Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

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11. CLIMATE

11.1 Introduction

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on climate arising from the extension of operation and decommissioning of the Proposed Project and has been completed in accordance with the EIA guidance and legislation set out in Chapter 1: Introduction. The full description of the Proposed Project (Proposed Lifetime Extension and Proposed Offsetting Measures) is detailed in Chapter 4 of this EIAR.

The objective of this assessment is to assess the potential effects that the Proposed Project may have on Climate and set out proposed mitigation measures to avoid, reduce or offset any potential significant effects that are identified. Chapter 16 of this EIAR consolidates the risks and vulnerabilities identified throughout all EIAR chapters to assess the overall risk to the Proposed Project concerning major accidents and natural disasters, including climate change.

The aim of the Proposed Lifetime Extension, when in operation, is to reduce the input of carbon intensive energy into the national grid and reduce the amount of greenhouse gas emissions being released to the atmosphere that are associated with electricity generation and use. Harnessing more energy by means of renewable sources will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Lifetime Extension', 'Proposed Offsetting Measures', 'Proposed Offsetting Lands', 'Proposed Project' and 'the Site'.

11.1.1 Background

The Existing Taurbeg Wind Farm is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork, in the townlands of Taurbeg, Glasheenanargid and Taurmore. The Existing Taurbeg Wind Farm is based within peat bogs, agricultural pastures, coniferous forestry and transitional woodland scrub. Within the wider landscape of the Existing Taurbeg Wind Farm, land use comprises wind energy production, agricultural pastures, transitional woodland scrub and peat bogs.

It is intended that the Proposed Lifetime Extension will connect into the national grid via the existing onsite 38kV substation to the existing Glenlara 110kV Substation. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The overhead line does not form part of the current planning application but has been assessed cumulatively with the rest of the Existing Taurbeg Wind Farm infrastructure, as part of the EIAR.

11.1.2 Scoping and Consultation

The scope for this chapter of the EIAR has also been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties. This consultation process and the List of Consultees is outlined in Section 2.9 of Chapter 2 of this EIAR. Matters raised by Consultees in their responses with respect to climate are summarised in Table 11-1 below.

Table 11-1 Summary of Climate Related Scoping Response

Consultee	Description	Addressed in Section
Failte Ireland	Transportation emissions affect not only air quality, but also greenhouse gases. Changing climatic patterns due to climate change should be factored into this analysis.	Section 11.3 and Section 11.5.2

	There is a requirement for tourist developments to describe expected significant effects on the environment of the proposed development's vulnerability to major accidents and/or natural disasters relevant to it. Where appropriate measures should be identified to prevent or mitigate the significant adverse effects of such accidents or disasters, including resulting from climate change, on the environment and detail the preparedness for the proposed response.	
Health Service Executive (HSE)	The Environmental Health Service (EHS) recommends that the following matters are included and assessed in the EIAR: › Climate change and opportunity for health gain	Section 11.5.2

11.1.3 Chapter Structure and Climate Study Areas

This chapter of the EIAR provides an assessment of the potential significant direct and indirect effects on climate arising from all phases of the Proposed Project.

The chapter structure is as follows:

- A review of all relevant climate change legislation policy and guidance applicable to the Proposed Project in an international, national, and local context (Section 11.2)
- Presentation of the baseline environment (Section 11.3 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 11.3.1 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 11.3.2 below)
- A detailed carbon assessment, which considers how the Proposed Project, and the Existing Taurbeg Wind Farm, will affect the greenhouse gas emissions associated with Ireland as a result of activities associated with the extended operation and decommissioning phases (inclusive of both carbon losses and carbon savings) (Section 11.4 below)
- Presents an assessment of the potential likely significant effects on climate arising from the Proposed Project during the extended operational phase (Section 11.5.2), and decommissioning phase (Section 11.5.3) 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, operational phase, and decommissioning phase is provided in this section.
- An assessment of potential cumulative impacts is provided in Section 11.6 and details any potential cumulative effects on climate between the Proposed Project and other permitted or proposed projects and plans in the area, (wind energy or otherwise) for the construction phase (Section 11.6.1), operational phase (Section 11.6.2), and decommissioning phase (Section 11.6.3)

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 this EIAR, the overall Climate Study Area for the Proposed Project is defined as the national environment (Ireland), where the receptor is the climate and the global atmosphere. As stated in the IEMA 2022 guidance *'greenhouse gas emission impacts and*

resulting effects are global rather than affecting one localised area'[1]. 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 Site Boundary, as defined in Section 1.1.1 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 Site Boundary, i.e., the primary study area for the EIAR as defined in Section 1.1.1 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 Site Boundary, as defined in Section 1.1.1 of Chapter 1 of this EIAR.

11.1.4 Statement of Authority

This section of the EIAR has been prepared by Catherine Johnson and reviewed by Eoin McCarthy, both of MKO. Catherine is an Environmental Scientist and Climate Practitioner at MKO with over three years of consultancy experience in renewable energy 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 is a Project Director with over 13 years of environmental consultancy experience. Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway.

11.2 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 accelerating 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

[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*

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 2023 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 the 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 over more than 100,000 years globally, 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 2023[5], state that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere 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 mitigate the human activity catalysing climate change.

Relevant legislation, policy, and guidance in an international (Section 11.2.1), national (Section 11.2.2), and local (Section 11.2.3) context are detailed below.

11.2.1 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 11-2 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 11-1 Climate Legislation and Policy for further detail on each of the below international instruments.

Table 11-2 International Instruments Relating to Greenhouse Gas Emissions and Climate Change Targets

International Instrument	Description
Kyoto Protocol	The Kyoto Protocol was adopted on 11 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 8th December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

[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 (2023) European Climate Risk Assessment <*https://climate-adapt.eea.europa.eu/en/eu-adaptation-policy/key-eu-actions/climate_risk_assessment/index_html*>*
[5] *IPCC AR6 Synthesis Report: Climate Change 2023.* https://www.ipcc.ch/report/sixth-assessment-report-cycle/

	› 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
Conference of the Parties (COP): *Every year since 1995, the Conference of the Parties (COP) has gathered the 196 Parties (195 countries and the European Union) 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.*	**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 CO_2 emissions to zero by 2050.
	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 triples 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.
United Nations Sustainable Development Goals	On the 28th of June 2024, the United Nations published 'The Sustainable Development Goals Report 2024' 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, 48% of SDG targets are showing minimum or moderate progress, 18% having stalled in progress and 17% having regressed from 2023.
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/>

