

18. Climate Change

Introduction

- 18.1 This Chapter reports the outcome of the assessment of likely significant environmental effects arising from the Project for Assessment in relation to Climate Change. It also reports the likely significant environmental effects associated with the Proposed Scheme, which comprises the planning application.
- 18.2 The Chapter describes the technical consultation that has been undertaken during the EIA, the scope of the assessment and assessment methodology, and a summary of the baseline information that has informed the assessment.
- 18.3 In line with **Chapter 2: Approach to EIA**, the assessment reports on the likely significant environmental effects, the further mitigation measures required to prevent, reduce or offset any significant adverse effects, or further enhance beneficial effects. The conclusions are provided both in terms of the residual effects and whether these are considered significant. The assessment of effects takes into consideration both primary and tertiary mitigation (see **Chapter 2: Approach to EIA** for further details) and is informed by the EIA Scoping process (**Appendix 2.1 – 2.2**) and iterative scoping process where applicable.
- 18.4 This Chapter is intended to be read as part of the wider ES with particular reference to the introductory Chapters of this ES (**Chapters 1 – 6**).
- 18.5 In addition, this Chapter should be read in conjunction with **Chapter 19: Assessment of Cumulative Effects**.

Summary of Consultation

- 18.6 **Table 18.1** provides an overview of the consultation that has been undertaken to inform the EIA, including the consideration of likely significant effects and the methodology for assessment.

Table 18.1: Summary of Consultation

Body/ Organisation	Contact	Date/Form of Consultation	Summary of Consultation Outputs
RBC	Climate Resilience and Climate Change Officer, Woodlands and Natural Capital Office, Assistant	29 th July 2024, meeting	Discussion on the key considerations for the Climate Change assessment including how the assessment will scope out climate resilience, how GHG emissions will be considered assessing a worst case scenario, including the implications of Peat Land disturbance. Water use and efficiency noted as part of the discussions.

Body/ Organisation	Contact	Date/Form of Consultation	Summary of Consultation Outputs
	Development Manager		
BC	Environment Team Unit Manager, Climate Action Officer	05 th July 2024, meeting	Discussion on the key considerations for the Climate Change assessment including how the assessment will scope out climate resilience, how GHG emissions will be considered, including the implications of Peat Land disturbance.
United Utilities	Planning, Landscape and Ecology Team	27 th November 2024, response to EIA Scoping Report	The UU response to the EIA Scoping Report (Appendix 2.1) noted the importance to include water efficiency measures to enhance water efficiency such as rainwater recycling and water butts, as well as consideration of Places for Everyone Policy JP-S4 which sets water efficiency targets for new development. New residential development and non-residential development will reduce water consumption through: • Homes meeting the Governments higher water efficiency standard of 110l/p/d as set out in PfE Policy JP-S4; and • Non-residential development achieving the equivalent of 2 BREEAM Wat01 Water Efficiency credits. Consideration has been given to the potential for high water demand uses which might be accommodated within the Project for Assessment, for example data centres. Where data centres come forward they will be required, where feasible, to meet the water efficiency target set out by the Carbon Neutral Data Pact¹ which requires new data centres at full capacity in cool climates to be designed to meet a maximum WUE of 0.4 L/kWh in areas with water stress. This is as set out in Chapter 4: Development Specification – Project for Assessment and Chapter 5: Development Specification – Proposed Scheme .
Natural England	Strategic Planning	12 th November 2024, response to	Natural England noting that the ES should identify how development affects the ability of the natural environment to adapt to climate change; alongside how the development

Body/ Organisation	Contact	Date/Form of Consultation	Summary of Consultation Outputs
		EIA Scoping Report	impacts the environment's ability to store and sequester carbon. Mitigation has been set out within Chapters 4 and 5 which reflect the commitment to achieve a Biodiversity Net Gain through landscaping and green infrastructure provision. This includes the consideration of guidance such as the Natural England Climate Change Adaptation Manual. This Chapter includes consideration of the potential for peatland disturbance, as well as an assessment of the carbon sequestration potential.

Scope of the Assessment

- 18.7 An EIA Scoping Report was submitted to BC and RBC on 17th October 2024, as presented as **Appendix 2.1**. A Scoping Opinion has not been received to date; however a number of consultation responses have been received and are provided in **Appendix 2.2**. A response to the comments in **Appendix 2.2** are provided in **Appendix 2.3**. This section provides confirmation on the scope of the assessment presented within this Chapter following submission of the EIA Scoping Report.

Effects Not Considered to be Significant

- 18.8 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further in this Chapter:
- Increasing summer mean and daily maximum temperatures and influence on human health during construction (construction employees);
 - Changing annual temperatures / rainfall patterns and changes to air quality during construction and water supply, flood risk and during construction and operation;
 - Changes to future climate including temperature and rainfall and risk to building infrastructure and future occupants during operation;
 - Changes to future climate and resilience of Site habitats and species during operation; and
 - Higher average summer temperatures and risk of building overheating during operation.

Effects Considered Likely to be Significant

- 18.9 The following effects (**Table 18.2**) were considered likely to be significant and are reported within this Chapter:

Table 18.2: Effects Considered Likely to be Significant

Likely Significant Effect	Receptor(s)	Applicable Development Stage	Spatial Zone
GHG emissions	Global Climatic System	Construction	All
		Operational Stage – Buildings	All
		Operational Stage – Transport	All
		Operational Stage – Green Infrastructure	All
		Construction and Operation (In-combination)	All

- 18.10 It is worth noting that GHG emissions during operation have considered buildings, transport and green infrastructure separately. It has then been necessary for the operational phase to present an in-combination assessment of these three elements to capture the total impact during operation. It has also been necessary to identify the total GHG emissions across the construction and operational phase together, an in-combination effect.

Assessment Methodology

Legislative Framework, Policy and Guidance

- 18.11 The following legislation and policy have informed the assessment of effects within this Chapter:

- The Climate Change Act 2008² was revised in 2019 to set a 100% carbon reduction target (net zero) by 2050;
- National Planning Policy Framework (NPPF) (December 2024)³ paragraph 8(c) recognises the key role planning has to play in mitigating climate change and supporting the transition to a low carbon economy;
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017⁴ require the consideration of contributions from projects to climate change through the release of greenhouse gas (GHG) emissions and how such effects will be reduced ("climate change mitigation");
- The Government's Net Zero Strategy (October 2021)⁵ recognises the importance of the planning system to combating climate change and supporting sustainable growth;
- The UK's Sixth Carbon Budget⁶ was implemented in April 2021, enshrining in law a new target to reduce GHG emissions by at least 78% by 2035;
- The 2025 Future Homes Standard (FHS) and Future Buildings Standard (FBS) consultation⁷ was published in December 2023 which requires homes to achieve a 75% carbon reduction beyond Part L 2013, removing the use of fossil fuel and requiring increased fabric efficiency and use of low carbon renewable energy generation;

- Future Building Standard (FBS)⁸ (2021) adopted in June 2022 requires that new non-residential development should achieve an average 27% CO₂ improvement on the Part L 2013 standard, it is anticipated that from 2025 new non-residential buildings will be required to achieve a similar carbon reduction as proposed for the 2025 FHS;
- The Rochdale Core Strategy⁹ includes a number of climate change related policies, including Policy G1, Tackling and Adapting to Climate Change which expects new development to be zero carbon in line with national targets, and address the impacts of climate change by incorporating adaptation measures;
- The Bury Unitary Development Plan¹⁰ was adopted in 1997 and subsequent changes, including adoption of other documents, such as the Places for Everyone Strategy have superseded key climate change related policies; and
- The Places for Everyone Joint Development Plan 2022 to 2039¹¹ sets out the strategic spatial plan for Greater Manchester, including Bury and Rochdale. It sets out a number of climate change related policies and requirements, including JP-S2 Carbon and Energy, which requires development to be Net Zero (regulated operational carbon emissions), and from 2028 Net Zero in relation to construction emissions. Residential development is required to meet space heating targets, and non-residential development is required to achieve energy performance in accordance with the BREEAM mandatory Ene01 Excellent standard, and Outstanding standard from 2028.

