



Planning and
Environmental
Consultants

RECEIVED: 20/05/2026

Environmental Impact Assessment Report (EIAR)

Cunlaghfadda Green
Energy Project, Co. Mayo

Chapter 11 – Climate



Table of Contents

11.	CLIMATE	11-1
11.1	Introduction	11-1
11.1.1	Background	11-1
11.1.2	Chapter Structure and Climate Study Areas	11-2
11.1.3	Statement of Authority	11-3
11.2	Climate Legislation, Policy and Guidance	11-4
11.2.1	International Greenhouse Gas Emission and Climate Targets	11-4
11.2.2	National Greenhouse Gas Emission and Climate Targets	11-8
11.2.3	Local Greenhouse Gas Emission and Climate Targets	11-9
11.2.3.1	Mayo County Council Local Authority Climate Action Plan 2024-2029	11-9
11.2.3.2	Mayo County Development Plan 2022-2028	11-10
11.2.4	Relevant Guidance	11-12
11.3	Climate and Weather	11-12
11.3.1	Baseline Environment	11-12
11.3.1.1	Data Sources	11-12
11.3.1.2	Physical Environment	11-13
11.3.1.3	Existing Greenhouse Gas Emissions	11-18
11.3.2	Future Environment	11-18
11.3.2.1	Data sources	11-19
11.3.2.2	Physical Environment	11-19
11.3.3	Summary	11-22
11.4	Calculating Carbon Losses and Savings from the Proposed Project	11-23
11.4.1	Background	11-23
11.4.2	Methodology for Calculating Losses	11-23
11.4.3	Carbon Losses and Savings Calculations	11-26
11.4.3.1	Carbon Losses	11-26
11.4.3.2	Carbon Savings	11-27
11.5	Likely Significant Effects and Associated Mitigation Measures	11-29
11.5.1	'Do-Nothing' Effect	11-29
11.5.2	Construction Phase	11-29
11.5.2.1	Greenhouse Gas Emissions	11-29
11.5.3	Operational Phase	11-31
11.5.3.1	Greenhouse Gas Emissions	11-31
11.5.4	Decommissioning Phase	11-33
11.6	Cumulative Assessment	11-34
11.6.1	Construction Phase	11-34
11.6.2	Operational Phase	11-35
11.6.3	Decommissioning Phase	11-35
11.7	EIA Classification Summary	11-35
	TABLE OF TABLES	
	Table 11-1 International Instruments Relating to Greenhouse Gases and Climate Change Targets	11-4
	Table 11-2 National Legislation and Reports relating to Greenhouse Gases and Climate Change Targets	11-8
	Table 11-3 Data from Met Éireann Weather Station at Belmullet 1991-2020	11-14
	Table 11-4 Summary of Current Physical Baseline Environment	11-15
	Table 11-5 CO ₂ Losses from the Proposed Project	11-26
	Table 11-6 Impact Assessment Classification Summary	11-36

11.

CLIMATE

11.1

Introduction

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on climate arising from the construction, 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 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 Major Accidents and Natural Disasters of this EIAR consolidates the risks and vulnerabilities identified throughout all EIAR chapters to assess the overall risk of the Proposed Project concerning major accidents and natural disasters, including climate change.

The aim of the Proposed Project, 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.

For the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm', 'Proposed Grid Connection', 'Site'. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

11.1.1

Background

The Proposed Project is located within a rural, agricultural setting in Co. Mayo, approximately 5.3km northwest of the town Claremorris, and 16km southeast of the town of Castlebar. The L1505 Local Road runs west to east with the Proposed Project lying to the north of the road along the southern boundary of the Site, while the L5536 run in a west to east direction to the north of the Site. Proposed site access is via the L15053 Local Road in the southeast of the Site which runs into an unnamed private road, from which a new site entrance is proposed. The Site is also served by a number of existing roads and tracks.

The Proposed Grid Connection includes for underground 110kV electrical cabling from the proposed onsite 110kV substation to the Castlebar-Cloon Overhead Line (OHL) which runs from the northwest to the southeast adjacent to the Site.

Based on Corine (2018) mapping (www.epa.ie) the Site comprises predominantly of peat bogs with some agricultural pastures. Inland marshes are also mapped in the lands surrounding Drumady Lough. Historic Corine land cover maps do not record any significant changes to land at the Site. The published Teagasc soil map (www.epa.ie) for the area shows that the Site is mapped to be overlain predominantly by cutover/cutaway peat (cut). The peat depths recorded across the Site from peat probing investigations ranged from 0 to 6.1m, with an average peat depth of 1.2m. Approximately 91% of the peat depth probes recorded peat depths of less than 3.0m. A number of localised readings recorded peat depths were between 3.5 and 6.1m. The layout of the Proposed Project was designed to avoid the areas of deepest peat. A Geotechnical & Peat Stability Assessment Report (GPSRA) for the Proposed Project has been undertaken and is included as Appendix 8-1.

Current land-use on the Proposed Wind Farm is predominantly agricultural pastures and rough grazing, with areas of turbary lands used for private peat cutting and private forestry also present. Current land-

use along the Proposed Grid Connection comprises of pastures and private land principally used by agriculture. Land-use in the wider landscape of the site comprises a mix of agriculture, peat cutting, low density residential and private forestry.

The existing uses of the Site will continue in conjunction with the Proposed Project.

11.1.2

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 will affect the greenhouse gas emissions associated with Ireland as a result of activities associated with construction, 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 construction phase (Section 11.5.2), operational phase (Section 11.5.3), and decommissioning phase (Section 11.5.4) 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'*. 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 Study Area:
 - 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: 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.

11.1.3

Statement of Authority

This section of the EIAR has been drafted by Keelin Bourke and Natalia Stolarska and reviewed by Órla Murphy, all of MKO.

Keelin is an Environmental Scientist with MKO, with over 2 years' experience in private consultancy, having joined the company in September 2023. Keelin holds a BSc (Hons) in Environmental Science from University College Cork and an MSc (Dist) in Environmental Engineering from Trinity College Dublin. Keelin's current key strengths and areas of expertise are in environmental mapping, environmental surveying, and environmental report writing. Keelin has experience in conducting environmental impact assessments of a broad range of topics, including population and human health assessments, air quality assessments, climate assessment, assessments of built services and infrastructure and major accidents and natural disaster risk assessments for both onshore and offshore wind energy projects. Prior to taking up her position with MKO, Keelin worked as an Environmental Health and Safety Officer in an EPA licensed Waste Transfer Facility in Cork City. Since joining MKO, Keelin has become a member of the MKO Environmental Renewables Team and has been involved in preparing and managing Environmental Impact Assessments and in leading large multi-disciplinary teams in order to produce robust Environmental Impact Assessment Reports for large-scale onshore and offshore wind energy developments.

Natalia Stolarska is a Project Environmental Scientist within the environment renewables team in MKO with over 2 years' of professional experience as an environmental consultant. Natalia holds a BSc in Earth and Ocean Science and an MSc in Environmental Leadership. Natalia's key strengths and areas of expertise are in managing wind farm EIAR projects, drafting and reviewing of EIAR chapters, wind farm feasibility studies and QGIS mapping. Since joining MKO Natalia has also been involved in coordinating environmental site work for a wide range of developments, assisting in stakeholder engagement, scoping exercises, organising, attending and leading pre-application meetings with local authorities and An Coimisiún Pleanála. Natalia also holds a membership with the Institute of Sustainability and Environmental Professionals (ISEP).

Órla Murphy is a Senior Environmental Scientist with McCarthy O'Sullivan Ltd. with nearly 10 years of experience in private consultancy. Órla holds BSc (Hons) in Geography from Queens University Belfast & a MSc in Environmental Protection and Management from the University of Edinburgh. Prior to taking up her position with McCarthy Keville O'Sullivan in January 2018, Órla worked as an Environmental Project Assistant with ITP Energised in Scotland. Órla's key strengths and areas of expertise are in Environmental Protection and Management, EIA, Project Management, Renewable Energy and Peatland Management, where she has carried out research projects and site work relating to restoration and management of peatland sites in both Scotland and Northern Ireland. On joining MKO Órla has been involved on a range of renewable energy infrastructure projects. In her role as a project manager, Órla works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Within MKO, Órla plays a role in the

management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

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 accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing the world today and is primarily the result of increased levels of greenhouse gases in the atmosphere. Increasing human emissions of carbon dioxide and other greenhouse gases cause a positive radiative imbalance at the top of the atmosphere, meaning energy is being trapped within the climate system. The imbalance leads to an accumulation of energy in the Earth system in the form of heat that is driving global warming.^{1,2} Greenhouse gases come primarily from the combustion of fossil fuels in energy use.