	Ireland, ranked 43rd in 2024, has risen 14 places to 29th for 2024, 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.
State of the Global Climate 2024	In March 2025, the World Meteorological Organisation (WMO) published a report entitled the 'State of the Global Climate 2024. This report provided a summary on the state of the climate indicators in 2023 with sections on key climate indicators, extreme events and impacts. The key messages in the report include: › Greenhouse gases reached record observed levels in 2023. Real time data indicate that they continued to rise in 2024. › The annually averaged global mean near-surface temperature in 2024 was 1.55 °C ± 0.13 °C above the 1850–1900 average used to represent pre-industrial conditions.
Renewable Energy Directive	The first Renewable Energy Directive (RED)[7] is legislation that influenced the growth of renewable energy in the EU and Ireland for the decade ending in 2020. From 2021, RED was replaced by the second Renewable Energy Directive (REDII),[8] which continues to promote the growth of renewable energy out to 2030. REDII introduced a binding EU-wide target for overall RES of 32% in 2030 and requires Member States to set their national contributions to the EU-wide target. As per the National Energy and Climate Plan (NECP) 2021-2030, Ireland's overall RES target is 34.1% in 2030. Given the need to ratchet up the EUs clean energy transition, RED was revised in 2023, and the amending Directive EU/2023/2413 (REDIII)[9] entered into force on 20 November 2023. REDIII amended the EU-wide overall 2030 RES target from 32% to at least 42.5%, and it is assumed that Irelands 2030 RES target will increase accordingly.
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.
Council Regulation (EU) 2022/2577 and 2024/223	Council Regulation (EU) 2022/2577 and 2024/223 lay down a framework to accelerate the deployment of renewable energy. Regulation 2022/2577 and 2024/223 recognises the relative importance of renewable energy deployment

[7] *Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Available from: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF*
[8] *Directive (EU) 2018/2001 on the promotion of the use of energy from renewable resources (recast). Available from: https://eurlex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L2001*
[9] *Directive (EU) 2023/2413 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413*

	in the current difficult energy context and provides significant policy and legislative support to enabling renewable energy projects. Further detail is provided in Section 1.1.1.9 of Appendix 11-1 and in Section 2.4.1 in Chapter 2 of this EIAR.
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 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 1.1.1.10 of Appendix 11-1 for further details on the EU ESR

11.2.2 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 change targets are critical for achieving Irelands climate ambitions.

Table 11-3 below provides an overview of the national agreements that have played key roles in establishing climate governance; please refer to Appendix 11-1 Climate Legislation and Policy for further detail on each of the below national legislation measures.

Table 11-3 National Legislation and Reports relating to Greenhouse Gas Emission and Climate Change Targets

National Instrument	Description
Programme for the Government – Securing Irelands Future	The Programme for Government – Securing Irelands 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 18th January 2016 under the Climate Action and Low Carbon Development Act 2015. The Annual Review 2024: Electricity report has been released by the CCAC and focuses specifically on key findings and recommendations for the Electricity sector. In 2023, emissions from the sector reduced by approximately 21% from 2022 to the lowest level since records began in 1990. This was driven by a considerable decline in the use of coal for electricity generation, coupled with a notable rise in imported electricity.
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 1.1.2.5 of Appendix 11-1.
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 1.1.2.6 of Appendix 11-1.
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.
Irelands Climate Change Assessment	In 2023 the EPA published Irelands 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 Irelands Future › Volume 4: Realising the Benefits of Transition and Transformation

	Please refer to Section 1.1.2.8 of Appendix 11-1 for further information on the ICCA.

11.2.3 Local Greenhouse Gas Emission and Climate Targets

11.2.3.1 Cork County Council Local Authority Climate Action Plan 2024-2029

The Cork County Council Local Authority Climate Action Plan 2024-2029[10] (Cork LACAP) was adopted and published in February 2024.

The Cork LACAP highlights the current state of climate action in Ireland, and how Cork County Council will be responsible for enhancing climate resilience, increasing energy efficiency, and reducing greenhouse gas emissions, across its own assets and services. The Cork LACAP 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 Cork LACAP 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 Cork equated to 8,083,000tCO2 in the baseline year 2018. The top three emitting sectors within County Cork in terms of total greenhouse gas emissions in the baseline year were agriculture, transport and commercial & manufacturing, producing 43%, 15%, and 13% of total emissions respectively. Cork County Council, 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 2024 (Section 11.2.2 above).

During the operational phase the Proposed Lifetime Extension will assist in reducing emission by enabling renewable energy to be fed into the grid and the subsequent decarbonisation of other sectors, particular the main emitting sectors in County Cork as identified above. Please see Section 11.4.3.2 below for further information on carbon savings associated with the Proposed Lifetime Extension.

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

11.2.3.2 Cork County Development Plan 2022-2028

The Cork County Development Plan 2022-2028[11] (CCDP) sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The CCDP includes numerous actions and objectives on sustainability and climate for Cork to achieve over the 6-year period.

In relation to wind energy, the CCDP states that *'[i]n 2020, installed wind capacity reached 3,700 MW within the Republic of Ireland. Cork County currently has 38 commissioned wind farms with capacity of 603MW, equivalent to approximately 16% of the national capacity. However, if Ireland is to meet our*

[10] *Cork County Council Local Authority Climate Action Plan 2024-2029.* <https://www.corkcoco.ie/sites/default/files/2024-02/cork-county-council-climate-action-plan-2024-2029.pdf>
[11] *Cork County Development Plan 2022-2028* <https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028>

renewable energy target then we need to double capacity nationally over the next ten years. On a pro rata basis, that could see capacity in Cork expand to 1,100MW. At present they are valid but unimplemented permissions in the county for a further 200MW of wind power.'[12]

A key objective identified in the CCDP relating to wind energy is as follows:

- **ET 13-4**: In order to facilitate increased levels of renewable energy production consistent with national targets on renewable energy and climate change mitigation as set out in the National Energy and Climate Plan 2021-2030, the Climate Action Plan 2021, and any updates to these targets, and in accordance with Ministerial Guidelines on Wind Energy Development, the Council will support further development of on-shore wind energy projects including the upgrading, repowering or expansion of existing infrastructure, at appropriate locations within the county in line with the Wind Energy Strategy and objectives detailed in this chapter and other objectives of this plan in relation to climate change, biodiversity, landscape, heritage, water management and environment etc..

Further detail on local policy relating to wind energy in Co. Cork can be found in Section 2.6.3 of Chapter 2 of this EIAR.

11.2.4 Relevant Guidance

The climate chapter 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 1.8.2 of Chapter 1: Introduction. Due to the nature of the Proposed Lifetime Extension, a wind farm project, 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'* (2013) European Commission
- Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.7.10) (TII, 2020)
- *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition'* (IEMA 2022)

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 Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document, GE-ENV-01106 (TII 2022d).

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on climate arising from the continued operation and decommissioning of the Proposed Lifetime Extension and has been completed in accordance with the EIA Directive and the guidance listed in Section 1.1.1 of Chapter 1 Introduction.

