EIAR ADDENDUM APPENDIX 11-2A

ADDENDUM CLIMATE CHAPTER

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11. CLIMATE

11.1 Introduction

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on climate arising from the 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 of the previously submitted Environmental Impact Assessment Report (EIAR). The full description of the Proposed Project is detailed in Chapter 4 of this previously submitted EIAR. An Coimisiún Pleanála has requested, as part of the Response Format and Timeframe of the Response to Further Information (RFI) that all points of further information be addressed by way of an addendum to the previously submitted EIAR (hereafter referred to as "**the EIAR**") as relevant, and should clearly indicate where changes to the original documents are made. Where best practice with respect to Chapter structure has evolved since the original submission (March 2024), to ensure maximum clarity and transparency the whole chapter has been updated, to include removal of text in red strikethrough and insertion of text in green are outlined.

The objective of this assessment is to assess the potential effects that the Proposed Project may have on Climate and sets out proposed mitigation measures to avoid, reduce or offset any potential significant effects that are identified.

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.

11.1.1 Background

For the purposes of ~~this~~ the EIAR:

- The 'Proposed Wind Farm' refers to the 8 no. turbines and supporting infrastructure which is the subject of this Section 37E application.
- The 'Proposed Grid Connection' refers to the 110kV substation and supporting infrastructure which will be the subject of a separate Section 182A application.
- The 'Proposed Project' comprises the Proposed Wind Farm and the Proposed Grid Connection, all of which are located within the EIAR Study Boundary (the 'Site') and assessed together within ~~this~~ the EIAR.

The Proposed Project is located within a rural setting in northwest Galway, approximately 8km southwest of Tuam and 10km north of Claregalway. The N83 National Road runs in a north-south direction directly to the east of the Proposed Wind Farm. Current land-use on the Proposed Wind Farm comprises a mix of pastural agricultural land. Current land use along the Proposed Grid Connection comprises a mix of public road corridor, agricultural land and one-off housing. Land use in the wider landscape is primarily comprised of pastural agricultural lands, as well as one-off rural housing.

The Proposed Wind Farm comprises 8 no. turbines, met mast, temporary construction compound and supporting infrastructure. The Proposed Grid Connection comprises a 110kV onsite substation, temporary construction compound and associated 110kV underground cabling connecting to the existing Cloon 110kV substation near Tuam, Co. Galway.

11.1.2 Chapter Structure and Climate Study Areas

This chapter of the EIAR aims to provide an assessment of the potential significant direct and indirect effects on climate arising from all phases of the Proposed 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)

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~~ the EIAR, the overall Climate Study Area for the Project is defined as the national environment (Ireland), where the receptor is the climate and the global atmosphere. As stated in the IEMA 2022 guidance *'greenhouse gas emission impacts and resulting effects are global rather than affecting one localised area*'[1]. Therefore, effects arising from the potential impacts on climate are considered to impact on a national level. National, regional and local data has been considered where relevant and available. The study areas considered across the different assessments provided within this report are detailed below.

Baseline Environment

- Current Baseline
  - Current Baseline Study Area: the EIAR Site Boundary, as defined in Section 1.1.1 of Chapter 1 of ~~this~~ the 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~~ the EIAR.

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

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~~ the EIAR.

~~Relevant Guidance~~

~~The climate section of this EIAR is carried out in accordance with the 'EIA Directive' as amended by Directive 2014/52/EU and has been prepared in accordance with guidance listed in Section 1.7.2 of Chapter 1: Introduction. Due to the nature of the Proposed Project, a wind farm project, the following methodology and guidance was utilised for the climate section of this EIAR:~~

- ~~*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands'* (University of Aberdeen and the Macauley Institute 2008); and~~
- ~~*'Wind Farms and Carbon Savings'* (Scottish Natural Heritage, 2003).~~
- ~~Macauley Institute Carbon Calculator for Wind Farms on Scottish Peatlands (Version 1.8.1) (2023)~~
- ~~Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.7.3) (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).~~

11.1.3 Statement of Authority

This section of the EIAR has been prepared by Catherine Johnson and reviewed by Ellen Costello and Michael Watson, all of MKO. Catherine is an Environmental Scientist and Climate Practitioner at MKO with over one year of consultancy experience in climate and sustainability. Prior to joining MKO in 2022, Catherine worked as an Environmental Social Governance (ESG) analyst for Acasta in Edinburgh. Catherine has expertise in international climate law and policy, earth science, and sustainability/ESG processes. Catherine has a BSc in Earth and Ocean Science and an LLM in Global Environment and Climate Change Law. Ellen is a Project Environmental Scientist and Climate Practitioner with over four years of consultancy experience with MKO and has been involved in a range of projects including climate and sustainability context reports for masterplans and commercial developments, renewable energy infrastructure projects, and the compilation of numerous chapters including the preparation of air and climate assessments for Environmental Impact Assessment Reports. Ellen holds a BSc. in Earth Science and a MSc. in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on climate adaptation and mitigation, and its implications on environment and society. Michael Watson is Project Director and head of the Environment Team in MKO. Michael has over 25 years' experience in the environmental sector. Following the completion of his Master's Degree in Environmental Resource Management, Geography, from National University of Ireland, Maynooth he worked for the Geological Survey of Ireland and then a prominent private environmental & hydrogeological consultancy prior to joining MKO in 2014. Michael's professional experience includes managing Environmental Impact Assessments, EPA License applications, hydrogeological assessments, environmental due diligence, and general environmental assessment on behalf of clients in the wind farm, waste management, public sector, commercial and

industrial sectors nationally. Michaels key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Michael is a key member of the MKO senior management team and as head of the Environment Team has responsibilities to mentor various grades of team members, foster a positive and promote continuous professional development for employees. Michael also has a Bachelor of Arts Degree in Geography and Economics from NUI Maynooth, is a Member of IEMA, a Chartered Environmentalist (CEnv) and Professional Geologist (PGeo).

11.1.4 Scoping and Consultation

The scope for this chapter of the EIAR has also been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties. This consultation process and the List of Consultees is outlined in Section 2.6 of ~~this~~ the EIAR. Matters raised by consultees in their responses with respect to climate are summarised in Table 11-1 below.

Table 11-1 Summary of Climate Related Scoping Response

Consultee	Description	Addressed in Section
Transport Infrastructure Ireland (TII)	TII recommends that the development include the following points relating to climate: › The developer, in preparing an EIAR, should have regard to TIIs Environmental Assessment and Construction Guidelines, including the *'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes'* (National Roads Authority (NRA), 2006).	Section 11.1.2. Due to the interrelationship between air quality and climate, consideration has also been given to Chapter 10 of ~~this~~ the EIAR: Air Quality.
Health Service Executive (HSE)	The Health Service Executive (HSE) recommends that the following matters are included and assessed as part of the EIAR: › Climate Change and Opportunity for Health Gain	Sections 11.~~5~~6.3

11.2 Climate Legislation, Policy, and Guidance ~~Change and Greenhouse Gases~~

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. Greenhouse gases, when emitted, create a 'greenhouse effect' in the atmosphere, effectively trapping heat near the earth surface, resulting in higher temperatures and a warming planet. 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.[2] 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 over more than 100,000 years globally, at 1.48°C above pre-industrial levels, with the world's ocean temperature also reaching new heights.

The Intergovernmental Panel on Climate Change (IPCC), in their AR6 Synthesis Report: Climate Change 2023[3], 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. ~~Changing climate patterns are thought to increase the frequency of extreme weather conditions such as storms, floods and droughts. In addition, warmer weather trends can place pressure on animals and plants that cannot 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.~~

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.

International greenhouse gas emission and climate targets play an important role in stimulating and enabling action for developed and developing nations. The following sections provide an overview of the international agreements that have played key roles in establishing climate governance.

11.2.1.1 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. It set limitations and reduction targets for greenhouse gases for developed countries (Annex I countries) and set a special obligation for certain countries to provide financial resources and facilitate technology transfer to developing countries (Annex II countries). The EU, and therefore Ireland, was both an Annex I and Annex II country.

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.

Under the Kyoto Protocol, the EU agreed to achieve a significant reduction in total greenhouse gas emissions in the period 2008 to 2012. These EU emission targets are legally binding in Ireland. Ireland's contribution to the EU commitment for the period 2008 – 2012 (the first commitment period) was to limit its greenhouse gas emissions to no more than 13% above 1990 levels. Ireland achieved its Kyoto Protocol targets under the EU burden-sharing agreement.

11.2.1.1.1 *Doha Amendment to the Kyoto Protocol*

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

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.
  - The amendment entered into force on 31 December 2020
- A revised list of greenhouse gases to be reported on by Parties in the second commitment period; and
- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

During the first commitment period, 37 industrialised countries and the European Community committed to reduce greenhouse gas emissions to an average of 5% below 1990 levels. During the second commitment period, Parties committed to reduce greenhouse gas emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020. The composition of Parties in the second commitment period is different from the first; however, Ireland and the EU signed up to both the first and second commitment periods. Under the protocol, countries must meet their targets primarily through national measures, although market-based mechanisms (such as international emissions trading) can also be utilised.

Although the 1997 Kyoto Protocol and 2012 Doha Amendment were in force in 2020, the 2015 Paris Agreement superseded the Kyoto Protocol as the principle regulatory instrument governing the global response to climate change.

11.2.1.2 Conference of the Parties

Every year since 1995, the 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.

The following details the most significant COPs in terms of impact on climate action as well as a summary of the recent COP – COP28 which took place in Dubai.

11.2.1.2.1 *COP21 Paris Agreement*

COP21 was the 21st session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). COP21 was organised by the United Nations in Paris and held from 30th November to 12th December 2015.

COP21 closed on 12th December 2015 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. It is flexible and takes into account the needs and capacities of each country. It is balanced as regards adaptation and mitigation, and durable, with a periodical ratcheting-up of ambitions.

11.2.1.2.2 *COP25 Climate Change Conference - Madrid*

The 25th United Nations Climate Change conference COP25 was held in Madrid and ran from December 2nd to December 13th, 2019. While largely regarded as an unsuccessful conference, the European Union launched its most ambitious plan, 'The European Green Deal' which aims to lower CO_2 emissions to zero by 2050. The deal includes proposals to reduce emissions from the transport, agriculture and energy sectors and will affect the technology chemicals, textiles, cement, and steel

industries. Measures such as fines and pay-outs by member states who rely on coal power will be in place to encourage the switch to renewable clean energies such as wind. On the 4th of March 2020, the European Commission put forward the proposal for a European climate law. This aims to establish the framework for achieving EU climate neutrality. It aims to provide a direction by setting a pathway to climate neutrality and to this end, aims to set in legislation the EU's 2050 climate-neutrality objective.

11.2.1.2.3 COP28 Climate Change Conference – Dubai

The 28th Conference of the Parties for the United Nations Framework Convention on Climate Change (COP28) took place in Dubai from the 30th of November 2023 to the 13th of December 2023.

COP28 resulted in a landmark deal to 'transition away' from fossil fuels, the UAE Consensus. The agreement calls for 'transitioning away from fossil fuels in energy systems, in a just, orderly, and equitable manner.' This is the first time in 28 years that fossil fuels have been mentioned in a COP outcome. However, it is noted that the text of 'phase out as soon as possible inefficient fossil fuel subsidies' does not address energy poverty or the just transition. The UAE Consensus also calls for more explicit near-term goals in the lead up to 2050, calling for the world to cut greenhouse gas emissions by 43% by 2030 as compared to 2019 levels. However, many island states have criticised that despite the text being an improvement over previous agreements, there is a litany of loopholes that will enable destructive environmental practices to continue and do not assuage their concerns over rising sea levels and other climate change impacts.

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. Parties have two years to submit their Nationally Determined Contributions for 2035, these need to be aligned with the best available science and the outcomes of the Global Stocktake.

An unusual aspect that came out of COP28 in the final hours of discussion was the quantity of decisions and documents which remain unfinished and not signed off. Notably, discussions on carbon markets collapsed in the final days of COP28 as no consensus could be reached on the country-to-country trading regimes or rules for the market in relation to Article 6 of the Paris Agreement. Negotiations will be continued at COP29 in Azerbaijan.