In March 2024 the European Environment Agency (EEA) published the European Climate Risk Assessment.³ This assessment states that Europe is the fastest warming continent on the planet and is warming at about twice the global rate. The average global temperature in the 12-month period between February 2023 and January 2024 exceeded pre-industrial levels by 1.5°C. 2023 was the warmest year on record in more than 100,000 years, at 1.48°C above pre-industrial levels, with the world's ocean temperature also reaching new heights.

The Intergovernmental Panel on Climate Change (IPCC), in their AR6 Synthesis Report: Climate Change 2023⁴, 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 combat 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 11-1 below identifies international instruments relating to greenhouse gases 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, Policy, and Guidance' for further detail on each of the below international instruments.

Table 11-1 International Instruments Relating to Greenhouse Gases and Climate Change Targets

International Instrument	Description
--------------------------	-------------

¹ 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>

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

³ European Environment Agency (2024) European Climate Risk Assessment <<https://www.eea.europa.eu/publications/european-climate-risk-assessment>>

⁴ IPCC AR6 Synthesis Report: Climate Change 2023. <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>

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: ➤ 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
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 CO₂ 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 triple finance to developing countries, with commitments increasing from USD 100 billion annually to USD 300 billion annually by 2035. Significant progress was made in the discussions surrounding carbon markets, with nearly 200 nations agreeing on critical rules under Article 6 of the Paris Agreement. The adoption of these rules is seen as a crucial step towards operationalising a robust and credible carbon market. Despite the advances, concerns were expressed about the potential for weak governance and risks of exploitation in the system; these issues must be addressed to ensure the market's full functionality.
	COP30 – Belém (10th November 2025 to 21st November 2025)

	The 30th UN Climate Change Conference in Belém, Brazil concluded with a mix of political progress and unresolved tensions. Parties adopted the “Belém Political Package,” reinforcing the Paris Agreement’s goals and calling for tripling adaptation finance by 2035 to help vulnerable countries cope with climate impacts, alongside a set of 59 voluntary indicators to track adaptation progress. New mechanisms were launched to bridge the gap between pledges and implementation, including the Global Implementation Accelerator and the Belém Mission to 1.5°C, reflecting a growing focus on turning plans into action. A just transition mechanism and a Gender Action Plan were agreed to support equitable transitions that protect workers, Indigenous groups, and marginalized communities. Progress was also made on nature protection, with initiatives like the Tropical Forests Forever Facility to finance tropical forest conservation. However, negotiators failed to include a formal roadmap for phasing out fossil fuels or a zero-deforestation commitment in the core COP text, highlighting persistent geopolitical divides and the challenge of securing broad consensus. Despite these outcomes, leaders emphasised the urgency of deep emissions cuts and stronger climate finance to stay aligned with the 1.5°C target.
United Nations Sustainable Development Goals	On the 14th July 2025, the United Nations published ‘The Sustainable Development Goals Report 2025’. This report finds that, following an assessment of all 169 targets, for which trend data is available, only 17% of the SDG targets are on track, 18% of SDG targets are showing minimum or moderate progress, 47% having stalled in progress and 18% having regressed from 2024.
Climate Change Performance Index	Established in 2005, the Climate Change Performance Index (CCPI)⁵ is an independent monitoring tool which tracks individual countries climate protection performance. Ireland, ranked 43rd in 2024, has risen 14 places to 29th for 2025, 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)⁶ is legislation that influenced the growth of renewable energy in the EU and Ireland for the decade ending in 2020.

⁵ Climate Change Performance Index 2024 <<https://ccpi.org/>>

⁶ 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>

	From 2021, RED was replaced by the second Renewable Energy Directive (REDII),⁷ 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 EU's clean energy transition, RED was revised in 2023, and the amending Directive EU/2023/2413 (REDIII)⁸ entered into force on 20 November 2023 and was partially transposed into Irish Law in August 2025. REDIII amended the EU-wide overall 2030 RES target from 32% to at least 42.5% with the aim of 45%.
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.
European Climate Law	The European Climate Law, part of the European Green Deal, makes climate neutrality by 2050 legally binding for all EU member states. It sets an intermediate, binding target to reduce net greenhouse gas emissions by at least 55% by 2030 (compared to 1990 levels), with a proposed 90% reduction target by 2040
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-

⁷ Directive (EU) 2018/2001 on the promotion of the use of energy from renewable resources (recast). Available from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L2001>

⁸ 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

	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 targets are critical for achieving Ireland's climate ambitions.

Table 11-2 below provides an overview of national legislation and reports relating to greenhouse gases and climate change targets in Ireland; please refer to Appendix 11-1 for further detail on each of the below national legislation measures.

Table 11-2 National Legislation and Reports relating to Greenhouse Gases and Climate Change Targets

National Instrument	Description
Programme for the Government – Securing Ireland's Future	The Programme for Government – Securing Ireland's Future was published in January 2025. The programme notes that the government are committed to reducing greenhouse gas emissions by an average 7% per annum over the next decade in a push to achieve a net zero emissions by the year 2050. The Programme states the Government's ongoing support and commitment to take "the necessary action to deliver at least 70% renewable electricity by 2030".
Climate Action and Low Carbon Development Act 2015	The Climate Action and Low Carbon Development Act 2015 established the national framework for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy.
Climate Action and Low Carbon Development (Amendment) Act 2021	The Climate Action and Low Carbon (Amendment) Act 2021 amended the Climate Action and Low Carbon Development Act 2015 and is a piece of legislation which 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 2024	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.
Ireland's Climate Change Assessment	In 2023 the EPA published Ireland's Climate Change Assessment (ICCA). This assessment provides a comprehensive overview and breakdown of the state of knowledge around key aspects of climate change with a focus on Ireland. The ICCA report is presented in four volumes. > Volume 1: Climate Science – Ireland in a Changing World > Volume 2: Achieving Climate Neutrality in 2050 > Volume 3: Being Prepared for Ireland's Future > Volume 4: Realising the Benefits of Transition and Transformation Please refer to Section 1.1.2.8 of Appendix 11-1 for further information on the ICCA.

11.2.3 Local Greenhouse Gas Emission and Climate Targets

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

The Mayo County Council Local Authority Climate Action Plan 2024-2029 (Mayo LACAP)⁹ was adopted on 12th February 2024 alongside its publication on Mayo County Council's website that same month.

The Mayo LACAP highlights the current state of climate action in Ireland, and how Mayo County Council will take climate action by enhancing climate resilience, increasing energy efficiency and reducing greenhouse gas emissions across its own assets, services and infrastructure, whilst also demonstrating a broader role of influencing, advocating, and facilitating other sectors, to meet their own climate targets and ambitions.

The Mayo 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

⁹ Mayo County Council (2024). Mayo County Council Local Authority Climate Action Plan 2024-2029. Available at: https://www.mayo.ie/getmedia/dfab91e5-939b-41c7-883e-0cee6e359900/139306-Mayo-County-Council-Climate-Action-Plan-2024-V2_Final.pdf

within a defined structure that ensures alignment between on the ground actions and the high-level vision that the Mayo LACAP aspires to deliver. The Mayo 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 Mayo equated to 2,631 ktCO₂-eq in the baseline year, 2018. The top four emitting sectors within County Mayo in terms of total greenhouse gas emissions in the baseline year were Agriculture, Land Use Land Use Change and Forestry (LULUCF), Residential and Manufacturing, producing 43%, 20%, 14% and 10% respectively of total emissions in County Mayo. Mayo 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 2025 (Section 11.2.2 above).

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

During the operational phase, the Proposed Project will assist in reducing emissions by generating renewable energy to be fed into the grid and the subsequent decarbonisation of other sectors, in particular the main emitting sectors in County Mayo as identified above. Please see Section 11.4.3 below for further information on carbon savings associated with the Proposed Project.

11.2.3.2 Mayo County Development Plan 2022-2028

The Mayo County Development Plan 2022-2028¹⁰ (MCDP) sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The MCDP includes numerous actions and objectives on sustainability and climate for County Mayo to achieve over the 6-year period. Climate change is emphasised as one of the greatest global challenges within the MCDP, with MCC acknowledging that continual action is needed for Mayo to become a low carbon and climate resilient county.

