,230	0.3%
9th Carbon Budget (2048 to 2052)		24,000,000	622,200	3%

- 14.6.12 The relative contribution of the Proposed Development's emissions to the Carbon Budgets is small for all periods, with a maximum of 0.1% for the Carbon Budget periods (and a maximum of 3% for the indicative Carbon Budgets).
- 14.6.13 From 2050 on, the goal for the UK is to align with net zero GHG emissions, with any residual emissions balanced by removals. The Proposed Development is estimated to emit 1,106,030 tCO₂e from 2053 until its decommissioning in 2061. This assessment represents a reasonable worst case, as it applies conservative assumptions, including the use of precautionary carbon intensities for activities beyond 2050. In practice, continued decarbonisation of energy systems, materials, and technologies is expected to reduce carbon intensities over time, meaning that actual emissions are likely to be lower than those presented.
- 14.6.14 The Carbon Budgets accommodate development and activity at a national scale, and are intended to inform national policy, development and action. As a result, almost all individual projects when compared to the adopted/published (4th/5th/6th/7th) budgets appear small and are only a fraction of the allocated budget.
- 14.6.15 In line with ISEP guidance [Ref 23], the significance of GHG emissions is not determined by their magnitude alone, nor by direct comparison with UK

Carbon Budgets only. Instead, significance is determined by the extent to which a project aligns with the UK's net zero trajectory and demonstrates the effective application of the mitigation hierarchy. As such, further contextualisation of the Proposed Development's emissions is required to support a robust assessment of significance.

- 14.6.16 The ISEP guidance [Ref 25] encourages a more sector-specific contextualisation. The Proposed Development's GHG emissions have also been contextualised against the CCC's Balanced Pathway trajectory for both the Aviation and Fuel Supply sectors. For both sectors, their trajectories have been translated into indicative "carbon budgets" following the same time horizons as the UK Carbon Budgets have been set out in Table 14.6 and Table 14.7.
- 14.6.17 While the CCC's Balanced Pathway provides indicative emissions trajectories for sectors such as aviation and fuel supply, these are not formal carbon budgets and are presented here for contextualisation purposed only.
- 14.6.18 Table 14.6 compares the GHG emissions of the Proposed Development with the indicative carbon budgets for the Aviation sector. The table shows that, as with the UK Carbon Budgets, the GHG emissions of the Proposed Development have a small relative contribution to the Aviation sector indicative carbon budgets, never exceeding 0.7%.

Table 14.6 Proposed Development's GHG emissions contextualised against the CCC Balanced Pathway for the aviation sector

Carbon budget period	Indicative Aviation Sector carbon budgets Based Upon the CCC's Balanced Net Zero Pathway (tCO ₂ e)	Proposed Development emissions within Carbon Budget period (tCO ₂ e)	Total as percentage of CCC carbon budget (%)
4th carbon budget (2025 to 2027)	107,558,538	0	0%
5th carbon budget (2028 to 2032)	165,667,342	715,350	0.4%
6th carbon budget (2033 to 2037)	152,836,134	622,510	0.4%
7th carbon budget (2038 to 2042)	145,648,851	622,320	0.4%
8th carbon budget (2043 to 2047)	130,490,806	622,230	0.5%
9th carbon budget (2048 to 2052)	95,118,683	622,200	0.7%

- 14.6.19 Table 14.7 compares the estimated GHG emissions of the Proposed Development with the indicative carbon budgets for the Fuel Supply sector. The Proposed Development's estimated emissions represent a relatively small proportion of the indicative budgets up to the 2040's. Beyond the 2040's, the Proposed Development is estimated to contribute a larger proportion of the indicative carbon budgets, including approximately 12% for the indicative 9th carbon budget.
- 14.6.20 It should be noted that these budgets are indicative only, and while the CCC's Balanced Pathway provides indicative emissions trajectories for sectors such as aviation and fuel supply, these are not formal carbon budgets and are presented here for contextual comparison only. Additionally, the emissions estimated for the Proposed Development reflect a reasonable worst-case scenario and do not account for future decarbonisation across the SAF production value chain –including upstream and downstream activities such as biomass cultivation, transport, and processing – which is expected to reduce the lifecycle emissions associated with the low-carbon SAF plant over time.
- 14.6.21 It is also important to highlight that the emissions reported do not include the avoided emissions expected from the substitution (i.e. displacement) of conventional jet engine fuel by the low-carbon SAF produced by the Proposed Development. These avoided emissions are anticipated to be significant (see following subsection in this chapter) and would materially reduce the net climate impact of the Proposed Development.