11.3 Climate and Weather

11.3.1 Baseline Environment

Climate change projections show that the Earth is getting warmer and extreme weather events are increasing in frequency on an annual basis. The Proposed Project will assist in mitigating these effects

[12] *Ibid (page 296)*

through the deployment of clean renewable energy to the national grid and subsequent decarbonisation of energy systems, and the rehabilitation of coniferous forestry and agricultural land for hen harrier. Please refer to Appendix 7-7 for further detail on Proposed Offsetting Measures. Changes to climate and weather in Ireland will occur as a result of climate change, for further details on the risks associated with the Proposed Project please refer to Chapter 16: Major Accidents and Natural Disasters.

11.3.1.1 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 Averages[13]
- Irelands Climate Averages 1991-2020 Summary Report[14]
- Ireland's National Inventory Report 2025[15]
- Climate Status Report for Ireland 2020[16]
- Annual Review 2025 – Our Changing Climate in 2024[17]

11.3.1.2 Physical Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Shannon Airport which is located approximately 50 kilometres to the north of the Site, is the nearest weather and climate monitoring station to the Site that has meteorological data recorded for the 30-year period from 1991-2020. Meteorological data recorded at the Shannon Airport weather station over the 30-year period from 1991-2020 is shown in Table 11-4 below. 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.

More recent monthly meteorological data recorded at Shannon Airport, located approximately 50km north of the Site, from January 2022 to January 2025 is available at: https://www.met.ie/climate/available-data/monthly-data. December 2023 was the wettest month in this time period, with 202.9mm of rainfall recorded, while March 2022 was the driest month with 39mm of rainfall. June 2023 was the warmest month in this time period, with a mean monthly temperature of 16.7° Celsius. December 2022 was the coldest month in this time period with a mean monthly temperature of 3.4° Celsius.

Table 11-5 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] https://www.met.ie/climate/30-year-averages
[14] *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>
[15] *EPA (2025) Ireland's National Inventory Report* <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/Ireland's-NID-2025.pdf>
[16] *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>
[17] *Climate Change Advisory Council (2025) Annual Review 2025 – Our Changing Climate in 2024* <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC%20AR25%20Our%20Changing%20Climate-final.pdf>

Table 11-4 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 >= 0.2mm	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 >= 1.0mm	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 >= 5.0mm	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 11-5 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 winters[18]. Irelands 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 2020[19] states that air temperatures in Ireland have '*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'*. Temperatures in Ireland are increasing, with sixteen of the top 20 warmest years on record occurring since 1990[20]. On 10th July 2024 Met Éireann confirmed that 2023 was Irelands wettest and warmest year on record (records going back to 1900).[21]	Chapter 10 Air Quality

[18] *IPCC (2021) Climate Change 2021: The Physical Science Basis* <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>
[19] *Government of Ireland (2020) Climate Status Report for Ireland 2020* <https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf>
[20] *Irelands 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>
[21] https://www.met.ie/2023-confirmed-as-irelands-wettest-year-on-record

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
	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.[22] However, this moderating influence could be in jeopardy if the Atlantic Meridional Overturning Circulation (AMOC) continues to weaken[23]. The AMOC is a large system of ocean currents responsible 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	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 regimes[24]. 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)[25]. Irelands 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.	Further detail on rainfall and evaporation data is provided in Section 9.3.2 in Chapter 9 Hydrology and Hydrogeology.

[22] https://www.met.ie/climate/what-we-measure/temperature#:~:text=The%20moderating%20influence%20of%20the,mild%20winters%20and%20cool%20summers.
[23] 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>
[24] IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>
[25] Department of Housing, Local Government and Heritage (2024) Irelands Climate Averages 1991-2020 Summary Report <https://edepositireland.ie/handle/2262/108695>

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 variations[26]. Irelands 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 storms[27]. 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 42km/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 weaken[29]. 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 Strom 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>*

11.3.1.3 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 1.1.2.6 of Appendix 11-1 Climate Legislation Policy and Guidance. These sectors include:

- Electricity
- Transport
- Built Environment
  - Residential
  - Commercial
- 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 $ktCO_2e$ in 1990 to 71,476.9 $ktCO_2e$ 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 $ktCO_2e$ to 71,213.8 $ktCO_2e$. There was then a sharp decrease from 69,032.5 $ktCO_2e$ in 2008 to 58,582.4 $ktCO_2e$ in 2011. In 2023, total emissions of greenhouse gases including indirect emissions from solvent use (excluding LULUCF) in Ireland were 54,934.4$ktCO_2e$, which is 1.4% lower than emissions in 1990. Emissions in 2023 at 54,934.4 $ktCO_2e$ are 6.8% lower than 2022, and the lowest level in the time series.

The Electricity sector accounted for the bulk of the CO_2 emissions in 2023 (57.1%), Agriculture contributed 36.2%, while a further 5.2% emanated from Industrial Processes and Product Use and 1.5% was due to Waste. Emissions of CO_2 accounted for 61.1% of the national total in 2023, with CH_4 and N_2O contributing 28.9% and 8.%, respectively. The combined emissions of fluorinated gases (HFC, PFC, SF_6 and NF_3) accounted for 1.2% of total emissions in 2023.[31]

11.3.2 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, 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 discussions[32]. It has become clear that even if greenhouse gas emissions were to cease immediately, climate alterations would persist for many decades. Therefore, alongside

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

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.

11.3.2.1 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 2020[34]
- Climate Ireland[35]

11.3.2.1.1 *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 emissions[36]. The physical environment of the Proposed Project under the RCP 8.5 scenario is discussed under the following headers:

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

Air Temperature

Annual surface air temperatures[37] in Ireland are now approximately 1°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 scenario[38].

Met Éireann projections[39] 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

[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>
[37] https://www.epa.ie/publications/monitoring-assessment/climate-change/irelands-climate-change-assessment-volume-1.php
[38] *Irelands Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World*
[39] https://www.met.ie/climate/climate-change#Reference3

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[40,41].

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.[42]

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 months[43]. Further information on flood risk is presented in the section below.

Flood Risk

Chapter 9 Hydrology and Hydrogeology, and the accompanying Flood Risk Assessment (FRA) (Appendix 9-1) detail the flood risk of the Proposed Project. Based on the information provided in the stated documents, the areas of the Proposed Project at risk of flooding were identified.

There are no recurring or historic flood incidents are recorded within the Proposed Project; the closest mapped historical flood event is ~5km downstream of the Site at the confluence of the Knockahorrea East stream and the Feale River at Rockchapel. This event was recorded in August 1986 (Flood ID: 2414). The closest mapped recurring flood event is mapped ~7km downstream of the Site along the R578 on the Glenlara River, near its confluence with the Dalua River. According to the Area Engineer Notes for Newmarket, the R578 road flooding occurs along a stretch of ~1km, resulting from high flows in River Dalua (Flood ID: 5153).

The GSI Maximum Historic Groundwater Flood Map, produced based on flood extents for the 2015/2016 winter flood event, does not record any groundwater flood zones within the Site, the Proposed Offsetting Lands, or in the surrounding areas.