The importance of climate action is outlined at the beginning of 'Chapter 11: Climate Action and Renewable Energy' of the MCDP as it states, *"The overall vision and strategic aims of the county development plan have been influenced by climate action"*. The strategic aim of Chapter 11 is outlined below:

"... to transition to a low carbon and climate resilient county, with an emphasis on reduction in energy demand and greenhouse gas emissions, through a combination of effective mitigation and adaptation responses to climate change; in addition to maximising the opportunities to become a national leader in renewable energy generation, whilst increasing the resilience of our Natural and Cultural Capital to climate change by planning and implementing appropriate adaptation measures."

Furthermore, the MCDP includes the following policies in relation to climate action and reducing GHG emissions, which aligns the County with wider European, national and regional objectives:

- **CAP 1:** To support and enable the implementation and achievement of European and national objectives for climate adaptation and mitigation as detailed in the following documents, taking into account other provisions of the Plan (including those relating to land use planning, energy, sustainable mobility, flood risk management and drainage); Climate Action Plan (2019 and any subsequent versions);

¹⁰ Mayo County Council (2024). Mayo County Development Plan 2024-2030. Available at: <https://www.mayo.ie/getmedia/db6f18d0-73c2-463f-a6cc-5b1186762a48/Vol-1-Written-Variation-No-1.pdf>

- National Climate Change Adaptation Framework (2018 and any subsequent versions).
- Relevant provisions of any Sectoral Adaptation Plans prepared to comply with the requirements of the Climate Action and Low Carbon Development Act 2015, including those seeking to contribute towards the National Transition Objective, to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050; and Mayo Council Climate Change Adaptation Strategy (2019-2024 and any subsequent versions).
- **CAP 2:** To support the National Climate Change Strategy and methods of reducing anthropogenic greenhouse gases on an ongoing basis through implementation of supporting objectives in this Plan, particularly those supporting use of alternative and renewable energy sources, sustainable transport, air quality, coastal zone management, flooding and soil erosion and promotion of the retention of, and planting of trees, hedgerows and afforestation, subject to no significant adverse effects on the environment including the integrity of the Natura 2000 network.
- **CAP 3:** To support, promote and facilitate the advancement of climate action at the local and community level in County Mayo and to raise general awareness of issues associated with climate action and climate change mitigation and adaptation.
- **CAP 4:** To support local, regional, national and international initiatives for climate adaptation and mitigation and to limit emissions of greenhouse gases through energy efficiency and the development of renewable energy sources, which make use of all natural resources, including publicly owned lands, in an environmentally acceptable manner.
- **CAP 5:** To support the National Dialogue on Climate Action, in an effort to increase awareness of climate change, behavioural change and adaptation actions and in doing so provide an ongoing platform for planning climate resilience with a focus on personal responsibility at all levels.
- **CAP 6:** To support the transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050, by way of reducing greenhouse gases, increasing renewable energy, and improving energy efficiency and supporting nature-based solutions to climate adaptation and mitigation that provides co benefits.
- **CAP 8:** To cooperate with the Climate Action Regional Office (CARO) in respect of the implementation of existing and future climate change adaption and mitigation strategies.
- **CAP 9:** To support Ireland's renewable energy commitments outlined in national policy by facilitating the development and exploitation of all appropriate renewable energy sources at suitable locations within the county, where such development does not have a negative impact on the surrounding environment (including water quality), landscape, biodiversity or local amenities, so as to provide for further residential and enterprise development within the county.

A key policy of the MCDP relating to wind energy development is:

- **"REP 7:** To promote the harnessing of wind energy to contribute toward decarbonising County Mayo, including new emerging by-product markets."

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

- **"REO:** To encourage the development of wind energy, in accordance with Government policy, and having regard to the Landscape Appraisal of County Mayo and the Wind Energy Development Guidelines (2006) and Mayo Renewable Energy Strategy, or any revisions there of or future guidelines, and ensure consistency with the provisions of RPO 4.16 and RPO 5.2(b) of the RSES (2020-2032)."

Section 2.5.4.1 of Chapter 2 provides further detail on the MCDP and key objectives within. In summary, the MCDP and associated Mayo Renewable Energy Strategy fully recognises the importance

of tackling climate change through the increased supply of renewable energy. The Mayo LACAP outlines the County's commitment to climate action and the need to meet national objectives regarding a reduction in GHG emissions. MCC seeks to support and facilitate the sustainable provision of a reliable energy supply in the County, with emphasis on increasing energy supplies derived from renewable resources. Furthermore, there is a range of policies in place which support the development of renewable energy. Accordingly, the Proposed Project is considered to be compliant with the relevant provisions of the MCDP and represents proper planning and sustainable development in the functional area of MCC.

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 1.7.2 of Chapter 1. Due to the nature of the Proposed Project, a wind farm and associated infrastructure, the following best practise 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;
- › 'Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation' (Institute of Environment Management and Assessment (IEMA), 2020);
- › 'Calculating Carbon Savings from Wind Farms on Scottish Peat Lands' (University of Aberdeen and the Macauley Institute 2008);
- › 'Wind Farms and Carbon Savings' (Scottish Natural Heritage, 2003);
- › Environmental Protection Agency (2024) National Climate Change Risk Assessment Technical Guidance for Sectoral Assessment;
- › Macauley Institute Carbon Calculator for Wind Farms on Scottish Peatlands (Version 2.15.0) (2023); and
- › Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.9.0) (TII, 2020).

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

11.3 Climate and Weather

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 through the deployment of clean renewable energy to the national grid and subsequent decarbonisation of energy systems. 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 Baseline Environment

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 Averages¹¹
- › Irelands Climate Averages 1991-2020 Summary Report¹²
- › Ireland's National Inventory Report 2026¹³
- › Climate Status Report for Ireland 2020¹⁴
- › Annual Review 2025 – Our Changing Climate in 2024¹⁵

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 Belmullet, Co. Mayo which is located approximately 79km to the northwest of the Proposed Project, is the nearest weather and climate monitoring station that has meteorological data recorded for the 30-year period from 1991-2020. The Met Éireann weather station in Claremorris, Co. Mayo is located at a closer distance of 6.6km southeast to the Site, however this weather station only has data for the 30-year average period from 1971-2010, which has been deemed an inappropriate timescale to determine weather in the existing environment. Meteorological data recorded at the Belmullet weather station over the 30-year period from 1991-2020 is shown in Table 11-3 below. The wettest months are January and November, with May and June being the driest. August is the warmest month with an average temperature of 17.7° Celsius.

Recent monthly meteorological data recorded at Claremorris, Co. Mayo, located approximately 6.6km southeast of the Proposed Project, from January 2023 to May 2026 is available at: <https://www.met.ie/climate/available-data/monthly-data>. December 2023 was the wettest month in this time period, with 205.3mm of rainfall recorded, while March 2025 was the driest month with 41.7mm of rainfall. June 2023 was the warmest month in this time period, with a mean monthly temperature of 16.5° Celsius. January 2025 was the coldest month in this time period, with a mean monthly temperature of 4.4° Celsius.

Table 11-4 below provides a summary of the current physical baseline environment with reference to relevant chapters within the submitted EIAR where further information is available.