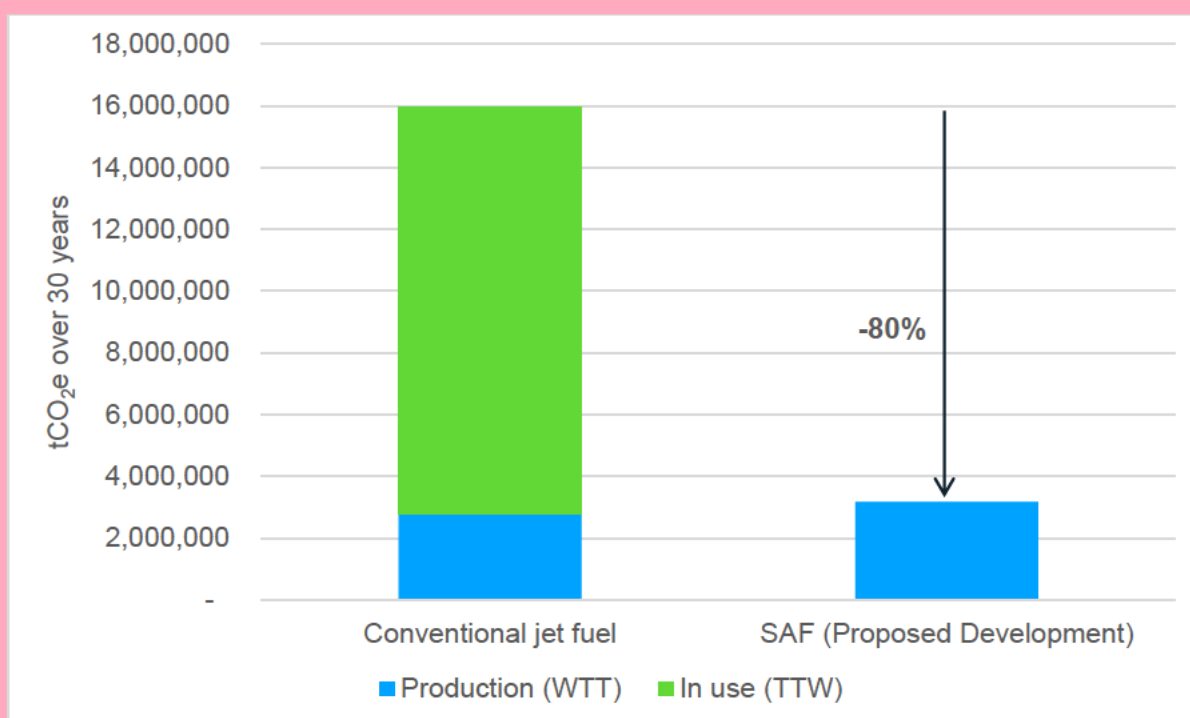
Table 14.7 Proposed Development's GHG emissions contextualised against the CCC Balanced Pathway for the fuel supply sector

Carbon budget period	Indicative Fuel Supply Sector carbon budgets Based Upon the CCC's Balanced Net Zero Pathway (tCO ₂ e)	Proposed Development emissions within Carbon Budget period (tCO ₂ e)	Total as percentage of CCC carbon budget (%)
4th carbon budget (2025 to 2027)	75,571,595	0	0%
5th carbon budget (2028 to 2032)	81,485,054	715,350	0.9%
6th carbon budget (2033 to 2037)	42,982,001	622,510	1%
7th carbon budget (2038 to 2042)	25,684,407	622,320	2%
8th carbon budget (2043 to 2047)	12,400,087	622,230	5%

Carbon budget period	Indicative Fuel Supply Sector carbon budgets Based Upon the CCC's Balanced Net Zero Pathway (tCO ₂ e)	Proposed Development emissions within Carbon Budget period (tCO ₂ e)	Total as percentage of CCC carbon budget (%)
9th carbon budget (2048 to 2052)	5,245,253	622,200	12%