11.2.1.2.1 COP29 Climate Change Conference – Azerbaijan

The 29th COP of the UNFCCC, (COP29), held in Baku, Azerbaijan, from November 11th 2024 to November 22nd 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; while developing countries advocated for at least USD 1 trillion annually by 2035, developed nations agreed to triples finance to developing countries, with commitments increasing from USD 100 billion annually to USD 300 billion annually by 2035. The NCQG has already drawn criticism for being inadequate given the global financial need of developing nations to mitigate and adapt to climate change effects and due to its lack of strong terminology in relation to the requirements of developed nations and detailed implementation strategies.

At COP29, 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. These rules aim to establish an UN-backed international carbon market. 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.

Energy transition discussions focused on accelerating the global shift toward sustainable energy systems, aligned with the Paris Agreement goals of limiting warming to 1.5°C. The conference emphasized the need for robust policies to phase out coal, expand renewable energy infrastructure, and develop green hydrogen as a low-carbon alternative for hard-to-electrify sectors.

COP29 operationalized the Fund for responding to Loss and Damage ('the Fund') with $50 billion in initial pledges aimed at assisting vulnerable countries. The Fund is expected to begin financing initiatives by 2025, focusing on the most vulnerable populations facing extreme weather events and slow-onset climate impacts. Despite these advancements, ongoing discussions are required to define the Fund's vision, scope, and integration with existing climate finance mechanisms.

11.2.1.3 United Nations Sustainable Development Goals Report ~~2023~~

Transforming our World: the 2030 Agenda for Sustainable Development which includes 17 Sustainable Development Goals (SDGs), and 169 targets was adopted by all UN Member States at a UN summit held in New York in 2015. The agenda is universally applicable with all countries having a shared responsibility to achieve the goals and targets which came into effect on January 1st, 2016. The goals and targets are to be actions over the 15-year period, are integrated and indivisible i.e., all must be implemented together by each Member State.

In June 2025 the Dublin University Press published the *'Sustainable Development Report 2025.*[4] The report highlights the following key messages:

- Global commitment to the SDGs is strong: 190 out of 193 countries have presented national action plans for advancing sustainable development.
- On average globally, the SDGs are far off-track. At the global level, none of the 17 goals are currently on course to be achieved by 2030.
    - While only 17% of the targets are on track to be achieved worldwide, most UN member states have made strong progress on targets related to access to basic services and infrastructure
    - At the global level, SDG 2 (Zero Hunger), SDG 11 (Sustainable Cities and Communities), SDG 14 (Life Below Water), SDG 15 (Life on Land) and SDG 16 (Peace, Justice and Strong Institutions) are particularly off track, facing major challenges (indicated in red on the dashboards) and showing no or very limited progress since 2015
- European countries continue to top the SDG Index. Finland ranks first this year and 19 of the top 20 countries are in Europe.

[4] *Dublin University Press (2025) Sustainable Development Report 2024 The SDGs and the UN Summit of the Future Includes the SDG Index and Dashboards. <https://dashboards.sdgindex.org/chapters>*

Figure 11-1 Ireland SDG Dashboard and Trends. Source: Sustainable Development Report 2025 pg. 224

~~On 10th July 2023, the United Nations published '*The Sustainable Development Goals Report 2023*[5], highlighting that the lasting impacts of the COVID-19 pandemic, the war in Ukraine and subsequent refugee crisis, and the increasing consequences of the climate crisis have hindered the achievement of the SDGs. The report stipulates that due to these unprecedented events, the world is falling short of meeting most of the SDGs by 2030, especially in terms of climate action. An assessment of the around 140 targets for which trend data is available shows that about half of these targets are moderately or severely off track; and over 30% have either seen no movement or regressed below the 2015 baseline~~.

In October 2022 the Department of Communications, Climate Action & Environment in partnerships with all Government Departments, key stakeholders, and based on input from two public consultation processes published the Sustainable Development Goals National Implementation Plan 2022-2024 ('the SDG Plan').[6] The SDG Plan identifies that, overall, the world is not on track to achieve the global Goals by 2030. The SDG Plan sets out how Ireland will work to achieve the goals and targets of the Agenda for Sustainable Development both domestically and internationally. Irelands first National Implementation Plan provided a framework for Ireland to work towards the implementation of the SDGs; the SDG Plan aims to build on the structures and mechanisms from the first National Implementation Plan and to develop and integrate additional approaches in areas identified as requiring further action.

In September 2023, the UN Summit on the SDGs took place in New York and was co-facilitated by Ireland and Qatar. Representing the halfway mark to achieving the SDGs by 2030, it marked the beginning of a new phase of accelerated progress towards the SDGs with high-level political guidance on transformative and accelerated actions. The Global Sustainable Development Report 2023[7] was published in September 2023. The previous Global Sustainable Development Report (2019[8]) found that for some targets the global community was on track, but for many others the world would need to quicken the pace. In 2023, the situation is much more worrisome owing to slow implementation and a confluence of crises. The 2023 Report goes on to highlight the current standing of each SDG and its relevant indicators. A 2023 UN Special Report[9] found that over 30% of the SDGs have seen either no improvement or reverse trends in progress. The push for transformation to achieve the SDGs will come through shifts in six key entry points:

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[5] ~~*The Sustainable Development Goals Special Report (2023)* https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf~~

[6] *National Implementation Plan for the Sustainable Development Goals 2022-2024. Available at:* <https://www.gov.ie/en/publication/e950f-national-implementation-plan-for-the-sustainable-development-goals-2022-2024/>

[7] *Global Sustainable Development Report 2023* <https://sdgs.un.org/sites/default/files/2023-09/FINAL%20GSDR%202023-Digital%20-110923_1.pdf>

[8] *Global Sustainable Development Report 2019* <https://sdgs.un.org/sites/default/files/2020-07/24797GSDR_report_2019.pdf>

[9] *The Sustainable Development Goals Report 2023: Special Edition* <https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf>

1. *Human Well Being and Capabilities*
2. *Sustainable and Just Economies*
3. *Food Systems and Healthy Nutrition*
4. *Energy Decarbonisation with Universal Access*
5. *Urban and Peri-Urban Development*
6. *Global Environmental Commons*

On the 14th of July 2025, the United Nations published '*The Sustainable Development Goals Report 2025*'[10] (hereafter referred to as the UN SDG 2025 Report) highlighting how the ongoing and escalating geopolitical conflicts, and the increasing consequences of the climate crisis have hindered the achievement of the SDGs. The UN SDG 2025 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 2023. The UN SDG 2025 Report highlights the urgent need for stronger and more effective international cooperation to maximize progress, with immediate effect.

The Proposed Project will contribute to Entry Point 4 due to the clean and renewable energy it will provide over its operational life. The phase out of fossil fuels in a manner that is globally and domestically just, while strengthening the transition to renewables by increasing energy efficiency and encouraging behavioural change will be key to achieving the relevant SDGs to the Proposed Project.

Relevant SDGs to the Proposed Project and how they are implemented into Irish National plans and policies can be found in Table 11-2.

[10] *The Sustainable Development Goals Report (2025). Available at: https://unstats.un.org/sdgs/report/2025/*

Table 11-2 Sustainable Development Goals Report 2023, Relevant SDGs to the Proposed Project, and Implementation into Irish National Plans

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
SDG 7 Affordable and Clean Energy: *Ensure access to affordable, reliable, sustainable and modern energy for all*	› By 2030, ensure universal access to affordable, reliable and modern energy services › By 2030, increase substantially the share of renewable energy in the global energy mix › By 2030, double the global rate of improvement in energy efficiency › By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology › By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	Progress towards Goal 7 has been notable: from 2015 to 2023, global electricity access rose from 87 to 92 per cent, access to clean cooking fuels increased by 16 per cent, and renewable electricity continued to grow. However, progress is slowing –renewables lag in the transport and heating sectors, and energy efficiency gains have stalled. Moreover, only a small portion of global energy investment reaches the areas most in need. Achieving Goal 7 will require a significant boost in investment in emerging and developing economies, in particular in sub-Saharan Africa, to expand access to electricity and clean cooking, scale up renewable energy, improve energy efficiency and strengthen policy and regulatory frameworks. In 2023, the global electricity access rate reached 92%, reducing the number of people without access to 666 million – 18.8 million fewer than in 2022. Despite 73 million new connections annually, population growth is outpacing progress, and 645 million may remain unserved by 2030. Achieving universal access requires increasing the annual access rate to 1.2%. In 2022, renewable energy accounted for 17.9% of total final energy consumption. Excluding traditional biomass, modern renewables grew from 10 per cent in 2015 to 13% in 2022. The electricity sector leads, with renewables at 30 per cent of total final electricity consumption in 2022. While biofuels dominate renewable transport energy, making up for almost 90% of the total, overall progress in the heat and transport sectors remains limited.	*Ireland's Transition to a Low Carbon Energy Future 2015-2030;* *Energy Poverty Action Plan;* *Ireland's Transition to a Low Carbon Energy Future 2015-2030;* *National Mitigation Plan;* *National Energy Efficiency Action Plan;* *One World, One Future;* *The Global Island* *Economic Recovery Plan* *Project Ireland 2040: National Planning Framework;* *Project 2040;* *National Development Plan 2021-2030;* *Climate Action Plan 2024*

[11] *United Nations, the 17 Goals – Sustainable Development* <https://sdgs.un.org/goals>

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
		Global renewable energy capacity per capita hit a record 478 watts in 2023, up 13% from 2022, with developed countries reaching 1,162 watts and developing countries reaching 341 watts. While developing countries showed stronger growth at 17%, compared with 8.1% in developed countries, significant expansion of modern energy infrastructure and technology remains necessary in developing countries~~The war in Ukraine and global economic uncertainty continue to cause significant volatility in energy prices, leading some countries to raise investments in renewables and others to increase reliance on coal, putting the green transition at risk.~~ ~~The share of renewable sources in total final energy consumption amounted to 19.1% globally in 2020, or 2.4 percentage points higher than in 2015. Part of this progression is due to lower final energy demand in 2020, as the pandemic disrupted social and economic activities worldwide. The electricity sector shows the largest share of renewables in total final energy consumption (28.2% in 2020) and has driven most of the growth in renewable energy use, while the heat and transport sectors have seen limited progress over the past decade.~~ ~~The rate of improvement in primary energy intensity, which had already slowed in recent years, dropped to 0.6% in 2020. This makes it the worst year for energy intensity improvement since the global financial crisis. This slowdown was influenced by a shift in the economic structure during Covid towards more energy intensive industrial production, combined with only modest rates of technical efficiency improvements, in the context of low energy prices.~~	
SDG 9: Industry,	› Develop quality, reliable, sustainable and resilient infrastructure, including regional	Since 2015, notable progress has been made in expanding infrastructure, fostering industrial growth and boosting innovation.	*National Development Plan 2021-2030;*

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
Innovation, and Infrastructure *Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation*	and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all. › Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries › Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	However, stark regional disparities persist, and many developing countries continue to face systemic barriers to inclusive and sustainable industrialization. Global manufacturing annual growth rebounded sharply by 9.2 per cent in 2021, stabilized at 2.2% in 2022, then lowered to 1.7% in 2023 owing to geopolitical and economic volatility. In 2024, growth rose to 2.%, Global manufacturing value added per capita increased by 17.3%, from $1,649 in 2015 to $1,934 in 2024. The global manufacturing employment share held steady at 14.3% from 2015 until 2020, dipping to 14.1% in 2023, owing to pandemic disruptions, geopolitical tensions and sanctions in 2024, global CO2 emissions from fuel combustion and industrial processes reached a record 37.6 gigatons, a 0.8% increase from 2023. Rising natural gas and coal consumption drove emissions, while record temperatures increased electricity demand for cooling. However, the expansion of clean energy technologies such as solar, wind and nuclear power mitigated what could have been a threefold larger emissions increase. ~~The manufacturing industry's recovery from COVID-19 remains incomplete and uneven: some high-income regions achieved record high manufacturing value added per capita in 2022 but levels in least developed countries were not much higher than the 2015 baseline.~~ ~~Global carbon dioxide (CO2) emissions from energy combustion and industrial processes grew by 0.9% in 2022 to a new all-time high of 36.8 billion tonnes. Emissions shrank by more than 5% in 2020, but rebounded past pre-pandemic levels in 2021, growing more than 6% in tandem with economic stimulus and a surge in coal demand even as renewables capacity additions scaled record heights. CO2 growth in 2022 was well below GDP growth of 3.2%.~~	*National Economic Recovery Plan;* *Climate Action Plan 2024;* *National Implementation Plan on Persistent Organic Pollutants;* *Waste Action Plan for a Circular Economy;* *National Waste Prevention Programme;* *A Better World*