18.12 The following guidance has informed the assessment of effects within this Chapter:

- IEMA's EIA Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022)¹² (IEMA's GHG Assessment Guidance) – provides guidance on the assessment of GHG emissions;
- RIBA 2030 Climate Challenge¹³ – provides good and best practice guidance on reducing energy demand and embodied carbon for residential and non-residential development;
- LETI Climate Emergency Design Guide (2020)¹⁴ and LETI's Embodied Carbon Target Alignment (2021)¹⁵ – provides good and best practice for upfront embodied carbon and operational energy for residential and non-residential buildings; and
- UK Net Zero Buildings Standard¹⁶ – provides best practice targets for upfront embodied carbon and operational energy for residential and non-residential buildings.

Defining the Study Area

18.13 The Assessment Boundary forms the principal study area for the assessment; however, the assessment will include GHG emissions / savings outside of the Assessment Boundary (or 'off-site') such as those associated with the manufacture and transportation of construction materials, and those associated with the off-site generation (e.g. at a power station) of grid electricity consumed by the operation of the Project for Assessment / Proposed Scheme.

Background Studies to Inform the ES / Establishing the Baseline

18.14 **Table 18.3** summarises all studies undertaken to inform the assessment presented within this Chapter.

Table 18.3: Background Studies

Study / Survey / Analysis / Evaluation	Overview	Date of Completion
Climate Change Assessment	A review of UKCP18 climate change projections and potential climate change risks	June 2024
High level review of potential GHG emissions	Estimate of the Project for Assessment's GHG emission and contextualisation against local and national emissions and carbon budgets.	February 2025
EIA Briefing Note: Peat (Appendix 2.4)	Review of the potential for peat within the Assessment Boundary, including consideration on the implications on GHG emissions	February 2025

Assessment Process

- 18.15 There is at present no single accepted methodology for the assessment of GHG emissions within EIA. The proposed assessment methodology outlined below is therefore based on application of IEMA's GHG Assessment Guidance, together with professional judgement.
- 18.16 Determining the magnitude, level of effect and significance of climate change (GHG emissions or savings) from new development remains an emerging practice and is complex given the local scale at which GHG emissions typically occur in contrast to the global and transboundary nature of climate change.
- 18.17 In line with IEMA's GHG Assessment guidance, the approach taken in this assessment is to estimate GHG emissions resulting from the construction and operation stages of the Project for Assessment and to evaluate these emissions in the context of baseline GHG emissions from the Assessment Boundary, local authority (i.e. the Bury and Rochdale administrative area), Greater Manchester and UK region (i.e. North West), as well as the future carbon budgets proposed for Bury and Rochdale and the UK.
- 18.18 Furthermore, and in accordance with IEMA guidance, consideration is also given to the contribution of the Project for Assessment to a science-based net zero trajectory in line with the 2015 Paris Agreement's 1.5°C pathway. In order to evaluate the contribution of the Project for Assessment to this net zero pathway, its construction and operational stage performance is evaluated against available good and best practice metrics for 'upfront embodied carbon' and 'operational energy use intensity' respectively.
- 18.19 A summary is provided below on the scope of the GHG Assessment, noting which elements are scoped in, which elements are scoped out, and which elements will be assessed qualitatively and quantitatively. Further detail is provided in the Limitations and Assumptions section.

- 18.20 **Demolition** – As part of the Materials and Waste section of the EIA Scoping Report consideration has been given to the potential for demolition waste as a result of the Project for Assessment. While figures of waste generation are not available at this stage, a pre-demolition waste audit will be carried out to identify materials that can be reused or recycled.
- 18.21 As outlined in **Chapter 4: Development Specification – Project for Assessment** and **Chapter 5: Development Specification – Proposed Scheme**, concrete hardstanding will be crushed and reused within the Assessment Boundary, and steel will be recycled. The Project for Assessment is aiming to divert non-hazardous demolition/site clearance waste from landfill by 80% by volume 90% by tonnage. Taking into account the waste mitigation proposed, the level of waste and therefore GHG emissions from demolition will be small and Not Significant, therefore this element has been scoped out from the GHG assessment.
- 18.22 **Building Construction and Operation** – The construction and operation of the Project for Assessment will result in the release of GHG emissions associated with the upfront embodied carbon of buildings and infrastructure, as well as operational emissions from the buildings. This has been scoped in and will form part of the GHG assessment based on the quantum of uses for the Project for Assessment as set out in **Chapter 4: Development Specification – Project for Assessment** and **Chapter 5: Development Specification – Proposed Scheme**.
- 18.23 It is noted that a range of uses may be delivered within the land use classes proposed and assessed, for example data centres. At this stage, this Chapter includes a reasonable worst case assessment based on available information, so as to ensure a robust assessment.
- 18.24 **Peatland** – As part of the ES, consideration has been given to the potential impact of peatland in relation to a number of topics, including Climate Change. Active peatland is an important carbon sink and disturbance of peatland can lead to carbon losses.
- 18.25 An EIA Briefing Note on Peat has been prepared and is set out in **Appendix 2.4**. It reviews the potential presence of peat within the Assessment Boundary and notes that the records of peat are limited to isolated ‘pockets of peat’ located sporadically within a small area (>0.001ha) of the Assessment Boundary. The potential loss of peat and associated release of carbon dioxide from the Assessment Boundary is therefore relatively small when considered in the context of the Assessment Boundary (570ha).
- 18.26 It is difficult to determine whether the peat within the Site is ‘active’¹ and therefore providing an increasing carbon store. However, the presence of limited pockets of peat suggests it is likely to be ‘inactive’².
- 18.27 The DCO assessment for the Simister Island junction¹⁷, located immediately west of the Assessment Boundary identified ‘pockets of peat’ which are considered representative of that recorded within the Assessment Boundary. The DCO assessment identified that extraction of peat soil excavation (net change in carbon stocks in the soil) would result in the loss of approximately 3,140 (TCO₂e) the impact of which is considered to be not significant. As the Assessment Boundary is likely to contain peat on a similar scale, it is likely that any

¹ Active peatland is described as areas where peat is currently forming and accumulating.

² Peatlands lacking current peat formation.

extraction of peat as a result of the Project for Assessment is also unlikely to be significant. Therefore this element has been scoped out from the GHG assessment.

- 18.28 **Transport** – The completed and operational Project for Assessment will generate additional vehicle trips on the local road network as a result of its construction and operation.
- 18.29 The construction stage transport emissions form part of the construction stage A1-A5 carbon emissions and form part of the Project for Assessment’s upfront carbon emissions. The upfront embodied carbon has been included in the assessment of Building Construction emissions.
- 18.30 In terms of the operation of the trips associated with the residential uses they are likely to already exist on the transport network and will be redistributed within the local area. Therefore, these have not be considered in the assessment.
- 18.31 In relation to the non-residential elements proposed, it is very likely that a proportion of the trips generated will come from the relocation or consolidation of businesses, and not all trips will be generated through new or growth of business operations. Therefore a quantitative assessment of transport emissions as part of the Chapter would likely overstate emissions as it is not possible to accurately quantify the net operational transport emissions of the Project for Assessment.
- 18.32 The Government has previously stated an intention to end the sale of new non-zero emissions HGVs with all new HGVs from 2040 to be fully zero emissions. A zero emissions HGV and coach infrastructure strategy is being prepared which will set the strategic direction to deliver zero emissions HGVs¹⁸.
- 18.33 With the phased introduction of zero emission HGVs from 2035 and as the Project for Assessment is not likely to be completed until 2045 it is likely that the majority of trips associated with its lifetime operation will be net zero.
- 18.34 Given the potential for double counting construction stage emissions, and lack of certainty over the operational data, the transport GHG emissions have not been directly assessed quantitatively. However, transport has been scoped in, although an assessment of emissions has been made on available transport data and considered qualitatively as part of the GHG assessment.
- 18.35 **Green Infrastructure** – Due to the nature of the Project for Assessment there will be a change in the net carbon sequestration potential of the green infrastructure within the Assessment Boundary. While this is likely to be very small and not significant, in response to likely scoping feedback from Natural England an assessment of the Assessment Boundary’s current carbon sequestration and subsequent carbon sequestration potential has also been carried out. This includes a quantitative assessment based on data available for the Proposed Scheme, with the Project for Assessment considered qualitatively. However, whilst this is scoped into the GHG assessment, given the potential variability in sequestration rates and small-scale of emissions, this has been considered qualitatively.
- 18.36 **Water** – GHG emissions from water are generally considered small. Construction stage water GHG emissions are included, within the upfront embodied carbon of development as set out in the RICS construction counted in A1 – A5.¹⁹ Operational water GHG emissions are difficult to estimate as there are no available benchmarks to estimate water use from commercial

buildings. Water use in B2/B8 uses is likely to be limited and to minimise water use building will be designed to achieve at least two BREEAM Wat01, Water Efficiency credits, achieving a 25% reduction in water consumption. It is noted that the proposed uses include the potential for data centres which can have increased water demand. While water demand can be high there are alternative technologies which limit water use.

