

10. CLIMATE

10.1 Introduction

MKO has prepared the Climate chapter of this Environmental Impact Assessment Report (EIAR) for the Proposed Development which is located in the townland of Barrymore approximately 4 kilometres (km) to the northwest of Athlone, Co. Roscommon.

This chapter identifies, describes and assesses the potential significant direct and indirect effects on climate arising from the construction phase and operational phase of the Proposed Development.

The objective of this assessment is to assess the potential effects that the Proposed Development may have on climate and sets out proposed mitigation measures to avoid, reduce or offset any potential significant effects that are identified. This EIAR comprehensively assesses the susceptibility of the Proposed Development to climate change across EIAR Chapters 4 through 15, outlining specific measures in each chapter to enhance the Proposed Development's ability to withstand potential impacts, including those from climate change. Chapter 15 of this EIAR identifies the vulnerability of the project to natural disasters and major accidents.

10.1.1 Statement of Authority

This section of the EIAR has been prepared by Feargal Lennon and Catherine Johnson and reviewed by Eoin O'Sullivan, all from MKO. Feargal Lennon is an Environmental Scientist with MKO with over 2 years of experience in environmental consultancies. Feargal holds MSc in Environmental Resource Management from University College Dublin. Over his time at MKO Feargal has developed strong skills in environmental fieldwork, report writing and project management. Feargal has contributed to a wide range of projects over his time with MKO preparing Environmental Impact Assessments, Construction and Environmental Management Plans, and Construction Waste Management Plans. Feargal has been involved in a variety of projects including greenways, quarries, waste facilities, industrial and residential developments. Through his work on projects such as the Dexcom Athenry Pharmaceutical Plant and Ulster Canal restoration project, Feargal has gained extensive experience in coordinating and preparation of EIARs.

Catherine is an Environmental Scientist and Climate Practitioner at MKO with over three years of consultancy experience in renewable energy projects and infrastructure projects. Catherine has expertise in greenhouse gas assessments, international climate law and policy, earth science, and sustainability/ESG processes. Catherine possesses skills in mapping and design, which complement her experience in preparing comprehensive reports for EIAs with a particular focus on climate change. Catherine has a BSc in Earth and Ocean Science and an LLM in Global Environment and Climate Change Law.

Eoin O'Sullivan is a Project Director at MKO with over 18 years of experience in the environmental assessment of a wide range of energy and infrastructure related projects and working in the fields of environmental and human health risk assessment, waste management, waste policy and permitting. Eoin has also experience in completing Environmental Impact Assessment Reports for renewable energy projects, quarries, waste infrastructure and wastewater treatment facilities. Eoin holds a BSc (Hons) in Environmental Science & Technology and an MSc in Environmental Engineering. Eoin's key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Eoin is a Chartered Member of the Chartered Institute of Water and Environmental Management and Chartered Environmentalist with the Society of Environment.

10.1.2 Background

The site of the Proposed Development is located approximately 4 km to the northwest of Athlone, Co. Roscommon. The Proposed Development is located both on the shore of and within Lough Ree. Land-use on the site currently comprises of the existing Baysports water sports building and its associated structures, the existing Waterways Ireland marina, car parking areas, the L2020 Local Road to access the lakeshore area, landscaped public realm areas and an Uisce Éireann pumping station. The primary land-use in the vicinity of the site comprises mainly tourism & recreation, residential (one-off housing) and agricultural pasture. The area is renowned as a leisure destination, and the Hodson Bay Hotel and Athlone Golf Club are adjacent to the subject site.

10.1.3 Chapter Structure and Climate Study Areas

This chapter of the EIAR aims to provide an assessment of the potential significant direct and indirect effects on climate arising from all phases of the Proposed Development, as well as the vulnerability of the Proposed Development to changes in climate.

The chapter structure is as follows:

- A review of all relevant climate change legislation policy and guidance applicable to the Proposed Development (Section 10.2).
- Presentation of the baseline environment (Section 10.3 below), including:
 - A description of the current baseline environment established from desk study, utilising relevant datasets and data provided within other sections of the EIAR (Section 10.3.1 below)
 - A description of the future baseline environment, established from desk study, utilising relevant datasets and data provided within other sections of the EIAR (Section 10.3.2 below)
- Detailed overview of Roscommon County Council (RCC's), (the Applicant) sustainability commitments and the role of the circular economy in relation to the Proposed Development and associated potential impacts on climate change (Section 10.4).
- A detailed carbon assessment, which considers how the Proposed Development will affect the greenhouse gas emissions associated with Ireland as a result of activities associated with the Proposed Development (Section 10.5 below).
- Presents an assessment of the potential likely significant effects on climate arising from the Proposed Development during the construction phase (Section 10.6.2) and operational phase (Section 10.6.3) based on the information gathered and the analysis and assessments undertaken.
 - All required mitigation measures to prevent, minimise, reduce or offset the likely significant environmental effects identified in the construction phase and operational phase is provided in this section.
- An assessment of potential cumulative impacts is provided in Section 10.7 and details any potential cumulative effects on climate between the Proposed Development and other permitted or proposed projects and plans in the area

By their very nature, the impacts and resulting effects of greenhouse gas emissions are global rather than affecting one localised area. For the purposes of the EIAR, the overall Climate Study Area for the Proposed Development is defined as the national environment (Ireland), where the receptor is the climate and the global atmosphere. As stated in the Institute of Environmental Management and Assessment (IEMA) (Institute of Sustainability and Environmental Professionals (ISEP)) 2022 guidance *'greenhouse gas emission impacts and resulting effects are global rather than affecting one localised*

area¹. Therefore, effects arising from the potential impacts on climate are considered to impact on a national level. National, regional and local data has been considered where relevant and available. The study areas considered across the different assessments provided within this report are detailed below.

Baseline Environment

- Current Baseline
 - Current Baseline Study Area: defined as the EIAR Study Area, as defined in Section 1.2.1 of Chapter 1 of this EIAR. Relevant information taken from EIAR Chapters for inclusion in the current baseline assessment is within the relevant discipline's specific assessment boundary, as identified in each cited EIAR Chapter.
- Future Baseline
 - Future Baseline Study Area: defined as the EIAR Study Area, i.e., the primary study area for the EIAR as defined in Section 1.2.1 of Chapter 1 of this EIAR. Relevant information taken from relevant EIAR Chapters for inclusion in the future baseline assessment will be within the relevant discipline's specific assessment boundary, as identified in each cited EIAR Chapter.

Carbon Assessment

Carbon Assessment Study Area: defined as the EIAR Study Area, as defined in Section 1.2.1 of Chapter 1 of this EIAR.

10.2 Climate Legislation, Policy, and Guidance

Although variation in climate is thought to be a natural process, the rate at which the climate is changing has been accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing the world today and is primarily the result of increased levels of greenhouse gases in the atmosphere. Increasing human emissions of carbon dioxide and other greenhouse gases cause a positive radiative imbalance at the top of the atmosphere, meaning energy is being trapped within the climate system. The imbalance leads to an accumulation of energy in the Earth system in the form of heat that is driving global warming.^{2,3} Greenhouse gases come primarily from the combustion of fossil fuels in energy use.

In March 2024 the European Environment Agency (EEA) published the European Climate Risk Assessment.⁴ This assessment states that Europe is the fastest warming continent on the planet and is warming at about twice the global rate. The average global temperature in the 12-month period between February 2023 and January 2024 exceeding pre-industrial levels by 1.5°C. 2023 was the warmest year on record in more than 100,000 years, at 1.48°C above pre-industrial levels, with the world's ocean temperature also reaching new heights.

The Intergovernmental Panel on Climate Change (IPCC), in their AR6 Synthesis Report: Climate Change 2023⁵, state that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere

¹ IEMA (2022). *Assessing Greenhouse Gas Emissions and Evaluating their Significant*, 2nd Edition. Available online at: <https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions>

² Hansen, J.; Sato, M.; Kharecha, P. et al. *Earth's Energy Imbalance and Implications*. *Atmospheric Chemistry and Physics* 2011, 11 (24), 13421–13449. <https://doi.org/10.5194/acp-11-13421-2011>

³ von Schuckmann, K.; Palmer, M. D.; Trenberth, K. E. et al. *An Imperative to Monitor Earth's Energy Imbalance*. *Nature Clim Change* 2016, 6 (2), 138–144. <https://doi.org/10.1038/nclimate2876>

⁴ European Environment Agency (2024) *European Climate Risk Assessment* <<https://www.eea.europa.eu/publications/european-climate-risk-assessment>>

⁵ IPCC AR6 Synthesis Report: Climate Change 2023. <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>

have occurred. This has led to widespread adverse impacts and related losses and damages to people and nature due to the pressures of climate change and the inability to adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

Relevant legislation and policy in an international (Section 10.2.1), national (Section 10.2.2), and local (Section 10.2.3) context, and guidance (Section 10.2.4) are detailed below.

10.2.1

International Greenhouse Gas Emission and Climate Targets

Globally, governance relating to climate change has changed significantly since 1994 when the United Nations Framework Convention on Climate Change (UNFCCC) entered into force. Greenhouse gas emissions have been a primary focus of climate related international agreements for almost two decades.

Table 10-1 below identifies international instruments relating to greenhouse gas emissions and climate change targets. The following table provides an overview of the international agreements that have played key roles in establishing climate governance; please refer to Appendix 10-1 for further detail on each of the below international instruments.

Table 10-1 International Instruments Relating to Greenhouse Gas Emissions and Climate Change Targets

International Instrument	Description
Kyoto Protocol	The Kyoto Protocol was adopted on 11 th December 1997; this Protocol operationalised the UNFCCC and was the first international agreement that committed countries to reduce their greenhouse gas emissions. The Kyoto Protocol came into effect in 2005, as a result of which, emission reduction targets agreed by developed countries, including Ireland, became binding for the first time.
Doha Amendment to the Kyoto Protocol	In Doha, Qatar, on 8 th December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes: ➤ New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from starting in 2013 and lasting until 2020. ➤ A revised list of greenhouse gases to be reported on by Parties in the second commitment period; and ➤ Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.
Conference of the Parties (COP): <i>Every year since 1995, the Conference of the Parties (COP) has gathered the 196 Parties (195 countries and the European Union)</i>	COP21 – Paris (30th November to 12th December 2015) COP21 closed with the adoption of the first international climate agreement (concluded by 195 countries and applicable to all). The twelve-page text, made up of a preamble and 29 articles, provides for a limitation of the temperature rise to below 2°C above pre-industrial levels and even to tend towards 1.5°C. COP25 – Madrid (December 2nd to December 13th 2019) At COP25 the European Union launched its most ambitious plan, 'The European Green Deal' which aims to lower CO₂ emissions to zero by 2050.