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
SDG 11: Sustainable Cities and Communities *Make cities and human settlements inclusive, safe, resilient and sustainable*	› By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums › By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons › Strengthen efforts to protect and safeguard the world's cultural and natural heritage › By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Urbanization continues to accelerate, with more than half the global population now living in cities, projected to be nearly 70% by 2050. However, cities face mounting challenges, including rising urban poverty, growing slum populations, inadequate public transport and threats to infrastructure from disasters. Housing affordability is a pressing issue, affecting 1.6 billion to 3 billion people globally, encompassing challenges from homelessness to overcrowding and lack of basic services. In 2023, the national urban policies of 68 countries addressed key development issues as follows: › respond to population dynamics (59 countries, up from 54 in 2021); › ensure balanced territorial development (55 countries, unchanged since 2021); and › increase local fiscal space (33 countries, up from 26 in 2021). In 2024, local-level disaster risk reduction governance improved, with 110 countries reporting local disaster risk reduction strategies and approximately 73% of local governments having such strategies in place ~~Climate change, the pandemic, and conflicts tend to have a disproportionate impact on cities. These factors mean that the world is far from achieving the goal of sustainable cities. In many developing countries, slum populations have been growing, putting at risk the target of adequate housing for all by 2030. Since 2015, the number of countries with national disaster risk reduction strategies has more than doubled.~~	*Rebuilding Ireland Action Plan for Housing and Homelessness;* *Housing for All;* *EU Regulation 1370/2007 on Public Passenger Transport Services by Rail and by Road;* *Project Ireland 2040 National Planning Framework;* *National Clean Air Strategy;* *Rural Development Programme 2014-2022;* *National Implementation Plan on Persistent Organic Pollutants;* *Waste Action Plan for a Circular Economy;* *National Waste Prevention Programme;* *A Better World*

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
		~~According to 2022 data from 1,507 cities in 126 countries, only 51.6% of the world's urban population has convenient access to public transport, with considerable variations across regions.~~ ~~Data for 2020 from 1,072 cities in 120 countries indicate that more than three quarters of these cities have less than 20% of their area dedicated to open public spaces and streets, about half of the proportion recommended.~~ ~~By the end of 2022, 102 countries reported having local governments with disaster risk reduction strategies, an increase from 51 countries in 2015.~~	
SDG 12 Responsible Consumption and production: *Ensure sustainable consumption and production patterns.*	› By 2030, achieve the sustainable management and efficient use of natural resources. › By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment › Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	Globally, sustainability efforts are advancing, with an increasing number of policies supporting sustainable consumption and production. Environmental agreement compliance remains strong. However, challenges persist, including low sustainable e-waste management and high fossil fuel subsidies. Corporate sustainability reporting has expanded dramatically, with most large companies now disclosing environmental performance through standardized mechanisms. As of 2025, 530 policy instruments related to sustainable consumption and production have been recorded, with 71 countries participating, a 6% increase from the previous reporting cycle. There were 1.05 billion tons of food wasted in 2022, with 60% of waste from households, equating to more than 1 billion meals discarded daily. There are growing global efforts to reduce food waste, with countries such as Japan and the United Kingdom of Great Britain and	*National Implementation Plan on Persistent Organic Pollutants;* *Waste Action Plan for a Circular Economy;* *National Waste Prevention Programme;* *Climate Action Plan 2024* *Tourism Action Plan;* *National Clean Air Strategy;* *Towards Responsible Business: Ireland's Second National Plan on Corporate Social Responsibility (CSR) 2017-2020;* *Sustainable, Inclusive and Empowered Communities 2019-2024;*

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
	› Promote public procurement practices that are sustainable, in accordance with national policies and priorities. › Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	Northern Ireland cutting waste by 31% and 18%, respectively, showing that large-scale action is possible. In 2022, global e-waste reached a record 7.8 kg per capita, with only 22.3% properly managed, a figure declining since 2010. Significant uncontrolled transboundary movement continues. Sustainability reporting has become standard for large companies, with 96% of the world's 250 largest companies by revenue and 79% of the top 100 companies in each country surveyed now reporting on sustainability, up from 64% in 2015. In 2023, fossil fuel subsidies fell by 34.47% to $1.10 trillion, down from a record $1.68 trillion in 2022, owing mainly to lower energy prices and the end of COVID-19 support measures. However, subsidies are still approximately three times higher than they were before the COVID-19 pandemic, showing no sustained reversal of recent trends. ~~Unsustainable patterns of consumption and production are the root cause of the triple planetary crisis:~~ ~~› Climate Change~~ ~~› Biodiversity Loss~~ ~~› Pollution~~ ~~The world is seriously off track in its effort to halve per capita food waste and losses by 2030.The COVID-19 pandemic has had significant impacts on consumption and production patterns, with disruptions to global supply chains and changes in consumer behaviour. Responsible consumption and production must be an integral part of the recovery from the pandemic. But the global economy also needs to speed up the decoupling of economic growth from resource use by maximizing the~~	

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
		~~socio-economic benefits of resources while minimizing their negative impacts. Reporting on corporate sustainability has tripled since the beginning of the SDG period, but the private sector will need to significantly improve reporting on activities that contribute to the SDGs.~~ ~~Global data showed a rise in fossil fuel subsidies in 2021, after a brief fall in 2020 which was largely caused by a drop in energy prices. In 2021, Governments spent an estimated $732 billion on subsidies to coal, oil, and gas, against $375 billion in 2020. This brings the subsidies back to pre-2015 levels. High oil and gas prices in 2022 will likely bring a new increase, as subsidies are often linked to the price of energy.~~	
SDG 13 Climate Action: *Take urgent action to combat climate change and its impacts** **Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.*	› Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries › Integrate climate change measures into national policies, strategies and planning › Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Human-induced climate change reached alarming new levels in 2024, with some impacts already irreversible for centuries. Global temperatures broke records and temporarily exceeded the 1.5°C threshold, highlighting the urgent need to curb greenhouse gas emissions. Extreme weather events – including tropical cyclones, floods and droughts – led to the highest number of new displacements in 16 years, worsening food crises and bringing massive economic losses and social instability. Nonetheless, with bold action, limiting long-term global warming to 1.5°C is still possible. Every fraction of a degree matters in reducing risks, lowering costs and preventing catastrophic and irreversible damage to people and the planet. At the twenty-ninth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, States set a new collective quantified goal on climate finance and completed guidance to fully operationalize article 6 of the Paris Agreement on carbon markets, along with making additional commitments on mitigation, adaptation and the operationalization of the Fund for Responding to Loss and Damage.	*National Adaptation Framework;* *Building on Recovery: Infrastructure and Capital Investment 2016-2021;* *National Mitigation Plan;* *National Biodiversity Action Plan 2017-2021;* *National Policy Position on Climate Action and Low Carbon Development;* *Project 2040: National Development Plan 2021-2030;* *Climate Action Plan 2024;* *National Dialogue on Climate Action;* *Agriculture, Forest, and Seafood Climate Change sectoral Adaptation Plan;*

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
		Disaster-related deaths and missing persons dropped from 1.61 per 100,000 population in the period 2005–2014 to 0.79 in the period 2014–2023. Nonetheless, disasters claimed 41,647 lives annually over the past decade. The number of people affected by disasters surged by more than two thirds, from 1,158 per 100,000 population in the period 2005–2014 to 2,028 in the period 2014–2023, with an average of 124 million people affected every year over the past decade. By 2024, 131 countries reported the adoption and implementation of national disaster risk reduction strategies, up from 57 in 2015. 2024 likely marked the first year when global temperatures surpassed the 1.5°C threshold, reaching 1.55°C above the pre-industrial level – making it the hottest year in 175 years. This was driven by rising greenhouse gas emissions, El Niño and other factors. In 2023, atmospheric concentrations of CO_2 levels remained at their highest in more than 2 million years and were 151 per cent above pre-industrial levels. ~~The world is on the brink of a climate catastrophe and current actions and plans to address the crisis are insufficient. Without transformative action starting now and within this decade to reduce greenhouse gas emissions deeply and rapidly in all sectors, the 1.5°C target will be at risk and with it the lives of more than 3 billion people. Failure to act leads to intensifying heatwaves, droughts, flooding, wildfires, sea level rise, and famines. Emissions should already be decreasing now and will need to be cut almost by half by 2030 – a mere seven years from now.~~ ~~Global temperatures have already hit 1.1°C, rising due to increasing global greenhouse gas emissions, which reached record highs in 2021. Real time data from 2022 show emissions continuing an upward~~	*The National Strategy on Education for Sustainable Development in Ireland*

SDG	Targets	International Progress/Downfalls to Date (2025~~3~~)[11]	National Relevant Policy
		~~trajectory. Instead of decreasing emissions as required by the target to limit warming, carbon dioxide levels increased from 2020 to 2021 at a rate higher than the average annual growth rate of the last decade and is already 149% higher than pre-industrial levels. Projected cumulative future CO2 emissions over the lifetime of existing and currently planned fossil fuel infrastructure exceed the total cumulative net CO2 emissions in pathways that limit warming to 1.5°C (>50%) with no or limited overshoot.~~	

11.2.1.4 Climate Change Performance Index ~~2024~~

Established in 2005, the Climate Change Performance Index (CCPI)[12] is an independent monitoring tool which tracks countries climate protection performance. It assesses individual countries based on climate policies, energy usage per capita, renewable energy implementation and greenhouse gas emissions and ranks their performance in each category and overall. The 2025 4 CCPI was published in December 20243. While the CCPI 20254 indicates signs of potential reductions in global emissions, no country achieved its Paris Climate targets and therefore the first three places of the ranking system remain unoccupied.

Ireland, ranked 43rd in 2024, has risen 14 places to 29th for 2025, and is now considered a 'medium' performer in international performance ~~Ireland, ranked 37th in 2023, has fallen 6 places to 43rd for 2024, and remains as a "low" 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. Ireland has remained in the 'low' category in 2025 on the Greenhouse Gas Emissions ratings ~~Rebound effects from economic growth in emissions-intensive sectors (such as agriculture and land use) cause absolute emissions to remain high. The chance to integrate clear sanctions into the framework has so far been missed.~~

In 2022, Ireland's government introduced legally binding five-year carbon budgets and sectoral emissions ceilings. It also resolved a legislative framework with annually revised Climate Action Plans to align with the country's 2030 net emissions reduction target of 51% (compared with 2018 levels) and net zero by 2050. The CCPI national experts note that, despite these legal requirements,
the policy implementation remains problematic. Recent EPA projections indicate that while considerable emissions decline in 2023 (6.8%) brought Ireland closer to achieving its first carbon budget, the lack of substantial progress makes it unlikely Ireland will meet its second carbon budget in 2026–2030.