- 18.37 Where data centres come forward, they will be required, where feasible, to meet the water efficiency target set out by the Carbon Neutral Data Pact which requires new data centres at full capacity in cool climates to be designed to meet a maximum WUE of 0.4 L/kWh in areas with water stress.
- 18.38 The residential development will be built to achieve the Building Regulations higher water efficiency standard of 110l/p/d²⁰, minimising water consumption. In this context, GHG emissions associated with water consumption have been scoped out of the GHG assessment.
- 18.39 **Waste** – GHG emissions from waste are also generally considered to be small. Construction stage waste GHG emissions are included within the upfront embodied carbon of development as set out in the RICS construction counted in A1 – A5. Operational waste was estimated as part of the EIA Scoping Report which included setting targets for diverting operational waste from landfill and measures to recycle and re-use of materials. These targets will minimise waste generation and encourage reuse and recycling of materials rather than landfill, which represents the most carbon intensive waste management practice. In this context it is considered that GHG emissions from waste are likely to be small in comparison to the operation of the Project for Assessment and this has therefore been scoped out of from the GHG assessment.
- 18.40 The applied methodology therefore comprises the following components:
- A quantitative assessment of **Building Construction and Operational** GHG emissions, including:
 - Establish national and local legislation, policy and guidance relating to climate change mitigation;
 - Establish baseline conditions with respect to GHG emissions at the Site, Bury and Rochdale administrative areas, Greater Manchester and North West;
 - Establish future baseline conditions with respect to GHG emissions from future carbon budgets proposed for Bury and Rochdale and the UK;
 - Calculate GHG emissions resulting from the construction and operation stages of the Project for Assessment;
 - Evaluate primary and tertiary GHG mitigation measures in place for the Project for Assessment;
 - Evaluate project GHG emissions in the context of baseline emissions and future carbon budgets to establish their context and magnitude;
 - Appraise the contribution of the Project for Assessment to the UK's net zero trajectory;

- Establish whether secondary mitigation is required to reduce adverse effects or enhance beneficial effects; and
- Establish the level of effect in relation to GHG and whether it is significant or not.
- A qualitative assessment of GHG emissions associated with:
 - **Operational Transport** – Assessing the potential net GHG emissions as a result of operational transport.
- A combined quantitative and qualitative assessment of GHG emissions associated with:
 - **Green Infrastructure** – Assessing the potential net GHG emissions from current and proposed green infrastructure based on data for the Proposed Scheme, qualitatively used to assess the Project for Assessment.

18.41 The timescales for the construction and operation stages of the Project are set out in **Table 18.4**.

Table 18.4: Assessed Project Timescales

Development Stage	First Year	Completion / Assessment period	Summary
Construction	2026	2045	Assuming appropriate planning permission is forthcoming, construction works could commence as early as 2026. Demolition and Construction activities will take place across an approximately 19-year period. Therefore, a construction period of 19 years is assumed in order to assess the worst-case scenario.
Operation	2035	2037	In order to assess the worst-case scenario, the Project for Assessment is assumed to be fully operational from 2035, roughly half way through the anticipated build out as the phasing of development is not fixed. This provides a reasonable worst case considering that operational GHG emissions will reduce over time. Operational GHG emissions are assessed up to the end of 2037 to enable comparison with the UK carbon budgets ending 2037. GHG emissions will continue beyond this point, however as the Project for Assessment will be all-electric GHG emissions will reduce over time in line with the decarbonisation of the electricity

Development Stage	First Year	Completion / Assessment period	Summary
			network. Assessing beyond this point is not considered necessary.

Reporting of the Environmental Effects and Significance Criteria

18.42 The assessment of likely significant environmental effects as a result of the Project for Assessment has taken into account the construction and operational stage. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value/importance), magnitude of change (or impact), the level of effect and significance.

Determining Sensitivity of Receptor

18.43 The sensitivity of affected receptors has been considered on a scale of **high, medium, low** or **negligible**.

18.44 GHG emissions affect the global climate system which, in accordance with IEMA guidance, is considered potentially sensitive to any additional GHG emissions. This sensitivity may, however, vary depending on the future global response to climate change, for example should a significant global reduction in GHG emissions (compared with the currently increasing emissions) be achieved over time. IEMA's latest EIA guide to climate change adaptation and resilience²¹ recommends the use of the Met Office UKCP18 high emissions scenarios (known as RCP8.5), unless the case can be made for using a different, lower emissions scenario. The RCP 8.5 scenario is considered most appropriate for this assessment and as a result the sensitivity of the global climate system is considered to be high.

Determining the Magnitude of Change

18.45 The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of **large, medium, small** or **negligible**.

18.46 There are currently no published or agreed significance criteria for evaluating GHG emissions in EIA. Therefore, the magnitude of change of GHG emissions estimated from the Project for Assessment is determined by establishing their scale relative to recent GHG emissions from the local area (Bury and Rochdale administrative area), Greater Manchester and North West, and also to future Bury and Rochdale UK carbon budgets as presented in **Table 18.5**, together with professional judgement. Given the Project for Assessment is of regional importance and scale the primary consideration in determining the magnitude of change will be contextualisation against the Greater Manchester and National emissions and budgets.

Table 18.5: Determining the Magnitude of Change

Magnitude of Change	Description of Change
Large	A large increase/decrease in GHG emissions (>10%) relative to baseline emissions and/or future carbon budgets
Medium	A medium increase/decrease in GHG emissions (5% – 10%) relative to baseline emissions and/or future carbon budgets
Small	A small increase/decrease in GHG emissions (1% – 5%) relative to baseline emissions and/or future carbon budgets
Negligible	A negligible increase/decrease in GHG emissions (<1%) relative to baseline emissions and/or future carbon budgets

- 18.47 The magnitude of GHG emissions (or savings) from a project, how this effect changes (or otherwise) baseline conditions and/or future carbon budgets at the local, regional and national level are also important components when establishing the magnitude of change. However, how much the project contributes (or otherwise) to the UK's net zero trajectory is a critical additional component as recognised by IEMA GHG Assessment Guidance. This is factored into determining the magnitude of change using professional judgement.

Determining the Level of Effect

- 18.48 The level of effect has been informed by the magnitude of change due to the Project for Assessment and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and **Table 18.6** has been a tool which has assisted with this process.
- 18.49 Whilst **Table 18.6** provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is '*beneficial*' or '*adverse*'.