¹¹ <https://www.met.ie/climate/30-year-averages>

¹² 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](https://edepositireland.ie/bitstream/handle/2262/108695/Ireland%27s%20climate%20averages%201991-2020_rev2.pdf?sequence=1&isAllowed=y)>

¹³ EPA (2026) Ireland's National Inventory Document <<https://www.epa.ie/publications/monitoring-assessment/climate-change/air-emissions/Ireland-NID-2026.pdf>>

¹⁴ 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>>

¹⁵ 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 111-3 Data from Met Éireann Weather Station at Belmullet 1991-2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE (degrees Celsius)													
Mean daily max	8.9	9.2	10.5	12.2	14.6	16.3	17.6	17.7	16.5	13.8	11	9.2	13.1
Mean daily min	3.9	3.9	4.9	6	8.2	10.6	12.3	12.4	11	8.7	6.3	4.6	7.7
Mean temperature	6.4	6.5	7.7	9.1	11.4	13.5	14.9	15	13.7	11.2	8.7	6.9	10.4
Absolute max.	13.7	15.6	22.2	23.9	26.3	27.2	29.9	27.7	25	21	16.2	14.6	29.9
Absolute Min.	-5.9	-4.1	-4.9	-2.1	0.5	3.5	5.6	5.2	3.1	-1.7	-4.6	-7.8	-7.8
Mean No. of Days with Air Frost	3.1	2.9	1.2	0.3	0	0	0	0	0	0	0.5	2.4	10.4
Mean No. of Days with Ground Frost	9.4	8.8	6.7	4	1.5	0	0	0	0	1.4	4.5	8.7	45.1
RELATIVE HUMIDITY (%)													
Mean at 0900UTC	86.6	86.5	84.1	80.7	78.7	80.7	83.9	83.9	84.4	85.4	85.9	86.6	83.9
Mean at 1500UTC	82.4	80	76.2	73.5	72.8	76.2	78.5	78.1	77.5	79.2	82.3	83.9	78.4
SUNSHINE (Hours)													
Mean daily duration	1.4	2.4	3.5	5.3	6.3	5.6	4.4	4.6	4	3	1.7	1.2	3.6
Greatest daily duration	8.3	10	11.9	14.1	15.5	15.9	15.5	13.9	12.6	11	8.6	7.2	15.9
Mean no. of days with no sun	9.5	6	5.3	2.5	2	2.4	2.7	2.8	3.3	5.4	7.7	10.4	60
RAINFALL (mm)													
Mean monthly total	136.9	109.9	90.6	74	70.8	73	85.9	100.5	102.6	131.2	139.6	126.6	1241.6
Greatest daily total	44.3	31.3	29	25.9	36.3	38.9	33.2	49.5	57	40	43	34.4	57
Mean num. of days with $\geq 0.2\text{mm}$	24.4	21.7	21.5	18.8	18.1	17.8	21.1	21.2	20.8	23.2	24.7	24.2	257.5
Mean num. of days with $\geq 1.0\text{mm}$	20.1	17.8	16.7	13.8	13.2	12.4	14.9	15.8	15.8	18.7	21	20.7	200.9
Mean num. of days with $\geq 5.0\text{mm}$	10.2	8.8	6.7	5.3	4.8	4.8	6.1	6.6	6.7	9.1	10.1	9.9	89.1
WIND (knots)													
Mean monthly speed	14.8	14.2	13.2	12.1	11.6	11.2	10.7	10.9	11.7	12.5	13	14.2	12.5
Max. gust	94	82	74	75	78	63	62	56	73	71	80	93	94
Max. mean 10-minute speed	54	53	50	44	46	45	37	40	50	49	47	59	59
Mean num. of days with gales	6.3	4	2.6	1.4	0.8	0.3	0.1	0.3	1.2	2	2.7	4.7	26.5

Table 111-4 Summary of Current Physical Baseline Environment

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
Air Temperature	Climate change is impacting air temperatures in the Northern European region, with a range of observable effects including rising temperature, increased frequency of heatwaves, changes in seasonal temperature patterns and milder winters¹⁶. 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 2020¹⁷ states that air temperatures in Ireland have ‘<i>been increasing at an average rate of 0.078°C per decade since 1900 and that the annual average temperature is now approximately 0.9°C higher than it was in the early 1900s</i>’. Temperatures in Ireland are increasing, with sixteen of the top 20 warmest years on record occurring since 1990¹⁸. On 10th July 2024 Met Éireann confirmed that 2023 was Irelands wettest and warmest year on record (records going back to 1900).¹⁹ 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.²⁰ However, this moderating influence could be in jeopardy if the Atlantic Meridional Overturning Circulation (AMOC) continues to weaken²¹. 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	Chapter 10 Air Quality

¹⁶ IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>

¹⁷ Government of Ireland (2020) Climate Status Report for Ireland 2020 <https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf>

¹⁸ 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>>

¹⁹ <https://www.met.ie/2023-confirmed-as-irelands-wettest-year-on-record>
²⁰ <https://www.met.ie/climate/what-we-measure/temperature>, <https://www.met.ie/climate/what-we-measure/temperature#:~:text=The%20moderating%20influence%20of%20the,mild%20winters%20and%20cool%20summers>
²¹ IPCC (2019) IPCC Special Report on the Ocean and Cryosphere in a Changing Climate Chapter 6. Extremes, Abrupt Changes, and Managing Risk <https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/08_SROCC_Ch06_FINAL.pdf>

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
	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 regimes²². 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)²³. 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 Water.
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 variations²⁴. 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.	N/A

²² IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>

²³ Department of Housing, Local Government and Heritage (2024) Irelands Climate Averages 1991-2020 Summary Report <<https://depositireland.ie/handle/2262/108695>>

²⁴ IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
	In late 2023 and early 2024, Ireland experienced a very active storm season; the county was affected by 13-14 severe storms²⁵. In 2025 there were 5 no. named storms, with Storm Eowyn, occurring in January 2025, reaching hurricane force winds (maximum wind speed recorded as 142km/h).²⁶ 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 weaken²⁷. The weakening of this current would result in increased storm activity in Northern Europe.	

²⁵ Met Éireann (2024) Human-caused Climate Change Brings Increased Storm Rainfall <<https://www.met.ie/human-caused-climate-change-brings-increased-storm-rainfall/>>

²⁶ Met Éireann Storm Centre <https://www.met.ie/climate/storm-centre>

²⁷ 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)²⁸, 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 ktCO₂e in 1990 to 71,476.9 ktCO₂e in 2001, which is the highest level of greenhouse gas emissions ever reported in Ireland. Emissions then plateaued until 2008 with estimates ranging from 69,032.5 ktCO₂e to 71,213.8 ktCO₂e. There was then a sharp decrease from 69,032.5 ktCO₂e in 2008 to 58,582.4 ktCO₂e in 2011. In 2023, total emissions of greenhouse gases including indirect emissions from solvent use (excluding LULUCF) in Ireland were 54,934.4 ktCO₂e, which is 1.4% lower than emissions in 1990. Emissions in 2023 at 54,934.4 ktCO₂e are 6.8% lower than 2022, and the lowest level in the time series.

The Electricity sector accounted for the bulk of the CO₂ 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 CO₂ accounted for 61.1% of the national total in 2023, with CH₄ and N₂O contributing 28.9% and 8.8%, respectively. The combined emissions of fluorinated gases (HFC, PFC, SF₆ and NF₃) accounted for 1.2% of total emissions in 2023²⁹.

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 above, 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 discussions³⁰. It has become clear that even if greenhouse gas emissions were to cease immediately, climate alterations would persist for many decades. Therefore, alongside efforts for mitigation, it's imperative to develop effective adaptive strategies (adaptation) to mitigate damages or seize opportunities arising from climate change.

²⁸ EPA (2024) National inventory Report 2025 <<https://www.epa.ie/publications/monitoring-assessment/climate-change/air-emissions/Ireland's-NIR-2025.pdf>>

²⁹ Ibid.

³⁰ 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>

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)³¹
- › Climate Status Report for Ireland 2020³²
- › Climate Ireland³³

11.3.2.2 Physical Environment

This section will describe 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 emissions³⁴. 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; and,
- › Wind and Storms.

Air Temperature

Annual surface air temperatures³⁵ 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 scenario³⁶.

Met Éireann projections³⁷ 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

³¹ 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>

³² https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf

³³ <https://www.climateireland.ie/>

³⁴ *Climate Change (2011) A scenario of comparatively high greenhouse gas emissions*

<<https://link.springer.com/article/10.1007/s10584-011-0149-y>>

³⁵ <https://www.epa.ie/publications/monitoring-assessment/climate-change/irelands-climate-change-assessment-volume-1.php>

³⁶ *Ireland's Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World*

³⁷ <https://www.met.ie/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^{38,39}.

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.⁴⁰

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 months⁴¹. Further information on flood risk is presented in the section below.

Flood Risk

Chapter 9 Water, 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.

The OPW National Flood Hazard Maps have no records of any recurring or historic flood incidences within the Site (www.floodinfo.ie). The closest mapped historic flood event is at Barnagreggaun (Flood ID: 4751) located ~2km northeast of the Site in a low-lying area, south of the N60. Another past flood event is mapped at Gowel Mayo (Flood ID: 655) located ~2km southwest of the Site.

The GSI's Winter 2015/2016 surface water flood map shows areas of fluvial and pluvial flooding during the Winter 2015/2016 flood event, which was the largest recorded flood event in many areas. This flood map does not record any mapped flood areas within the Site. Historic surface water flood zones are mapped in the immediate vicinity of Drumady Lough but do not extend any significant distance from the lake nor do the mapped flood zones encroach upon the Site. Flood zones are also mapped around Lough Fark, ~440m to the north of the Site.