Comparison of low-carbon SAF versus traditional jet fuel

- 14.6.22 The primary purpose of the Proposed Development is to produce low-carbon SAF that displaces conventional jet (A-1) fuel, thereby contributing to the decarbonisation of the aviation sector and supporting the UK's SAF Mandate targets. Over its 30-year operational life, the Proposed Development is expected to produce approximately 180 million litres of low-carbon SAF annually, which equates to a significant reduction in lifecycle GHG emissions when compared to an equivalent volume of traditional jet fuel.
- 14.6.23 As illustrated in Inset 14.5, the lifecycle emissions of the Proposed Development's low-carbon SAF are approximately 80% lower than those of conventional jet (A-1) fuel. This displacement results in avoided emissions that are directly attributable to the Proposed Development. Over the full operational period, the cumulative avoided emissions are estimated to be in the region of 12.8MtCO₂e, based on the comparative lifecycle intensity of low-carbon SAF produced by the Proposed Development and jet (A-1) fuel.



Inset 14.5 Carbon impact of the low-carbon SAF produced by the Proposed Development over its 30-year operational period compared to an equivalent amount of traditional jet fuel²

- 14.6.24 By comparison, the total lifecycle emissions associated with the Proposed Development - including construction, operation, and decommissioning - are approximately 4.3MtCO₂e. This means the Proposed Development is expected to deliver a carbon payback ratio of approximately 3:1, whereby for every tonne of GHG emitted across its lifecycle, around three tonnes are avoided through low-carbon SAF displacement of jet (A-1) fuel. This represents a substantial net climate benefit.
- 14.6.25 This payback dynamic is particularly important when considering the construction phase emissions, which are often viewed as a carbon “investment.” The construction emissions of approximately 559,670 tCO₂e are expected to be offset within less than 1.5 years of operation, based on annual avoided emissions from low-carbon SAF use. This relatively short payback period reinforces the strategic value of the Proposed Development in accelerating aviation sector decarbonisation.
- 14.6.26 Therefore, while the Proposed Development does result in GHG emissions from construction, operation and decommissioning, its role in displacing conventional jet fuel leads to a net reduction in atmospheric GHG concentrations. The project not only aligns with the UK’s Net Zero Strategy and Jet Zero ambitions but also supports UK net zero pathways through the substitution of conventional jet fuel with low-carbon SAF, delivering a strong return on its carbon investment, making it a key enabler of low-carbon aviation.
- 14.6.27 Furthermore, the UK Jet Zero Strategy sets out how the Government will achieve net zero aviation by 2050. They consider SAF a key lever to decarbonise the aviation sector. Table 14.8 compares the carbon impact of the low-carbon SAF produced by the Proposed Development against an equivalent amount of traditional jet fuel, contextualised within the UK’s Jet Zero Strategy interim carbon targets for 2030, 2040, and 2050:
- in 2040, the low-carbon SAF produced by the Proposed Development would account for 0.4% of the Jet Zero interim carbon target, whereas the equivalent amount of traditional jet fuel would represent 2% of the same target; and

² Note: The comparison includes Well-to-Tank (WTT) and Tank-to-Wheel (TTW) emissions. In line with RTFO and SAF Mandate guidance, biogenic CO₂ emissions from biomass SAF combustion are treated as zero, with upstream carbon uptake assumed to offset downstream release. Non-CO₂ GHGs from combustion (e.g. CH₄, N₂O) are minor and excluded for consistency with indicative figures provided by the Applicant.

- by 2050, SAF contributes 0.5%, while traditional jet fuel would account for 3% of the carbon target.

Table 14.8 Comparison of yearly amount of low-carbon SAF produced by the Proposed Development against an equivalent amount of traditional jet fuel in the context of the interim carbon targets set out by the Jet Zero Strategy

Year	Interim carbon target (tCO ₂ e)	Traditional jet fuel - Percentage of carbon target (%)	SAF - Percentage of carbon target (%)
2030	35,400,000	0%	0%
2040	28,400,000	2%	0.4%
2050	19,300,000	3%	0.5%

14.6.28 The SAF Mandate is the UK's key policy for decarbonising aviation fuel. It aims to stimulate the production and use of SAF by setting minimum percentages of SAF in the overall UK aviation fuel mix from 2025 to 2040. Table 14.9 quantifies how the Proposed Development contributes to the SAF blending targets set in the UK's SAF Mandate:

- in 2030, the UK SAF Mandate requires 1.2 Mtpa of SAF (10% of total UK aviation fuel demand). The Proposed Development is not yet operational, so its contribution is 0%; and
- in 2040 and 2050, the mandate requires 2.6 Mtpa of SAF (22% of total aviation fuel). The Proposed Development is expected to produce 0.14 Mtpa, which equates to 5% of the mandated requirement.