Table 18.6: Matrix to Support Determining the Level of Effect

Magnitude of change (or impact)	Sensitivity (or value, importance, etc.)				
		High	Medium	Low	Negligible
Large		Major	Moderate to Major	Minor to Moderate	Negligible
Medium		Moderate to Major	Moderate	Minor	Negligible
Small		Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible		Negligible	Negligible	Negligible	Negligible

- 18.50 The following terms have been used to define the level of the effects identified and these can be '*beneficial*' or '*adverse*':

- **Major effect:** GHG mitigation measures are not in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a large increase (e.g. ≥10%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with major adverse effects is locking in GHG emissions and does not make a meaningful contribution to the national trajectory to net zero;
- **Moderate effect:** GHG mitigation measures are partly in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a medium increase (e.g. >5%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with moderate adverse effects complies with some up-to-date policy and good practice but is locking in some emissions and makes only a partial contribution to the national trajectory to net zero;
- **Minor effect:** GHG mitigation measures are in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a small increase (e.g. <5%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with minor adverse effects complies with up-to-date and emerging policy and good practice reduction measures and makes a contribution to the national trajectory to net zero; and
- **Negligible:** where the Project for Assessment is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

- 18.51 Beneficial net GHG impacts are below zero and the project results in a reduction in atmospheric GHG concentrations, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact. It should be noted that the latest IEMA guidance on GHGs in EIA does not seek to differentiate between different levels of beneficial effect (Minor, Moderate, Major) or whether they would be 'Significant/Not Significant'.
- 18.52 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.
- 18.53 Carbon dioxide equivalency (CO₂e) is a quantity that describes, for a given mixture and amount of GHG, the amount of CO₂ that would have the same global warming potential (GWP), when measured over a specified timescale (generally, 100 years). In view of this timescale and the findings of the Intergovernmental Panel on Climate Change (IPCC) 1.5°C Report²² that some effects from climate change may be long-lasting or irreversible, the duration of effect of the built elements of the Project for Assessment is assumed to be **long-term**.

Determining Significance

- 18.54 For each effect, a statement has been made as to whether the level of effect is '**Significant**' or '**Not Significant**'. This determination has been based on professional judgement and/or relevant guidance/legislation where applicable.

- 18.55 Significance has only been concluded for residual effects (i.e. following the identification of secondary mitigation).

Baseline Conditions

- 18.56 Current baseline conditions regarding greenhouse gas (GHG) emissions have been established at the local authority (Rochdale and Bury) and the regional level (North West) from the latest (2022) UK Government local authority and regional carbon dioxide emissions national statistics: 2005 to 2024 as presented in **Table 18.7**.
- 18.57 The current GHG emissions for the Assessment Boundary are unknown in quantitative terms and for the purposes of the GHG emissions assessment, baseline GHG emissions from the Assessment Boundary are assumed to be zero, an approach that helps ensure a reasonable 'worst-case' scenario regarding the GHG effect of the Project for Assessment.

Table 18.7: Baseline Local and Regional GHG Emissions

Geographical Area	2022 GHG Emissions (tonnes CO ₂ e)
Bury and Rochdale	1,899,500
Greater Manchester	11,930,400
North West	40,593,000
Assessment Boundary	0

Future Baseline

- 18.58 The future baseline conditions regarding GHG emissions have been established in the form of carbon budgets proposed for Rochdale, Bury and Greater Manchester via the Tyndall Centre⁵ and the UK⁶ as presented in **Table 18.8**. These will be used to contextualise GHG emissions from the Project for Assessment in order to establish the magnitude of its net GHG effect.

Table 18.8: Local and National Carbon Budgets

Period	UK	Greater Manchester	Rochdale and Bury
2018 – 2022	2,544,000,000	49,800,000	7,500,000
2023 – 2027	1,950,000,000	25,500,000	3,800,000
2028 – 2032	1,725,000,000	12,700,000	1,900,000
2033 – 2037	965,000,000	6,300,000	900,000
2038 – 2042	Not yet set	3,100,000	500,000
2043 – 2047	Not yet set	1,600,000	200,000
2048 - 2100	Not yet set	1,600,000	200,000

- 18.59 In order to determine whether the Project for Assessment is aligned with and makes an appropriate contribution to the UK's net zero trajectory, it is necessary to provide context for

the magnitude of GHG emissions. LETI Climate Emergency Design Guide (2020) and LETI's Embodied Carbon Target Alignment (2021), RIBA 2030 Climate Challenge, and the UK Net Zero Buildings Standard provide benchmarks for embodied carbon and upfront carbon for non-residential buildings to ensure the construction industry delivers the significant reductions necessary in order to have a realistic prospect of achieving net zero for the whole UK building stock by 2050.

- 18.60 Embodied carbon is the total GHG emissions and removals associated with materials and construction processes throughout the whole lifecycle of a building (RICS lifecycle modules A1-A5, B1-B5 and C1-C4). As such embodied carbon comprises construction (or upfront) carbon (typically accounting for the large majority of embodied carbon), together with emissions during building use and end of life.
- 18.61 Upfront carbon is the GHG emissions associated with materials and construction processes up to practical completion (RICS lifecycle modules A1-A5), excluding any biogenic carbon sequestered in construction products and materials (e.g. timber). As such upfront carbon relates to emissions occurring during a buildings' construction stage and is the focus of this Chapter (alongside operational emissions).
- 18.62 **Table 18.9** sets out the LETI 2020 Design targets, RIBA 2030 Climate Challenge targets, and UK Net Zero Building Targets for embodied carbon for new residential and non-residential buildings.

Table 18.9: LETI and RIBA Operational and Embodied Carbon Targets

Embodied Carbon and Operational Energy and Carbon Targets			
LETI Design Guide Targets			
	2020	2025	2030
Upfront Carbon – Offices (A1-A5) kgCO ₂ e/m ²	<600	N/A	<350
Operational Energy – Offices (kWh/m ² /year)	<55	N/A	N/A
Upfront Carbon – Residential (A1-A5) kgCO ₂ e/m ²	<500	N/A	<300
Operational Energy – Residential (kWh/m ² /year)	<35	N/A	N/A
Upfront Carbon – Education (A1-A5) kgCO ₂ e/m ²	<500	N/A	<300
Upfront Carbon – Retail (A1-A5) kgCO ₂ e/m ²	<550	N/A	<300
RIBA 2030 Climate Challenge Targets			
	Business as usual	2025 targets	2030 targets
Whole Life Carbon – Residential (A1-D4) kgCO ₂ e/m ²	1200	<800	<35
Operational Energy – Residential (kWh/m ² /year)	120	<60	<35

Embodied Carbon and Operational Energy and Carbon Targets			
Whole Life Carbon – Offices (A1-D4) kgCO ₂ e/m ²	1,400	<970	<750
Operational Energy (kWh/m ² /year)	130	<75	<55
UK Net Zero Buildings Standard ³			
	Current	2025	2030
Upfront Carbon – Residential (single family homes) (A1-A5) kgCO ₂ e/m ²	N/A	<430	<290
Operational Energy – Residential (single family homes) (kWh/m ² /year)	N/A	<45	<42
Upfront Carbon – Offices (A1-A5) kgCO ₂ e/m ²	N/A	<735	<500
Operational Energy – Offices (kWh/m ² /year)	N/A	<85	<72
Upfront Carbon – Storage and Distribution (A1-A5) kgCO ₂ e/m ²	N/A	<635	<475
Operational Energy – Storage and Distribution (unconditioned) (kWh/m ² /year)	N/A	<35	<30
Upfront Carbon – Retail (A1-A5) kgCO ₂ e/m ²	N/A	<715	<535
Operational Energy – Retail ⁴ (kWh/m ² /year)	N/A	<166	<143

Primary and Tertiary Mitigation

Construction Stage

18.63 The following primary and tertiary mitigation which has been evaluated as part of the construction stage assessment is outlined in the table below. It is worth noting that those which are relevant to the Proposed Scheme can be controlled through **Volume 3: Environmental Management Plan**, although those that apply to the Project for Assessment will be a matter for when planning applications are made for those relevant areas.

Table 18.10: Primary and Tertiary Mitigation to Inform Assessment of Construction Effects

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
Concrete hardstanding will be crushed and reused within the Assessment Boundary, and steel will be recycled.	✓	✓

³ Note these targets include both shell and core and fitout emissions. They exclude renewable energy technologies which include separate targets. These targets are in draft and subject to change and annual improvement beyond 2030.