Catchment Flood Risk Assessment and Management (CFRAM)[44] mapping has not been completed for the area of the Proposed Project. The closest CFRAM mapping to the Site has been completed along the Dalua River to the southeast of Newmarket town, ~11km to the southeast. The closest CFRAM mapping to the Proposed Offsetting Lands has been completed along the River Maine at Castleisland.

There is a slight risk of pluvial flooding at the Proposed Project due to the presence of impermeable blanket peat soils. However, the risk is very low as drainage moves relatively freely as a result of the sloping topography and the existing drainage. Fluvial flood modelling was also completed in order to

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[40] *Nolan, P. 2015. EPA Report: Ensemble of Regional Climate Model Projections for Ireland. EPA climate change research report no. 159. EPA: Wexford.*
[41] *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.*
[42] https://www.epa.ie/our-services/monitoring--assessment/climate-change/climate-ireland/impact-of-climate-change-on-ireland/climate-hazards/coastal-flooding.
[43] *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*>*
[44] *CFRAM is Catchment Flood Risk Assessment and Management. The national CFRAM programme commenced in Ireland in 2011 and is managed by the OPW. The CFRAM Programme is central to the medium to long-term strategy for the reduction and management of flood risk in Ireland.*

consider future climate scenarios where the potential effects of climate change can increase rainfall. The National Indicative Fluvial Flood Mapping mid-range future scenarios models flood extents based on a 20% increase in rainfall and the high-range scenario models flooding based on a 30% increase in rainfall. As stated in the FRA both modelled flood extents demonstrate similar flooding as seen in the Present-Day Scenario. Therefore the Proposed Project site is unlikely to be significantly impacted by future climate change.

The FRA concludes that the overall risk of flooding posed by the Proposed Project and associated works within the site is very low. In addition, the risk of the Proposed Project contributing to downstream flooding is also very low. The long-term plan for the Site is to retain and slow down drainage water rates prior to release. Robust drainage measures on the Site will include swales, silt traps, check dams, settlement ponds and buffered outfalls. Please refer to the Chapter 9 of the EIAR for further details.

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 months[45]. 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 months[46]. Storm surge levels over a 20-to-30-year return period are anticipated to increase by up to 9cm by 2100[47].

11.3.2.2 Greenhouse Gas Emissions Projections

In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 42% by 2030, relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 42% in greenhouse gas emissions is achieved at EU-level[48].

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR[49]). This established binding annual greenhouse gas emission targets for Member States for the period 2021–2030. Please see Section 11.2.1 above and Section 1.1.1.9 of Appendix 11-1 for further details on the EU ESR.

Considerable progress has been made in the decarbonisation of the Electricity Sector, with emissions falling 22% between 2022 and 2023. This reduction in emissions is due to an increase in the share of renewable electricity generation, from 38.6% to 40.7% from 2022 to 2023, with wind energy accounting for 33.7% of electricity supply.[50]

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[45] https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/windspeed/
[46] https://www.epa.ie/publications/research/climate-change/research-339-high-resolution-climate-projections-for-ireland-.php
[47] https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/waves-surges/
[48] *Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024* https://www.gov.ie/en/publication/79659-climate-action-plan-2024/
[49] *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 There was a significant drop in emissions from the Energy Industries sector between 2022 and 2023 (down 2.1 Mt CO2eq 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 202Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance)*
[50] *Department of the Environment, Climate and Communications (2025) - Climate Action Plan 2025*

The Environmental Protection Agency (EPA) publish Ireland's greenhouse gas emission projections and at the time of writing, the most recent report, *'Ireland's Greenhouse Gas Emissions Projections 2024-2055'*[51] was published in May 2025. The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2030 set under the ESR.

The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario assumes no additional policies and measures, beyond those already in place by the end of 2023. This is the cut off point for which the latest national greenhouse gas emission inventory data is available. The WAM scenario has a higher level of ambition and includes government policies and measures to reduce emissions such as those in Ireland's Climate Action Plan 2024 that are not yet implemented. As implementation of policies and measures occurs, they will be migrated into the WEM Scenario. Please note, CAP25 is not specifically referenced in this report as it had yet to be published during the preparation phase of the 2024-2055 projections. A review was undertaken and there are no significant additional measures in CAP25 therefore no major omissions in these projections.

The EPA Emission Projections Update notes the following key trends:

- Ireland is not on track to meet the 51% emissions reduction target by 2030 (as compared to 2018 levels) based on most up to date EPA projections which include many of Climate Action Plan 2024 measures
- The first two carbon budgets (2021-2030), which aim to support achievement of the 51% emissions reduction goal, are projected to be exceeded by a significant margin
    - Carbon Budget 1 to be exceeded by a margin of 8 to 12 $MtCO_2eq$
    - Carbon Budget 2 to be exceeded by a margin of 77 to 114 $MtCO_2eq$ (with carryover from Carbon Budget 1)
- Sectoral emissions ceilings for 2025 and 2030 are projected to be exceeded by the Buildings, Electricity, Industry and Transport Sectors and met by the Other sector
    - Please note, a direct comparison of emissions in the Agriculture sector against its Sectoral Emission Ceiling is no longer viable due to significant refinement of the Agriculture inventory
- From 21.4 $MtCO_2eq$ in 2018, total emissions from the Agriculture sector are projected to be between 18.0 and 21.6 $MtCO_2eq$ in 2030 (a 16% reduction in WAM and 1% increase in WEM)
    - Without full implementation of all planned policies and measures, there will be a net increase in emissions in this sector by 2030.
- Transport emissions are projected to decrease from 12.3 $MtCO_2eq$ in 2018 to between 9.7 $MtCO_2eq$ and 11.2 $MtCO_2eq$ in 2030 (a 9 to 21% reduction).
- From 10.6 $MtCO_2eq$ in 2018, emissions from the Energy Industries sector are projected to decrease to between 3.4 and 4.4 $MtCO_2eq$ in 2030 (a 59 to 68% reduction)
    - Renewable energy generation at the end of the decade is projected to range from 69 to 68% of electricity generation
- Emissions from the Energy Industries sector are projected to decrease by between 57 and 62% over the period 2022 to 2030
    - Renewable energy generation at the end of the decade is projected to range from 69 to 80% of electricity generation
- Total emissions from the LULUCF sector are projected to increase over the period 2018 to 2030 by between 1.5 and 3.8 $MtCO_2eq$ (an increase of 39 to 95%)
- Ireland is not projected to meet its EU target, set under the Effort Sharing Regulation, of a 42% emissions reduction by 2030 (compared to 2005) even with flexibilities applied

[51] *EPA (2025) Ireland's Greenhouse Gas Emissions Projections 2024-2055*

- Under the WEM Scenario Ireland is projected to receive a 9.5% emission reduction from 2005 levels by 2030
- Under the WAM Scenario Ireland is projected to achieve a 21.7% emission reduction from 2005 levels by 2030.