Catchment-based Flood Risk Assessment and Management (CFRAM) mapping has not been completed for the area of the Site.

National Indicative Flood Mapping (NIFM) does not record any fluvial flood zones within the Site. The closest modelled fluvial flood zones are located along the Meander River to the west of the Site. These flood zones are ~1.4km west of the Site. NIFM fluvial flood zones are also mapped along the stream which outfalls from Drumady Lough. These flood zones are ~4km downstream of the Site.

There are no historic or predictive groundwater flood zones within the Site. The closest predictive groundwater flood zones are located ~1.3km to the west of the Site.

³⁸ Nolan, P. 2015. EPA Report: Ensemble of Regional Climate Model Projections for Ireland. EPA climate change research report no. 159. EPA: Wexford.

³⁹ 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.

⁴⁰ <https://www.epa.ie/our-services/monitoring-assessment/climate-change/climate-ireland/impact-of-climate-change-on-ireland/climate-hazards/coastal-flooding>.

⁴¹ 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>>

The Site is located in Flood Zone C (less than 0.1% annual probability of fluvial flooding) and is considered to be at low risk of flooding.

The FRA concludes that the overall risk of flooding posed at the site is low. Furthermore, the risk of the Proposed Project contributing to downstream flooding is also very low, as 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 Section 4.7 of Chapter 4 and Section 9.4 of 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 months⁴². 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 months⁴³. Storm surge levels over a 20-to-30-year return period are anticipated to increase by up to 9cm by 2100⁴⁴.

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR⁴⁵). 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 1.1.1.8 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.⁴⁶

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*⁴⁷ 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 Ireland's 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

⁴² <https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/windspeed/>

⁴³ <https://www.epa.ie/publications/research/climate-change/research-339-high-resolution-climate-projections-for-ireland-.php>

⁴⁴ <https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/waves-surges/>

⁴⁵ Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance)

⁴⁶ Department of the Environment, Climate and Communications (2025) - Climate Action Plan 2025

⁴⁷ EPA (2025) Ireland's Greenhouse Gas Emissions Projections 2024-2055

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) which include many 2024 Climate Action Plan measures. Greenhouse gas emissions are projected to be 9 - 23% lower by 2030 (compared to 2018) which places Ireland further from the 2030 national climate target compared to previous assessments.
- 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. This assessment shows that greenhouse gas emissions will be reduced by 10 - 22% by 2030 (compared to 2005) without the use of flexibilities and by 13 - 26% with the use of flexibilities.
- Budget period 1 (2021-2025) of 295 Mt CO₂eq is projected to be exceeded by between 8 to 12 Mt CO₂eq. Budget period 2 (2026-2030) of 200 Mt CO₂eq is also expected to be exceeded by a significant margin of 77 to 114 Mt CO₂eq (with carryover from Budget period 1).
- Sectoral emissions ceilings for 2030 are projected to be exceeded by the Buildings, Electricity, Industry and Transport sectors; and met by the sector 'Other'. A direct comparison of emissions in the Agriculture sector against its Sectoral Emission Ceilings is no longer viable due to significant refinement of the Agriculture inventory.
 - Emissions from the Residential Sector are projected to decrease from 7.0 Mt CO₂eq in 2018 to between 5.7 and 5.4 Mt CO₂eq in 2030 (a 19 - 22% reduction). 571,000 domestic heat pumps are projected to be installed by 2030.
 - Transport emissions are projected to decrease from 12.3 Mt CO₂eq in 2018 to between 9.7 Mt CO₂eq and 11.2 Mt CO₂eq in 2030 (a 9 - 21% reduction).
 - Emissions from the LULUCF sector are projected to increase over the period 2018 to 2030 by between 1.5 and 3.8 Mt CO₂eq (an increase of 39 - 95%).
- From 10.6 Mt CO₂eq in 2018, emissions from the Energy Industries sector are projected to decrease to between 3.4 and 4.4 Mt CO₂eq in 2030 (a 59 - 68% reduction).
 - Renewable energy generation at the end of the decade is projected to range from 60 - 68% of electricity generation as a result of a projected rapid expansion in wind energy and other renewables.
- From 21.4 Mt CO₂eq in 2018, emissions from the agriculture sector are projected to be between 18.0 and 21.6 Mt CO₂eq in 2030 (a 16% reduction in WAM and 1% increase in WEM).
- The ten PaMs (WEM and WAM) estimated to achieve the largest potential GHG emission reductions in 2030 account for over three quarters of the total potential GHG emission reduction in 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 has considered the potential climate change effects under both the baseline and future environment. 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 Project is situated on coniferous forestry, agricultural land, heath and areas of peatland. 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. Note, in line with the Forest Service's published policy⁴⁸ on granting felling licences for wind farm developments, areas cleared of forestry for access tracks, and any other wind farm-related uses will be replaced by replanting at an alternative site or sites. The Forest Service policy requires replacement or replanting on a hectare for hectare basis for the footprint of the infrastructure developments.

CO₂ 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 CO₂ 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 CO₂ 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 CO₂. It is essential therefore that any wind farm development in a peatland area saves more CO₂ than is released.

The below assessment includes all carbon losses associated with turbine infrastructure lifecycle (manufacture, construction, decommissioning) of the Proposed Project, back up of turbines, reduced carbon fixing potential of the Site, soil organic matter, tree felling activities, traffic generation, embodied carbon of all construction materials, and those emissions associated with carbon savings from the Proposed Project.

11.4.2

Methodology for Calculating Losses

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macaulay 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

⁴⁸ Department of Agriculture, Food, and the Marine, Tree Felling and Reforestation Policy
<<https://www.gov.ie/en/publication/19b8d-tree-felling-licences/>>

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 2.15.0) 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 tracks, construction compounds, etc. and, on a site such as Proposed Project, this requires peat excavation resulting in the loss of the carbon-fixing potential associated with peat. The determination of the carbon losses associated with the carbon-fixing potential of peat is calculated from the area affected by proposed infrastructure (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 by the Macauley Institute carbon tool using default values from the IPCC Revised 1996 Guidelines for National Greenhouse Gas Inventories⁴⁹, as well as by more site-specific equations derived from the scientific literature and updated emission factors.⁵⁰ Please note, carbon losses associated with the removal of other carbon-fixing vegetation will result in additional carbon losses. These have not been quantified as the lack of consistent national-level field data and methodologies limits the ability to make accurate projections on carbon sequestration potential for other carbon fixing habitat types, i.e., hedgerow, grassland, etc., and therefore carbon loss associated with removal. While it can be assumed that loss of carbon fixing vegetation will occur as part of the Proposed Project due to the removal of these habitat types, the exact carbon loss is not quantifiable. However, to ensure a robust assessment in Section 11.5 these carbon losses have been considered; please see Section 11.5.2 and 11.5.3 below for the detailed impact assessment and Appendix 11-2 for further information on assumptions used in this assessment.

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. In order to calculate the carbon emissions resulting from the removal or drainage of the peat, the Macauley Institute method accounts for emissions occurring if the peat had been left in-situ and subtracts these from the emissions occurring after removal and drainage.

The Macauley Institute methodology states that the total volume of peat impacted by the construction of the wind farm is strongly correlated to the extent of the peatland affected by drainage at the Site.

The drainage of peat soils leads to continual loss of soil carbon until a new steady state is reached, when inputs are approximately equal to losses. For peats, this steady state approximates 0% carbon, so 100% carbon loss from drained peats is assumed if the Site is not restored after decommissioning of the wind farm. The amount of carbon lost is calculated on the basis of the annual emissions of methane and carbon dioxide, the area of drained peat, and the time until the Site is restored. In the case of the Proposed Project, the model has been prepared on the basis that restoration will not occur upon decommissioning (i.e., site tracks and hardstands will be left in situ). However, as detailed in Section 4.12 of Chapter 4 Description of the Proposed Project of the EIAR, upon decommissioning, all above ground turbine and met mast components will be removed, and foundations and compounds would

⁴⁹ IPCC (1997) Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories

⁵⁰ Calculating potential carbon losses and savings from wind farms on Scottish peatlands (2018) <

<https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/carbon-calculator-technical-guidance/documents/calculating-potential-carbon-losses-and-savings-from-wind-farms-on-scottish-peatlands-technical-guidance/calculating-potential-carbon-losses-and-savings-from-wind-farms-on-scottish-peatlands-technical-guidance.pdf>

remain underground and covered with earth and allowed to revegetate. The Decommissioning Plan, included as Appendix 4-6, will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the competent authority at that time.