International Instrument	Description
<i>that have ratified the Convention in a different country, to evaluate its implementation and negotiate new commitments, and is the supreme decision-making body of the UNFCCC.</i>	COP28 – Dubai (30th of November 2023 to the 13th of December 2023) COP28 resulted in a landmark deal to ‘transition away’ from fossil fuels, the United Arab Emirates (UAE) Consensus. The agreement calls for ‘transitioning away from fossil fuels in energy systems, in a just, orderly, and equitable manner.’ COP28 concluded the first ever Global Stocktake under the Paris Agreement. The Global Stocktake recognises that the world is not on track to meet 1.5°C and will require Parties to align their national targets and measures with the Paris Agreement.
	COP29 – Azerbaijan (11th November 2024 to 22nd November 2024) COP29 focused on accelerating global efforts to address climate change, in particular global efforts related to climate finance. The New Collective Quantified Goal on Climate Finance (NCQG) was agreed in the final days of COP with developed nations agreeing to triple climate finance to developing countries, with commitments increasing from USD 100 billion annually to USD 300 billion annually by 2035. Significant progress was made in the discussions surrounding carbon markets, with nearly 200 nations agreeing on critical rules under Article 6 of the Paris Agreement. The adoption of these rules is seen as a crucial step towards operationalising a robust and credible carbon market. Despite the advances, concerns were expressed about the potential for weak governance and risks of exploitation in the system; these issues must be addressed to ensure the market's full functionality.
	COP30 – Belém (November 10th 2025 to November 21st 2025) The 30th UN Climate Change Conference in Belém, Brazil concluded with a mix of political progress and unresolved tensions. Parties adopted the “Belém Political Package,” reinforcing the Paris Agreement’s goals and calling for tripling adaptation finance by 2035 to help vulnerable countries cope with climate impacts, alongside a set of 59 voluntary indicators to track adaptation progress. New mechanisms were launched to bridge the gap between pledges and implementation, including the Global Implementation Accelerator and the Belém Mission to 1.5°C, reflecting a growing focus on turning plans into action. A just transition mechanism and a Gender Action Plan were agreed to support equitable transitions that protect workers, Indigenous groups, and marginalized communities. Progress was also made on nature protection, with initiatives like the Tropical Forests Forever Facility to finance tropical forest conservation. However, negotiators failed to include a formal roadmap for phasing out fossil fuels or a zero-deforestation commitment in the core COP text, highlighting persistent geopolitical divides and the challenge of securing broad consensus. Despite these outcomes, leaders emphasised the urgency of deep emissions cuts and stronger climate finance to stay aligned with the 1.5°C target.
United Nations Sustainable Development Goals	On the 14th July 2025, the United Nations published ‘The Sustainable Development Goals Report 2025’ this report finds that, following an assessment of all 169 targets, for which trend data is available, only 17% of the SDG targets are on track, 18% of SDG targets are showing minimum or moderate progress, 47% having stalled in progress and 18% having regressed from 2024. Please see Section 1.1.3 of Appendix 10-1 for further detail.
Climate Change Performance Index	Established in 2005, the Climate Change Performance Index (CCPI)⁶ is an independent monitoring tool which tracks individual countries climate protection performance.

⁶ Climate Change Performance Index 2024 <<https://ccpi.org/>>

International Instrument	Description
	Ireland, ranked 29 th in 2025, has down 4 places to 33 rd in 2026 and is now considered a 'medium' performer in international performance. The CCPI states that Ireland's policies are missing a long-term strategy for phasing out fossil fuel infrastructure and shifting investments from natural gas towards an emissions-neutral energy supply.
Corporate Sustainability Reporting Directive	On the 5 th of January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force. This new directive modernises and strengthens the rules concerning the social and environmental information that companies have to publicly report. The CSRD serves as a major update to the Non-Financial Reporting Directive and will place environmental social governance (ESG) considerations at the forefront of European company reporting. The new rules will ensure that investors and other stakeholders have access to the information they need to assess the impact of companies on people and the environment and for investors to assess financial risks and opportunities arising from climate change and other sustainability issues. The new rules proposed in the Directive will increase the number of companies required to report from 12,000 to over 50,000 and will be implemented in phases for different financial sectors to allow for adequate prep time.
State of the Global Climate 2025	In March 2026, the World Meteorological Organisation (WMO) published a report entitled the 'State of the Global Climate 2025'. This report provided a summary on the state of the climate indicators with sections on key climate indicators, extreme events and impacts. The key messages in the report include: ➤ 2015–2025 was the warmest 11-year period on record, with 2025 ranked as the 2nd or 3rd hottest year at ~1.43°C above the 1850–1900 average; ➤ The Earth's energy imbalance: the difference between incoming solar energy and outgoing radiation—is now at the highest level ever recorded, confirming rapid, persistent warming; ➤ The ocean has been absorbing about eighteen times the annual human energy use each year for the past two decades.
European Green Deal	The European Green Deal is a comprehensive package of policy initiatives aimed at achieving climate neutrality across the EU by 2050. It features a wide range of actions and targets in different sectors such as energy, transport, industry, environment and agriculture. The goal is to transform the EU into a resource-efficient, competitive circular economy that is fair and inclusive for every individual and region. In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Under the EU Green Deal, the targets for the ETS and non-ETS sectors will be revised upwards in order to achieve the commitment, at EU level, to reach an economy-wide 2030 reduction in emissions of at least 55%, compared to 1990 levels.
EU Nature Restoration Law	The Nature Restoration Law is the first continent-wide, comprehensive law of its kind. It is a key element of the EU Biodiversity Strategy, which sets binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. The law aims to restore ecosystems, habitats and species across the EU's land and sea areas in order to ➤ Enable the long-term and sustained recovery of biodiverse and resilient nature. ➤ Contribute to achieving the EU's climate mitigation and climate adaptation objectives. ➤ Meet international commitments. The EU Nature Restoration Law was approved on June 17th, 2024; EU countries are expected to submit National Restoration Plans to the Commission within two years of the

International Instrument	Description
	Regulation coming into force (by mid-2026), showing how they will deliver on the targets. They will also be required to monitor and report on their progress.
EU Effort Sharing Regulation	Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR). This established binding annual greenhouse gas emission targets for Member States for the period 2021–2030. Ireland is required to reduce its emissions from these sectors by 30% by 2030, relative to 2005 levels. Please see Section 1.1.8 of Appendix 10-1 for further details on the EU ESR.

10.2.2 National Greenhouse Gas Emission and Climate Targets

Ireland has reached a crucial point in addressing climate change with a goal to becoming climate neutral by 2050 and to significantly cut greenhouse gases by 2030. National greenhouse gas emission and climate targets are critical for achieving Ireland's climate ambitions.

Table 10-2 below provides an overview of the national agreements relating to greenhouse gas emissions and climate change targets; please refer to Appendix 10-1 for further detail on each of the below national legislation measures.

Table 10-2 National Legislation and Reports relating to Greenhouse Gas Emissions and Climate Change Targets

National Instrument	Description
Programme for the Government – Securing Ireland's Future	The Programme for Government – Securing Ireland's Future was published in January 2025. The programme notes that the government are committed to reducing greenhouse gas emissions by an average 7% per annum over the next decade in a push to achieve a net zero emissions by the year 2050. The Programme states the Government's ongoing support and commitment to take "the necessary action to deliver at least 70% renewable electricity by 2030".
Climate Action and Low Carbon Development Act 2015	The Climate Action and Low Carbon Development Act 2015 established the national framework for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy.
Climate Action and Low Carbon Development (Amendment) Act 2021	The Climate Action and Low Carbon (Amendment) Act 2021 is a piece of legislation which builds on the Climate Action and Low Carbon Development Act 2015 and commits the country to move to a climate resilient and climate neutral economy by 2050. This was passed into law in July 2021. The Programme for Government has committed to a 7% average yearly reduction in overall greenhouse gas emissions over the next decade, and to achieve net zero emissions by 2050. This Act will manage the implementation of a suite of policies to assist in achieving these annual targets.
Climate Change Advisory Council	The Climate Change Advisory Council (CCAC) was established on 18 th January 2016 under the Climate Action and Low Carbon Development Act 2015. The Annual Review 2026: Transport ⁷ report and the Annual Review 2025: Built

⁷ Climate Change Advisory Council (2026) Annual Report 2026: Transport <
<https://www.climatecouncil.ie/councilpublications/annualreviewandreport/AR26-Transport-final.pdf>>

National Instrument	Description
	Environment, Industry and Waste ⁸ report has been released by the CCAC and focuses specifically on key findings and recommendations for the Transport and Built Environment, Industry and Waste sectors.
Carbon Budgets	The first national carbon budget programme proposed by the CCAC, approved by Government and adopted by both Houses of the Oireachtas in April 2022 comprises three successive 5-year carbon budgets. The total emissions allowed under each budget are shown in Section 1.2.1.6 of Appendix 10-1.
Sectoral Emission Ceilings	The Sectoral Emissions Ceilings were launched in September 2022. The Sectoral Emissions Ceilings alongside the annual published Climate Action Plan provide a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030. The Sectoral Emission Ceilings for each 5-year carbon budget period was approved by the government on the 28th of July 2022 and is shown in Section 1.2.1.6 of Appendix 10-1.
Climate Action Plan 2025	The National Climate Action Plan (CAP) 2025 was launched in April 2025. CAP 2025 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022 following the Climate Action and Low Carbon Development (Amendment) Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. CAP 2025 highlights the firm commitment that has been made by Ireland in relation to the clean energy transition and provides an outline of precise goals for renewable energy, focusing on solar, onshore wind, and offshore wind. The assessment has regard to CAP 2025, the current statutory Climate Action Plan for Ireland, which builds upon and updates the measures contained within CAP 2024
Circular Economy and Miscellaneous Provisions Act 2022	In July 2022, the Circular Economy and Miscellaneous Provisions Act 2022 became law in Ireland. This Act underpins Ireland's shift from a 'take-make-waste' linear waste model to a more sustainable pattern of production and consumption. This Act defines the circular economy for the first time in Irish domestic law, stating that a circular economy means an economic model and the policies and practices that give effect to that model in which: ➤ Production and distribution processes in respect of goods, products and materials are designed so as to minimise the consumption of raw materials associated with the production and use of those goods, products and materials, ➤ The delivery of services is designed so as to reduce the consumption of raw materials, ➤ Goods, products and materials are kept in use for as long as possible thereby further reducing the consumption of raw materials and impacts harmful to the environment, ➤ The maximum economic value is extracted from goods, products, and materials by the persons using them, and

⁸ Climate Change Advisory Council (2025) Annual Report 2025: Built Environment, Industry and Waste. <
<https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR2025-Built%20Environment,%20Industry%20and%20Waste-final.pdf>>

National Instrument	Description
	 Goods, products and materials are recovered and regenerated at the end of their useful life.
Ireland's Climate Change Assessment	In 2023, the EPA published Ireland's Climate Change Assessment (ICCA). This assessment provides a comprehensive overview and breakdown of the state of knowledge around key aspects of climate change with a focus on Ireland. The ICCA report is presented in four volumes.  Volume 1: Climate Science – Ireland in a Changing World  Volume 2: Achieving Climate Neutrality in 2050  Volume 3: Being Prepared for Ireland's Future  Volume 4: Realising the Benefits of Transition and Transformation Please refer to Section 1.2.2.1 of Appendix 10-1 for further information on the ICCA.

10.2.3 Local Greenhouse Gas Emission and Climate Targets

10.2.3.1 Roscommon Local Authority Climate Action Plan 2024-2029

The Roscommon County Council Local Authority Climate Action Plan 2024-2029⁹ (RLACAP) was adopted and published in February 2024.