The CCPI experts indicate an urgent need for port infrastructure and grid strengthening to ensure medium-to-long-term offshore wind expansion and heating and transport electrification. Coupled with low levels of battery storage and ongoing gas connections, the state is set to remain greatly dependent on fossil fuel generation ~~However, the CCPI experts welcome Ireland's medium-term offshore wind and solar plans. The country's offshore wind offers considerable opportunities for capitalising on renewable energy and (over the long term) potential for electricity export.~~

Ireland has remained in the 'low' category in 2025 on the Greenhouse Gas Emissions ratings and has risen from 54th in 2024 to 40th in 2025. Ireland remains in the 'Medium' category in the Renewable Energy rating table and has risen from 31st in 2024 to 21st in 2025. ~~Ireland has moved to the 'low' category in 2024 from the 'very low' category in 2023 on the Greenhouse Gas Emissions ratings despite falling to 54th in 2024 in the world from 47th in 2023. Ireland remains in the 'Medium' category in the Renewable Energy rating table; however, Ireland has fallen from 23rd in 2023 to 31st in 2024.~~

11.2.1.5 State of the Global Climate 2024

The '*State of the Climate 2024 Update for COP29*'[13] report states that renewable energy generation, primarily driven by the dynamic forces of solar radiation, wind and the water cycle, has surged to the forefront of climate action for its potential to achieve decarbonization targets. There has been a substantial worldwide energy transition, with global renewable capacity expected to grow by 2.7 times by 2030, surpassing countries' current ambitions by nearly 25%, but it still falls short of tripling.[14] This growth represents the highest rate observed in the past two decades, signalling a significant momentum

[12] *Climate Change Performance Index 2024* <https://ccpi.org/>
[13] *WMO (2024) State of the Climate 2024 Update for COP29* <https://wmo.int/publication-series/state-of-climate-2024-update-cop29>
[14] *IEA (2024), Renewables 2023, IEA, Paris* <https://www.iea.org/reports/renewables-2024>

toward achieving the clean energy goal set at COP28 meeting in 2023 to triple renewable energy capacity globally to 11,000 GW by 2030.

In March 2025, the World Meteorological Organisation (WMO) published a report entitled the '*State of the Global Climate 2024*.[15] 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:

- 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.
- The year 2024 was the warmest year in the 175-year observational record, clearly surpassing the previous warmest year, 2023 at 1.45 °C ± 0.12 °C above the 1850–1900 average.
- In 2024, global mean sea level reached a record high in the satellite record (from 1993 to present).
    - The rate of global mean sea-level rise in the past 10 years (2015–2024) was more than twice the rate of sea-level rise in the first decade of the satellite record (1993–2002).

Alterations in the physical climate can trigger a series of repercussions on national advancement and the pursuit of SDGs (Section 1.1.3 above). The interconnections between the climate emergency and development pathways can foster synergistic endeavours, resulting in positive benefits for communities and human well-being (refer to Chapter 5 of the EIAR for more details). This synergy serves as a potent driver for adapt to climate change and lay the groundwork for the global energy transition. Emphasizing wind energy and other renewable sources enables the global energy transition towards sustainability.

11.2.1.6 Renewable Energy Directive

The Renewable Energy Directive (RED) is the legal framework for the development of clean energy across all sectors of the EU economy, supporting cooperation between EU countries towards this goal.

The first RED[16] is legislation that influenced the growth of renewable energy in the EU and Ireland for the decade ending in 2020. The directive set and confirmed mandatory national targets consistent with the EU's overall goal. It also required EU countries to develop indicative trajectories for achieving their targets, submit national renewable energy action plans and publish national renewable energy progress reports every two years.

In 2018, as part of the 'Clean Energy for all Europeans' package, the first revision of RED entered into force (the second Renewable Energy Directive (REDII)[17]) which continued 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. This directive, which had to be transposed into national law by EU countries by June 2021, established a new binding renewable energy target for the EU of at least 32% of gross final energy consumption by 2030, along with an increased target of 14% for the share of renewable fuels in transport by 2030.

[15] *WMO (2025) State of the Global Climate 2024 <https://library.wmo.int/records/item/69455-state-of-the-global-climate-2024>*
[16] *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*
[17] *Directive (EU) 2018/2001 on the promotion of the use of energy from renewable resources (recast). Available from: https://eurlex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L2001*

Under REDII, Ireland's National Energy and Climate Plan 2021-2030 included a planned renewable energy share in electricity (RES-E) of 70% in 2030, which has been replaced by the 80% by 2030 RES-E target as detailed in the most recent Climate Action Plan (2024).

Given the need to ratchet up the EUs clean energy transition, RED was revised in 2023, and the amending Directive EU/2023/2413 (REDIII)[18] entered into force on 20 November 2023. REDIII amended the EU-wide overall 2030 RES target from 32% to at least 42.5%, and it is assumed that Irelands 2030 RES target will increase accordingly. REDIII establishes the following sectoral and innovation targets for EU countries:

- In the industry sector, a binding target of 42% for renewable hydrogen in total hydrogen consumption by 2030 and 60% by 2035, with an indicative target of an annual average increase of 1.6 percentage points in renewable sources.
- In the buildings sector, an indicative target of 49% for the share of renewable energy by 2030, with heating and cooling targets to increase by 0.8 percentage points per year until 2025 and by 1.1 percentage points from 2026 to 2030.
- In the transport sector, either a 29% target for the share of renewable energy by 2030, or a 14.5% reduction of greenhouse gas emissions, through greater use of advanced biofuels and renewable fuels of non-biological origin (RFNBO), such as hydrogen.
- In research and innovation, an indicative target of 5% of newly installed renewable energy capacity from innovative technologies by 2030.

11.2.1.7 European Green Deal

The European Green Deal was introduced by the European Commission in December 2019 as the EUs response to the Paris Agreement ambitions (COP21 (please see section 11.2.1.2.1 above)). 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.

Key aspects of the European Green Deal include the adoption of the European Climate Law, which legally binds the EU to achieve net-zero emissions by 2050, and the establishment of a Carbon Border Adjustment Mechanism to prevent carbon leakage. Additionally, the Deal focuses on boosting green technologies, fostering clean energy, improving energy efficiency, and promoting biodiversity and sustainable agriculture.

To finance these ambitious goals, the European Green Deal is supported by the EU's Green Deal Investment Plan, also known as the "Just Transition Mechanism," which aims to mobilize at least €1 trillion in investments over the next decade. This funding will be used to help EU regions and industries transition to greener alternatives while mitigating social and economic impacts on communities and workers. The European Green Deal also emphasizes the importance of international collaboration in tackling climate change and aims to align European policies with the global agenda of the Paris Agreement.

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 European 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.

[18] *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*

11.2.1.8 Council Regulation (EU) 2022/2577 and 2024/223

Arising from REPowerEU, Council Regulation (EU) 2022/2577 laying down a framework to accelerate the deployment of renewable energy was adopted on the 22 December 2022. Regulation 2022/2577 came into effect on the 23 December 2022 and has effect until the 30 June 2024. The Regulation made provision for a review by the European Commission within 12 months. Following this review the Council introduced Regulation 2024/223 on the 22 December 2023 amending Regulation 2022/2577. Regulation 2022/2577 and 2024/223 recognises the relative importance of renewable energy deployment in the current difficult energy context and provides significant policy and legislative support to enabling renewable energy projects.

Article 2(2) of Regulation EU 2022/2577 requires priority to be given to projects that are recognised as being of overriding public interest whenever the balancing of legal interests is required in individual cases and where those projects introduce additional compensation requirements for species protection. An analogous provision is not present in Directive (EU) 2018/2001. The first sentence of Article 3(2) of Regulation (EU) 2022/2577 has the potential, in the current urgent and still unstable energy situation on the energy market which the Union is facing, to further accelerate renewable energy projects since it requires Member States to promote those renewable energy projects by giving them priority when dealing with different conflicting interests beyond environmental matters in the context of Member States' planning and the permit-granting process. The European Commission's report demonstrated the value of the first sentence of Article 3(2) of Regulation (EU) 2022/2577 which beyond the specific objectives of the derogations foreseen in the Directives referred to in Article 3(1) of Regulation (EU) 2022/2577. (emphasis added).

11.2.1.9 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 European Commission within two years of the Regulation coming into force (by mid-2026), showing how they will deliver on the targets. They will also be required to monitor and report on their progress.

11.2.1.10 EU Effort Sharing Regulation

The EU Effort Sharing Regulation (ESR[19]) was adopted in 2018 and establishes annual binding greenhouse gas emissions targets from 2020 to 2030 for each Member State. In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 43% by 2030,

[19] *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)*

relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 43% in greenhouse gas emissions is achieved at EU-level[20]. Emissions from all other sectors, including buildings, agriculture, waste, small industry, and transport, which account for around 60% of EU emission, are covered by the EU ESR.

The EU ESR focus on national accountability helps drive climate action at the local level while maintaining flexibility to account for economic disparities across Member States.

Considerable progress has been made in the decarbonisation of the electricity sector, with emissions falling by 45% between 2001 and 2022.[21] The decarbonisation of the Electricity Sector has been made possible through the deployment of renewables and their successful integration into the national grid, further facilitating the decarbonisation other sectors, such as transport, heating and industry as they look towards electrification

11.2.2 National Greenhouse Gas Emission and Climate Targets

11.2.2.1 Programme for Government

The Programme for Government 2025 – Securing Ireland's Future (January 2025) places specific emphasis on climate change, recognising that time is critical in addressing the climate crisis. The Programme states that the Government is committed to taking *"decisive action to radically reduce our reliance on fossil fuels and to achieve a 51% reduction in emissions from 2018 to 2030, and to achieving net-zero emissions no later than 2050".*

The Programme states that the next ten years are a critical period in addressing the climate crisis, and therefore, a deliberate and swift approach to reducing more than half of Ireland's carbon emissions over the course of the decade (2020-2030) must be implemented. The programme states 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.

With regard to renewable energy generation, the Programme notes that the Government is committed to the rapid decarbonisation of the energy sector. The Programme states the Government's ongoing support and commitment to take "*the necessary action to deliver at least 70% renewable electricity by 2030".* This target has been updated by Climate Action Plan 2025 (Section 11.2.2.7 below). ~~The Programme for Government was published in October 2020 and last updated July 2021. In relation to climate change the programme recognises that the next ten years are a critical period in addressing the climate crisis. It is an ambition of the programme to more than halve carbon emissions over the course of the decade (2020-2030). 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 also recognises the severity of the climate challenge as it clarifies that:~~

11.2.2.2 Climate Action and Low Carbon Development Act 2015

The Climate Action and Low Carbon Development Act 2015 established Ireland's first statutory framework for tackling climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy. The 2015 Act Defined the national climate objective as

[20] *Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024 https://www.gov.ie/en/publication/79659-climate-action-plan-2024/*
[21] *Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024 https://www.gov.ie/en/publication/79659-climate-action-plan-2024/*

'transitioning to a climate-resilient, biodiversity-rich, environmentally sustainable, and climate-neutral economy by 2050'. To achieve this, the 2015 Act requires the Minister to develop and submit for government approval a suite of plans: carbon budgets, sectoral emission ceilings, a climate action plan, a national long-term climate strategy, and a national adaptation framework. It also established the Climate Change Advisory Council (CCAC) to provide independent oversight and annual progress reviews. Local authorities and public bodies were mandated to align policies and plans with these objectives, ensuring climate considerations are integrated throughout national and local governance structures.

~~*"Climate change is the single greatest threat facing humanity".*~~

11.2.2.3 Climate Action and Low Carbon Development (Amendment) Act 2021

The Climate Action and Low Carbon (Amendment) Act 2021 (the '2021 Act') 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 2021 Act will manage the implementation of a suite of policies to assist in achieving these annual targets.

The 2021 Act includes the following key elements, among others:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy.
- Embeds the process of carbon budgeting into law, the Government are required to adopt a series of economy-wide five-year carbon budgets, including sectoral targets for each relevant sector, on a rolling 15-year basis, starting in 2021.
- Actions for each sector will be detailed in the Climate Action Plan, updated annually.
- A National Long Term Climate Action Strategy will be prepared every five years.
- Government Ministers will be responsible for achieving the legally binding targets for their own sectoral area with each Minister accounting for their performance towards sectoral targets and actions before an Oireachtas Committee each year.
- Strengthens the role of the Climate Change Advisory Council, tasking it with proposing carbon budgets to the Minister.

Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment.

11.2.2.4 Climate Change Advisory Council 2023

The Climate Change Advisory Council (CCAC) was established on 18th January 2016 under the Climate Action and Low Carbon Development Act 2015. The CCAC aims to provide independent evidence-based advice and recommendations on policy to support Ireland's Just Transition to a biodiversity-rich, environmentally sustainable, climate-neutral, and resilient society.