⁴ Calculated average

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
Diversion of non-hazardous demolition/site clearance waste from landfill by 80% by volume 90% by tonnage.		
Embodied carbon will be assessed as part of each Plot/s with buildings including a Lifecycle Carbon Assessment to assess the upfront embodied carbon (Stages A1-A5) to demonstrate how upfront embodied carbon will be reduced in line with the following LETI 2020 Climate Emergency Design Guide targets : <600kgCO ₂ /m ² for non-residential development and <500kgCO ₂ /m ² for residential development.	✓	✓

Operational Stage

18.64 The following primary and tertiary mitigation which has been evaluated as part of the operational stage assessment is outlined in the table below.

Table 18.11: Primary and Tertiary Mitigation to Inform Assessment of Operational Effects

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
The requirements of the forthcoming Building Regulations 2025, including the Future Homes Standard (FHS) and Future Buildings Standard (FBS) (whereby residential and non-residential development will achieve at least a 75% carbon reduction beyond Part L 2013) and the Future Buildings Standard.	✓	✓
Provision of Electric Vehicle Charging Infrastructure in line with Part S of the Building Regulations ²³ .	✓	✓
Implementation of the Government's Net Zero Emissions HGV strategy.	✓	✓
All green and blue infrastructure and compensatory habitat will mitigate the anticipated impacts of climate change in accordance with the England Biodiversity Strategy and Natural England Climate Change Adaptation Manual.	✓	✓

Mitigation	Relevant to	
	Project for Assessment	Proposed Scheme
Where data centres come forward, they will be required, where feasible, to meet the water efficiency target set out by the Carbon Neutral Data Pact which requires new data centres at full capacity in cool climates to be designed to meet a maximum WUE of 0.4 L/kWh in areas with water stress.	✓	✓

Assessment of Effects, Secondary Mitigation and Residual Effects

Construction Stage

GHG Emissions (Project for Assessment and Proposed Scheme)

- 18.65 The construction phase of the Project for Assessment, and therefore the Proposed Scheme will result in GHG emissions both on- and off-site from a range of activities. These include the manufacture of construction materials and products, the transport of materials and waste on- and off-site, the consumption of fossil fuels and electricity by site plant and vehicles, and the treatment of residual construction waste.
- 18.66 In order to estimate baseline construction stage GHG emissions including mitigation, performance in line with the LETI 2020 upfront carbon benchmarks of 500 - 600 kgCO₂e/m² is assumed. This is applied to the maximum quantum areas of the Project for Assessment (sqm).
- 18.67 **Table 18.12** below presents annual and total construction phase GHG emissions calculated for the Project for Assessment.

Table 18.12: Estimated Construction Carbon GHG Emissions

	Assumed floor area (m ²)	Total GHG Emissions (tCO ₂ e)	Annual GHG Emissions (tCO ₂ e)
B2 – General Industrial	307,362	169,049	8,897
B8 – Storage and Distribution	717,178	394,448	20,760
C3 - Dwelling ⁵	18,000	9,000	474
C1 / E/ F1 / F2 – Hotels, Retail, Education etc	10,000	6,000	316
Total		578,497	30,447

⁵ Estimated based on an average floor area of 90m² per dwelling.

- 18.68 The construction phase of the Project for Assessment is estimated to result in total emissions of 578,497tCO₂e, equating to annual construction emissions of circa 30,447 tCO₂e across the 19 year construction period.
- 18.69 **Table 18.13** presents construction emissions as a proportion of baseline emissions from Rochdale and Bury, Greater Manchester and North West, as well as future UK carbon budgets. In order to assess the worst-case scenario, annual average construction emissions are used for comparison with baseline Rochdale, Bury and Greater Manchester emissions (given these are also annual emissions), whilst total construction emissions are compared with UK carbon budgets for that period.

Table 18.13: Estimated Construction Carbon GHG Emissions

Contextualised Construction GHG Emissions	
Context	Construction Phase GHG Emissions (as a %)
Baseline emissions	
Bury and Rochdale	1.60%
Greater Manchester	0.255%
North West	0.075%
Carbon budgets	
UK 4th Carbon Budget (2023 – 2027)	0.008%
UK 5th Carbon Budget (2028 – 2032)	0.008%
UK 6th Carbon Budget (2033 – 2037)	0.016%

- 18.70 Annual construction emissions of 30,477tCO₂e equate to circa 1.6% of Bury and Rochdale’s annual emissions, and 0.255% of Greater Manchester’s annual emissions. Total construction emissions of 578,497tCO₂e equates to a maximum of 0.016% of the UK carbon budget.
- 18.71 It should be noted that Rochdale, Bury and Greater Manchester carbon budgets proposed by Tyndall Centre relate to emissions from the energy system only, whereas construction emissions from the Project for Assessment will largely comprise those from the manufacture and transport of construction products and materials. Construction GHG emissions are therefore not readily comparable given a significant proportion of these emissions are likely to occur outside the geographical and/or temporal boundary of the Local and Greater Manchester carbon budgets.
- 18.72 Performance in line with LETI 2020 design targets for upfront carbon is considered to represent good practice regarding construction carbon and, therefore, the Project for Assessment is considered to make an appropriate contribution to the UK net zero trajectory for this issue.

Project for Assessment

- 18.73 The sensitivity of the Global Climate System is considered to be high. The magnitude of change is considered to be small. The Project for Assessment’s construction GHG emissions are considered to comprise current and emerging good practice and contribute to the UK’s

net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Proposed Scheme

18.74 The sensitivity of the Global Climate System is considered to be high. Whilst the magnitude of the GHG emissions from the Proposed Scheme will be smaller than the Project for Assessment, the magnitude of change is considered to remain small. The Proposed Scheme's construction GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Secondary Mitigation or Enhancement

18.75 The following will be required as part of the development of the construction methodology and would be delivered by the contractor:

- Preparation of a Site Waste Management Plan;
- Preparation of a Materials Management Plan for Plot/s with associated demolition, identifying materials for reuse and recycling; and
- A pre-demolition audit.

Residual Effect

18.76 In the absence of secondary mitigation the residual effects for Global Climatic System is that same as that reported in the pre-mitigation scenario.

Significance

18.77 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Operational Stage

GHG Emissions (Project for Assessment and Proposed Scheme) – Buildings

18.78 Occupation of the Project for Assessment will result in GHG emissions from the generation of energy consumed by the operation of the proposed buildings.

18.79 In order to estimate occupation phase GHG emissions energy performance data has been utilised from the Energy Strategy being prepared to support the Application. This includes consideration of the maximum quantum associated with the Project for Assessment as set out in **Chapter 4**. This includes data for the broad use classes proposed, including data for B2 and B8 uses, and retail use for the remainder of the proposed uses. This is anticipated to provide a reasonable worst case scenario.

18.80 As set out in **Table 18.11** all development will be constructed as a minimum to meet the anticipated FHS and FBS which will require development to achieve a c.75% carbon reduction beyond Building Regulations Part L 2013.

18.81 **Table 18.14** presents estimated occupation phase GHG emissions for the first year of assumed full operation (2035), for the last year of the assessed period (2037) as well as emissions over the assessed period (2035 – 2037). As the assessment uses UK electricity grid factors which reflect the continued decarbonisation of the UK electricity grid, operational

GHG emissions are anticipated to reduce over time, with emissions in year 1 representing the peak/worst-case.

Table 18.14: Operational Phase GHG Emissions

	Operational phase GHG Emissions (tCO ₂ e/yr)
Year 1 (2035)	749
Year 3 (2037)	683
Total (2035-2037)	2,132

18.82 The Project for Assessment is estimated to result in GHG emissions of 749 tCO₂e during the assumed first year of occupation (2035), and 683 tCO₂e in 2037, and accumulating to 2,132 tCO₂e across the assessed assumed operational phase (2035 – 2037).

18.83 **Table 18.15** presents operational emissions as a proportion of baseline emissions from Rochdale and Bury, Greater Manchester and North West, as well as future Local and UK carbon budgets. In order to assess the worst case scenario, peak annual operational emissions are used for comparison with baseline Bury, Rochdale, Greater Manchester and North West emissions, whilst cumulative operational emissions from 2035 – 2037 are compared with UK and local carbon budgets for that period.