The RLACAP highlights the current state of climate action in Ireland, and how RCC will be responsible for enhancing climate resilience, increasing energy efficiency, and reducing greenhouse gas emissions, across its own assets and services. The RLACAP provides a mechanism for bringing together both adaptation and mitigation actions to help drive positive climate action and outcomes across the local authority and its administrative area. The framework of climate actions set within the plan, configures the arrangement of climate actions within a defined structure that ensures alignment between on the ground actions and the high-level vision that the plan aspires to deliver. The RLACAP will help address the mitigation of greenhouse gases, the implementation of climate change adaption measures, and will strengthen the alignment between national climate policy and the delivery of effective local climate action.

Overall, the greenhouse gas emissions generated from County Roscommon equated to 1,622,291.4 tCO₂ in the baseline year 2018. The top three emitting sectors within County Roscommon in terms of total greenhouse gas emissions in the baseline year were agriculture, transport and 'land-use, land-use change and forestry', producing 43%, 22%, and 16% of total emissions respectively. RCC, along with all public sector entities must reduce greenhouse gas emissions by 51% by 2030 as compared to 2018 in line with the National Climate Action Plan 2025 (Section 10.2.2 above).

The RLACAP assesses climate risk relevant to Ireland and to County Roscommon; this, plus the evidence baseline, inform the climate objectives and actions that will be undertaken by RCC to assist in the achievement of national and international climate targets.

Climate Change Risk Assessment

The RLACAP climate change risk assessment (CCRA) outlines that droughts, heatwaves and flooding are the main climate change impacts anticipated with resultant pressure on recreational amenity sites, potential fires, damage to road surfaces, increased temperature

⁹ Roscommon County Council Local Authority Climate Action Plan 2024-2029.

<<https://www.roscommoncoco.ie/en/services/climate-action/roscommon-climate-action-plan/roscommon-county-council-climate-action-plan-.pdf>>

of water bodies, lower water levels. The CCRA also identifies that an increase in the severity of windstorms has been attributed to climate change and this should also be considered in relation the resilience of energy, communications and transport networks and how this relates to proposed developments.

Summary of Relevant RLACAP Objectives and Individual Actions

The following RLACAP objectives and individual actions are considered most relevant to the Proposed Development.

Built Environment and Transport

Objective BET (vi) - Focus ancillary tourism facilities in established destinations to promote sustainable travel choices, rationalise investment in services and utilities, consolidate destination benefits and protect amenity assets in accordance with appropriate guidance including the National Investment framework for Transport.

Action BET 1 – Net Zero – Ensure that all new Local Authority Buildings are designed to meet Net Zero Carbon using new innovative construction techniques, products, and processes. Identify a pilot building project to establish RCC as an exemplar of best practice.

Action BET 6 – Embed water conservation measures throughout all RCC buildings.

Action BET 11 – Facilitate the prioritised expansion of active travel projects in line with NTA/TFI strategy in high impact urban areas such as Roscommon Town and Athlone. Facilitate the expansion of the local link network in line with the National Transport Investment Framework, Transport for Ireland Strategy and smarter travel initiatives, including advancement of decarbonisation (alternative fuels), physical infrastructure (bus stops, linked cycle and walkways), digital technologies (streamline timetables, payment methods), target dedicated service provision (e.g. education, healthcare, employment, rural) alignment with national, regional and local services and promotion of modal shift. Promote - through control or influence as appropriate - the carrying out of development supported by this action in a manner that has due regard to: relevant environmental sensitivities, including European Sites; and opportunities to promote Nature-Based Solutions and Sustainable Drainage Systems.

Action BET 12 - Implement urban place making initiatives, including the reuse and regeneration of vacant, underused and derelict sites in the urban areas throughout the county in accordance with the CDP, LAPs and emerging Town Centre First policy promoting compact urban growth and vibrancy, facilitating modal shift and creating destination assets to focus benefits of regenerative tourism and protect amenity and heritage assets, having due regard to protected species, biodiversity, European Sites and the need to appropriately conserve protected structures.

Natural Environment and Green Infrastructure

Objective NEGI (vi) - Maintain, augment and enhance green infrastructural resources to provide ecosystem services and amenity benefits.

Objective NEGI (vii) - Promote heritage, biodiversity and Climate Action awareness in the management and maintenance of Local Authority assets, landbank and properties.

Action NEGI 2 - Establish holistic linkages between existing, planned and proposed amenity infrastructure and heritage assets within the county to enhance archaeological protection, biodiversity (wildlife corridors), flood resilience (ecosystem services) and increase public awareness (immersion in nature/ heritage), whilst promoting the adoption nature-based solutions and SUDs as appropriate, avoidance of habitat fragmentation, and adherence to environmental protection requirements.

Action NEGI 8 - Implement the tree management strategy with a focus on native trees to promote enhanced canopy cover within the County including tree protection measures and planting programmes in Local Authority property. Roll out internal training programmes for relevant council staff and contractors and externally for communities, landowners and potential developers on appropriate planting and maintenance for canopy preservation and biodiversity enhancement. Investigate potential system to monitor planting regimes.

Action NEGI 10 - Implement the sustainable management practices for public open spaces report and guidelines in local authority operations with the aim of advocating for the elimination and avoidance of glyphosate-based products and promote education and awareness on the use of herbicides and pesticides to the public and local communities to protect biodiversity and water quality. Training regarding herbicides and pesticides promotes use that does not cause significant effects on the receiving water environment, biodiversity or European Sites Highlight danger of invasive species and develop internal and external educational resources on prevention and biodiversity-aware eradication. Ensure that the invasive species educational resource is developed by a competent ecology team.

Community Resilience and Transition

Objective CRT (iii) - Align with the Just Transition process to ensure that those communities most affected by the transition to a low carbon society have access to enhanced social, economic and environmental opportunities.

Objective CRT (iv) - Embed climate resilience in design, operation and maintenance of all functional areas within RCC.

Objective CRT (vi) - Engage with the business community in the management of food and other wastes in support of a circular economy.

Action CRT 1 - Identify gaps in support for communities in achieving their climate ambition in the areas of placemaking, economic development and employment generation, agriculture, mobility, tourism and heritage, social enterprise, retail, commerce, industry, waste management and the circular economy and renewable energy development. Engage externally and internally to address these.

Sustainable Resource Management

Objectives SRM (v) - Ensure that existing, planned and proposed infrastructure is protected from the future potential effects of Climate Change.

Objectives SRM (vi) - Prioritise development of vacant, underused or derelict lands/buildings in serviced urban areas and degraded lands in rural areas as potential locations for spatially-based Climate Actions.

Objectives SRM (vii) - Manage RCC assets to achieve national emissions reductions targets.

Action SRM 1 - Embed Green procurement into all functional areas of RCC.

Action SRM 4 - Develop and implement multi-faceted campaigns on the practical need for behavioural change at all levels, work, home and recreation in order to achieve Climate Action ambitions.

Action SRM 6 - Prioritise Climate Action based interventions in locations when greatest emissions savings can be achieved, such as EV charging in town centres, prioritising reuse of existing built fabric where services and infrastructure are in place, reuse existing paving/ building material where possible and in line with relevant specifications, having due regard to environmental sensitivities such as the receiving water environment, biodiversity, European Sites, local air quality.

10.2.3.2 Roscommon County Development Plan 2022-2028

The Roscommon County Development Plan 2022-2028¹⁰ (RCDP) sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The RCDP includes numerous actions and objectives on sustainability and climate for Roscommon to achieve over the 6-year period.

In relation to tourism and recreation activities, the RCDP states that

‘Having regard to national and regional tourism policy, the Council is committed to supporting the growth of tourism, taking full advantage of national and regional initiatives and funding schemes and maximising the potential of the unique natural, heritage, cultural, and amenity assets. Roscommon County Council together with LEADER, Fáilte Ireland and local communities are working together to develop tourism throughout the county, utilising the natural landscape and heritage to offer the visitor a unique destination. The Council will continue to collaborate with relevant agencies, stakeholders and other established working groups to continue to support collective development and marketing initiatives underway.’¹¹

Key objectives identified in the RCDP relating to tourism and recreation include:

‘Policy Objective ED 6.22:

Promote tourism as an integral part of County Roscommon’s economic profile, supporting urban and rural enterprise, and recognising the key strategic location of the county and access to tourist sites and attractions

Policy Objective ED 6.25:

Promote the development of sustainable tourism as part of our economy, that recognises our landscapes, our cultural heritage and our environment.

Policy Objective ED 6.29:

¹⁰ Roscommon County Development Plan 2022-2028 <<https://www.rosdevplan.ie/roscommon-county-development-plan-2022-2028/>>

¹¹ Roscommon County Development Plan 2022-2028 Vol I (page 79) <<https://www.rosdevplan.ie/roscommon-county-development-plan-2022-2028/>>

Facilitate the creation of a network of cycling/ walking routes (including existing footpaths and walking routes, off road routes, local walks, tourist walks, medium and long distance walking routes) within the county.'

Further detail on local policy in Co. Roscommon can be found in Section 2.4.4 of Chapter 2 of this EIAR.

10.2.4 Relevant Guidance

The climate section of this EIAR is carried out in accordance with the 'EIA Directive' as amended by Directive 2014/52/EU and has been prepared in accordance with guidance listed in Section 1.5.3 of Chapter 1: Introduction. Due to the nature of the Proposed Development, the following methodology and guidance was utilised for the climate section of this EIAR:

- 'Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment' (European Commission 2013).
- Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document, GE-ENV-01106 (TII 2022b).
- Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.9.0) (TII, 2020).

Consideration has also been given to the 'Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107' (Transport Infrastructure Ireland, December 2022 (2022a)), 'Climate Assessment of Proposed National Roads – Standard and Overarching Technical Documentation' (Transport Infrastructure Ireland, December 2022b/c) and TII Carbon Tool for Road and Light Rail Projects: User Guidance Document, GE-ENV-01106 (TII, 2022d).

10.3 Climate and Weather in the Existing Environment

10.3.1 Baseline Environment

Climate change projections show that the earth is getting warmer and extreme weather events are increasing in frequency on an annual basis. Changes to climate and weather in Ireland will occur as a result of climate change. Details of the Proposed Development susceptibility to climate change are provided in EIAR Chapters 4 through 15. Further information on the Proposed Development site's susceptibility to major accidents and natural disasters is provided in Chapter 15 of this EIAR. Due to the location and nature of the Proposed Development site, the main risk associated with climate change to the Proposed Development is flooding.

The following sections outline the current baseline environment in Ireland and the projected future baseline environment of Ireland, factoring in physical environmental changes resulting from climate change.

10.3.1.1 Data Sources

A review of literature and data relating to climate change in Ireland was undertaken and utilised to provide an overview of the current baseline environment. The following key data sources were reviewed:

- Met Éireann 30-Year Averages¹²

¹² Met Éireann (2023) <<https://www.met.ie/climate/30-year-averages>>

- Ireland's Climate Averages 1991-2020 Summary Report¹³
- Ireland's National Inventory Report 2026¹⁴
- Climate Status Report for Ireland 2020¹⁵
- Annual Review 2026 – Our Changing Climate in 2025¹⁶

10.3.1.2 Physical Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Shannon Airport is the nearest weather and climate monitoring station to the Proposed Development site that has meteorological data recorded for the 30-year period from 1991-2020. The monitoring station is located approximately 106 km southwest of the site. Meteorological data recorded at Shannon Airport over the 30-year period from 1991-2020 is shown in Table 10-3. The wettest months are November and December, with April and May being the driest. July is the warmest month with an average temperature of 16° Celsius.