11.3.3 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 Project considered the potential climate change effects under both the baseline and future environment and it is considered that the Proposed Project will not be negatively impacted by climate change, nor will it have a negative impact on climate change over its 10-year design horizon.

Further information on the vulnerability of the Proposed Project to major accidents and natural disasters is detailed in Chapter 16 Major Accidents and Natural Disasters.

11.4 Calculating Carbon Losses and Savings from the Proposed Project

11.4.1 Background

In addition to the combustion of fossil fuels, greenhouse gases are also released through natural processes such as the decomposition of organic material (which is composed of carbon). Bogs and peatlands are known to store large amounts of carbon. Due to the waterlogged nature of these habitats, stored carbon is not broken down and released into the atmosphere. The construction of wind farms on bog and peat habitats may affect the natural hydrological regime, thus exposing and drying out the peat and allowing the decomposition of carbon. It is therefore necessary to demonstrate that any wind farm constructed on such sites saves more carbon than is released. The Proposed Lifetime Extension is predominantly overlain by blanket peat; the Proposed Offsetting Lands is situated on agricultural land and peatland with small sections being covered by coniferous forestry located on commercial forestry and agricultural land. For this reason, the carbon balance between the use of renewable energy and the loss of carbon stored in the peat will be assessed in this section of the EIAR.

CO_2 emissions occur naturally in addition to being released with the burning of fossil fuels. All organic material is composed of carbon, which is released as CO_2 when the material decomposes. Organic material acts as a store of carbon. Peatland habitats have a significant capacity to store organic carbon. The vegetation on a peat bog slowly absorbs CO_2 from the atmosphere when it is alive and converts it to organic carbon. When the vegetation dies, in the acidic waterlogged conditions of bogs and peatlands, the organic material does not decompose fully, and the organic carbon is retained in the ground.

The carbon balance of wind farm developments in peatland habitats has attracted significant attention in recent years. When developments such as wind farms are proposed for peatland areas, there will be direct impacts and loss of peat in the area of the development footprint. There may also be indirect impacts where it is necessary to install drainage in certain areas to facilitate construction, or from the reinstatement of extracted peat. The works can either directly or indirectly allow the peat to dry out, locally, which permits the full decomposition of the stored organic material with the associated release of the stored carbon as CO_2. It is essential therefore that any wind farm development in a peatland area saves more CO_2 than is released.

The original EIAR for the Existing Taurbeg Wind Farm did not include a discussion on carbon losses and savings. The below assessment includes for this carbon loss assessment. Please note, under a

precautionary scenario all carbon losses associated with the Proposed Project and those from the Exiting Taurbeg Wind Farm turbines were calculated with 2025 emission factors rather than 2006 emissions factors (i.e., when the Existing Taurbeg Wind Farm was constructed). Please see Appendix 11-2 Carbon Calculations for further information on carbon calculations for the Proposed Project.

11.4.2 Methodology for Calculating Losses

During wind farm construction, carbon is lost as a result of peat excavation and peat drainage. The amount of carbon lost can be estimated using default values from the IPCC (IPCC, 1997) as well as by more site-specific equations derived from the scientific literature and updated emission factors. Carbon gains due to habitat improvement and site restoration are calculated in a similar fashion.

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macauley Institute with support from the Rural and Environment Research and Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands'*, was developed to calculate the impact of wind farm developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. The web-based version of the carbon calculator, which supersedes the excel based versions of the tool, was released in 2016. Please note, the web-based version of the carbon calculator is currently not available, the Macauley Institute has supplied a worksheet of the calculator (Version 2.14.0) which has been used to complete the following carbon loss assessment. The tool provides a transparent and easy to follow method for estimating the impacts of wind farms on the carbon dynamics of peatlands. Previously guidance produced by Scottish Natural Heritage in 2003 had been widely employed to determine carbon payback in the absence of any more detailed methods.

Although the loss of carbon fixing potential from plants on peat land is not substantial, it is nonetheless calculated for areas from which peat is extracted and the areas affected by drainage. The development of a wind farm requires the construction of infrastructure, i.e., turbines and associated foundations and hardstands, internal site roads, construction compounds, etc. and, on a site such as the Proposed Offsetting Lands, this requires peat excavation resulting in the loss of the carbon-fixing potential of the associated vegetation. The determination of the carbon losses associated with the carbon-fixing potential is calculated from the area affected by a wind farm (both directly by removal of peat and indirectly by drainage, the annual gains due to the carbon fixing potential of the peatland, and the time required for habitat restoration. The amount of carbon lost is estimated using default values from the IPCC (IPCC, 1997) as well as by more site-specific equations derived from the scientific literature and updated emission factors.

Peatlands are essentially unbalanced systems. When flooded, peat soils emit less carbon dioxide but more methane than when drained. In waterlogged soils, carbon dioxide emissions are usually exceeded by plant fixation, so the net exchange of carbon with the atmosphere is negative and soil carbon stocks increase. When soils are aerated, carbon emissions usually exceed plant fixation, so the net exchange of carbon with the atmosphere is positive. As there is no construction proposed as part of the Proposed Lifetime Extension, there will be no carbon losses associated as a result of construction of turbines on peatlands. Please refer to the original planning application for the Existing Taurbeg Wind Farm (CCC Ref 02/3608) for further information on the construction phase of the Existing Taurbeg Wind Farm.

As part of the Proposed Offsetting Measures, deforestation of approximately 105.5ha of existing forestry is proposed to allow for the creation of habitat of approximately 123.3ha for hen harrier. At present, coniferous forestry at the Proposed Offsetting Lands is subject to cycles of felling and afforestation, typical of plantation forestry crops which limits the nature and longevity of the resulting timber produced. As stated in Table 5 of the Felling and Reforestation Policy[52] permanent removal of forestry

[52] *Felling and Reforestation Policy, Forest Service, Department of Agriculture, Food & the Marine, Ireland (2017) https://assets.gov.ie/96814/4830fc08-0227-4504-83fa-2fd90a7942f2.pdf*

may be considered and alternative afforestation is not required under a scenario whereby overriding environmental considerations are applied, such as protecting habitats and species and qualifying interests with SACs and SPAs. In this scenario, the Proposed Offsetting Lands are located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, with Hen Harrier being the qualifying interest of the SPA. Restoring the forested areas within the Proposed Offsetting Lands to dry heath aligns also with the conservation objectives for the SPA[53], with one of the targets being to restore the extent and quality of heath, and bog associated habitats to support targets relating to hen harrier population size, productivity rate and spatial utilisation. Therefore, if planning permission for the Proposed Project is granted, the Applicant commits to consultation with the Forestry Service and NPWS to discuss afforestation requirements prior to the granting of any felling licence associated with the removal of forestry at the Proposed Offsetting Lands. Under a precautionary approach, the carbon losses associated with the loss of 105.5ha of existing forestry have been calculated and are detailed in Table 11-6 below.