In July 2023, the CCAC published the 2023 Annual Review[22], this is the seventh annual review carried out by CCAC and details the CCAC concerns that the necessary national actions are not taking place

[22] *Climate Change Advisory Council 2023 Review* <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR-2023-FINAL%20Compressed%20web.pdf>

or being enabled at the required speed, going on to state that 'at the current rate of policy implementation, Ireland will not meet the targets set in the first and second carbon budget periods unless urgent action is taken immediately, and emissions begin to fall much more rapidly.'

In 2024 the CCAC has changed it approach to produce sector specific annual reviews in order to emphasise the requirement for greater effort across all sectors to remain within their sectoral emission ceiling. In a statement released on 9th July 2024 the CCAC state that while '*the provisional greenhouse gas emissions data published today by the EPA shows some positive results across the sectors but overall, it is increasingly unlikely that the first carbon budget will be achieved. Much more urgent action is required from Government if Ireland is to achieve its climate change objectives.*'[23]

The Annual Review 2025: Electricity[24] report has been released by the CCAC and focuses specifically on key findings and recommendations for the Electricity sector. In 2024, emissions from the sector reduced by approximately 7% from 2023 to the lowest level since records began in 1990. This was driven by a continued decline in the use of coal for electricity generation, coupled with a notable rise in imported electricity for the second consecutive year. Renewable energy is still not being rolled out fast enough, and insufficient investment in the electricity grid means that some of the renewable energy we currently generate cannot be used. Emissions are currently projected to exceed the sectoral emissions ceiling, even in the most optimistic scenario.

Renewables accounted for 40% of electricity demand in 2024, with total wind generation at 11.1 TWh in 2024, constituting 33% of electricity generated in Ireland, a 0.3 TWh or 2% decrease from 2023. However, solar saw the largest year-on-year percentage increase of any generation source, increasing by 74% in 2024 or 0.3 TWh, now accounting for 0.7 TWh or 2.1% of national electricity generation.

11.2.2.5 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 Table 11-3.

Table 11-3 Proposed Carbon Budgets of the Climate Change Advisory Council

	2021 – 2025 Carbon Budget 1	2026 – 2030 Carbon Budget 2	2031 – 2035 Provisional Carbon Budget 3
	All Gases		
Carbon Budget (Mt CO_2eq)	295	200	151
Annual Average Percentage Change in Emissions	-4.8%	-8.3%	-3.5%
The figures are consistent with emissions in 2018 of 68.3 Mt CO_2eq reducing to 33.5 Mt CO_2eq in 2030 thus allowing compliance with the 51% emissions reduction target by 2030			

[23] https://www.climatecouncil.ie/news/chairs-statement-irelands-provisional-greenhouse-gas-emissions-1990-2023.htmle
[24] Climate Change Advisory Council (2025) Annual Report 2025: Electricity <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR2025-Electricity-FINAL.pdf>

Most recent data from the EPA indicated that from 2021- 2024 Ireland has used 82.5% (243.3 Mt CO2eq) of the 295 Mt CO2eq Carbon Budget for the five-year period 2021-2025.[25] A reduction of 10.3% in national emissions is now required in 2025 to stay within budget.

11.2.2.6 Sectoral Emissions Ceilings

The Sectoral Emissions Ceilings were launched in September 2022. The objective of the initiative is to inform on the total amount of permitted greenhouse gas emissions that each sector of the Irish economy can produce during a specific time period. 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.

Section C of the Climate Action and Low Carbon Development (Amendment) Act 2021 provides the minister with a method of preparing the Sectoral Emissions Ceiling within the bounds of the carbon budget. The Sectoral Emission Ceilings for each 5-year carbon budget period was approved by the government on the 28th of July 2022 and are shown in Table 11-4 below.

Table 11-4 Sectoral Emission Ceilings 2022

	Sectoral Emission Ceilings for each 5-year carbon budget period (MtCO2eq.)	
Sector	2021 – 2025 Carbon Budget 1	2026 – 2030 Carbon Budget 2
Electricity	40	20
Transport	54	37
Built Environment-Residential	29	23
Built Environment-Commercial	7	5
Industry	30	24
Agriculture	106	96
LULUCF[1]	Yet to be determined	Yet to be determined
Other (F-Gases, Waste & Petroleum refining)	9	8
Unallocated Savings		*-26*
Total[2]	Yet to be determined	Yet to be determined
Legally binding Carbon budgets and 2030 Emission Reduction Targets	295	200

[1] *Finalising the Sectoral Emissions Ceiling for the land-use, Land-use Change and Forestry (LULUCF) sector has been deferred for up to 18 months to allow for the completion of the Land-use Strategy*
[2] *Once LULUCF sector figures are finalised, total figures will be available.*

[25] *EPA (2025) Irelands Provisional Greenhouse Gas Emissions 1990-2024*

The electricity sector is the third largest emitting sector in Ireland, and the successful decarbonisation of this sector could lead to decarbonisation in other sectors, such as the electrification of transport and heating. The CCAC 2023 Annual Review, detailed above, stated that the electricity sector had been set one of the smallest sectoral emission ceilings and the steepest decline in emissions of all sectors with emission ceilings of 40MtCO$_2$eq for the first carbon budget period (2021–2025) and 20MtCO$_2$eq for the second carbon budget period (2026–2030). This equates to a headline target of a 75% reduction in emissions in the sector from 2018 levels by 2030, which will be achieved by increasing the share of renewable electricity to 80%, encompassing 9GW of onshore wind capacity, at least 5GW of offshore wind capacity, with 2 GW earmarked for green hydrogen production, and 8GW of solar photovoltaic capacity, supported by a range of actions set out in the Climate Action Plan 2024.

The Annual Review 2025: Electricity, detailed above in Section 11.3.2.3 stated that the EPA's latest greenhouse gas emissions inventory and projections reports estimate a cumulative overshoot of 5 MtCO2eq (9%) of Electricity's sectoral emission ceiling by 2030, achieving a 65% reduction on 2018 levels against the target of 75%. This points to expensive compliance costs, as outlined in the Council's joint paper with the Irish Fiscal Advisory Council.[26]

Accelerated deployment of onshore wind and solar electricity generation is crucial if the Electricity sector is to meet its sectoral emissions ceiling for the first carbon budget period, whilst also looking forward to the second carbon budget period. Approximately 1.6 GW of onshore wind (0.7 GW) and solar (about 0.9 GW) electricity projects received planning permission during 2024. If all these projects progress through to development, they could deliver 15% of the increase in onshore renewable capacity required to achieve the 2030 targets. While delays remain prevalent in the planning process, 2024 saw 22 decisions made on onshore wind farm projects by An Coimisiún Pleanála (formerly An Bord Pleanála), a welcome 16% annual increase on 2023.

~~The electricity sector is the third largest emitting sector in Ireland and the successful decarbonisation of this sector could lead to decarbonisation in other sectors, such as the electrification of transport and heating. The CCAC 2023 Annual Review states that the electricity sector has been set one of the smallest sectoral emission ceilings and the steepest decline in emissions of all sectors with emission ceilings of 40MtCO$_2$eq for the first carbon budget period (2021–2025) and 20MtCO$_2$eq for the second carbon budget period (2026–2030). This equates to a headline target of a 75% reduction in emissions in the sector from 2018 levels by 2030, which will be achieved by increasing the share of renewable electricity to 80%, encompassing 9GW of onshore wind capacity, at least 5GW of offshore wind capacity, with 2 GW earmarked for green hydrogen production, and 8GW of solar photovoltaic capacity, supported by a range of actions set out in the Climate Action Plan 2024.~~

11.2.2.7 Climate Action Plan 2025~~4~~

The National Climate Action Plan 2025 (CAP 2025)[27] was launched in April 2025. CAP 2025 marks the fourth update to the Climate Action Plan 2019, and the third to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and the introduction of the 2022 Sectoral Emissions Ceilings (SEC) and the establishment of economy-wide carbon budgets.

CAP 2025 seeks to build on the progress made under Climate Action Plan 2024 by delivering policies, measurements and actions that will support the achievement of Irelands carbon budgets, sectoral emission ceilings, and 2030 and 2050 climate targets; while further enabling the closure of identified emissions gaps and the allocation of unallocated emission savings associated with each carbon budget period.

[26] https://www.climatecouncil.ie/news/a-colossal-missed-opportunity--irelands-climate-action-and-the-potential-costs-of-missing-targets.html
[27] ehttps://www.gov.ie/en/department-of-the-environment-climate-and-communications/publications/climate-action-plan-2025/

Building on previous iterations, CAP 2025 offers a detailed sector-by-sector roadmap outlining the key actions required to transition Ireland to a low-carbon society and reaffirms the goals of a 51% reduction in greenhouse gas emissions by 2030 and reaching climate neutrality no later than 2050. Major measures include a significant scale-up of renewable energy, especially wind and solar power, extensive retrofitting of homes to improve energy efficiency, support for nearly one million electric vehicles by 2030, and reforms in agriculture and land use aimed at promoting sustainability. CAP 2025 also emphasises public engagement, a just transition, and effective carbon pricing to ensure that the costs and benefits of climate action are distributed equitably across society. As with Climate Action Plan 2024, CAP 2025 provides an Annex of Actions[28], which only contain new, high-impact actions for delivery in 2025. The full set of measures for CAP 2025 (i.e., proposed new actions and existing actions) are still located within CAP 2025.

~~The National Climate Action Plan 2024 (CAP 2024)[29] was launched in December 2023. Following on from Climate Action Plans 2019, 2021, and 2023, CAP 2024 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 2024 seeks to build on the progress made under Climate Action Plan 2023 by delivering policies, measurements and actions that will support the achievement of Irelands carbon budgets, sectoral emission ceilings, and 2030 and 2050 climate targets; while further enabling the closure of identified emissions gaps and the allocation of unallocated emission savings associated with each carbon budget period.~~

Six Vital High Impact Sectors were identified within Climate Action Plan 2023[30] relating to the sectoral emission ceilings (Section 11.3.2.5 above). These sectors and their associated targets are as follows:

Powering Renewables – 75% Reduction in emissions by 2030

We will facilitate a large-scale deployment of renewables that will be critical to decarbonising the power sector as well as enabling the electrification of other technologies.

- *Accelerate the delivery of onshore wind, offshore wind, and solar.*
- *Dial up to 9 GW onshore wind, 8 GW solar, and at least 7 GW of offshore wind by 2030 (with 2 GW earmarked for green hydrogen production).*
- *Support at least 500 MW of local community-based renewable energy projects and increased levels of new micro-generation and small-scale generation.*
- *Phase out and end the use of coal and peat in electricity generation.*
- *New, dynamic Green Electricity Tariff will be developed by 2025 to incentivise people to use lower cost renewable electricity at times of high wind and solar generation.*

Achievement of the 75% reduction in emissions by 2030 and the decarbonisation of the grid in Ireland would assist in the achievement of the Electricity sectoral emission ceiling.

Building Better – 45% (Commercial/Public) and 40% (Residential) Reduction in Emissions by 2030

We will increase the energy efficiency of existing buildings, put in place policies to deliver zero-emissions new builds, and continue to ramp up our retrofitting programme.

[28] https://assets.gov.ie/static/documents/Climate_Action_Plan_2025_-_Annex_of_Actions.pdf
[29] ~~Department of the Environment, Climate and Communications (2023) Climate Action Plan 2024. Available at: https://www.gov.ie/en/publication/79659-climate-action-plan-2024/#new-approach-to-the-2024-annex-of-actions~~
[30] *Department of the Environment, Climate and Communications (2022) Climate Action Plan 2023 – Summary Document*

- Ramp up retrofitting to 120,000 dwellings to BER B2 by 2025, jumping to 500,000 by 2030.
- Put heat pumps into 45,000 existing and 170,000 new dwellings by 2025, up to 400,000 existing and 280,000 new dwellings by 2030.
- Generation up to 0.8 TWh of district heating by 2025 and up to 2.5 TWh by 2030.

Achievement of the 45% (Commercial/Public) and 40% (Residential) reduction in emissions by 2030 would assist in the achievement of the Built Environment (Commercial/Residential) sectoral emission ceiling.

Turning Transport Around – 50% Reduction in Emissions by 2030

We will drive policies to reduce transport emissions by improving our town, cities, and rural planning, and by adopting the Avoid-Shift-Improve approach: reducing or avoiding the need for travel, shifting to public transport, walking, and cycling and improving the energy efficiency of vehicles.