Recent monthly meteorological data recorded at Mount Dillon, County Roscommon, located approximately 26 km north of the site, from January 2023 to May 2026 is available at: [Monthly Data - Met Éireann - The Irish Meteorological Service](#). July 2023 was the wettest month in this time period, with 206mm of rainfall recorded, while February 2023 was the driest month with 21.7mm of rainfall. July 2025 was the warmest month in this time period, with a mean monthly temperature of 16.2° Celsius. January 2025 was the coldest month in this time period with a mean monthly temperature of 4.1° Celsius.

Table 10-4 below provides a summary of the current physical baseline environment with reference to relevant chapters within the submitted EIAR where further information is available.

¹³ Department of Housing, Local Government and Heritage (2024) Irelands Climate Averages 1991-2020 Summary Report <https://edepositireland.ie/bitstream/handle/2262/108695/Ireland%27s_climate_averages_1991-2020_rev2.pdf?sequence=1&isAllowed=y>

¹⁴ EPA (2026) Ireland's National Inventory Report <<https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/Ireland-NID-2026.pdf>>

¹⁵ EPA (2021) Climate Status Report for Ireland 2020 <<https://www.epa.ie/publications/research/climate-change/research-386-the-status-of-irelands-climate-2020.php>>

¹⁶ Climate Change Advisory Council (2026) Annual Review 2026 – Our Changing Climate in 2025 <<https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR2026-2-our-changing-climate-final.pdf>>

Table 10-3 Data from Met Éireann Weather Station at Shannon Airport from 1991-2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE (degrees Celsius)													
Mean daily max	8.9	9.4	10.9	13.4	16	18.3	19.5	19.1	17.5	14.2	11.1	9.2	14
Mean daily min	3.3	3.3	4	5.8	8.1	10.8	12.6	12.4	10.7	8.1	5.5	3.7	7.4
Mean temperature	6.1	6.3	7.5	9.6	12	14.5	16	15.8	14.1	11.2	8.3	6.4	10.7
Absolute max.	14.7	15.5	19.6	23	27.8	32	30.2	29.2	25.6	21.9	17.2	15.4	32
Absolute min.	-11.2	-5.1	-5.8	-2.9	0.1	3.1	6.2	4.4	1.7	-2.3	-6.6	-11.4	-11.4
Mean num. of days with air frost	5.2	4.6	3.2	0.6	0	0	0	0	0	0.4	1.9	4.4	20.3
Mean num. of days with ground frost	13	11.8	11.9	7.7	2.9	0.2	0	0	0.8	3.3	8	11.3	70.9
RELATIVE HUMIDITY (%)													
Mean at 0900UTC	87.8	87.9	85	79.3	76.2	76.6	80	82.3	85.1	87.4	89.9	88.9	83.9
Mean at 1500UTC	81.2	75.4	69.8	64.1	63.5	64.6	69.3	69.1	70	75	81	83.5	72.2
SUNSHINE (Hours)													
Mean daily duration	1.7	2.4	3.6	5.4	5.9	5.5	4.4	4.6	3.9	3	2.1	1.5	3.7
Greatest daily duration	8.1	10.2	11.5	13.6	15.6	15.8	15.7	14.4	12.2	10.1	8.3	7.1	15.8
Mean num. of days with no sun	9.1	5.9	5.3	2.3	1.9	1.8	2.1	2.1	2.6	5.1	7.7	10.1	56
RAINFALL (mm)													
Mean monthly total	103.8	86.7	75.8	62.3	63.1	69.6	75.8	87.6	77.4	95.5	106.6	115.4	1019.7
Greatest daily total	38.2	33.8	34.8	40.2	25	45.3	39.5	51	52.3	36.9	29.4	33.5	52.3
Mean num. of days with ≥ 0.2 mm	21.3	18.3	18	16.2	16.2	15.5	18.3	19	17.7	19.9	21.6	21	223
Mean num. of days with ≥ 1.0 mm	16.9	13.9	13.4	11.4	12.1	11.3	13.5	13.7	12.9	15.4	16.8	17.2	168.5
Mean num. of days with ≥ 5.0 mm	7.8	5.8	5.5	4.7	4.6	4.8	4.9	5.8	4.8	7	8	8.5	72.2
WIND (knots)													
Mean monthly speed	10	10.1	9.6	9.2	9	8.5	8.4	8.3	8.4	8.9	9.1	9.7	9.1
Max. gust	75	86	63	66	52	51	52	61	58	66	69	83	86
Max. mean 10-minute speed	47	61	44	45	37	37	38	44	44	47	50	57	61
Mean num. of days with gales	2.1	1.2	1.4	0.5	0.5	0.1	0	0.1	0.6	0.9	1	1.5	9.8
WEATHER (Mean No. of Days With:)													

Snow or sleet	1.5	1.8	1.2	0.3	0	0	0	0	0	0	0.1	1	5.9
Snow lying at 0900UTC	0.2	0	0.1	0	0	0	0	0	0	0	0	0.1	0.5
Hail	3.1	3.4	2.8	2	0.7	0	0	0.1	0.1	0.5	1	2.3	16
Thunder	0.9	0.4	0.3	0.3	0.5	0.4	0.7	0.5	0.2	0.3	0.3	0.4	5.2
Fog	3.4	2.2	2.4	1.8	1.3	1	0.9	1.6	2.8	3.1	4	3.8	28.3

Table 10-4 Summary of Current Physical Baseline Environment

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
Air Temperature	Climate change is impacting air temperatures in the Northern European region, with a range of observable effects including rising temperature, increased frequency of heatwaves, changes in seasonal temperature patterns and milder winters¹⁷. Ireland's Climate Averages 1991-2020 Summary Report identifies that the annual mean air temperature for Ireland over the period 1991-2020 is 9.8°C. The annual mean air temperature ranges from approximately 8.5°C to 10.8°C. Comparing the 1991-2020 annual mean air temperature for Ireland with that of the 1961-1990 period, there has been an increase of approximately 0.7°C. The Climate Status Report for Ireland 2020¹⁸ states that air temperatures in Ireland have <i>'been increasing at an average rate of 0.078°C per decade since 1900 and that the annual average temperature is now approximately 0.9°C higher than it was in the early 1900s'</i>. Temperatures in Ireland are increasing, with sixteen of the top 20 warmest years on record occurring since 1990¹⁹. On 10th July 2024 Met Éireann confirmed that 2023 was Ireland's wettest and warmest year on record (records going back to 1900).²⁰ Due to the moderating influence of the North Atlantic, Ireland has, and will continue to, experience much milder air temperatures as compared to mainland Europe and other continental countries.²¹ However, this moderating influence could be in jeopardy if the Atlantic Meridional Overturning Circulation (AMOC) continues to weaken²². The AMOC is a large system of ocean currents responsible	Chapter 9 Air Quality

¹⁷ IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>

¹⁸ Government of Ireland (2020) Climate Status Report for Ireland 2020 <https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf>

¹⁹ Ireland's Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World <<https://www.epa.ie/publications/monitoring--assessment/climate-change/irelands-climate-change-assessment-volume-1.php>>

²⁰ <https://www.met.ie/2023-confirmed-as-irelands-wettest-year-on-record>

²¹ <https://www.met.ie/climate/what-we-measure/temperature#:~:text=The%20moderating%20influence%20of%20the,mild%20winters%20and%20cool%20summers.>

²² IPCC (2019) IPCC Special Report on the Ocean and Cryosphere in a Changing Climate Chapter 6. Extremes, Abrupt Changes, and Managing Risk <https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/08_SROCC_Ch06_FINAL.pdf>

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
	for carrying warm water from the tropics into the North Atlantic and the strength of this current is a function of global mean temperature. The weakening of this current would counterbalance the warming effects of climate change creating instability for local ecosystems, agriculture, and fisheries.	
Precipitation and Flood Risk	Climate change is impacting precipitation patterns in the Northern European region, with a range of observable effects including increased precipitation, more extreme precipitation events, seasonal variations and impacts on hydrological regimes²³. Precipitation has been measured systematically in Ireland since the late 19th century and is a key indicator of changes in the climate; measurements and analysis of rainfall are essential for assessing the effects of climate change on the water cycle, water balance and for flood mitigation. Met Éireann highlights that it is already observing these trends, with the national annual average rainfall over the period 1991-2020 being approximately 1,288mm, which represents an increase of 7% from the previous 30-year monitoring period (1961-1990)²⁴. Ireland's Climate Averages 1991-2020 Summary Report obtained averages for the annual, seasonal and monthly number of rain days (number of days with rainfall ≥ 0.2 mm), wet days (number of days with rainfall ≥ 1 mm) and very wet days (number of days with rainfall ≥ 10 mm). Over the period 1991-2020, on an annual basis, the average number of rain days ranges from 201 days to 272 days; the average number of wet days ranges from 147 days to 226 days; and the average number of very wet days ranges from 22 days to 68 days. Ireland has been subject to a number of major flood events around the country over the last decade and climate change is likely to result in increased flood risk. For Ireland, the occurrence of flooding is now quite widespread and includes all inland flooding (all types – i.e., pluvial, fluvial, groundwater) and coastal flooding²⁵. Coastal flooding poses a serious threat for Ireland; and this is particularly the case as most of Ireland's population and infrastructure are concentrated on the coast and in the coastal cities of Dublin, Cork, Limerick and Galway. Current exposure to coastal flood risk is determined by a number of factors including topography, storm surge and sea level rise.	Further detail on rainfall and evaporation data is provided in Section 8.3.2 in Chapter 8 Hydrology and Hydrogeology. Further information on flood risk is provided in Section 8.3.5 and in Appendix 8-1 Flood Risk Assessment

²³ IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>

²⁴ Department of Housing, Local Government and Heritage (2024) Ireland's Climate Averages 1991-2020 Summary Report <<https://edepositireland.ie/handle/2262/108695>>

²⁵ Climate Ireland Coastal Flooding <<https://www.climateireland.ie/impact-on-ireland/climate-hazards/coastal-flooding/>>

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
Wind and Storms	Climate change is impacting wind patterns in the Northern European region with a range of observable effects including increased wind speeds, changes in wind direction and seasonal variations²⁶. Ireland's Climate Averages 1991-2020 Summary Report identifies that the annual mean hourly wind speed ranges from 9 knots at Shannon Airport to 15 knots at Malin Head. Winds are generally strongest in the northwest of the country. The strongest winds are observed during the winter months and range from 10 knots at Shannon Airport to 18 knots at Malin Head. The lightest winds are observed during the summer months and range from 8 knots at Valentia Observatory to 13 knots at Malin Head. In late 2023 and early 2024, Ireland experienced a very active storm season; the county was affected by 13-14 severe storms²⁷. In 2025 there has been 5 no. named storms at the time of writing, with Storm Eowyn, occurring in January 2025, reaching hurricane force winds (maximum wind speed recorded as 184km/h).²⁸ The increased frequency and intensity of storm events will lead to associated increases in precipitation (see above). As stated in 'Air Temperature' above, the AMOC has a moderating influence on Europe, however as identified by the IPCC, the strength of the AMOC is directly correlated to global mean temperature, and as global mean temperature increases, the AMOC will weaken²⁹. The weakening of this current would result in increased storm activity in Northern Europe.	N/A