Where possible, carbon emissions, or losses, associated with embodied carbon of material used for the Proposed Project and associated transport movements have been identified. Embodied carbon refers to the emissions associated with procuring, mining and harvesting raw materials, the transformation of those materials into construction products, transporting them to Site, installation of these materials during a construction phase, and the subsequent replacement, removal, and disposal of these materials upon decommissioning.[54] These carbon losses have been completed with the use of the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)[55]. The TII Carbon Tool is customised for road and light rail projects in Ireland, using the most up to date emission factors from recognised sources during the construction, maintenance and operation of TII projects in Ireland.

Section 15.2.5.5.1 in Chapter 15 of this EIAR outlines traffic generation numbers relative to the decommissioning of the Proposed Lifetime Extension, the details of which have been utilised to determine the emissions associated with these activities and are included in Appendix 11-2.

11.4.3 Carbon Losses and Savings Calculations

11.4.3.1 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 Project in terms of potential carbon losses, associated with the operational and decommissioning phase.

A copy of the outputs is provided as Appendix 11-2 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 main CO_2 losses due to the Proposed Project are summarised in Table 11-6.

[53] *Conservation Objectives for Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, NPWS 2022: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004161.pdf*
[54] *Irish green Building Council – What is embodied carbon?* <https://www.igbc.ie/what-is-embodied-carbon/>
[55] *Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document* https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf

Table 11-6 CO_2 Losses from the Proposed Project

Origin of Losses	CO_2 Losses (tonnes CO_2 equivalent) of the Proposed Project	
	Expected	Maximum
Existing Taurbeg Wind Farm Carbon Losses		
Losses due to turbine life (e.g. manufacture, construction, decommissioning)	18,496	19,524
Losses due to backup	4,699	4,903
Losses due to reduced carbon fixing potential	69	143
Losses from soil organic matter	2,979	6,517
Sub-Total	**26,243**	**31,087**
Proposed Lifetime Extension Carbon Losses		
Losses associated to embodied carbon of decommissioning phase materials	142.4	142.4
Losses associated to decommissioning phase transport movements	0.7	0.7
Sub-Total	**143**	**143**
Proposed Offsetting Measures Carbon Losses		
Losses due to forestry felling	13,927	14,328
Sub-Total	**13,927**	**14,328**
Total	**40,313**	**45,558**

The worksheet models and online tools calculate that the Existing Taurbeg Wind Farm and the Proposed Project will give rise to 40,313 tonnes of CO_2 equivalent losses. Of this total figure, losses due to turbine life account for 18,496 tonnes, or 46%. Losses due to backup account for 4,699 tonnes or 12%. Losses due to reduced carbon fixing potential accounts for 0.2% or 69 tonnes. Losses from soil organic matter account for 2,979 tonnes or 7%. Losses due to the embodied carbon of decommissioning phase materials is 142.4 tonnes or 0.4%. Losses due to decommissioning phase transport movements equates to 0.7 tonnes or 0.002%. Losses due to forestry felling (i.e., the deforestation of the Proposed Offsetting Lands) directly account for 13,927 tonnes, or 35%.

The values discussed above are based on the assumption that offsetting activities will not take place as part of the Proposed Project. As detailed in Appendix 7-7, a Hen Harrier Offsetting Plan for the Proposed Project has identified habitat creation activities such as restoring existing hedgerow and scrub for hen harrier, implementing grazing regime to create foraging and nesting opportunities for hen harrier prey species, and establishing linear strips of wildlife cover that will take place. This will serve to improve the carbon sequestration potential of the land within the Proposed Project. Therefore, the actual CO_2 losses for associated with the Proposed Project are expected to be lower than the values detailed in Table 11-6 over the lifetime of the Proposed Project.

The figure of 0.7 tonnes of CO_2 arising from transport movements associated with construction activities associated with the Proposed Project is calculated based on the assumption that material will be imported locally and assumes that each HGV or LGV will be carrying material at its full capacity where applicable (i.e., 25 tonnes). Details on the assumptions made for the modelling of embodied carbon and construction phase transport emissions are included in Appendix 11-2.

The values discussed above are based on the assumption that the hydrology of the Proposed Lifetime Extension are not restored during decommissioning of the Existing Taurbeg Wind Farm. As detailed in the Decommissioning Plan, Appendix 4-3, all 11 no. turbines will be dismantled and removed offsite in a similar manner to how they will be transported to the Site originally. It is not intended to remove the concrete foundations from the ground as it is considered that its removal will be the least preferred options in terms of having potential effects on the environment. The associated foundations will be backfilled and covered with soil material. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible with no environmental impact associated with leaving the ducting in situ. It is intended to remove fencing, transformers and all associated electrical plant and components from the Site. It is intended that the substation hardstanding area will be left in-situ and allowed to revegetate naturally. Taking into account the proposals incorporated in the Decommissioning Plan, the actual CO_2 losses are expected to be lower than the values detailed in Table 11-6.

11.4.3.2 Carbon Savings

The Proposed Lifetime Extension will continue to feed renewable energy to the national grid and result in carbon dioxide emissions reductions. While the carbon losses assessment considered both the Existing Taurbeg Wind Farm and the Proposed Project, the carbon savings assessment focuses solely on the 10-year extended operational life of the Proposed Lifetime Extension. The Existing Taurbeg Wind Farm, operational for 19 years at the time of writing, has consistently provided renewable energy during that period to the national grid. Emissions associated with the Existing Taurbeg Wind Farm during construction and operation are assumed to have been offset by its 19-year operational life to date. Therefore, the carbon savings and offset period discussed below relate exclusively to the Proposed Lifetime Extension.

A simple formula can be used to calculate carbon dioxide emissions reductions resulting from the generation of electricity from wind power rather than from carbon-based fuels such as peat, coal, gas and oil. The formula is:

$$CO_2 \text{ (in tonnes)} = \frac{(A \times B \times C \times D)}{1000}$$

where: A = ... The rated capacity of the wind energy development in MW

B = ... The capacity or load factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc.

C = ... The number of hours in a year

D = ... Carbon load in grams per kWh (kilowatt hour) of electricity generated and distributed via the national grid.

For the purposes of this calculation, the rated capacity of the Proposed Lifetime Extension is assumed to be 25.3 MW (based on 11 No. 2.3 MW turbines).

A load factor of 0.37 (or 37%) has been used for the Proposed Lifetime Extension [56]

The number of hours in a year is 8,760.

A conservative figure for the carbon load of electricity generated by natural gas in Ireland was sourced from Sustainable Energy Authority Ireland's (SEAI) December 2023 report, '*Energy in Ireland*'.[57] The provisional emission factor for electricity generated in Ireland in 2023 was 229.9gCO_2/kWh.