14.6.29 This shows that the Proposed Development will be a significant contributor to the SAF Mandate targets from 2040 onwards. While not sufficient on its own to meet the mandate, it represents a substantial share of the required SAF volume.

Table 14.9 The contribution of the Proposed Development to the SAF blending targets set in the UK's SAF Mandate

Year	Target (%)	Required SAF (Mtpa)	Produced SAF by Proposed Development (Mtpa)	% of required SAF produced by Proposed Development
2030	10%	1.2	0	0%
2040	22%	2.6	0.14	5%
2050	22%	2.6	0.14	5%

Significance conclusion

14.6.30 The key consideration to concluding whether a project's GHG emissions are significant or not is determining whether these support or undermine a

UK trajectory to net zero i.e. does the project hinder the UK's ability to achieve its legally binding net zero target by 2050. It is, hence, the role of the competent professional carrying out the assessment to consider the scale of changes in emissions, the context within which these are expected to occur, the mitigation undertaken to minimise negative impacts and the overall alignment of the project with the UK's carbon targets.

- 14.6.31 The Proposed Development is expected to result in approximately 4.3MtCO₂e of lifecycle emissions. However, its primary purpose is to produce low-carbon SAF that displaces conventional jet (A-1) fuel, mitigating GHG emissions by delivering an estimated 12.8MtCO₂e of avoided emissions over its 30-year operational life. This equates to a carbon payback ratio of approximately 3:1, whereby for every tonne of GHG emitted across its lifecycle, around three tonnes are avoided through SAF displacement of jet (A-1) fuel. Further, it is estimated that construction emissions are offset by the avoided emissions within less than 1.5 years of operation.
- 14.6.32 When contextualised against the UK's Carbon Budgets and the CCC's Balanced Pathway, the Proposed Development's emissions remain below 3% of any five-year budget period.
- 14.6.33 Importantly, the Proposed Development supports the UK's Jet Zero Strategy and SAF Mandate. From 2040 onwards, its contribution to the UK's mandated SAF requirement is expected to represent 5% (see Table 14.9), making it a significant enabler of aviation decarbonisation.
- 14.6.34 In line with the ISEP guidance [Ref 25] and applying professional judgement, the Proposed Development is considered to have a **minor adverse (not significant)** effect on GHG emissions. This is due to its role in the substitution (i.e. displacement) of fossil-derived aviation fuel and supporting national decarbonisation targets. It is supportive of existing and emerging aviation policy requirements necessary to achieve the UK's trajectory towards net zero.
- 14.7 Mitigation and enhancement measures**
- 14.7.1 The Proposed Development is considered to have a **minor adverse (not significant)** effect on GHG emissions. Because the Proposed Development aligns and supports the aviation sector's drive towards net zero, no additional mitigation is proposed.
- 14.7.2 As a potential future enhancement and not a mitigation measure included within the current proposal, carbon dioxide from the CHP plant and thermal pretreatment could be captured, purified, compressed using a (to be separately consented) on-site carbon capture and compression plant. This

captured carbon dioxide would then be transported for permanent storage via a connection included within the DCO application (via either Work No. 11B or 11C) to the Northern Endurance Partnership's CO₂ Gathering Network pipeline, when available. The Proposed Development is not dependent upon the availability or operation of the Northern Endurance Partnership CO₂ Gathering Network and can operate independently of carbon dioxide transport and storage infrastructure. This would enable the Proposed Development to further remove direct GHG emissions produced on site.

14.8 Residual effects and conclusions

- 14.8.1 No significant effects have been identified and as a result the assessment of residual effects remains the same as those reported in Section 14.6. The Proposed Development is considered to have a **minor adverse (not significant)** effect on GHGs.

14.9 Summary of significant effects

- 14.9.1 Summaries of the potential significant effects associated with the construction, operation and decommissioning of the Proposed Development are presented in Table 14.10.

Table 14.10 Summary of significant effects

Potential Impact	Receptor	Sensitivity	Magnitude of Impacts	Likely Significant Effects	Proposed Mitigation	Residual Effects
GHG emissions	Global atmosphere	High	4.3 MtCO ₂ e emitted, and 12.8 MtCO ₂ e avoided	Minor adverse (not significant) effect	None	Minor adverse (not significant) effect

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