- Change the way we use our road space.
- Reduce the total distance driven across all car journeys by 20%.
- Walking, cycling and public transport to account for 50% of our journeys.
- Nearly 1 in 3 private cars will be an Electric Vehicle.
- Increase walking and cycling networks.
- 70% of people in rural Ireland will have buses that provide at least 3 trips to the nearby town daily by 2030.

Achievement of the 50% reduction in emissions relating to transport by 2030 would assist in the achievement of the Transport sectoral emission ceiling.

Making Family Farms More Sustainable – 25% Reduction in Emissions by 2030

We will support farmers to continue to produce world class, safe and nutritious food while also seeking to diversify income through tillage, energy generation and forestry.

- Significantly reduce our use of chemical nitrogen as a fertilizer.
- Increase uptake of protected urea on grassland farms to 90-100%.
- Increase organic farming to up to 450,000 hectares, the area of tillage to up to 400,000 ha.
- Expand the indigenous biomethane sector through anaerobic digestion, reaching up to 5.7TWh of biomethane.
- Contribute to delivery of the land use targets for afforestation and reduced management intensity of organic soils.

Achievement of a 25% reduction in emissions by 2030 in agriculture and farming practices would assist in the achievement of the Agriculture sectoral emission ceiling.

Greening Business and Enterprise – 35% Reduction in Emissions by 2030

We're changing how we produce, consume, and design our goods and services by breaking the link between fossil fuels and economic progress. Decarbonising industry and enterprise are key to Ireland's economy and future competitiveness.

- Reduce clinker content in cement and substitute products with lower carbon content for construction materials, ensuring 35% reduction in emissions by 2030 (against 2018).
- Reduce fossil fuel use from 64% of final consumption (2021) to 45% by 2025 and further by 2030.

- Increase total share of heating to carbon neutral to 50-55% by 2025, up to 70-75% by 2030.
- Significantly grow the circular economy and bioeconomy.

Achievement of a 35% reduction in emissions by 2030 in relation to Irish production and consumption would enable a more circular economy and assist in the achievement of the Industry and Other sectoral emission ceilings.

Changing our land use

The first phase of the land use review will tell us how we are using our land now. Then, we can map, with evidence, how it can be used most effectively to capture and store carbon and to produce better, greener food and energy.

- Increase our annual afforestation rates to 8,000 hectares per annum from 2023 onwards.
- Rethink our Forestry Programme and Vision.
- Promote forest management initiatives in both public and private forests to increase carbon sinks and stores.
- Improve carbon sequestration of 450,000 ha of grasslands on mineral soils and reduce the management intensity of grasslands on 80,000 ha of drained organic soils.
- Rehabilitate 77,600 hectares of peatlands.

Exact reduction target for this sector is yet to be determined. By improving the manner in which Ireland utilises its land use, Ireland can achieve emission reductions and mitigate the ongoing climate and biodiversity crisis's. The LULUCF sectoral emission ceiling will be set after completion of the Land-use Strategy.

CAP 2024 provides a more enhanced sectoral breakdown of these Vital High Impact Sectors as the majority have since developed their own independent, but complimentary, analytical approaches to emissions reductions.

Climate Sectoral Adaptation Planning includes for 12 sectoral adaptation plans that describe and assess the extent of the risks presented by climate change to a sector, and present contingency plans to address these risks and ensure climate resilience. They include actions to mainstream adaptation into policy and administration at sectoral level to improve the resilience of existing and planned critical infrastructure, systems, and procedures, to the effects and variability of climate change, as well as to improve cooperation and coherence within and across sectors, as well as on a local and national level.

CAP 2024 goes on to highlight the need for adaptation to climate change. Adaptation is the process of adjustment to actual or expected climate change and its effects. Observations show that Irelands climate is changing in terms of coastline, sea level rise, seasonal temperatures, and changes in typical weather patterns. Climate change is expected to have diverse and wide-ranging impacts on Ireland's environment, society, and economic development, including on managed and natural ecosystems, water resources, agriculture and food security, the built environment, human health, and coastal zones.

11.2.2.8 Irelands Climate Change Assessment

In 2023 the EPA published Irelands Climate Change Assessment (ICCA).[31] 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.

[31] *EPA (2023) Irelands Climate Change Assessment <https://www.epa.ie/our-services/monitoring--assessment/climate-change/irelands-climate-change-assessment-icca/>*

- Volume 1: Climate Science – Ireland in a Changing World
- Volume 2: Achieving Climate Neutrality in 2050
- Volume 3: Being Prepared for Irelands Future
- Volume 3: Realising the Benefits of Transition and Transformation

The ICCA Synthesis Report states that having peaked in 2001, Irelands greenhouse gas emissions have reduced in all sectors except agriculture. However, Ireland currently emits more greenhouse gases per person than the EU average. The report goes on to state that there has been an identified gap in policy that indicates that Ireland will not meet its statutory greenhouse gas emission targets. Already Ireland has seen significant and ongoing deterioration in environmental quality, including declines in water quality, biodiversity and ecosystem quality. Developing a climate-resilient Ireland will require sufficient public and private investment and financial support in ways that adequately recognise the value of ecosystem services and the importance of societal wellbeing.

There are well-established 'no-regret options' that need to happen now, which can get Ireland most of the way to net zero carbon dioxide emissions. Beyond that, there are 'future energy choices' relating to the scale and magnitude of technologies that will assist in achieving Ireland statutory climate targets. Ireland's no-regret options are demand reduction (e.g. through energy efficiency and reduced consumption), electrification (e.g. electric vehicles and heat pumps), deployment of market-ready renewables (e.g. wind energy and solar photovoltaics) and low-carbon heating options (e.g. district heating). Irelands future choices include hydrogen, carbon capture and storage, nuclear energy and electro-fuels.

Achieving net zero carbon dioxide emissions by 2050 requires significant and unprecedented changes to Ireland's energy system. Policies tailored to suit different stages of technology development are critical for achieving a net zero energy system. Established technologies, such as wind energy, solar photovoltaics and bioenergy, will be key in meeting short-term emission reduction targets (i.e. 2030), whereas offshore wind infrastructure is expected to be the backbone of future energy systems (i.e., 2050).

The ICCA serves as a stark warning: Ireland stands to face a myriad of challenges in efforts to mitigate and adapt to climate change at the almost halfway mark to 2030. Further decisive action is imperative to mitigate the escalating impacts of climate change on Irelands environment, economy, and society that are highlighted throughout the four volumes of the ICCA.

~~11.2.2.9 Greenhouse Gas Emissions Projections~~

~~In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 43% by 2030, relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 43% in greenhouse gas emissions is achieved at EU level[32].~~

~~Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR[33]). 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. 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.~~

~~[32] Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024 https://www.gov.ie/en/publication/79659 climate action plan 2024/~~
~~[33] 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)~~

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 2022–2040'* was published in June 2023. The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2030 set under the ESR.

The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario assumes that no additional policies and measures, beyond those already in place by the end of 2020. This is the cut off point for which the latest national greenhouse gas emission inventory data is available, known as the 'base year' for projections. 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.

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) – expected to achieve a total reduction of 29% under a WAM scenario
  - Will only achieve an 11% reduction under a WEM scenario
- Almost all sectors are projected to breach their sectoral emission ceiling (SEC) for 2025 and 2023 in both WAM and WEM scenarios
  - Only the residential sector will achieve their SEC
- Projected that Ireland could meet the original EU Effort Sharing Regulation target of 30% emissions reductions by 2030 (compared to 2005) – this goal has since been updated to a 42% reduction which will require full and rapid implementation of CAP 2024 measures and further measures to be implemented
- Energy sector emissions are projected to decrease by 50-60% between 2021-2030
  - Achievement of the 80% renewable energy target is expected
- Transport emissions are expected to decrease between 1-35% between 2021-2030
- Emissions from LULUCF are projected to increase over the period 2021-2030 as forestry reaches harvesting age
  - Planned policies for the sector are expected to reduce the extent of emissions increase

11.2.3 Local Greenhouse Gas Emission and Climate Targets

11.2.3.1 Galway Local Authority Climate Action Plan 2024-2029

The Galway County Council Local Authority Climate Action Plan 2024-2029 (Galway LACAP) was adopted on February 19th, 2024 and published in March 2024.

The Galway LACAP highlights the current state of climate action in Ireland, and how Galway County Council will be responsible for enhancing climate resilience, increasing energy efficiency, and reducing greenhouse gas emissions, across its own assets and service. The Galway LACAP provides a mechanism for bringing together both adaptation and mitigation actions to help drive positive climate action and outcomes across the local authority and its administrative area. The framework of climate actions set within the plan, configures the arrangement of climate actions within a defined structure that ensures alignment between on the ground actions and the high-level vision that the Galway LACAP aspires to deliver. The Galway 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 Galway equated to 1,905 ktCO2-eq in the baseline year, 2018. The top four emitting sectors within County Galway in terms of total greenhouse gas emissions in the baseline year were Agriculture, Transport, Land Use, Land Change

and Forestry (LULUCF) and Residential, producing 44%, 16%, 16% and 15% respectively of total emissions in County Galway. Galway 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 11.2.2.7 above).

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

During the operational phase, the Proposed Project will assist in reducing emission 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 Galway as identified above. Please see Section 11.4.3 below for further information on carbon savings associated with the Proposed Project.

The Galway County Development Plan 2022-2028[34] (GCDP) sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The GCDP includes numerous objectives on sustainability and climate within, as well as a Renewable Energy Strategy. Please see Section 2.4.6 of Chapter 2 of the EIAR for more details on the GCDP ~~The Galway County Council Local Authority Climate Action Plan 2024 2029 (Galway LACAP) was adopted on 19th February 2024. The Galway LACAP has not yet been made available to view by the public. MKO will continue to monitor for publication of the Galway LACAP, with the deadline of publication being 19th March 2024.~~

~~The Galway LACAP is expected to highlight the current state of climate action in Ireland, and how Galway County Council intends to deliver and enable climate action for a just transition to a low carbon and climate resilient future within County Galway.~~

~~Overall, the greenhouse gas emissions generated from County Galway equated to 1,950,000 tCO2eq in the baseline year, 2018.[35] The top emitting sectors within County Galway in terms of total greenhouse gas emissions in the baseline year were Agriculture, Transport, Land use, Land Use Change and Forestry (LULUCF) and Residential producing 44%, 16%, 16% and 15% respectively of the total greenhouse gas emissions in the county. In 2019, Irelands national emissions totalled 65,152,000tCO2eq, with County Galway being responsible for approximately 5% of this (i.e., 3,009,000 tCO2eq).~~

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

~~The Galway County Development Plan 2022 2028[36] sets out the overall strategy for the proper planning and sustainable development of the County over a 6 year period. The Development Plan includes numerous objectives on sustainability and climate within, as well as a Renewable Energy Strategy.~~

11.2.4 Relevant Guidance

The climate section of the 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: Introduction. Due to the nature of the Proposed Project, a wind farm project, the following methodology and guidance was utilised for the climate section of the EIAR:

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[34] *The Galway County Development Plan 2022-2028, https://consult.galway.ie/en/consultation/adopted-galway-county-development-plan-2022-2028*

~~[35] Galway County Council (2023) Baseline Emissions Inventory <https://consult.galway.ie/en/system/files/materials/7736/Baseline%20Emissions%20Inventory_Galway.pdf>~~

~~[36] Adopted Galway County Development Plan 2022-2028 <https://consult.galway.ie/en/consultation/adopted-galway-county-development-plan-2022-2028>~~

- *Calculating Carbon Savings from Wind Farms on Scottish Peat Lands'* (University of Aberdeen and the Macauley Institute 2008); and
- '*Wind Farms and Carbon Savings'* (Scottish Natural Heritage, 2003).
- Macauley Institute Carbon Calculator for Wind Farms on Scottish Peatlands (Version ~~1.8.1~~2.14.0) (2023)
- Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.8.0~~7.3~~) (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 ~~in the Existing Environment~~

Climate change projections show that the Earth is getting warmer and extreme weather events are increasing in frequency on an annual basis. The Proposed Project will assist in mitigating these effects 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 Averages[37]
- Irelands Climate Averages 1991-2020 Summary Report[38]
- Ireland's National Inventory Report 2025[39]
- Climate Status Report for Ireland 2020[40]
- Annual Review 2025 – Our Changing Climate in 2024[41]

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 Birr, Co. Offaly, which is located approximately 115 kilometres to the southeast of

[37] https://www.met.ie/climate/30-year-averages
[38] *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>
[39] *EPA (2025) Ireland's National Inventory Report* <https://www.epa.ie/publications/monitoring-assessment/climate-change/air-emissions/Ireland's-NID-2025.pdf>
[40] *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>
[41] *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>

the Site, is the nearest weather and climate monitoring station to the Site that has meteorological data recorded for the 30-year period from 1979-2008. The Met Éireann weather station in Claremorris is located closer to the Proposed Project, however this weather station only has data for the 30-year average period from 1971-2000, which has been deemed an inappropriate timescale to determine weather in the existing environment. Meteorological data recorded at Birr over the 30-year period from 1979-2008 is shown in Table 11-5 below. The wettest months are October and December, with April and July being the driest. July is the warmest month with an average temperature of 15.2° Celsius.