The effects of drainage may also reduce dissolved and particulate organic carbon retention within the peat. Losses of carbon dioxide due to leaching of dissolved and particulate organic carbon are calculated as a proportion of the gaseous losses of carbon from the peat. The Macauley Institute method assumes that published good practice is employed in relation to avoiding the risk of peat landslides. As detailed in Section 8.3.10 in Chapter 8 of this EIAR: Land Soils and Geology, the Proposed Project has been the subject of a Geotechnical & Peat Stability Assessment; further details are contained within Appendix 8-1 of this EIAR.

Tree felling will be required within and around the Proposed Project infrastructure footprint to allow for the construction of the proposed turbines, grid connection masts, access tracks, underground cabling, and the other ancillary infrastructure. Forestry may be felled earlier than originally planned due to the Proposed Project, so limiting the nature and longevity of the resulting timber produced. If a forestry plantation was due to be felled with no plan to replant, the effect of the land use change is not attributable to the wind farm development and is omitted from the calculation. If, however, the forestry is felled for the development, as is the case for the Proposed Project, the effects are judged to be attributable to the wind farm development. Carbon losses as a result of felling are calculated from the area to be felled, the average carbon sequestered annually, and the lifetime of the wind farm. Alterations in soil carbon levels following felling are calculated using the equations for drainage and site restoration already described.

The outputs of the Macauley Institute web-based carbon calculator are included in Appendix 11-2 of this EIAR, '*Carbon Calculations*'.

In addition to the Macauley Institute methodology described above, where possible, carbon emissions or losses associated with embodied carbon of materials used in the construction, operational and decommissioning phase of the Proposed Project 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 the Site, installation of these materials during a construction phase, and the subsequent replacement, removal, and disposal of these materials upon decommissioning.⁵¹

The full life cycle and embodied carbon of the Proposed Project turbines have been taken account of in the Macauley Institute model. The emissions associated with the embodied carbon, along with the construction phase transport movements, of the remaining features of the Proposed Project are considered using the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)⁵². The TII Carbon Tool is customised for road and light rail projects in Ireland, using emission factors from recognised sources during the construction, maintenance and operation of TII projects in Ireland.

Section 15.1 in Chapter 15 of this EIAR outlines traffic generation numbers relative to quantum of materials required for the construction of the Proposed Project, the details of which have been utilised to determine the emissions associated with these activities and are included in Appendix 11-2 Carbon Calculations.

⁵¹ Irish green Building Council – What is embodied carbon? <<https://www.igbc.ie/what-is-embodied-carbon/>>

⁵² Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document <https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf>

11.4.3 Carbon Losses and Savings Calculations

11.4.3.1 Carbon Losses

The Scottish Government online carbon calculator was used to assess the impacts of the Proposed Project in terms of potential carbon losses taking into account drainage, habitat improvement, forestry felling and site restoration. The online calculator is pre-loaded with information specific to the CO₂ emissions from the United Kingdom's electricity generation plant, which is used to calculate emissions savings from proposed wind farm projects in the UK. However, due to the availability of Irish specific carbon intensity emission factors for the Irish electricity generation plant, the CO₂ emissions savings from the Proposed Project have been calculated separately from the online carbon calculator as set out in Section 11.4.3.2 below.

In relation to embodied carbon and associated transport movements of all other ancillary elements of the Proposed Project, the TII Carbon Tool has been utilised to assess the impacts of the Proposed Project in terms of potential carbon losses in regards to construction phase transport emissions and embodied carbon.

A copy of the outputs is provided as Appendix 11-2 of this EIAR. Where available and relevant, site-specific information was inserted into the online carbon calculators. Otherwise, default values were used.

The main CO₂ losses due to the Proposed Project are summarised in Table 11-5.

Table 11-5 CO₂ Losses from the Proposed Project

Origin of Losses	CO ₂ Losses (tonnes CO ₂ equivalent)	
	Expected	Maximum
Losses due to turbine life (e.g., manufacture, construction, decommissioning)	26,159	26,159
Losses due to backup	21,103	21,103
Losses from reduced carbon fixing potential	830	1,380
Losses associated to forestry felling	310	364
Losses associated with embodied carbon in construction materials	15,428.48	15,428.48
Losses associated with traffic and transport movements	231.04	231.04
Total	64,062	64,666

The worksheet models and online tools calculate that the Proposed Project will give rise to 64,062 tonnes of CO₂ equivalent losses over its 35-year life. Of this total figure, the proposed turbines directly account for 26,159 tonnes, or 40.8%. Losses due to backup account for 21,103 tonnes, or 32.9%. Losses from reduced carbon fixing potential accounts for 1.3% or 830 tonnes. Losses due to tree felling account for 310 tonnes or 0.5%. Losses due to embodied carbon accounts for 15,428.48 tonnes or 24.1% and losses due to construction phase transport emissions accounts for 0.36% or 231.04 tonnes.

The figure of 830 tonnes of CO₂ arising from ground activities associated with the Proposed Project is calculated based on the entire Proposed Project footprint being in “Acid Bog”, as this is one of only two choices the model allows (the other being Fen). The Carbon Calculator Technical Guidance document⁵³ defines ‘Acid Bog’ as being ‘a wetland fed primarily by rainwater and often inhabited by sphagnum moss, thus making it acidic’ and ‘Fen’ as being ‘a type of wetland fed by surface and/or groundwater (McBride et al., 2011)’. The habitat that will be impacted by the development footprint comprises a mix of peatland, coniferous forestry and pastoral agriculture land rather than acid bog, as assumed by the model. The value of 830 tonnes of CO₂ arising from ground activities in ‘Acid Bog’ is under a precautionary scenario, and therefore the actual CO₂ losses are expected to be lower than this value.

The values discussed above are based on the assumption that no habitat enhancement or afforestation activities will take place as part of the Proposed Project. As detailed in Section 4.4.3.3 of this EIAR, the estimated 0.7 hectares (ha) of forestry that will be permanently felled for the footprint of the Proposed Project infrastructure will be replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Project. Similarly, as detailed in Appendix 6-4, a Biodiversity Management and Enhancement (BMEP) for the Proposed Project has identified enhancement activities such as the creation of wet heath habitat and native woodland habitat. Taking into account the afforestation and habitat enhancement that will take place, the actual CO₂ losses for forestry felling and reduced carbon fixing potential are expected to be lower than the values detailed in Table 11-5, over the lifetime of the Proposed Project.

The figure of 15,428.48 tonnes of CO₂ arising from the embodied carbon of construction materials associated with the Proposed Project is calculated based the types of materials available in the TII Carbon tool such as, concrete, steel, cement and granular fill, and assumes that each HGV or LGV will be carrying material at its full capacity. The figure of 231.04 tonnes of CO₂ arising from transport movements associated with construction activities of the Proposed Project is calculated based on the assumption that material will be imported locally or from a port/city location where applicable. 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 Project and habitats within the Site are not restored on decommissioning of the Proposed Project after its expected 35-year proposed operational life. As detailed in the Decommissioning Plan, Appendix 4-6, the wind turbines and met mast will be dismantled and removed offsite. It is not intended to remove the concrete foundations from the ground as it is considered that its removal will be the least preferred option in terms of having potential effects on the environment. The associated foundations will be backfilled and covered with soil material. The soil material will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation and accelerate the resumption of the natural drainage management that will have existed prior to any construction. The underground electrical cabling connecting the turbines to the on-site substation will be removed from the cable ducts. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility. Taking into account the proposals incorporated in the Decommissioning Plan, the actual CO₂ losses are expected to be lower than the values detailed in Table 11-5.

11.4.3.2 Carbon Savings

According to the model described above, the Proposed Project will give rise to total losses of 64,062 tonnes of carbon dioxide.

⁵³ Scottish Government (2018) Carbon Calculator: Technical Guidance <<https://www.gov.scot/publications/carbon-calculator-technical-guidance/>>

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:

$$\text{CO}_2 \text{ (in tonnes)} = \frac{(A \times B \times C \times D)}{1000}$$

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 Project is assumed to be 31.5 MW (based on 7 no. 4.5 MW turbines).