Table 18.15: Operational Phase GHG Emissions in Context

Context	Construction Phase GHG Emissions (as a %)
Baseline emissions	
Bury and Rochdale	0.03943%
Greater Manchester	0.00628%
North West	0.00185%
Carbon budgets	
UK 6th Carbon Budget (2033 – 2037)	0.00037%
Bury and Rochdale Carbon Budget (2033 - 2037)	0.39472%

18.84 Peak annual emissions of 749 tCO₂e equate to circa 0.039% of Bury and Rochdale’s annual emissions, less than 0.006% of Greater Manchester’s emissions, and less than 0.001% of the North West annual emissions. Total emissions of 2,132 tCO₂e for the assessed assumed period equate to a maximum of 0.039% of Bury and Rochdale’s carbon budgets (for 2035-37) and less than 0.0003% of UK carbon budgets.

18.85 **Table 18.16** presents operational GHG emissions for the Project for Assessment within the context of the UKNZB target metrics set out in **Table 18.9** for operational energy for residential homes, storage and distribution buildings and retail buildings.

Table 18.16: Operational GHG Emissions Guidance Context

LETI Design Guide Target				
	2020	2025	2030	Project for Assessment
B2 – General Industrial - (kWh/m ² /year)	<55	N/A	N/A	37.8
B8 – General Industrial - (kWh/m ² /year)	<55	N/A	N/A	35.5
C3 – Dwellings (kWh/m ² /year)	N/A	N/A	N/A	63.8
C1/ E / F1 / F2 – Hotels, Retail, Education etc (kWh/m ² /year)	N/A	N/A	N/A	63.9
RIBA 2030 Climate Challenge Targets				
	Business as usual	2025 targets	2030 targets	Project for Assessment
Residential (C3 – Dwellings) (kWh/m ² /year)	120	<60	<35	38.7
Offices (B2 – General Industrial - (kWh/m ² /year)	130	<75	<55	37.8
Offices (B8 – General Industrial - (kWh/m ² /year)	130	<75	<55	35.5
Offices (C1/ E / F1 / F2 – Hotels, Retail, Education etc -kWh/m ² /year)	130	<75	<55	63.9
UKNZB				
Residential (C3 – Dwellings) (kWh/m ² /year)	Current	45	42	38.7
Storage and Distribution (B2 – General Industrial - (kWh/m ² /year)	N/A	35	30	37.8
Storage and Distribution (B8 – General Industrial - (kWh/m ² /year)	N/A	35	30	35.5
Retail (C1/ E / F1 / F2 – Hotels, Retail, Education etc -kWh/m ² /year)	N/A	166	142	63.9

- 18.86 Estimated annual operational energy demand of c.38 - 64kWh/m² for the range of uses proposed aligns with the 2025 and 2030 UKNZB operational energy targets. Therefore the Project for Assessment is considered to make an appropriate contribution to the UK net zero trajectory for this issue.

Project for Assessment

18.87 The sensitivity of the Global Climate System is considered to be high. The magnitude of change is considered to be negligible. The Project for Assessment operational GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Proposed Scheme

18.88 The sensitivity of the Global Climate System is considered to be high. While the magnitude of the GHG emissions from the Proposed Scheme will be smaller than the Project for Assessment, the magnitude of change is considered to remain negligible. The Proposed Scheme's operational GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Secondary Mitigation or Enhancement

18.89 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

18.90 In the absence of secondary mitigation the residual effects for the Global Climatic System is that same as that reported in the pre-mitigation scenario.

Significance

18.91 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

GHG Emissions (Project for Assessment and Proposed Scheme) – Transport

18.92 The operation of the Project for Assessment will result in an increase in local trips, from residents, employees and commercial operation. As discussed, residential trips are likely to have been relocated from other areas of the road network and have been excluded from the assessment.

18.93 The commercial operation of the Project for Assessment and employee transport is also likely to include an element of relocation and consolidation of business, as well as growth. However, it is not possible to accurately estimate which element of these operational transport emissions are 'net new'. In this context a purely quantitative assessment will likely overstate the operational transport emissions of the Project for Assessment.

18.94 In this context a qualitative assessment has been undertaken, informed by an assessment of 'Gross' transport emissions. As outlined in **Chapter 2**, and in line with the assumptions made in this Chapter, the total quantum tested in the Transport Assessment is less than the quantum outlined for the Project for Assessment in **Chapter 4** (which is 1, 034,540sqm). This is as a result of the non B2/B8 uses being scoped out of the traffic analysis.

18.95 The assessment of operational transport emissions considers the Governments pathway for Net Zero vehicles. This currently includes:

- Plans for all new HGVs to be fully net zero from 2040²⁴; and
- All cars and vans to be fully net zero from 2035²⁵.

- 18.96 The Project for Assessment will include EV charging infrastructure to support this strategy, in line with Part S of the Building Regulations.
- 18.97 To inform the assessment of transport GHG impacts, an estimate of potential GHG emissions from the Project for Assessment has been made based on a number of assumptions, including:
- Operational transport associated with the commercial floor space proposed, profiled as set out in **Table 18.17**;
 - Estimated trip lengths for cars, Light Good Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) based on census data, likely destinations and Government statistics;
 - Average vehicle age based on Government statistics²⁶; and
 - Current Electric Vehicle licensing figures (2023)²⁷.
- 18.98 Based on this data a profile of the decarbonisation of cars, LGVs and HGVs has been created to estimate transport emissions over time.
- 18.99 **Table 18.17** sets out the floorspace profile used as part of the Transport Assessment, including the total daily trips anticipated.

Table 18.17: Floor Space Profile

Year	Anticipated Floorspace	Total daily trips
2032	395,000sqm	9,698
2039	600,000sqm	16,226
2047	1,025,000sqm	28,845

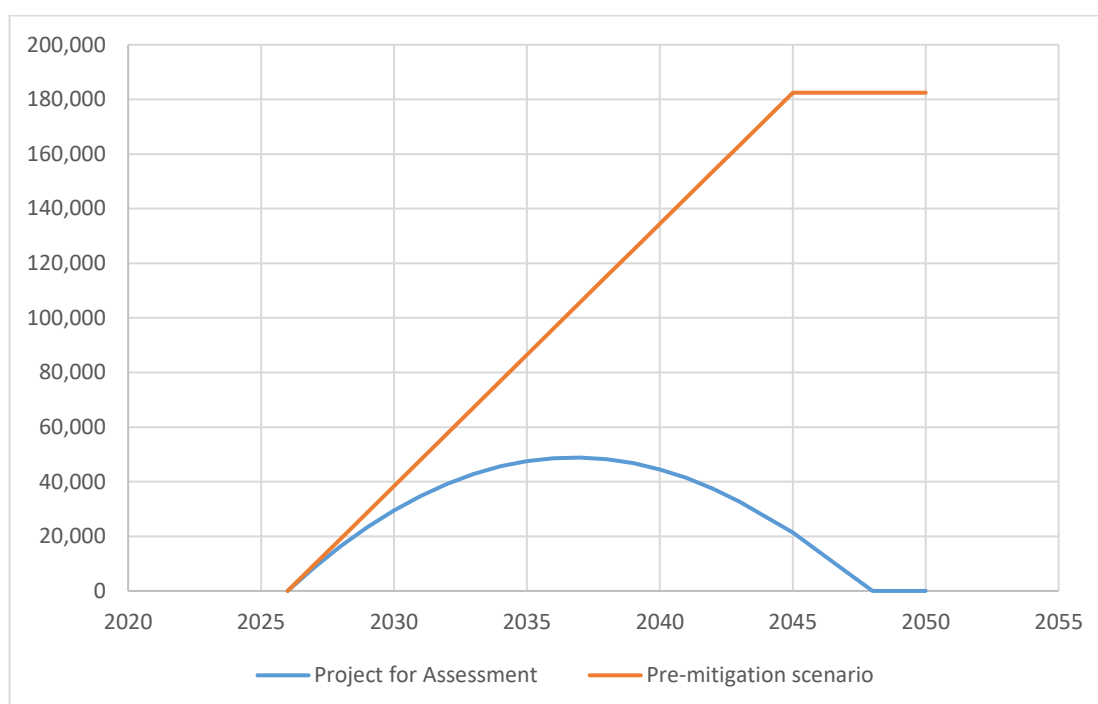
- 18.100 Based on the scenarios set out in **Table 18.17**, **Table 18.18** presents the estimated gross operational GHG emissions for the commercial operation of the Project for Assessment.