More recent monthly meteorological data recorded at Athenry, Co Galway, located approximately 18.6km southeast of the EIAR Site Boundary at its closest point, from January ~~2021~~ 2022 to January ~~2024~~ 2025 is available at: https://www.met.ie/climate/available-data/monthly-data. July 2023 was the wettest month in this time period, with 224.1mm of rainfall recorded, while March 2022 was the driest month with 39mm of rainfall. June 2023 was the warmest month in this time period, with a mean monthly temperature of 16.7° Celsius. December 2022 was the coldest month with a mean monthly temperature of 3.4° Celsius.

Table 11-6 below provides a summary of the current physical baseline environment with reference to relevant chapters within the submitted EIAR where further information is available ~~July 2023 was the wettest month in this time period, with 224.1mm of rainfall recorded, while April 2021 was the driest month with 23.9mm of rainfall. July 2021 was the warmest month in this time period, with a mean monthly temperature of 17.3° Celsius. December 2022 was the coldest month with a mean monthly temperature of 3.4° Celsius.~~

Table 11-5 Data from Met Éireann Weather Station at Birr, Co. Offaly, 1978-2008

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature (degrees Celsius)													
Mean daily max	8.1	8.6	10.3	12.6	15.5	17.8	19.6	19.3	17.1	13.6	10.4	8.6	13.5
Mean daily min	2.0	2.0	3.3	4.3	6.6	9.5	11.6	11.3	9.3	6.6	4.0	2.7	6.1
Mean temperature	5.1	5.3	6.8	8.4	11.0	13.6	15.6	15.3	13.2	10.1	7.2	5.6	9.8
Absolute max.	14.3	15.5	18.6	23.2	25.7	29.7	30.8	29.4	25.6	20.4	17.5	15.3	30.8
Absolute Min.	-14.6	-7.1	-7.8	-4.7	-2.3	0.2	3.7	2.0	-1.1	-5.2	-6.9	-8.6	-14.6
Mean No. of Days with Air Frost	8.2	7.7	4.9	3.5	0.9	0.0	0.0	0.0	0.2	1.6	4.8	7.0	38.8
Mean No. of Days with Ground Frost	16.0	15.0	13.0	12.0	7.0	1.0	0.0	0.0	2.0	6.0	11.0	15.0	98.0
Relative Humidity (%)													
Mean at 0900UTC	89.8	88.9	86.9	81.5	77.7	78.3	80.9	84.2	86.6	89.1	90.9	90.3	85.4
Mean at 1500UTC	82.4	75.6	71.6	65.1	64.7	66.2	67.5	68.5	70.3	76.1	81.1	84.5	72.8
Sunshine (hours)													
Mean daily duration	1.5	2.2	2.9	4.5	5.1	4.3	3.9	4.0	3.5	2.9	1.9	1.4	3.2
Greatest daily duration	7.7	9.4	10.5	13.0	15.1	15.7	15.2	13.6	11.5	9.7	8.5	6.9	15.7
Mean no. of days with no sun	11.0	7.1	5.8	2.9	2.2	2.9	2.5	2.5	3.5	6.2	8.8	12.0	67.4
Rainfall (mm)													
Mean monthly total	78.8	58.6	67.4	55.0	59.5	66.5	59.4	81.6	66.4	94.2	74.7	83.8	845.7
Greatest daily total	39.2	28.0	22.0	26.3	19.7	41.1	44.5	59.1	35.7	32.3	29.7	37.5	59.1
Wind (knots)													
Mean monthly speed	7.9	8.0	7.8	6.5	6.2	5.8	5.6	5.6	6.0	6.8	7.0	7.5	6.7
Max. gust	75	77	64	58	55	49	49	46	51	64	54	69	59.2
Max. mean 10-minute speed	40	38	33	29	29	27	24	27	30	37	32	38	32
Mean num. of days with gales	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
Weather (mean no. of days with...)													
Snow or sleet	3.5	2.6	2.5	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.2	1.9	11.7

Snow lying at 0900UTC	2.0	0.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.7
Hail	0.6	0.8	1.8	2.0	0.9	0.1	0.0	0.2	0.1	0.2	0.3	0.3	7.3
Thunder	0.1	0.1	0.2	0.3	0.4	0.8	0.9	0.5	0.3	0.1	0.2	0.1	3.9
Fog	2.1	1.3	1.1	1.5	1.1	0.8	1.1	1.8	2.5	2.1	1.9	2.9	20.4

Table 11-6 Summary of Current Physical Baseline Environment

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
Air Temperature	Climate change is impacting air temperatures in the Northern European region, with a range of observable effects including rising temperature, increased frequency of heatwaves, changes in seasonal temperature patterns and milder winters[42]. Irelands Climate Averages 1991-2020 Summary Report identifies that the annual mean air temperature for Ireland over the period 1991-2020 is 9.8°C. The annual mean air temperature ranges from approximately 8.5°C to 10.8°C. Comparing the 1991-2020 annual mean air temperature for Ireland with that of the 1961-1990 period, there has been an increase of approximately 0.7°C. The Climate Status Report for Ireland 2020[43] states that air temperatures in Ireland have '*been increasing at an average rate of 0.078°C per decade since 1900 and that the annual average temperature is now approximately 0.9°C higher than it was in the early 1900s'*. Temperatures in Ireland are increasing, with sixteen of the top 20 warmest years on record occurring since 1990[44]. On 10th July 2024 Met Éireann confirmed that 2023 was Irelands wettest and warmest year on record (records going back to 1900).[45] 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.[46] However, this moderating influence could be	Chapter 10 Air Quality

[42] *IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>*
[43] *Government of Ireland (2020) Climate Status Report for Ireland 2020 <https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf>*
[44] *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>*
[45] *https://www.met.ie/2023-confirmed-as-irelands-wettest-year-on-record*
[46] *https://www.met.ie/climate/what-we-measure/temperature#:~:text=The%20moderating%20influence%20of%20the,mild%20winters%20and%20cool%20summers.*

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
	in jeopardy if the Atlantic Meridional Overturning Circulation (AMOC) continues to weaken[47]. The AMOC is a large system of ocean currents responsible for carrying warm water from the tropics into the North Atlantic and the strength of this current is a function of global mean temperature. The weakening of this current would counterbalance the warming effects of climate change creating instability for local ecosystems, agriculture, and fisheries.	
Precipitation	Climate change is impacting precipitation patterns in the Northern European region, with a range of observable effects including increased precipitation, more extreme precipitation events, seasonal variations and impacts on hydrological regimes[48]. 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)[49]. 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 of the EIAR.
Wind and Storms	Climate change is impacting wind patterns in the Northern European region with a range of observable effects including increased wind speeds, changes in wind direction and seasonal variations[50].	N/A

[47] *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>*
[48] *IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>*
[49] *Department of Housing, Local Government and Heritage (2024) Irelands Climate Averages 1991-2020 Summary Report <https://edepositireland.ie/handle/2262/108695>*
[50] *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)
	Irelands Climate Averages 1991-2020 Summary Report identifies that the annual mean hourly wind speed ranges from 9 knots at Shannon Airport to 15 knots at Malin Head. Winds are generally strongest in the northwest of the country. The strongest winds are observed during the winter months and range from 10 knots at Shannon Airport to 18 knots at Malin Head. The lightest winds are observed during the summer months and range from 8 knots at Valentia Observatory to 13 knots at Malin Head. In late 2023 and early 2024, Ireland experienced a very active storm season; the county was affected by 13-14 severe storms[51]. In 2025 there has been 5 no. named storms at the time of writing, with Storm Eowyn, occurring in January 2025, reaching hurricane force winds (maximum sustained wind speed recorded as 142km/h and maximum gust speed as 184km/h).[52] The increased frequency and intensity of storm events will lead to associated increases in precipitation (see above). As stated in 'Air Temperature' above, the AMOC has a moderating influence on Europe, however as identified by the IPCC, the strength of the AMOC is directly correlated to global mean temperature, and as global mean temperature increases, the AMOC will weaken[53]. The weakening of this current would result in increased storm activity in Northern Europe.	

[51] *Met Éireann (2024) Human-caused Climate Change Brings Increased Storm Rainfall <https://www.met.ie/human-caused-climate-change-brings-increased-storm-rainfall>*
[52] *Met Éireann Strom Centre https://www.met.ie/climate/storm-centre*
[53] *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 11.2.2.6 above. 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)[54], was published in 2025 and refers to the greenhouse gas inventory timeseries for the years 1990-2023. From 1990-2001, total emissions of greenhouse gases (excluding LULUCF) increased steadily from 55,231.5 $ktCO_2e$ in 1990 to 71,476.9 $ktCO_2e$ in 2001, which is the highest level of greenhouse gas emissions ever reported in Ireland. Emissions then plateaued until 2008 with estimates ranging from 69,032.5 $ktCO_2e$ to 71,213.8 $ktCO_2e$. There was then a sharp decrease from 69,032.5 $ktCO_2e$ in 2008 to 58,582.4 $ktCO_2e$ in 2011. In 2023, total emissions of greenhouse gases including indirect emissions from solvent use (excluding LULUCF) in Ireland were 54,934.4$ktCO_2e$, which is 1.4% lower than emissions in 1990. Emissions in 2023 at 54,934.4 $ktCO_2e$ are 6.8% lower than 2022, and the lowest level in the time series.

The Electricity sector accounted for the bulk of the CO_2 emissions in 2023 (57.1%), Agriculture contributed 36.2%, while a further 5.2% emanated from Industrial Processes and Product Use and 1.5% was due to Waste. Emissions of CO_2 accounted for 61.1% of the national total in 2023, with CH_4 and N_2O contributing 28.9% and 8.%, respectively. The combined emissions of fluorinated gases (HFC, PFC, SF_6 and NF_3) accounted for 1.2% of total emissions in 2023.[55]

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 discussions[56]. 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.

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[54] *EPA (2024) National inventory Report 2025 <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/Ireland's-NID-2025.pdf>*
[55] *Ibid.*
[56] *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)[57]
- Climate Status Report for Ireland 2020[58]
- Climate Ireland[59]
- European Climate Risk Assessment[60]

11.3.2.1.1 *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 emissions[61]. The physical environment of the Proposed Project under the RCP 8.5 scenario is discussed under the following headers:

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

Air Temperature

Annual surface air temperatures[62] in Ireland are now approximately 1°C higher than they were in the early 1900's (2013 – 2022 period relative to 1903 - 1912).

The upward trend in air temperatures is predicted to continue for all seasons: annual air temperatures may increase by over 3°C by the end of the 21st century relative to a 1976 to 2005 reference period under an RCP 8.5 high emission scenario[63].