A capacity factor of 0.35 (or 35%) has been used for the Proposed Project.⁵⁴

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) Conversion and Emissions Factors for Publication worksheet.⁵⁵ The emission factor for electricity generated in Ireland in 2024 was 204.3 gCO₂/kWh.⁵⁶

The calculation for carbon savings is therefore as follows:

$$\begin{aligned} \text{CO}_2 \text{ (in tonnes)} &= \frac{(31.5 \times 0.35 \times 8,760 \times 204.3)}{1000} \\ &= 19,731 \text{ tonnes per annum} \end{aligned}$$

Based on this calculation, **19,731** tonnes of carbon dioxide will be displaced per annum from the largely carbon-based traditional energy mix by the Proposed Project. Over the proposed 35-year lifetime of the development, therefore **690,585** tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation.

As detailed in Section 11.4.3.1 above, habitat enhancement and afforestation activities will take place as part of the Proposed Project. As detailed in Section 4.4.3.3 of this EIAR, the estimated 0.7ha of forestry that will be permanently felled for the footprint of the Proposed Project infrastructure will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Project. Similarly, as detailed in Appendix 6-4, a BMEP for the Proposed Project has identified enhancement activities such as treeline and hedgerow planting, native broadleaved woodland planting and Molinia meadow enhancement. These activities, over the lifetime of the Proposed Project have the potential to give rise to carbon savings; please note, this potential has not been quantified but is considered in Section 11.5.3 below. The carbon storage capacity of restored

⁵⁴ EirGrid, 2025 Enduring Connection Policy 2.4 Solar and Wind Constraints Report: Assumptions and Methodology. Available at: <https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.4-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf> The Proposed Project is located within the B wind region for Ireland with an associated capacity factor of 35%.

⁵⁵ Conversion and Emission Factors for Publication (2023) <https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors/SEAI-conversion-and-emission-factors.xlsx>

⁵⁶ SEAI have published the provisional 2023 emission factor for electricity generation in Ireland as 229.9 gCO₂/kWh. Please note that this is a provisional value that may change.

habitats will vary over time as vegetation matures and land use and the baseline environment change. Therefore, while it can be assumed that the enhancement activities on the Site will result in an increased capacity of carbon storage due to the carbon storage potential that exists within these habitats, to ensure the assessment below is identified under a theoretical precautionary scenario the quantification of these potential carbon savings (via an increase in carbon storage potential) associated with these measures has not been included in the below assessment outside of an assumed offset potential (Section 11.5.3 below). Please note, the carbon sequestration potential associated with the replanting of native broadleaved woodland will be able to be determined in the future via the Teagasc Forest Carbon Tool⁵⁷; currently this is not able to be completed due to Teagasc carrying out further analysis and validation on current data and the sequestration potential not being available in the public domain.

11.5 Likely Significant Effects and Associated Mitigation Measures

11.5.1 'Do-Nothing' Effect

If the Proposed Project were not to proceed, the Site will continue to function as it does at present, with no changes to the current land-use.

If the Proposed Project were not to proceed, the opportunity to further significantly reduce emissions of greenhouse gases, including carbon dioxide (CO₂), oxides of nitrogen (NO_x), and sulphur dioxide (SO₂) from fossil fuels to the atmosphere would be lost. The opportunity to contribute to Ireland's commitments under the Kyoto Protocol, the Paris Agreement, and EU law would also be lost. This would be a long-term slight negative effect and is not significant.

Furthermore, the opportunity to create the new proposed areas of native broadleaved woodland, planting of treeline and hedgerow and enhanced habitats for Marsh Fritillary within the Site would be lost. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan for details.

11.5.2 Construction Phase

11.5.2.1 Greenhouse Gas Emissions

Pre-Mitigation impact

Proposed Project

The completion of construction of turbines and associated foundations and hard-standing areas, meteorological mast, access tracks, temporary construction compounds, underground cabling, borrow pit, peat and spoil management, biodiversity enhancement areas, site drainage, temporary turbine delivery accommodation areas and all ancillary works and apparatus, will require construction materials (such as cement), and the operation of construction vehicles and plant on and off-site, and the transport of workers to and from the Site. Greenhouse gas emissions, e.g., carbon dioxide (CO₂), carbon monoxide and nitrogen oxides, associated with the production of construction materials, and operation of vehicles and plant will arise as a result of the construction activities. This effect will be short-term and slight only, given the quantity of greenhouse gases that will be emitted to the atmosphere, as quantified above, and will be restricted to the duration of the construction phase. Mitigation measures to reduce this effect are presented below.

⁵⁷ <https://interactive.teagasc.ie/Open/ForestryCarbon/ForestryCarbonCalculator>

Some potential long-term imperceptible negative effects will occur due to the removal of carbon fixing vegetation and habitat, however, that has been avoided where possible by the design and layout of the Site, which has ensured the utilisation of as much of the existing tracks within the Site as possible to gain access to the proposed turbine locations and minimise the construction of additional tracks. This effect will be long-term, negative and imperceptible only, given the quantity of greenhouse gases that will be emitted to the atmosphere and is not significant, given the minor quantities of vegetation and habitat that will be lost.

Transport to Site

The transport of turbines and construction materials to the Site, which will occur on specified routes only (see Section 4.6 in Chapter 4 and Section 15.1 of Chapter 15 of this EIAR), will also give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This impact will be short-term and slight only, given the quantity of greenhouse gases that will be emitted, as quantified above, and will be restricted to the duration of the construction phase, therefore it is not significant. Mitigation measures to reduce this effect are presented below.

Waste Disposal

Construction waste will arise from the construction of the Proposed Project, mainly from excavation and unavoidable construction waste including material surpluses, damaged materials and packaging waste. Waste arising from the construction phase will be outlined in a waste management plan which will be detailed prior to the commencement of construction. The waste hierarchy will always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels. 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 construction phase, therefore it is not significant. Further detail on waste management can be found in Section 3.8.3 of the CEMP which has been included as Appendix 4-5 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 and the principles of the circular economy.

Please refer to Section 4.5.6 of Chapter 4 of this EIAR and Section 3.8 of the Construction and Environmental Management Plan (CEMP) for detailed processes on waste management during the construction phase of the Proposed Project.

Mitigation

- Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager will produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.
- All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.
- Turbines and construction materials will be transported to the site on specified routes only unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details.
- It is intended to obtain the materials for the construction of the Proposed Project from the Site.
- Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas.

- › A Construction and Environmental Management Plan (CEMP) (Appendix 4-5) will be in place throughout the construction phase.
- › The CEMP (Appendix 4-5) includes a Waste Management Plan (WMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material.
 - The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort.
 - Section 4.5.7 of Chapter 4 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 Proposed Project to reduce the amount of emissions associated with vehicle movements.
- › It is intended to obtain materials for the construction of the Proposed Project from both the onsite borrow pit and to import from local licenced quarries. The use of the onsite borrow pit will reduce the number of delivery vehicles accessing the Site, thereby reducing the amount of emissions associated with vehicle movements.
- › Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.

Residual Effects

Following implementation of the mitigation measures above, residual effects of greenhouse gas emissions arising from the construction phase of the Proposed Project will have a short-term imperceptible negative effect and is not significant. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible negative effect on Climate, which is not significant.

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 Project will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year lifespan. Therefore, while there will be greenhouse gas emissions associated with the construction of the Proposed Project, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Project within its operational life.

Significance of Effects

Based on the assessment above there will be no significant effects arising from the construction phase of the project.

11.5.3 Operational Phase

11.5.3.1 Greenhouse Gas Emissions

Identification of Effect

Proposed Project

The Proposed Project will generate energy from a renewable source. As detailed in Section 11.4.3.2 above, the Proposed Wind Farm will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year lifespan of the Proposed Project. For the purposes of this EIAR, a

rated output of 4.5MW per turbine has been chosen to calculate the anticipated power output of the proposed turbines, which would result in an estimated output of 31.5MW, displacing approximately 19,731 tonnes of carbon dioxide per annum from traditional carbon-based electricity generation. This will have a long-term moderate positive impact on climate.

The operational phase of the Proposed Project will generate additional traffic to the area in the form of light goods vehicles (LGVs) visiting the site 1-2 times per day for maintenance and monitoring activities but on occasion, daily visits by LGVs and HGVs may be required over short periods during maintenance/component replacement activities. The addition of 1-2 HGVs per week on occasion over the 35-year lifetime of the Proposed Project will give rise to a long-term imperceptible negative effect on climate which is not significant.