The calculation for carbon savings is therefore as follows:

$$CO_2 \text{ (in tonnes)} = \frac{(25.3 \times 0.37 \times 8{,}760 \times 229.9)}{1000}$$

$$= 18{,}852 \text{ tonnes per annum}$$

Based on this calculation, **18,852** tonnes of carbon dioxide will be displaced per annum from the largely carbon-based traditional energy mix by the Proposed Lifetime Extension. Over the proposed continued 10-year lifetime of the Proposed Lifetime Extension, **188,523** tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation. Based on the carbon losses presented above in Section 11.4.3.1, approximately 14,070 tonnes of CO_2 will be lost to the atmosphere due to the Proposed Project. This represents 3% of the total amount of carbon dioxide emissions that will be offset by the Proposed Lifetime Extension. The 14,070 tonnes of CO_2 that will be lost to the atmosphere due to the Proposed Project will be offset by the operation of the Proposed Lifetime Extension in approximately 8.9 months of operation.

As detailed in Appendix 7-7, the Hen Harrier Offsetting Plan, will take place as part of the Proposed Project. The Hen Harrier Offsetting Plan identifies the appropriate methodologies for deforestation in identified 'Areas' within the Proposed Offsetting Lands, restoration of farmland, and forestry replanting as per commitments to be agreed with the NPWS and Forest Service should the Proposed Project receive planning permission.

11.5 Likely Significant Effects and Associated Mitigation Measures

11.5.1 'Do-Nothing' Effect

If the Proposed Project were not to proceed, the existing wind farm would be decommissioned in accordance with the conditions of the current planning permission.

If the Proposed Project were not to proceed, the opportunity to further significantly reduce emissions of greenhouse gas emissions, including carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2) from fossil fuels to the atmosphere would be lost. The opportunity to contribute to Ireland's commitments under the Paris Agreement and EU law would also be lost. This would be a long-term slight negative effect.

If the Proposed Offsetting Measures were not to proceed, existing land use of plantation forestry and agricultural practises within the Proposed Offsetting Lands would continue and the Proposed Offsetting

[56] *Eirgrid, 2022 Enduring Connection Policy 2.3 Constraints Report for Solar and Wind* <https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf> *The Site is located within the E wind region for Ireland with an associated capacity factor of 37%.*
[57] *SEAI (December 2023) Energy in Ireland 2023 Report* <https://www.seai.ie/sites/default/files/publications/Energy-in-Ireland-2023.pdf>

Measures would not take place. This would likely result in a long-term, imperceptible, negative effect on climate.

11.5.2 Proposed Lifetime Extension

11.5.2.1 Greenhouse Gas Emissions

The Proposed Lifetime Extension will generate energy from a renewable source. This energy generated will offset energy and the associated emission of greenhouse gases from electricity-generating stations dependent on fossil fuels, thereby having a positive effect on climate. As detailed in Section 11.4.3.2 above, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over its proposed 10-year extended operational lifespan. The Proposed Lifetime Extension will assist in reducing carbon dioxide (CO_2) emissions that would otherwise arise if the same energy were otherwise to be generated by conventional fossil fuel plants. This is a medium-term significant positive effect on climate.

Some potential medium-term slight negative impacts, which are not significant, that may occur during the extended operational phase of the Proposed Project is the release of carbon dioxide to the atmosphere due to maintenance and monitoring activities.

Transport

In the unlikely event that a turbine blade is damaged and must be replaced during the extended operational phase, the transport of new blades, which will occur on specified routes only (see Section 4.6.2 in Chapter 4 of this EIAR), will also give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be medium-term and slight only, given the quantity of greenhouse gases that will be emitted and will be restricted to the duration of the extended operational phase, therefore it is not significant. Mitigation measures to reduce this impact are presented below.

Emissions resulting from routine maintenance at are included in the section above.

Waste Disposal

Waste is not proposed to be generated on the Site during the extended operational phase, any waste that does arise will be minimal and any impact will be short-term and imperceptible, which 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

- Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.
- 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 Site to reduce the emissions associated with vehicle movements

Residual Effect

Following implementation of the mitigation measures above, the Proposed Lifetime Extension will have a medium-term slight positive effect on Climate. However, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 10-year extended operational lifespan. Therefore, while there will be greenhouse gas emissions associated with the operational phase of the Proposed Lifetime Extension (i.e. arising from maintenance and monitoring activities detailed above), these will be offset within the proposed 10-year extended operational lifespan.

Medium-term slight positive effect on Climate as a result of reduced greenhouse gas emissions.

Significance of Effects

Based on the assessment above there will be no significant effects.

11.5.3 Proposed Offsetting Measures

11.5.3.1 Greenhouse Gas Emissions

The Proposed Offsetting Measures will involve management of lands required for the offsetting of potential effects of the continued operation of the Existing Taurbeg Wind Farm on hen harrier. Proposed Offsetting Measures include the incorporation of a grazing regime, establishment of linear strips of wildlife cover, scrub and hedgerow enhancement, and the cessation of fertiliser use containing nitrate.

Some potential medium-term slight negative impacts, which are not significant, that may occur during the Proposed Offsetting Measures is the release of carbon dioxide to the atmosphere due to maintenance and monitoring activities (assessed in '*Transport'* below), and the removal of carbon fixing vegetation and habitat associated with Proposed Offsetting Measures.

Transport

As discussed in Section 15.2.4.3 in Chapter 15 of the EIAR, there will be approximately 20 days when 5 HGV loads or 10 HGV movements per day will be generated to and from the Proposed Offsetting Lands during the Proposed Offsetting Measures. This will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be short-term and imperceptible only, given the quantity of greenhouse gases that will be emitted and will be restricted to the duration identified in Chapter 15, therefore it is not significant. Mitigation measures to reduce this impact are presented below.

Waste Disposal

Waste is not proposed to be generated on site as a result of the Proposed Offsetting Measures, any waste that does arise will be minimal and any impact will be short-term and imperceptible, which 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

- Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.

- When stationary, delivery and on-site vehicles will be required to turn off engines.
- 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 Site to reduce the emissions associated with vehicle movements.

Residual Effects

Following implementation of the mitigation measures above, the Proposed Offsetting Measures will have a long-term imperceptible positive effect on Climate due to natural regeneration of the Proposed Offsetting Lands which will form a permanent part of the landscape, after the Existing Taurbeg Wind Farm and Proposed Lifetime Extension has been decommissioned.

Significance of Effects

Based on the assessment above there will be no significant effects

11.5.4 Decommissioning Phase

11.5.4.1 Greenhouse Gas Emissions

Proposed Project

The Proposed Lifetime Extension is expected to have a lifespan of 10 years. Following the end of the operational life of the wind farm, the wind farm will be decommissioned fully as agreed with the Planning Authority.