²⁶ IPCC (2021) *Climate Change 2021: The Physical Science Basis* <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>

²⁷ Met Éireann (2024) *Human-caused Climate Change Brings Increased Storm Rainfall* <<https://www.met.ie/human-caused-climate-change-brings-increased-storm-rainfall>>

²⁸ Met Éireann Storm Centre <https://www.met.ie/climate/storm-centre>

²⁹ IPCC (2019) *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* Chapter 6. *Extremes, Abrupt Changes, and Managing Risk* <https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/08_SROCC_Ch06_FINAL.pdf>

10.3.1.3 Existing Greenhouse Gas Emissions

Greenhouse gas emissions arise from a large majority of anthropogenic activities. The main sectors which release emissions in Ireland are detailed in Section 1.2.1.6 of Appendix 10-1 Climate Legislation Policy and Guidance. These sectors include:

- Electricity
- Transport
- Built Environment
 - Residential
 - Commercial/Institutional
- Industry
- Agriculture
- Land Use, Land Use Change, and Forestry (LULUCF)¹
- Other (F-Gases, Waste, Petroleum refining)
- Unallocated savings

The most recent inventory report for Ireland, National Inventory Report 2025 (NIR 2025)³⁰, was published in 2025 and refers to the greenhouse gas inventory timeseries for the years 1990-2023. From 1990-2001, total emissions of greenhouse gases (excluding LULUCF) increased steadily from 55,231.5 kilotonnes of CO₂ equivalent (ktCO₂e) in 1990 to 71,476.9 ktCO₂e in 2001, which is the highest level of greenhouse gas emissions ever reported in Ireland. Emissions then plateaued until 2008 with estimates ranging from 69,032.5 ktCO₂e to 71,213.8 ktCO₂e. There was then a sharp decrease from 69,032.5 ktCO₂e in 2008 to 58,582.4 ktCO₂e in 2011. In 2023, total emissions of greenhouse gases including indirect emissions from solvent use (excluding LULUCF) in Ireland were 54,934.4 ktCO₂e, which is 1.4% lower than emissions in 1990. Emissions in 2023 at 54,934.4 ktCO₂e are 6.8% lower than 2022, and the lowest level in the time series.

In July 2026, the EPA published 'Ireland's Provisional Greenhouse Gas Emissions 1990-2025'³¹. The report notes that the sectors (Electricity, Transport, Built Environment (Residential and Commercial and Public), Industry, Agriculture and Other) do not correspond directly to the sectors defined in the inventory as they take consideration of the division of Departmental responsibility. However, it has been possible to map the inventory data onto the sectorial emissions ceiling sectors to assess usage of the budgets to date and what is required to achieve ceiling compliance. Four sectors, Agriculture, Buildings (Commercial and Public), Buildings (Residential) and Other are provisionally under budget and 3 sectors, Industry, Transport and Electricity, are over budget. Agriculture is the largest contributor to the overall emissions at 38.7% of the total (excluding LULUCF). Transport and Energy Industries are the second and third largest contributors at 22.0% and 12.5%, respectively. Residential and Manufacturing Combustion emissions account for 9.9% and 7.9%, respectively. These five sectors accounted for 91.1% of national total emissions in 2025. The remainder is made up by the Industrial Processes sector at 3.5%, F-Gases at 1.2%, Commercial Services at 1.4%, Public Services at 1.3% and Waste at 1.6%.

10.3.2 Future Environment

Ireland is experiencing climate change in line with global trends, with current projections, detailed below, indicating that these effects will intensify in the coming decades. The baseline environment, detailed in the above sections, will undergo significant shifts, influencing Ireland's environment,

³⁰ EPA (2024) National inventory Report 2025 <<https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/Ireland's-NIR-2025.pdf>>

³¹ EPA (2026) Ireland's Provisional Greenhouse Gas Emissions 1990-2025. <<https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Provisional-GHG-Emissions-1990-2025-web.pdf>>

economy, and society. Predicted changes include rising temperatures, altered precipitation patterns, and increased frequency of extreme weather events.

Visible changes in global climate are evident worldwide, with climate change projections suggesting further, more pronounced impacts in the future. These impacts will have wide-ranging effects on both natural and man-made environments across various sectors and regions, resulting in socio-economic repercussions. Referred to as the 'costs of inaction,' these economic impacts of climate change are increasingly influencing policy discussions³². It has become clear that even if greenhouse gas emissions were to cease immediately, climate alterations would persist for many decades. Therefore, alongside efforts for mitigation, it's imperative to develop effective adaptive strategies (adaptation) to mitigate damages or seize opportunities arising from climate change.

This section provides a description of the future predictions for climate change.

10.3.2.1 Data sources

A review of literature and data relating to climate change in Ireland was undertaken and utilised to provide an overview of the future baseline environment. The following key data sources were reviewed:

- High-resolution Climate Projections for Ireland – A Multimodel Ensemble Approach (report No. 339)³³
- Climate Status Report for Ireland 2020³⁴
- Climate Ireland³⁵

10.3.2.2 Physical Environment

This section describes the future baseline for the site's physical environment under the Representative Concentration Pathways (RCP) 8.5 high emission scenario. RCPs represent climate change scenarios used in modelling the possible future climate evolution, and are based on a wide suite of assumptions, to specify the greenhouse gas concentrations that will result in defined radiative forcing by 2100. The RCP 8.5 combines assumptions about high population and relatively slow income growth with modest rates of technological change and energy intensity improvements, leading in the long term to high energy demand and greenhouse gas emissions in absence of climate change policies. Compared to the total set of RCPs, RCP 8.5 thus corresponds to the pathway with the highest greenhouse gas emissions³⁶. The physical environment of the Proposed Lifetime Extension under the RCP 8.5 scenario is discussed under the following headers:

- Air Temperature;
- Precipitation and Flood Risk;
- Wind and Storms.

³² European Environment Agency (2007) *Climate change: the cost of inaction and the cost of adaptation*
<https://www.eea.europa.eu/publications/technical_report_2007_13/download>

³³ EPA Research (2020) *High-resolution Climate Projections for Ireland – A Multimodel Ensemble Approach*
<https://www.epa.ie/publications/research/climate-change/Research_Report_339_Part1.pdf>

³⁴ https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf

³⁵ <https://www.climateireland.ie/>

³⁶ *Climate Change (2011) A scenario of comparatively high greenhouse gas emissions*
<<https://link.springer.com/article/10.1007/s10584-011-0149-y>>

Air Temperature

Global temperatures are expected to reach or exceed 1.5°C in the near term, with end-century warming ranging from approximately 1.5°C to over 3°C depending on emissions pathways, reflecting a divergence between low-emission and higher-end plausible scenarios³⁷.

Annual surface air temperatures³⁸ in Ireland are now approximately 1.4°C higher than they were in the early 1900's (2013 – 2022 period relative to 1903 - 1912).

The upward trend in air temperatures is predicted to continue for all seasons: annual air temperatures may increase by over 3°C by the end of the 21st century relative to a 1976 to 2005 reference period under an RCP 8.5 high emission scenario³⁹.

Met Éireann projections⁴⁰ indicate an increase of 1–1.6°C in mean annual temperatures in Ireland, with the largest increases seen in the east of the country. Warming is enhanced for the extremes (i.e. hot or cold days), with highest daytime temperatures projected to rise by 0.7–2.6°C in summer and lowest night-time temperatures to rise by 1.1–3°C in winter. Averaged over the whole country, the number of frost days (days when the minimum temperature is less than 0°C) is projected to decrease by 62% for the RCP 8.5 high emissions scenario^{41,42}.

Precipitation and Flood Risk

Climate change is expected to have a significant impact on Ireland's precipitation patterns. Ireland is predicted to experience greater seasonality in precipitation, with more extreme fluctuations between wet and dry periods. Winter and autumn are anticipated to see increased rainfall, while spring and summer are projected to become drier, leading to more frequent droughts. The EPA's climate projections indicate that very wet days (i.e., days with more than 30mm of rainfall) will become more common, increasing by 31% under a high emissions scenario (RCP 8.5).

Due to Ireland's location in the west of Europe, exposure to Atlantic storms is of concern and this is particularly the case in the context of rising sea levels which will enhance the impacts of storm surges.⁴³

Extreme rainfall events, such as those currently expected only once every 50 years, could become twice as frequent by the end of the century. This means more frequent flooding risks, particularly during the winter months⁴⁴. Further information on flood risk is presented in the section below.

Flood Risk

According to the Flood Risk Assessment (FRA) carried out by CIVIC Engineers (See Appendix 8-1 of this EIAR) and available Office of Public Works (OPW) Flood Maps⁴⁵, there are no records of pluvial or

³⁷ <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>

³⁸ <https://www.epa.ie/publications/monitoring--assessment/climate-change/irelands-climate-change-assessment-volume-1.php>

³⁹ *Ireland's Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World*

⁴⁰ <https://www.met.ie/climate/climate-change#Reference3>

⁴¹ Nolan, P. 2015. EPA Report: Ensemble of Regional Climate Model Projections for Ireland. EPA climate change research report no. 159. EPA: Wexford.

⁴² O'Sullivan, J., Sweeney, C., Nolan, P. and Gleeson, E., 2015. A high-resolution, multi-model analysis of Irish temperatures for the mid-21st century. *International Journal of Climatology*. doi: 10.1002/joc.4419.

⁴³ <https://www.epa.ie/our-services/monitoring--assessment/climate-change/climate-ireland/impact-of-climate-change-on-ireland/climate-hazards/coastal-flooding>.

⁴⁴ EPA (2005) *Climate Change Regional Climate Model Predictions for Ireland*
<<https://www.epa.ie/publications/research/climate-change/climate-change-regional-climate-model-predictions-for-ireland-.php>>

⁴⁵ Office of Public Works (OPW), Flood Maps. Available at: <https://www.floodinfo.ie/map/floodmaps/>

groundwater flooding in the area. The only fluvial flooding identified within the area was from Lough Ree.

Historic flood events including during the winters of 2009/2010 and 2015/2016, have demonstrated that there is potential for prolonged high-water levels on Lough Ree. Climate Change projections have shown that there is a potential future increase in extreme rainfall events and rising water levels which may increase the frequency and severity of flooding at vulnerable low-lying shoreline areas including Hodson Bay. The FRA also considers the potential influence of climate change on future flood risk.

A conservative 0.1% Annual Exceedance Probability (AEP) design flood level of 37.5 metres above ordnance datum (mAOD) was adopted for the assessment, based on CFRAM predictive modelling and long-term OPW hydrometric analysis. The report also concluded that the development does not encroach upon functional floodplain storage, does not obstruct flood conveyance and will not increase flood risk elsewhere. It is stated that some sections of the retained promenade access may be inundated during extreme events, however, the gradual nature of lake flooding and the non-residential use of the Proposed Development ensure that residual risk is low and manageable.