Table 18.18: Operational Transport GHG Emissions

Year	Estimated Annual GHG Emissions (tonnes CO ₂)
2032	39,233
2039	46,788
2047	14,242

- 18.101 **Extract 18.1** below shows the estimated annual transports emissions for the Project for Assessment comparing an unmitigated scenario against the mitigation based on the Government's Net Zero vehicle pathway. This demonstrates how transport emissions are likely to trend to zero over time.

Extract 18.1: Operational Transport GHG Emissions



18.102 Based on current available data for the UK it is noted that new registrations of HGVs continues to rise. Overall the proportion of net zero HGVs compared to the total HGVs operating in the UK remains relatively small, but this is growing.

18.103 The Government's net zero HGVs targets mean all new cars and vans will be net zero by 2035 and HGVs net zero by 2040. As older vehicles are phased out it is likely that all vehicles will be fully net zero by around 2048, around three years on from the anticipated completion of the Project for Assessment.

18.104 In support of the transition to Net Zero vehicles an EV infrastructure plan is proposed which will align with the requirements of Part S of the Building Regulations.

18.105 It is also noted that a number of larger scale commercial development operators have commitments to purchasing and operating fully electric fleets to reduce GHG emissions. For example Amazon has a commitment under The Climate Pledge to reach net-zero carbon emissions across their operations by 2040 and recently placed an order for 200 HGVs²⁸.

18.106 While it is estimated that initial gross operational transport emissions will be relatively high, as part of the Government's net zero transition transport emissions will start to fall as the construction of the Project for Assessment progresses.

18.107 It is anticipated that in line with the Government's zero emissions vehicles strategy GHG emissions as a result of the operation of the Project for Assessment will reduce over time, with the majority of vehicles likely to be net zero by the time the development is fully operational.

Project for Assessment

18.108 The sensitivity of the Global Climate System is considered to be high. The magnitude of change is considered to be small. The Project for Assessment's approach to reducing

operational transport emissions are considered align with the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Proposed Scheme

18.109 The sensitivity of climate system is considered to be high. The magnitude of change is considered to be small. The Proposed Scheme's approach to reducing operational transport emissions are considered align with the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Secondary Mitigation or Enhancement

18.110 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

18.111 In the absence of secondary mitigation the residual effects for the Global Climate System is the same as that reported in the pre-mitigation scenario.

Significance

18.112 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

GHG Emissions (Project for Assessment and Proposed Scheme) – Green Infrastructure

18.113 As requested by Natural England's EIA Scoping consultation response (see **Appendix 2.2**), estimates of the carbon sequestration of the existing Assessment Boundary and the Project for Assessment have been made using carbon flux data extracted from Natural England's report on carbon storage and sequestration of natural habitats²⁹ and the habitat types and areas (ha) provided by the Project Ecologist for the Proposed Scheme.

18.114 At this stage, data is not available for the proposed habitats associated with the Project for Assessment, therefore, professional judgement has been applied based on the data available for the Proposed Scheme.

18.115 The carbon sequestration of habitats can be contingent on its maturity, condition and environmental factors which make this estimate inherently uncertain. While the change in land use has the potential to sequester carbon, due to the uncertainty of this assessment it has not been incorporated into the wider GHG assessment of the Project for Assessment and has been considered qualitatively.

18.116 A summary of the assessment of carbon sequestration by natural environment is presented in **Table 18.19**, where a negative value indicates sequestration, positive values are emissions.

Table 18.19: GHG Sequestered by Natural Environment

Baseline Habitats				
Broad Habitat	Proposed Habitat	Area (ha)	Carbon Flux (tCO ₂ e/Ha/yr)	Sequestered CO ₂ e (T/yr)
Urban	Developed land: Sealed surface	5.2	0.0	0.0

Baseline Habitats				
Heathland and shrub	Mixed scrub / dense scrub	1.5	-1.7	-2.5
Grassland	Modified grassland	182.6	-0.4	-65.7
Grassland	Other neutral	7.2	-0.4	-2.6
Woodland and forest	Other woodland: broadleaved	3.2	-14.5	-46.4
Woodland and forest	Other woodland: broadleaved	6.6	-14.5	-95.0
Lakes	Ponds	0.2	-9.4	-1.6
Lakes	Ponds	0.3	-9.4	-2.5
Cropland	Cereal crops	3.4	2.9	9.8
Individual trees	Rural trees	2.2	-1.4	-3.0
Total carbon sequestration per year (tonnes)				-209.4
Created, Retained and Enhanced Habitats				
Broad Habitat	Proposed Habitat	Area (ha)	Carbon Flux (tCO ₂ e/Ha/yr)	Sequestered CO ₂ e (T/yr)
Heathland and shrub	Mixed scrub	2.8	-1.7	-4.7
Grassland	Other neutral	0.7	-0.4	-0.2
Urban	Developed land: Sealed surface	169.9	0.0	0.0
Grassland	Other neutral	1.3	-1.7	-2.3
Woodland	Other woodland: broadleaved	2.7	0.0	0.0
Lakes	Ponds	0.1	0.0	0.0
Individual trees	Rural trees	2.2	0.0	0.0
Heathland and shrub	Mixed scrub	0.4	-1.7	-0.6
Grassland	Other neutral	29.9	-0.4	-10.8
Woodland	Other woodland: broadleaved	2.3	-14.5	-33.8
Total carbon sequestration per year (tonnes)				-52.4
Net Change in sequestration per year (tonnes)				-157.0

18.117 The assessment of carbon sequestration shows that the Proposed Scheme will result in a net reduction in carbon sequestration of c.157 tonnes per year, primarily as a result of the urban development proposed.

18.118 As part of the Proposed Scheme and Project for Assessment all green and blue infrastructure and compensatory habitat will mitigate the anticipated impacts of climate change in accordance with the England Biodiversity Strategy and Natural England Climate Change Adaptation Manual.

18.119 In concluding the impact of the carbon sequestration, consideration has been given to the scale of change in the context of annual construction and operational GHG emissions which are significantly higher.

Project for Assessment

18.120 The sensitivity of the Global Climate System is considered to be high. The magnitude of change is considered to be negligible. The change in habitat will likely decrease carbon sequestration, however, all green and blue infrastructure and compensatory habitat will mitigate the anticipated impacts of climate change. Therefore, there is likely to be a direct, temporary, long-term, beneficial effect which is considered to be negligible.

Proposed Scheme

18.121 The sensitivity of the Global Climate System is considered to be high. The magnitude of change is considered to be negligible. The change in habitat will likely decrease carbon sequestration, however, all green and blue infrastructure and compensatory habitat will mitigate the anticipated impacts of climate change. Therefore, there is likely to be a direct, temporary, long-term, beneficial effect which is considered to be negligible.

Secondary Mitigation or Enhancement

18.122 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

18.123 In the absence of secondary mitigation the residual effects for the Global Climate System is the same as that reported in the pre-mitigation scenario.

Significance

18.124 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

GHG Emissions (Project for Assessment and Proposed Scheme) – (Construction and Operation, In Combination)

18.125 A combined assessment of GHG emissions has been provided considering the construction, building operation, transport and green infrastructure GHG emissions. As the transport emissions, and an element of the green infrastructure assessment have been assessed qualitatively, this assessment has also been provided qualitatively.

18.126 **Construction** – The assessment estimates annual construction emissions of 30,477tCO₂e equate to circa 0.248% of Bury and Rochdale's annual emissions, and 0.4% of Greater Manchester's annual emissions. Total construction emissions of 578,497tCO₂e equates to a maximum of 0.02% of the UK carbon budget. Construction stage mitigation includes performance in line with LETI 2020 design targets for upfront carbon which is considered to represent good practice regarding construction carbon and, therefore, the Project for

Assessment is considered to make an appropriate contribution to the UK net zero trajectory for this issue.