Some potential long-term not significant negative impacts that may occur during the operational phase of the Proposed Project are the release of carbon dioxide to the atmosphere due to the removal of carbon fixing vegetation and habitat, as well as associated drainage. With respect to transport volumes, there will only be an average of approximately 1 to 2 trips made to the Proposed Wind Farm by car or light goods vehicle per day, and less than this for the Proposed Grid Connection.

Transport to and from the Site

In the unlikely event that a turbine blade is damaged and must be replaced during the operational phase, emissions will arise from the transportation of the replacement turbine blade(s) to the Proposed Project and re-instatement of temporary tracks within the Site, as required. This impact will be short-term, negative and slight only, therefore it is not significant Emissions resulting from routine maintenance at the Proposed Project are included in the 'Proposed Project' section above.

Waste Disposal

Waste is not proposed to be generated on the site during the operational phase, any waste that does arise will be minimal and any impact will be short-term and imperceptible. 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.
- Any waste that does arise will be managed in accordance with best practice.

Residual Effect

Following implementation of the mitigation measures above, residual effects of greenhouse gas emissions arising from the operational phase of the Proposed Project will have potential long-term, imperceptible, negative, not significant effect on Climate.

Please note, as identified above in Section 11.4.3.2, the carbon storage capacity of restored habitats will vary over time as vegetation matures and land use and the baseline environment change. Therefore, while it can be assumed that measures outlined in the BMEP such as native broadleaved woodland planting and treeline/ hedgerow planting and enhancement that will occur as part of the Proposed Project will result in an increased capacity of carbon storage due to the carbon storage potential that exists within these habitats⁵⁸, to ensure this assessment is completed under a theoretical precautionary

⁵⁸ <https://teagasc.ie/news-events/daily/carbon-stocks-and-sequestration-in-hedgerows/>

scenario, the quantification of these potential carbon savings (via an increase in carbon storage potential) associated with these measures has not been included.

The operation of the Proposed Project will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year operational lifespan due to the provision of clean, renewable energy to the national grid. Therefore, while there will be greenhouse gas emissions associated with the operation of the Proposed Project, this will be offset by the Proposed Wind Farms operation over its 35-year operational life.

This will have a Long-term Moderate Positive Effect on Climate as a result of reduced greenhouse gas emissions and not significant.

Significance of Effects

Based on the assessment above there will be no significant effects arising from the operational phase.

11.5.4 Decommissioning Phase

The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of approximately 35-years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Proposed Wind Farm may be decommissioned.

Upon decommissioning of the Proposed Wind Farm, the wind turbines and the meteorological mast will be disassembled in reverse order to how they were erected. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and met mast foundations would remain underground and would be covered with earth and allowed to revegetate. Leaving the foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant temporary environment disturbances such as noise, dust and/or vibration. Site access tracks will be used during the operational phase by farm and forestry machinery and therefore will be retained post decommissioning to continue to facilitate these activities.

The underground electrical cabling connecting the proposed turbines to the onsite 110kV substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.

The onsite 110kV substation will remain in place as they will be part of the Electricity Grid under the ownership and control of Eirgrid and ESB Networks.

Any impact and consequential effects that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts.

A Decommissioning Plan has been prepared (Appendix 4-6). The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time. The potential for effects during the decommissioning phase of the Proposed Wind Farm has been fully assessed in the EIAR.

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 (Proposed Wind Farm and Proposed Grid Connection combined) will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans within 25km of the Site, such as other wind energy developments, extractive industries, battery energy storage systems, forestry etc. Please see Section 2.9 of Chapter 2 for the cumulative assessment methodology used.

Existing land uses on the Site (including private forestry, pastoral agriculture and turbary peat cutting) will continue during the Proposed Project. There will be no significant cumulative negative effects on climate as a result of these activities.

11.6.1

Construction Phase

During the construction phase of the Proposed Project and other permitted or proposed projects and plans within 25km of the Site as set out in Section 2.9 in Chapter 2 and Appendix 2-3 of this EIAR, that are yet to be constructed, there will be greenhouse gas emissions arising from production of construction materials (such as cement), and the operation of construction vehicles and plant. These plans and projects include other wind energy developments, extractive industries, battery energy storage systems, forestry etc. These will be restricted to the duration of the construction phase, and as such will give rise to emissions over a short-term duration. Existing wind farms and developments are not considered below given the low amount of operational related emissions associated with these developments. A list of developments with potential to give rise to potentially significant cumulative impacts on climate during the construction phase of the Proposed Wind Farm are provided below.

- > Proposed Shancloon Wind Farm
- > Connaught GAA Turbines
- > Tonregee Single Wind Turbine
- > Rosderra Farms (Castlebar)
- > Dawn Meats Ireland t/a Western Proteins
- > DINO Trading Company Limited
- > McHale Engineering
- > Western Brand Group Unlimited Company
- > Moneen Quarry
- > Fort Wayne Metals Ireland Limited
- > Martin Jennings Wholesale Limited
- > Heiton Buckley Limited t/a Heiton Buckley Builders Merchants
- > Velvet Cloud
- > IOMLÁN Animal Science
- > Baxter Healthcare Mayo

Once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible negative effect on Climate, which is not significant. A review of the chapters of the above developments EIAR's (where available) suggests that the construction phase effects of these developments will be short-term, imperceptible and negative, with these effects quickly being offset shortly after commencing operation. Once the mitigation proposals, as outlined in the above assessment are implemented during the construction phase of the Proposed Project, there will be no significant cumulative negative effects on climate, with any cumulative effects being offset completely after the operation of these proposed developments (should they be permitted and constructed as currently proposed.)

11.6.2 Operational Phase

Exhaust emissions during the operational phase of the Proposed Project will be minimal, relating to the use of maintenance vehicles onsite, and therefore there will be no measurable negative cumulative effect with other developments on climate.

The nature of the Proposed Project is such that, once operational, it will have a long-term, moderate, positive impact on climate, which is not significant. However, as noted above, the Proposed Project will offset the **64,062** tonnes of CO₂ associated with the construction and operational phase that will be lost to the atmosphere (Section 11.4.3.1) in approximately **39** months of operation. There will be no measurable negative cumulative effect with other developments on climate.

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 Wind Farm will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year lifespan of the Proposed Wind Farm. Therefore, while there will be greenhouse gas emissions associated with the construction of the Proposed Project, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Wind Farm within its operational life. Thus, there will be no cumulative effects arising on climate from the Proposed Project and other permitted or proposed projects in the area as set out in Section 2.9 in Chapter 2 of this EIAR.

It should be noted that the region the Proposed Wind Farm is located in features multiple permitted, operational and proposed wind energy developments. Once operational, the Proposed Wind Farm in conjunction with other operational wind farms will have a long-term, moderate, positive effect on climate.

11.6.3 Decommissioning Phase

The works required during the decommissioning phase are described in Section 4.11 in Chapter 4 of this EIAR and detailed in Appendix 4-6. Any cumulative impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential cumulative effects.

When considering these greenhouse gas emissions within the context of the Electricity Sector Emissions Ceilings detailed in Section 11.3.2.4, 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 11.5.2.1.2, the Proposed Project will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 35-year lifespan of the Proposed Project. Therefore, while there will be greenhouse gas emissions associated with the decommissioning of the Proposed Project, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Project within its operational life. Thus, there will be no cumulative effects arising on climate from the Proposed Project and other permitted or proposed developments and plans in the area as set out in Section 2.8 in Chapter 2 of this EIAR

11.7 EIA Classification Summary

Please see Table 11-6 below for a summary of all identified impacts for the Proposed Project relating to greenhouse gas emissions.

Table 11-6 Impact Assessment Classification Summary

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
Construction Phase				
Greenhouse Gas Emissions	Short-Term, Slight, Negative	Section 11.5.2	Permanent, Imperceptible, Negative	Not Significant
Operational Phase				
Greenhouse Gas Emissions	Proposed Wind Farm: Long-Term, Imperceptible, Negative Proposed Grid Connection: Long-Term, Imperceptible, Negative Transportation: Short-Term, Slight, Negative Waste Disposal: Short-Term, Imperceptible, Negative	Section 11.5.3	Long-term Moderate Positive Effect on Climate as a result of reduced greenhouse gas emissions	Not Significant
Decommissioning Phase				
Climate	Any impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent and lesser duration, and the mitigation measures outlined in Section 11.5.2 will be implemented during the decommissioning phase also	11.5.2	N/A	N/A