Wind and Storms

Future climate and weather predictions indicate a slight reduction in mid-century (2041 – 2060) average wind speeds around Ireland (-2.47% for RCP 8.5 high emissions scenario compared to the 1981 – 2000 baseline), with these decreases being more pronounced during the summer months⁴⁶. Predictions also point towards less frequent, but more intense storm activity around Ireland. Correspondingly, projections indicate a decrease in average and extreme wave heights towards the end of the century, but an increase in the frequency and severity of storm surges in coastal regions of western Ireland, particularly in winter months⁴⁷. Storm surge levels over a 20-to-30-year return period are anticipated to increase by up to 9cm by 2100⁴⁸.

10.3.2.3 Greenhouse Gas Emissions Projections

In its approach to decarbonisation, the EU has split greenhouse gas emissions into two broad areas: those covered by its Emissions Trading System (ETS) and those covered by the Effort Sharing Regulation (ESR, i.e., the 'non-ETS'). Emissions from electricity generation, large industry, aviation and maritime transport in the ETS are subject to an EU-wide cap requiring these sectors to cut emissions by 62% by 2030, relative to 2005 levels, following the 2023 revision of the ETS Directive (Directive (EU) 2023/959).⁴⁹ Within the ETS, participants must surrender allowances for every tonne of emissions, and the overall supply of allowances (the "cap") declines annually — via the Linear Reduction Factor, set at 4.3% per year for 2024–2027 and 4.4% from 2028 — to ensure the 62% reduction is achieved at EU level.⁵⁰ Sectors outside the ETS, such as buildings, road transport, agriculture and waste, are instead governed by the ESR⁵¹, which sets an EU-wide target of a 40% reduction by 2030 relative to 2005, disaggregated into differentiated binding national targets for each member state.⁵² A separate

⁴⁶ <https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/wind-speed/>

⁴⁷ <https://www.epa.ie/publications/research/climate-change/research-339-high-resolution-climate-projections-for-ireland-.php>

⁴⁸ <https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/waves--surges/>

⁴⁹ European Commission, Climate Action – About the EU ETS: https://climate.ec.europa.eu/eu-action/carbon-markets/about-eu-ets_en

⁵⁰ European Commission, Climate Action – EU ETS emissions cap: https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/eu-ets-emissions-cap_en

⁵¹ Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement. There was a significant drop in emissions from the Energy Industries sector between 2022 and 2023 (down 2.1 Mt CO₂e or 21.4%). This reduction in emissions was partly due to a 12-fold increase in the amount of imported electricity (9.5% of electricity supply in 2023), in combination with an increase in the share of renewable energy from 38.6% in 2022 to 40.7% in 2023.

⁵² European Commission – Effort Sharing Regulation

new system, ETS2, will extend carbon pricing to buildings, road transport and small industry not already covered by the original ETS, with its own target of a 42% reduction by 2030 compared to 2005 levels, becoming operational in 2027. Please see Section 10.2.1 above and Section 1.1.8 of Appendix 10-1 for further details on the EU ESR.

The transport sector is not on track to meet its 2025 sectoral emissions ceiling, having required a 12.4% reduction in emissions in both 2024 and 2025 to remain within the national emissions budget.⁵³ For commercial and public sector buildings, the corresponding required emissions reduction is 2.9% per annum to stay within the 2025 sectoral emissions ceiling. The first carbon budget allocates 61 MtCO₂eq. for the two sectoral emissions ceilings (54 MtCO₂eq. for transport and 7 MtCO₂eq. for commercial and public sector buildings) over the five-year period of 2021–2025. 64% of the transport sectoral carbon budget and 61.4% of the commercial and public sector sectoral carbon budget have been expended during the period 2021–2023. The transport sector has exceeded its 2021–2025 sectoral emissions ceiling, with the overshoot estimated at 4.4 MtCO₂eq., while the commercial and public sector also faces challenges in meeting its sectoral emissions ceiling.⁵⁴

The EPA publishes Ireland’s greenhouse gas emission projections and, at the time of writing, the most recent report, *Ireland’s Greenhouse Gas Emissions Projections 2025–2030*, was published in May 2026. The report includes an assessment of Ireland’s progress towards achieving its emission reduction targets out to 2030 under the ESR.

The EPA produced two scenarios in preparing these greenhouse gas emission projections: a “With Existing Measures” (WEM) scenario and a “With Additional Measures” (WAM) scenario. The WEM scenario projects future emissions based on measures currently implemented and actions committed to by Government. To be included in the WEM scenario, a policy or measure must be in place by the end of 2024, with resources and/or legislation committed to by Government Departments or Agencies. The WAM scenario includes the implemented measures within WEM, plus additional planned measures under discussion that have a realistic chance of future implementation.

Ireland’s 2024 and 2025 Climate Action Plans both discuss unallocated emissions savings of 26 Mt CO₂eq over the 2026–2030 period (5.25 Mt CO₂eq annually). While CAP25 set out actions to allocate these unallocated emissions savings by sector ahead of 2026 and update sectoral emissions ceilings for the second carbon budget period (2026–2030), the outcomes of these actions were not available in time for inclusion in the current projections.

The EPA Emissions Projections Update notes the following key trends:

- Ireland is not on track to meet the 51% emissions reduction target by 2030 (compared to 2018 levels). Even with full implementation of a wide range of policies and plans across all sectors, emissions are projected to reduce by approximately 25%.
- Carbon Budget: Budget Period 1 (2021–2030) of 295 Mt CO₂eq is projected to be largely met, with the WEM scenario exceeding the budget by 0.4 Mt CO₂eq, while the WAM scenario projects emissions will be 1.8 Mt CO₂eq below budget. With carryover from Budget Period 1, Budget Period 2 (2026–2030) of 200 Mt CO₂eq is expected to be exceeded by 53–81 Mt CO₂eq.
- Sectoral Emissions Ceilings: Of the seven sectors with legally binding Sectoral Emissions Ceilings, three are projected to remain below their ceiling in Budget Period 1 (Electricity, Residential Buildings and ‘Other’), while only the ‘Other’ sector (Waste, F-gas and Petroleum Refining) is projected to remain below its ceiling in Budget Period 2.

⁵³ Department of the Environment Climate and Communications (2025) – *Climate Action Plan 2025*

⁵⁴ Climate Change Advisory Council (2026) – *Annual Review 2026: Transport*, <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/AR26-Transport-final.pdf>; EPA State of the Environment Report 2024, <https://epawebapp.epa.ie/ebooks/soe2024/319/>

- Ireland is not projected to meet its EU Effort Sharing Regulation target of a 42% emissions reduction by 2030 (compared to 2005), even with flexibilities applied. Greenhouse gas emissions are projected to reduce by 13–23% by 2030 without flexibilities, and by 17–27% with flexibilities.
- Agriculture sector emissions are projected to decrease from 21.4 Mt CO₂eq in 2018 to between 17.3 and 20.5 Mt CO₂eq in 2030 (a 19% reduction under WAM and 4% reduction under WEM), primarily due to contraction in cattle numbers and lower fertiliser use.
- Transport emissions are projected to decrease from 12.4 Mt CO₂eq in 2018 to between 9.0 and 10.5 Mt CO₂eq in 2030 (a 28% reduction under WAM and 16% reduction under WEM).
- Energy Industries emissions are projected to decrease from 10.2 Mt CO₂eq in 2018 to between 4.0 and 4.7 Mt CO₂eq in 2030 (a 55–61% reduction).
- Total emissions from the LULUCF sector are projected to increase from 3.0 Mt CO₂eq in 2018 to between 3.1 and 5.2 Mt CO₂eq in 2030. Current and planned measures are unlikely to deliver the emissions reductions necessary to meet the EU LULUCF Regulation target.
- The top five policies and measures (PaMs) across the WEM and WAM scenarios are estimated to achieve 89 Mt CO₂eq in greenhouse gas emission reductions between 2025 and 2030, accounting for over 60% of the total potential emissions reductions over this period.

10.3.3 Summary

As outlined in the preceding sections, Ireland is and will continue to experience climate change in line with global trends, with current projections indicating that these effects will intensify in the coming decades. The design of the Proposed Development considered the potential climate change effects under both the baseline and future environment, and it is considered that the Proposed Development will not be negatively impacted by climate change, nor will it have a negative impact on climate change over its 30-year design horizon.

Further information on the vulnerability of the Proposed Development to major accidents and natural disasters is detailed in Chapter 15 of this EIAR.

10.4 RCC Sustainability Commitments

The RCC's Local Authority Climate Action Plan (LACAP) 2024-2029⁵⁵ was prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021 and in support of the National Climate Objective for a '*transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy*'. RCC is committed to achieving the national target of a 51% reduction in GHG emissions and a 50% increase in energy efficiency by 2030. RCC establishes a number of targets for the county under the LACAP, including the following:

- A required overall emission reduction from approximately 1,622,291.4 tCO₂-eq in 2018 to 794,922.79 tCO₂-eq across all sectors by 2030.
- Prioritising action in the highest emitting sectors: Agriculture (43%), Transport (22%), and Land Use (16%).
- Achieving carbon neutrality for council operations and the wider county by 2050.

⁵⁵ Roscommon County Council (2024) Roscommon County Council Local Authority Climate Action Plan 2024-2029 < <https://www.roscommoncoco.ie/en/services/climate-action/roscommon-climate-action-plan/roscommon-county-council-climate-action-plan-.pdf> >

RCC operates with a core focus on ‘Just Transition’, ensuring that the move toward carbon neutrality protects the most vulnerable in society while creating new economic opportunities.

RCC maintains a framework of Environmental Governance Principles, as follows:

- Promote Climate Action projects that support and maximise environmental co-benefits, such as biodiversity protection and enhancement; improved air, water or soil quality; or enhanced recreation, amenity and cultural heritage value, to ensure win-win benefits are gained.
- Support or facilitate Climate Action related projects and initiatives which seek to make improvements in soil structure, management and health by increasing soil organic carbon - which will create the environmental co-benefits of improving flood resilience by enhancing water holding capacity of soils and increasing the level of GHG sequestration associated with land use functions.
- Ensure local authority development underpinned or supported by plan actions is planned and implemented in a manner that appropriately considers the potential for environmental co-benefits, potential environmental impacts and environmental protection requirements. No local authority Climate Action related development project that is likely to have significant negative effects on the receiving environment shall be supported.
- Promote - through control or influence as appropriate - the carrying out of flood resilience measures underpinned by plan actions in a manner that supports Climate Action-biodiversity related co-benefits, and which has due regard for the protection and enhancement of rare, protected or important habitats and species.
- Promote the carrying out of Climate Action related projects supported by the plan in a manner that supports Climate Action-cultural heritage co-benefits, and which has due regard to cultural, archaeological or architectural features and sensitivities.
- Promote the carrying out of Climate Action related projects underpinned by the plan in a manner that supports Climate Action water quality co-benefits, and the achievement of Water Framework Directive objectives.
- Promote Climate Action projects that support protected trees, hedgerows and other habitats such as wetlands, flood-zones which contribute to green infrastructure.
- Support opportunities to improve ecological connectivity of non-designated habitats and sites to improve overall ecosystem resilience and functioning while supporting Climate Action within the county.
- Ensure local authority projects supported by plan actions have taken the necessary precautions to identify and manage invasive species, particularly with regard to Schedule III species. No local authority Climate Action related development project that is likely to cause the spread of invasive species listed in Schedule III shall be supported.
- Support opportunities to promote peatland restoration, rehabilitation and maintenance while achieving climate targets through the implementation of the Climate Actions within the plan.