- 18.127 **Building Operation** – The operational assessment estimates peak annual emissions of 749 tCO₂e equate to circa 0.039% of Bury and Rochdale’s annual emissions, less than 0.006% of Greater Manchester’s emissions, and less than 0.001% of the North West annual emissions. Total emissions of 2,132 tCO₂e for the assessed assumed period equate to a maximum of 0.039% of Bury and Rochdale’s carbon budgets (for 2035-37) and less than 0.0003% of UK carbon budgets
- 18.128 Estimated annual operational energy demand of c.38 - 64kWh/m² for the range of uses proposed aligns with the 2025 and 2030 UKNZB operational energy targets. Therefore the Project for Assessment is considered to make an appropriate contribution to the UK net zero trajectory for this issue.
- 18.129 **Transport** – Whilst it is estimated that initial gross operational transport emissions will be relatively high, as part of the Government’s net zero transition transport emissions will start to fall as the construction of the Project for Assessment progresses.
- 18.130 It is anticipated that in line with the Governments zero emissions vehicles strategy GHG emissions as a result of the operation of the Project for Assessment will reduce over time, with the majority of vehicles likely to be net zero by the time the development is fully operational.
- 18.131 **Green Infrastructure** – The assessment of the Proposed Scheme Green Infrastructure emissions shows a net decrease in carbon sequestration of c.157 tonnes annually. This will likely be reduced with all green and blue infrastructure and compensatory habitat anticipated to mitigate the impacts of climate change.

Project for Assessment

- 18.132 The sensitivity of the Global Climate System is considered to be high. The magnitude of change is considered to be small. The approach to reducing construction stage, operational building and transport emissions, and green infrastructure mitigation aligns with current good practice. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Proposed Scheme

- 18.133 The sensitivity of Global Climate System is considered to be high. Whilst the magnitude of the GHG emissions from the Proposed Scheme will be smaller than the Project for Assessment, the magnitude of change is considered to remain small. The Proposed Scheme’s approach to reducing operational transport emissions are considered align with current good practice. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

Secondary Mitigation or Enhancement

- 18.134 No secondary mitigation or enhancement is required/has been identified.

Residual Effect

- 18.135 In the absence of secondary mitigation the residual effects for the Global Climatic System is that same as that reported in the pre-mitigation scenario.

Significance

18.136 This effect is considered to be **Not Significant** for the Project for Assessment and the Proposed Scheme.

Limitations and Assumptions

18.137 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- **Climate Change Projections** – The UK climate projections are dependent on future GHG emission assumptions. UKCP18 uses scenarios for future GHGs that are based on assumptions on future population, economic development and the mitigation of GHG emissions towards international targets. The real world may follow a different pathway altogether and the scientific community cannot reliably place probabilities on which scenario of GHG emissions is most likely. As outlined in the IEMA guidance, the sensitivity of the Global Climatic System is considered to be high.
- **Demolition/site clearance waste** – Concrete hardstanding will be crushed and reused within the Assessment Boundary, and steel will be recycled. The Project for Assessment is aiming to divert non-hazardous demolition/site clearance waste from landfill by 80% by volume or 90% by tonnage.
- **Grid Factors** – The future UK electricity grid factors sourced from Department for Energy Security and Net Zero (DESNZ) are projections which may not reflect the actual emissions associated with grid electricity consumption in future. However, DESNZ projections have slightly underestimated the rate of grid decarbonisation in recent years, so any inaccuracy in these projections may serve to over-estimate as well as under-estimate GHG emissions associated with the proposed development's future electricity demand.
- **Transport Emissions** – The completed and operational Project for Assessment will generate additional vehicle trips on the local road network as a result of construction and operation. As noted above, emissions associated with construction are incorporated as part of the upfront embodied carbon assessment. Operational transport GHG emissions associated with residential uses has been scoped out on the basis that the movement of people to the Assessment Boundary will effectively relocate transport emissions already present on the transport network and would not be additional.
- At this stage it is not possible to determine how much of the new commercial floorspace will result in net additional transport emissions as it is likely an element of the floorspace will represent the relocation and consolidation of commercial activities, not just growth. In this context the operational transport emissions have been assessed qualitatively, informed by an assessment of 'Gross' operational transport emissions from the Project for Assessment.
- The assessment section sets out the key assumptions made in estimating transport emissions. This includes consideration of the Government's Net Zero vehicle pathway to assess the transition to Net Zero vehicles.

- **Energy Data** – A Sustainability and Energy Statement has been prepared to support the application for the Proposed Scheme which includes an estimate of operational building energy demand, considering the requirements of the FHS and FBS. This assessment has provided data on the land uses noted in **Table 18.20**. This has been used in conjunction with the Project for Assessment parameters to assess operational emissions.

18.138 **Table 18.20** sets out the energy data used to assess the Project for Assessment. This represents the same baseline energy performance expected for the Proposed Scheme which will also as a minimum need to meet the requirements of the FHS and FBS.

Table 18.20: Energy Data Assumptions

Use type Groupings	Floor Area Assumptions (m2)	Energy data used
B2 – General Industrial	307,362	FBS Compliant B2 – General Industrial.
B8 – Storage and Distribution	717,178	FBS Compliant B8 – Storage and Distribution.
C3 - Dwelling[1]	18,000	FHS Compliant C3 - Dwelling ⁶ .
C1 / E/ F1 / F2 – Hotels, Retail, Education etc	10,000	FBS Compliant Retail use – considered a reasonable worst case to cover the remaining non-residential floor space. Some uses are likely to have lower energy demand, i.e. offices, while others, for example hotels are likely to be higher. Using a retail example provides a reasonable worst case, proportionate assessment.

- It is noted that the proposed uses associated with the Proposed Scheme and Project for Assessment include the potential for data centre(s). These use types can have large energy demands. At this stage no specific modelling has been undertaken to consider the delivery of data centres given the uncertainty over delivery and scale of any proposals. Understanding of potential climatic impacts from Data Centres is increasing and the Climate Neutral Data Centre Pact³⁰ provides guidance on limiting climate impacts associated with GHG emissions, water use and refrigerant use.
- **Green Infrastructure** – Details of the baseline and proposed habitats of the Proposed Scheme have been taken from the Biodiversity Net Gain Assessment prepared to support the Application. Details on further offsite enhancement and mitigation is not available at this stage, however, all green and blue infrastructure and compensatory habitat will mitigate the anticipated impacts of climate change in accordance with the England Biodiversity Strategy and Natural England Climate Change Adaptation Manual.

⁶ estimated based on an average floor area of 90m² per dwelling.

Summary

18.139 **Table 18.21** provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter, with reference to both the Project for Assessment and Proposed Scheme.

18.140 The table only provides a summary of the residual effects identified within the assessment. Details of all primary, secondary and tertiary mitigation that has been taken into account is summarised within **Volume 3: Environmental Management Plan**.

Table 18.21: Summary of Residual and Significant Effects for the Project for Assessment and Proposed Scheme

Effect	Receptor	Project for Assessment		Proposed Scheme	
		Residual Effect	Is the Effect Significant?	Residual Effect	Is the Effect Significant?
Construction Stage					
Construction Stage	Release of GHG emissions impacting the Global Climatic System	Minor Adverse	No	Minor Adverse	No
Operational Stage					
Operational Stage – Buildings	Release of GHG emissions impacting the Global Climatic System	Minor Adverse	No	Minor Adverse	No
Operational Stage – Transport	Release of GHG emissions impacting the Global Climatic System	Minor Adverse	No	Minor Adverse	No
Operational Stage – Green Infrastructure	Release of GHG emissions impacting the Global Climatic System	Negligible	No	Negligible	No
Construction and Operation Stages (In-combination)					
Construction and Operation	Release of GHG emissions impacting the Global Climatic System	Minor Adverse	No	Minor Adverse	No

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