Upon decommissioning of the Existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components would be separated and removed off-site for recycling. Please note, the Applicant has made a commitment not to send turbine blades to a landfill. Turbine foundations and hardstands would remain in place underground and will be covered with earth and reseeded as appropriate. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration. It is proposed to leave access roads in-situ, as these are in use by the participating landowners to access their lands and as existing walking trails. Underground cables will be removed, and the ducting left in place.

The Proposed Offsetting Lands will form a permanent part of the landscape, after the Existing Taurbeg Wind Farm and Proposed Lifetime Extension has been decommissioned. The Proposed Offsetting Measures that were put in place during the extended operational life will, including the restoration of existing hedgerow and scrub for hen harrier, implementing a grazing regime to create foraging and nesting opportunities for hen harrier prey species, and establishing linear strips of wildlife cover, will result in a long-term imperceptible positive effect on climate.

Transport

The transport of wind farm infrastructure away from the Site will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be short-term and slight only, given the quantity of greenhouse gases that will be emitted and will be restricted to the duration of the decommissioning phase. Mitigation measures to reduce this impact are presented below.

Waste Disposal

Waste will arise from excavation and unavoidable waste associated with decommissioning a wind farm, including damaged materials and packaging waste, and the removal of the 11 no. turbines which make up the Existing Taurbeg Wind Farm.

The relevant components will be removed from Site for re-use, recycling or waste disposal. Any structural elements that are not suitable for recycling will be disposed of in an appropriate manner. All lubrication fluids will be drained down and put aside for appropriate collection, storage, transport and disposal. Any materials which cannot be re-used or recycled will be disposed of by an appropriately licenced contractor.

A Waste Management Plan (WMP) will be agreed with the relevant authority prior to decommissioning of the Existing Taurbeg Wind Farm. The WMP will outline the best practice procedures during the decommissioning and the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of decommissioning. Disposal of waste will be seen as a last resort. Please see Section 3.10 of Appendix 4-3 Decommissioning Plan for further detailed on the WMP.

This potential impact will be short-term and slight only, given the quantity of greenhouse gases associated with the generation and management of these waste streams that will be emitted to the atmosphere and will be restricted to the duration of the decommissioning phase. 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

- All vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.
- When stationary, delivery and on-site vehicles will be required to turn off engines.
- Turbines and other infrastructure will be transported from the Site on specified routes only unless otherwise agreed with the Planning Authority (see Section 15.1 Chapter 15 for details)
- The Decommissioning Plan (Appendix 4-3) includes a Waste Management Plan (WMP) which outlines the best practice procedures that will occur during the decommissioning phase relating to waste material. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of the decommissioning of the Proposed Lifetime Extension.
    - Section 3.10 of the Decommissioning Plan (Appendix 4-3) for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor,
    - The MRF facility will be local to the Site where possible to reduce the amount of emissions associated with vehicle movements.
    - Disposal of waste will be seen as a last resort

Residual Effect

Following implementation of the mitigation measures above, residual effects of greenhouse gas emissions arising from the decommissioning phase of the Existing Taurbeg Wind Farm will have a short-term, imperceptible, negative effect. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from decommissioning phase activities will have a permanent, imperceptible, negative effect on Climate.

When considering these greenhouse gas emissions within the context of the national Electricity Sector Emissions Ceilings detailed in Section 11.2.2, Carbon Budget 1 (2021-2025) has an Electricity Sector budget of 40 MtCO2eq. and Carbon Budget 2 (2026-2030) has an Electricity Sector budget of 20 MtCO2eq for large-scale deployment of renewables. As detailed in Section 11.4.3.2, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed extended 10-year lifespan of the Proposed Lifetime Extension. Therefore, while there will be greenhouse gas emissions associated with the decommissioning of the Existing Taurbeg Wind Farm, this will take place under the Electricity sector emissions ceiling and will can be considered as offset by the operation of the Proposed Lifetime Extension within its operational life.

Significance of Effects

Based on the assessment above there will be no significant effects.

11.6 Cumulative Assessment

The potential for impact between the Proposed Project, and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Project will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans in the vicinity of the Site, as set out in Chapter 2 of this EIAR. Please see Section 2.11 of Chapter 2 for cumulative assessment methodology.

The other plans and projects considered as part of this cumulative effect assessment are presented in Appendix 2-3 of this EIAR. The cumulative project list was prepared following a review of planning files (An Bord Pleanála and Local Authority files), EPA search engines, development plans and National Roads Office/Transport Infrastructure Ireland road projects. Relevant developments with potential cumulative effects on Climate, within 1km of the Site being considered. This is in line with the Transport Infrastructure Ireland (TII) Publication Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107, December 2022.

11.6.1 Proposed Lifetime Extension

The nature of the Proposed Lifetime Extension is such that it will have a medium-term, slight, positive impact on climate. However, as noted above, the Proposed Lifetime Extension will offset the **14.070** tonnes of CO_2 associated with the Proposed Project that will be lost to the atmosphere (Section 11.4.3.1) in approximately **8.9** months of operation.

When considering these greenhouse gas emissions within the context of the Electricity Sector Emissions Ceilings detailed in Section 11.2.2, Carbon Budget 1 (2021-2025) has an Electricity Sector budget of 40 MtCO2eq. and Carbon Budget 2 (2026-2030) has an Electricity Sector budget of 20 MtCO2eq for large-scale deployment of renewables. As detailed in Section 11.4.3.2, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed extended 10-year lifespan of the Proposed Lifetime Extension. Therefore, while there will be greenhouse gas emissions associated with the extended operational phase of the Proposed Project, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Lifetime Extension within its extended operational life. Thus, there will be no cumulative effects arising on climate from the Proposed Project and other permitted or proposed projects and plans in the area as set out in Section 2.11 in Chapter 2 of this EIAR.

11.6.2 Proposed Offsetting Measures

The nature of the Proposed Offsetting Measures is such that it will have a long-term imperceptible positive effect on climate. However, as noted above, the Proposed Lifetime Extension will offset the

14.070 tonnes of CO_2 associated with the Proposed Project that will be lost to the atmosphere (Section 11.4.3.1) in approximately **8.9** months of operation.

Please note, while there will be greenhouse gas emissions associated with the Proposed Offsetting Measures, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Lifetime Extension within its extended operational life. Thus, there will be no cumulative effects arising on climate from the Proposed Offsetting Measures and other permitted or proposed projects and plans in the area as set out in Section 2.11 in Chapter 2 of this EIAR.

11.6.3 Decommissioning Phase

During the decommissioning phase of the Existing Taurbeg Wind Farm and other permitted or proposed projects and plans in the area as set out in Section 2.11 in Chapter 2 of this EIAR, that are yet to be constructed, there will be greenhouse gas emissions arising from the operation of vehicles and plant. These will be restricted to the duration of the decommissioning phase, and as such will give rise to emission over a short-term duration. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from decommissioning phase activities will have a permanent imperceptible negative effect on Climate.

The works required during the decommissioning phase are described in Section 4.7 in Chapter 4: Description of the Proposed Project.