10.4.1 Circular Economy

RCC is committed to leading the sustainable enhancement of the public realm across the county. As part of RCC’s LACAP 2024-2029, the Council prioritises a number of key commitments for development including the following:

- Sustainable Urban Design: Prioritising the reuse of existing built fabric and building materials in all public works.
- Active Travel & Connectivity: Facilitating the expansion of active travel networks—including high-quality walking and cycling infrastructure

- Nature-Based Solutions (NBS): Integrating NBS and Sustainable Drainage Systems (SuDS) into carrying out of developments.
- Green Infrastructure: Implementing a Tree Management Strategy focused on native planting.
- Regeneration & Accessibility: Focusing on the reuse and regeneration of vacant or underused sites.

The Proposed Development design has been informed by RCC's sustainability commitments. The following is a summary of how the Proposed Development design responds to climate change adaptation and long-term resilience:

- The location of the Water Sports Pavilion reuses a previously developed site, developing the facilities where the existing buildings, infrastructure and utilities are located to minimise environmental effects.
- Sustainable materiality and durability are key characteristics of the proposed new buildings. Longevity and maintenance considerations have informed design.
- The Water Sports Pavilion has a low-carbon design approach and is an all-electric building. For further detail, please see the Energy Statement prepared by CIVIC Engineers included in this Planning Application (document reference 71589-CIV-XX-XX-R-J-50001)
- The Water Sports Pavilion architecture integrates with the wider landscape and engineering strategy, including SuDS, biodiversity enhancements and NBS.
- The Proposed Development site design incorporates flood resilience, including elevated finished floor levels of the Water Sports Pavilion buildings being informed by the FRA (Appendix 8-1) and the wider public realm being designed to accommodate flood events where appropriate.

10.5 Calculating Carbon Losses and Savings from the Proposed Development

10.5.1 Background

Transport and the commercial built environment are important sectors in Ireland's decarbonisation journey, with transport alone accounting for 19.5% of greenhouse gas emissions in 2023⁵⁶. While emissions in the transport sector have effectively plateaued, a significant and unprecedented annual reduction of 12.4% is now required in both 2024 and 2025 for the sector to remain within its first carbon budget. Similarly, buildings in the commercial and public sectors must achieve an annual emissions reduction of 2.9% to stay within their 2025 sectoral ceiling.

To address these challenges, CAP 2025 emphasizes a "Avoid-Shift-Improve" strategy for transport, targeting a 20% reduction in total vehicle kilometres and a 50% reduction in fuel usage by 2030 through fleet electrification and increased sustainable transport trips. For the commercial built environment, the focus is on improving energy performance standards and transposing the Energy Performance of Buildings Directive, which will introduce minimum energy performance standards and a roadmap to phase out fossil fuel boilers and has been transposed into Irish legislation through European Union (Energy Performance of Buildings) Regulations 2026 (S.I. No. 168 of 2026) and the European Union (Energy Performance of Buildings) (No. 2) Regulations 2026 (S.I. No. 195 of 2026). Achievement of these goals is supported by initiatives like the Business Energy Upgrades Scheme, which provides grant funding for technical assistance and capital investment in retrofitting for small and medium sized enterprises (SMEs).

⁵⁶ Department of Environment, Climate and Communications (2025) Climate Action Plan 2025

10.5.1.1 Carbon Losses

In relation to emissions associated with embodied carbon and associated transport movements, the TII Carbon Tool has been utilised to assess the impacts of the Proposed Development in terms of potential carbon losses, associated with both the construction and operational phases.

A copy of the outputs is provided as Appendix 10-2 of this EIAR, 'Carbon Calculations'. Where available and relevant, site-specific information was inserted into the online carbon calculators. Otherwise, default values were used. The worksheet models and online tools calculate that the Proposed Development will give rise to a total of 28,932 tonnes of CO₂ equivalent losses per annum.

The main CO₂ losses resulting from the transport elements of the Proposed Development are summarised in Table 10-5.

Table 10-5 Transport Elements, which includes Active Travel Works, Marina Extension, Parking Extension Works Carbon Losses

Origin of Losses	Expected (tonnes CO ₂ equivalent)
Losses associated with embodied carbon in construction materials.	11,656.80
Losses associated with traffic and transport movements	294.26
Total	11,951

The worksheet models and online tools calculate that the transport elements of the Proposed Development will give rise to 11,951 tonnes of CO₂ equivalent losses per annum. Of this figure, carbon losses associated with:

- Embodied carbon in construction materials is 11,656.8 tonnes of CO₂ equivalent or 97.54%.
- Traffic and transport movements is 294.26 tonnes of CO₂ equivalent or 2.46%.

The figure of 11,656.8 tonnes of CO₂eq arising from the embodied carbon of construction materials associated with the Proposed Development is calculated based on the types of materials available in the TII Carbon tool such as, concrete, steel, cement and granular fill. The figure of 294.26 tonnes of CO₂ arising from transport movements associated with construction activities associated with the Proposed Development is calculated based on the traffic volumes outlined in Chapter 14 of this EIAR, along with the assumption that material will be imported locally.

When considering these greenhouse gas emissions within the context of the Transport Sector Emissions Ceilings detailed in Section 10.2.2, the Transport sector has an emissions ceiling of 37 MtCO₂eq for the second carbon budget period (2026-2030). The information presented in Table 10-5 shows that the total amount of CO₂eq arising from the transport elements of the Proposed Development is 11,951 tonnes or 0.011951 MtCO₂eq. This accounts for **0.032%** of the available budget in the second carbon budgeting period for transport.

The main CO₂ losses resulting from the commercial built environment elements of the Proposed Development are summarised in Table 10-6.

Table 10-6 Commercial Built Environment Carbon Losses

Origin of Losses	Expected (tonnes CO ₂ equivalent)
Losses associated with embodied carbon in construction materials	8,994.16
Losses associated with excavation, site clearance, and demolition	2.26
Losses associated with waste generated from construction/demolition for the Proposed Development	7,975.92
Losses associated with waste generated from operational phase of the Proposed Development	8.45
Losses associated with vegetation loss	0.016
Total	16,981

The worksheet models and online tools calculate that the commercial built environment elements of the Proposed Development will give rise to 16,981 tonnes of CO₂ equivalent losses per annum. Of this figure, carbon losses associated with:

- Embodied carbon in construction materials is 8,994.16 tonnes or 52.97%;
- Excavation, site clearance, and demolition is 2.26 tonnes or 0.01%;
- Waste generated from construction/demolition for the Proposed Development is 7,975.92 tonnes or 46.97%;
- Waste generated from operational phase of the Proposed Development is 8.45 tonnes or 0.05%;
- Vegetation loss is 0.016 tonnes or approximately 0.00%.

The figure of 8,994.16 tonnes of CO₂eq arising from the embodied carbon of construction materials associated with the Proposed Development is calculated based on the types of materials available in the TII Carbon tool such as, concrete, steel, cement and granular fill. The figure of 2.26 tonnes of CO₂ arose from estimated excavation, site clearance, and demolition. The figure of 7,975.92 tonnes of CO₂ arising from waste generated from construction/demolition for the Proposed Development was calculated using a cost-based proxy in the TII Carbon Tool, in the absence of quantitative waste estimations at this project phase. The figure of 8.45 tonnes of CO₂ arising from waste generated from the operational phase of the Proposed Development was determined based on the expected waste arisings calculated in the Operational Management Plan (OMP) (Appendix 4-3). The figure of 0.016 tonnes of CO₂ arising from vegetation loss was determined from the area required to be replanted, calculated by applying a 2m buffer radius to all planting points in QGIS to represent a blended average establishment-stage canopy footprint across the mixed plant sizes specified, resulting in a replanting area of approximately 0.27 ha.

When considering these greenhouse gas emissions within the context of the national commercial built environment detailed in Section 10.2.2, the commercial built environment sector has an emissions ceiling of 5 MtCO₂eq for the second carbon budget period (2026-2030). The information presented in Table 10-6 shows that the total amount of CO₂eq arising from the commercial built environment elements Proposed Development is 16,981 tonnes or 0.016981 MtCO₂eq. This accounts for **0.34%** of the available budget in the second carbon budgeting period for commercial built environment.

10.5.1.2 Carbon Savings

According to the model described above, the Proposed Development will give rise to total losses of 28,932 tonnes of CO₂. The following elements of the Proposed Development will result in carbon savings which will help to offset these losses.

Native Tree Replanting

As set out in Table 10-7 below, the replanting of 240 native trees will result in offsetting carbon losses by approximately 0.0003%.

Table 10-7 Replanting Vegetation Carbon Savings

Vegetation Type	Quantity	Unit	Carbon Sink tCO ₂ eq (added)	Offset Calculations
Transitional woodland scrub	0.27	Ha	7.326	0.000253

Solar Panels

According to the Energy Statement which is including with the planning documentation for this planning application (document reference 71589-CIV-XX-XX-R-J-50001), the Solar Photovoltaic Array comprising a total 54 no. of panels (45 no. of panels on the Water Sports Pavillion and 9 no. of panels on the Café) will result in annual energy savings of approximately 16 MWh.

The following formula was used to calculate the CO₂eq saved (tonnes):

$$A = B * C / 1000$$

A = CO₂eq saved (tonnes)

B = Energy saved (MWh)

C = Grid carbon figure (gCO₂eq//kWh)⁵⁷

Given that the annual energy savings are 16 MWh and the relevant grid carbon figure is 225 gCO₂eq/kWh⁵⁷, the following applies:

$$3.6 \text{ CO}_2\text{eq saved (tonnes)} = (16 \text{ MWh} * 225 \text{ gCO}_2\text{eq/kWh}) / 1000$$

3.6 CO₂eq saved (tonnes) is anticipated annually from the Solar Panels.

Electric Vehicle Charging

Additionally, the initial provision of approximately 29 no. 7 kVA slow electric vehicle chargers and 2 no. 24 kVA rapid chargers will increase carbon savings.

The proposed installation EV charging will support the transition to low-emission transport by enabling guests, visitors and staff to charge electric vehicles on site. Based on moderate utilisation of the charging infrastructure and typical EV energy consumption, it is estimated that the Proposed Development could facilitate approximately 253,000 kWh of electricity delivery annually, equivalent to around 843,000 miles of electric vehicle travel. Assuming this displaces journeys that would otherwise be undertaken by conventional petrol and diesel vehicles, the proposal is estimated to achieve an annual carbon saving of approximately 170 tonnes of CO₂ equivalent. This estimate is based on conservative assumptions regarding charger usage and current Irish vehicle emission factors.

Table 10-8 Shows a summary of the estimated total carbon savings from the Proposed Development.

⁵⁷ SEAI (2025) *Energy in Ireland 2025*. Available at: <https://www.seai.ie/sites/default/files/publications/Energy-in-Ireland-2025.pdf>

Table 10-8 Summary of Estimated Total Carbon Savings from Proposed Development

Saving Description	Carbon Saving (tonnes CO ₂ eq)
Vegetation and Tree Replanting	7.326
Solar Panels	3.6
EV Charging (Estimated)	170
Total	180.926

10.6 Likely Significant Effects

10.6.1 'Do-Nothing' Effect

The impact of this is considered neutral in the context of the EIAR. If the Proposed Development were not to proceed, there would be no potential for negative effects on climate during the construction and operational phases of the Proposed Development. However, the opportunity to redevelop a key tourism and amenity area in County Roscommon, to upgrade the existing water sports facilities to more energy-efficient Water Sports Pavilion buildings, and to provide safer access to the site for road users, pedestrians and cyclists would be lost. Additionally, the opportunity to fulfil socio-economic development goals, tourism promotion and the public realm enhancement, would be lost.

10.6.2 Construction Phase

10.6.2.1 Greenhouse Gas Emissions

Identification of Impact

Construction activities will take place over approximately 30 months and will consist of the preparation of site for construction including site compounds, demolition and enabling works, pedestrian and active travel works, drainage and utilities, building foundations and substructure, construction of the water sports pavilion, marina extension works, car parks and site roads, public realm, and landscaping. Greenhouse gas emissions, e.g., carbon dioxide (CO₂), carbon monoxide and nitrogen oxides, associated with the production of construction materials, and operation of vehicles and plant will arise as a result of the construction activities. This impact will be Short-term, Negative and Slight only, which is Not Significant, given the quantity of greenhouse gases that will be emitted to the atmosphere and will be restricted to the duration of the construction phase. Mitigation measures to reduce this effect are presented below.

10.6.2.1.2 Traffic and Transport

Identification of Impact

As set out in Section 14.1.8.2 of Chapter 14 of this EIAR, during construction, there will be a short-term increase in traffic associated with construction staff, deliveries of materials and plant, and Heavy Goods Vehicle (HGV) Movements. A worst-case scenario of up to 30 two-way HGV movements per day been assumed during peak construction activity. These additional movements will be short term and will not materially affect the operation of the N61 National Road and L2020 Local Road networks. Delays may occur where construction vehicles enter or leave the site however, these will be localised and short in duration. These activities will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. The potential impact will be Short-term, Moderate, and Negative. Mitigation measures to reduce this impact are presented below.

10.6.2.1.3 **Waste Disposal****Identification of Impact**

Waste will arise from the Proposed Development during the construction phase, mainly from unavoidable waste including material surpluses, damaged materials, and packaging waste. This will have a Short-term, Slight, Negative effect on climate., given the quantity of greenhouse gases, i.e., the generation and management of these waste streams, that will be emitted to the atmosphere and will be restricted to the duration of the construction phase, the impact is not significant. Waste management will be carried out in accordance with *Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021) produced by the EPA. Mitigation measures to reduce this impact are presented below.

Please refer to Appendix 4-2 for the Construction and Environmental Management Plan (CEMP) for detailed processes on waste management during the construction phase of the Proposed Development.

10.6.2.1.4 **Vegetation Removal****Identification of Impact**

Construction of the Proposed Development will require the removal of 239 individual trees within the site footprint, including approximately 106 Leyland cypress and 32 cedar trees from existing treelines. This will have a Permanent, Slight Negative effect on climate without a replanting scheme. Measures to reduce this impact are detailed below.

10.6.2.1.5 **Mitigation**

- Construction of the Proposed Development will require the removal of 239 individual trees within the site footprint, including approximately 106 Leyland cypress and 32 cedar trees from existing treelines. This will be offset by replanting 240 trees with native species, varying in maturity from younger multi-stems to more mature trees. When stationary, delivery and on-site vehicles will be required to turn off engines.
- Users of the site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum.
- A Traffic Management Plan will be prepared ahead of the commencement of construction works to minimise traffic disruption including scheduling deliveries and traffic management measures. The Traffic Management Plan will include a construction and delivery programme, pre and post construction condition survey, liaison with the roads department of RCC, traffic management coordinator, information to locals, identification of delivery routes, temporary traffic signs, compliance with all relevant legislation, and additional traffic measures.
- A Resource Waste Management Plan is set out in the CEMP (Appendix 4-2) having regard to the '*Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects*' (EPA 2021) and any relevant guidelines for new construction or demolition projects
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Proposed Development to reduce the emissions associated with vehicle movements. See Resource Waste Management Plan in CEMP (Appendix 4-2).

- The methods of working will comply with all relevant legislation and best practice guidelines in reducing the environmental impacts of the works. A detailed CEMP has been prepared and included as Appendix 4-2.
- Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.

10.6.2.1.6 **Residual Effects**

Following implementation of the mitigation measures above, residual effects of greenhouse gas emissions arising from the Construction Phase of the Proposed Development will have a Short-term, Imperceptible, Negative effect on climate. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a Permanent, Imperceptible, Negative effect on climate. This does not have a significant effect.

The potential for health effects is considered to be imperceptible due to the quantity of greenhouse gases that will be emitted, Table 10-5 and Table 10-6 above. Whilst the Construction Phase of the Proposed Development will result in greenhouse gas emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent and minimise effects.

When considering these greenhouse gas emissions within the context of the national transport and commercial built environment Sector Emissions Ceilings detailed in Section 10.2.2 above and Section 1.2.1.6 of Appendix 10-1, Carbon Budget 2 (2026-2030) has a transport sector budget of 37 MtCO₂eq. Carbon Budget 2 (2026-2030) has a commercial built environment sector budget of 5 MtCO₂eq. Within the context of the 5-year Carbon Budget periods, the Proposed Development will give rise to 28,932 tCO₂eq or 0.028932 MtCO₂eq; this accounts for **0.032%** of the available budget in the second carbon budgeting period for transport and **0.34%** of the available budget in the second carbon budgeting period for commercial built environment.

10.6.2.1.7 **Significance of Effects**

Following mitigation and base on the assessment above there will be no significant effects on climate due to the emissions of GHGs associated with the construction phase.

10.6.3 **Operational Phase**

10.6.3.1 **Greenhouse Gas Emissions**

Identification of Impact

Greenhouse gas emissions may result during the operational phase from machinery and vehicles that are intermittently required onsite for maintenance, as well as from public recreational activities, boats using the marina, and from vehicle trips associated with visitors to the site. Energy demand from the Water Sports Pavilion and café buildings will further contribute to the operational carbon footprint.

This potential effect will not be significant given the relative quantity of emissions increase expected. It is considered a long-term, imperceptible, negative effect. Mitigation measures to reduce this effect are presented below.

10.6.3.1.1 **Traffic and Transport**

Identification of Impact

Greenhouse gas emissions may result during the operational phase due to increased visitor and vehicular traffic associated with the Proposed Development. The Proposed Development is forecast to

generate approximately 432 additional two-way vehicle trips per day, with an associated peak hour increase of approximately 44 two-way vehicle movements.

The Proposed Development will provide dedicated coach parking, Electric Vehicle Charging facilities, and a continuous shared pedestrian and cycle route linking the N61 National Road with the waterfront. Following implementation of these measures, the effect on greenhouse gas emissions from traffic and transport during the operational phase is permanent, not significant and negative.

10.6.3.1.2 **Waste Disposal**

Identification of Impact

Operational impacts on waste is described in Chapter 14 Material Assets, the Proposed Development is not expected to generate significant quantities of waste due to its nature and scale during the operational phase. The limited waste type will be general municipal waste, recyclable materials, organic/food waste, sanitary waste from welfare facilities, and foul wastewater from toilets, showers and changing areas. Additional marina-related waste may include domestic-type waste from boat users and foul water collected through the pump-out facilities.

10.6.3.1.3 **Mitigation**

- The proposed building will be designed to comply with the requirements of Building Regulations Part L (Buildings Other Than Dwellings) and will achieve the Nearly Zero Energy Building (NZEB) standard.
- 45 no. solar panels will be installed on the Water Sports Pavilion, with a further 9 no. on the café building. It is proposed that panels will be angled at 30 degrees and orientated south facing to maximise generation. The energy generation from the solar panels will offset a proportion of the operational electricity demand of both buildings, reducing associated GHG emissions over the lifetime of the development.
- The planting of 240 native trees will be in place to reduce the effect of the removal of 239 trees during the construction phase.
- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.
 - The MRF facility will be local to the Proposed Development to reduce the emissions associated with vehicle movements.
- Operational waste will be segregated, where practicable, and stored in designated waste storage areas prior to collection by authorised waste contractors.
- Adequate bins will be provided for general waste, recyclables and organic waste, as required.
- Any hazardous or special waste from routine maintenance will be stored separately and managed in accordance with relevant legislative requirements.

10.6.3.1.4 **Residual Effects**

When considering the greenhouse gas emissions associated with the operational phase of the Proposed Development, within the context of the national commercial built environment and Transport Sector Emissions Ceilings detailed in Section 10.2.2, the Proposed Development will have a Permanent, Imperceptible, Negative effect on climate change and global GHG concentrations.

10.6.3.1.5 **Significance of Effects**

Based on the assessment above there will be no significant effects due to the emissions of GHGs associated with the operational phase.

10.7 **Cumulative Effects**

Potential cumulative effects on climate between the Proposed Development and other permitted or proposed projects and plans in the area, as set out in Section 2.6 in Chapter 2 of this EIAR, were also considered as part of this assessment. The developments considered as part of the cumulative effect assessment are described in Section 2.6 of this EIAR, with relevant developments on a national basis and within the context of the national Carbon Budget and relevant sectoral emissions ceiling.

10.7.1 **Construction Phase**

During the construction phase of the Proposed Development and other permitted or proposed projects and plans in the area as set out in Section 2.6 in Chapter 2 of this EIAR, that are yet to be constructed, there will be cumulative greenhouse gas emissions arising from production of construction materials (such as cement), and the operation of construction vehicles and plant. These will be restricted to the duration of the construction phase, and as such will give rise to cumulative greenhouse gas emissions over a short-term duration. Within the context of the 5-year Carbon Budget periods, the Proposed Development will give rise to 28,932 tCO₂eq or 0.028932 MtCO₂eq; this accounts for **0.032%** of the available budget in the second carbon budgeting period for transport and **0.34%** of the available budget in the second carbon budgeting period for commercial built environment.

10.7.2 **Operational Phase**

The existing land use activities at the Proposed Development site will require plant items and vehicles which consume fossil fuels and therefore will lead to a minor level of cumulative greenhouse gas emissions. The facilities surrounding the Proposed Development site will be managed to control emissions, and further mitigation to reduce operational phase greenhouse gas emissions are in Section 10.6. above. However, there is potential for effects arising from the Proposed Development and other local existing developments, projects and plans as once greenhouse gases are emitted to the atmosphere, they are considered permanent. Mitigation measures for the operational phase of the Proposed Development are detailed above in Section 10.6.

Therefore, there will be cumulative greenhouse gas emissions associated with the operational phase of the Proposed Development along with other permitted or proposed projects, and these will take place under the transport and commercial built environment sector emissions ceiling and will have a permanent imperceptible negative effect on Climate.