Met Éireann projections[64] 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

[57] *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>
[58] https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf
[59] https://www.climateireland.ie/
[60] https://www.eea.europa.eu/en/analysis/publications/european-climate-risk-assessment
[61] *Climate Change (2011) A scenario of comparatively high greenhouse gas emissions* <https://link.springer.com/article/10.1007/s10584-011-0149-y>
[62] https://www.epa.ie/publications/monitoring-assessment/climate-change/irelands-climate-change-assessment-volume-1.php
[63] *Irelands Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World*
[64] https://www.met.ie/climate/climate-change#Reference3

frost days (days when the minimum temperature is less than 0°C) is projected to decrease by 62% for the RCP 8.5 high emissions scenario[65,66].

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.[67]

Extreme rainfall events, such as those currently expected only once every 50 years, could become twice as frequent by the end of the century. This means more frequent flooding risks, particularly during the winter months[68]. 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.

No recurring or historic flood incidents are recorded within the Proposed Wind Farm. The closest recurring flood event is situated ~1.88km southwest of the Site at the location of Balrobuck Beg Turlough (ID: 848). Furthermore, several recurring flooding incidents are mapped along the Ballinduff stream, situated 2.6km west of the Proposed Wind Farm.

A recurring flood event is also recorded in the immediate vicinity of the Proposed Grid Connection as it travels along the N83. This event occurs after heavy rain within low lying lands to the east of the grid connection at the Headford Road Junction (ID:1808).

The Ballinduff stream, 2.6km west of the Proposed Wind Farm and the Cregg stream ~4.7km to the south are mapped as part of a major arterial drainage scheme i.e. land identified by the OPW as potentially benefitting from the implementation of Arterial (Major) Drainage Schemes and an indicator of land subject to flooding and poor drainage. Additionally, the River Clare and the Glennafosha stream situated ~3.7km northeast of the Proposed Wind Farm site are also mapped as part of an arterial drainage scheme.

Catchment Flood Risk Assessment and Management (CFRAM) OPW Flood Risk Assessment Maps are now the primary reference for flood risk planning in Ireland and supersede the previous PFRA maps. CFRAM mapping has not been completed the Proposed Wind Farm. The closest CFRAM mapping extents are mapped along the Clare River and its tributary the Glennafosha stream, mapped ~3.7km northeast of the Proposed Wind Farm.

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[65] *Nolan, P. 2015. EPA Report: Ensemble of Regional Climate Model Projections for Ireland. EPA climate change research report no. 159. EPA: Wexford.*
[66] *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.*
[67] *https://www.epa.ie/our-services/monitoring--assessment/climate-change/climate-ireland/impact-of-climate-change-on-ireland/climate-hazards/coastal-flooding.*
[68] *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 Proposed Grid Connection is partially mapped within CFFRAM fluvial zones as it comes across the Glennfosha, the Clare River and the Killeelaun watercourses. CFRAM fluvial zones with low, medium and high probabilities are mapped along the Proposed Grid Connection near the Glennfosha and the Clare River. Whereas near the Killeelaun stream, CFRAM flood zones with low and medium probabilities are mapped along the route.

The National Indicative Fluvial Flood Mapping (www.floodinfo.ie) shows probabilistic fluvial flood zones for catchments greater than 5km2 for which flood maps were not produced under the CFRAM Programme. The Present-Day Scenario has been generated using methodologies based on historic flood data and does not consider the potential changes due to climate change. For the Present-Day Scenario, no medium (1 in 100) and low probability (1 in 1,000) fluvial flood zones are mapped within the Proposed Wind Farm. The nearest NIFM fluvial flood zone to the Site is mapped along the Ballinduff stream, situated 2.6km west of the Proposed Wind Farm. NIFM fluvial flood extents are mapped along the Cregg stream ~4.7km south of the Proposed Wind Farm. These NIFM flood extents continue along the course of the Cregg stream and also into Lough Corrib downstream. As such, the entire Proposed Wind Farm, including all proposed infrastructure is located in Fluvial Flood Zone C, where the probability of fluvial flooding is low (less than 0.1%).

The CFRAM Programme has modelled flooding associated with potential future climate change scenarios. These CFRAM flood zones have been modelled for 2 no. potential future climate change scenarios, with the Mid-Range and High-End Future Scenario flood extents generated using an increase in rainfall of 20% and 30% respectively. The modelled flood extents show similar flood zones along the Clare River to the Present Day Scenario discussed above. Therefore, CFRAM flood zones remain unlikely to encroach on the Proposed Wind Farm even in future mid-range and high-range climate change scenarios.

Similarly, there are NIFM flood zones modelled with potential future climate change scenarios. These NIFM flood zones have also been modelled for 2 no. potential future climate change scenarios, with the Mid-Range and High-End Future Scenario flood extents generated using an increase in rainfall of 20% and 30% respectively. Both of these modelled flood extents show similar flood zones in the vicinity of the Proposed Wind Farm to the Present Day Scenario discussed above. Therefore, fluvial flood zones at the Proposed Wind Farm are unlikely to be significantly impacted by future climate change.

The FRA concludes that the overall risk of flooding posed by the Proposed Project and associated works within the Proposed Wind Farm is low. Please refer to the Chapter 9 of the EIAR and Appendix 9-1 for further details.

Wind and Storms

Future climate and weather predictions indicate a slight reduction in mid-century (2041 – 2060) average wind speeds around Ireland (-2.47% for RCP 8.5 high emissions scenario compared to the 1981 – 2000 baseline), with these decreases being more pronounced during the summer months[69]. Predictions also point towards less frequent, but more intense storm activity around Ireland. Correspondingly, projections indicate a decrease in average and extreme wave heights towards the end of the century, but an increase in the frequency and severity of storm surges in coastal regions of western Ireland, particularly in winter months[70]. Storm surge levels over a 20-to-30-year return period are anticipated to increase by up to 9cm by 2100[71].

[69] https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/windspeed/
[70] https://www.epa.ie/publications/research/climate-change/research-339-high-resolution-climate-projections-for-ireland-.php
[71] https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/waves-surges/

11.3.2.2 Greenhouse Gas Emissions Projections

In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 43% by 2030, relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 43% in greenhouse gas emissions is achieved at EU-level[72].

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR[73]). This established binding annual greenhouse gas emission targets for Member States for the period 2021–2030. Please see Section 11.2.1.10 for further details on the EU ESR.

Considerable progress has been made in the decarbonisation of the Electricity Sector, with emissions falling by 45% between 2001 and 2022.[74] The decarbonisation of the Electricity Sector has been made possible through the deployment of renewables and their successful integration into the national grid, further facilitating the decarbonisation other sectors, such as transport, heating and industry as they look towards electrification.

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* was published in May 2025 The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2030 set under the ESR.

The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario assumes no additional policies and measures, beyond those already in place by the end of 2023. This is the cut off point for which the latest national greenhouse gas emission inventory data is available, known as the 'base year' for projections. 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.

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.

[72] *Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024 https://www.gov.ie/en/publication/79659-climate-action-plan-2024/*
[73] *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)*
[74] *Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024 https://www.gov.ie/en/publication/79659-climate-action-plan-2024/*

- 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 and it is considered that the Proposed Project will not be negatively impacted by climate change, nor will it have a negative impact on climate change over its 35-year design horizon.

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

11.4 Calculating Carbon Losses and Savings from the Proposed Project

11.4.1 Background

In addition to the combustion of fossil fuels, greenhouse gases are also released through natural processes such as the decomposition of organic material (which is composed of carbon). Bogs and peatlands are known to store large amounts of carbon. There is no peat present within the Proposed Wind Farm site.

As detailed in Section 8.3.3 in Chapter 8 of ~~this~~ the EIAR: Land, Soils and Geology, a majority of the Proposed Wind Farm is overlain by limestone tills. For this reason, the carbon balance between the use of a renewable energy and the loss of carbon stored in the peat is not assessed in this section of the EIAR.

Carbon dioxide is released in the manufacture and transportation of turbines and construction materials to the Site, as well as throughout the construction process and therefore a carbon loss/saving calculation for the Proposed Project has been undertaken (Section 11.4~~5~~.2.1).

11.4.2 Methodology for Calculating Losses

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macauley Institute with support from the Rural and Environment Research and Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands'*, was developed to calculate the impact of wind farm developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. The web-based version of the carbon calculator, which supersedes the excel based versions of the tool, was released in 2016 and is currently available as Version ~~1.8.1~~2.14.0 which was last updated in 2023. 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.

Given the absence of peat, the Proposed Wind Farm will not give rise to any impact on peat habitat. The Macauley Institute methodology states that the total volume of peat impacted by the construction of a wind farm is strongly correlated to the extent of the peatland affected by drainage at a site. Therefore, in calculating the carbon loss/saving of the Proposed Wind Farm, all potential carbon losses associated with constructing a wind farm on peatland environments were discounted. Please note, peat can be found along the Proposed Grid Connection, however this was not included in the calculations of carbon loss below due to its shallow nature and the degree of disruption associated with the construction of the Proposed Grid Connection. The carbon losses as a result of the manufacture, transportation and erection of the proposed turbines were included in the calculation.

The development of a wind farm requires the construction of infrastructure, i.e., turbines and associated foundations and hardstands, internal site roads, construction compounds, etc. which results in the loss of carbon-fixing potential of on-site vegetation. The determination of the carbon losses associated with the carbon-fixing potential of this vegetation is not possible due to a lack of Irish specific emission factors required for accurate calculation. 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 below, 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.

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. There are no areas of forestry within the Site. Therefore, clear-felling of forestry surrounding turbine locations is not necessary to allow for the construction of the Proposed Wind Farm footprint and the erection of the wind turbines. Therefore, there was no carbon loss assessment required for loss of forestry. There will be no loss of woodland associated with the Proposed Project, and therefore there is no planting of native woodland proposed. While some areas of hazel woodland occur within the Site and have been classified as oak-ash-hazel woodland, the importance of this woodland habitat has been recognised, and the Proposed Project has

been designed to completely avoid this habitat, i.e., there will be no felling and therefore no carbon losses associated with the removal of this vegetation.

As identified in Section 6.5.2.1.1 of Chapter 6 Biodiversity of the EIAR, the Proposed Project will result in the removal of 23.3ha of improved agricultural grassland (GA1) and 1800m of hedgerow/treeline (WL1/WL2) and associated stone wall (BL1). There will be carbon losses associated with this loss of vegetation, as stated in Section 11.6.2.1 above, however the quantification of the exact carbon losses associated with vegetation removal is not possible due to a lack of Irish specific emission factors required for accurate calculation. Similarly, it is not feasible to quantify carbon storage potential associated with replanting due to the range in carbon sequestration rates which are dependent on species composition, soil type, climate, and land management practices[75,76].

For hedgerows, carbon storage depends on factors such as age, density, and cutting regimes; while Above-Ground Biomass (AGB) can be estimated, below-ground and soil carbon changes are harder to quantify. Assumptions of carbon storage potential in existing hedgerow could be applied however this information is not yet available and research to determine this is ongoing by Teagasc[77]. As stated in the EPA 2014 Publication '*Carbon Sequestration by Hedgerows in the Irish Landscape*',

"*reporting and accounting for hedgerow activities under the LULUCF sector have not been possible in the past due to:*

- *A lack of historic data (baseline data), which are used as a reference period for calculating [greenhouse gas] changes over time*
- *No national spatial or geographic information systems to detect changes in the area of hedgerows and non-forest woody biomass over time; and*
- *No inventory information on biomass stock changes in these land-cover types.*"[78]

It has been determined that AGB of hedgerows can be measured via direct methods which involves the destructive sampling and weighing of hedgerow material, nevertheless, despite this lack of Irish data, the replanting of hedgerows will over time mitigate the temporary loss of carbon sequestering vegetation that arises during the loss of this habitat during the construction phase. It is important to note that, as outlined in the submitted BMEP, in order to offset the loss of 1800m of hedgerows, it is proposed to replant 3600m of hedgerow habitat within the Proposed Project site for a 100% net gain; once the 3600m of hedgerow is planted and mature, will result in an improvement to current site conditions due to the more extensive coverage of this habitat type. For grasslands, permanent systems can be assessed to show measurable long-term soil carbon accumulation, however changes in soil organic carbon are often slow and influenced by past land use. To determine the carbon sequestration potential of permanent grassland systems, measurements of soil carbon changes is required; to date accurate methods to assess this for Irish grasslands are still being determined.[79]

The outputs of the Macauley Institute web-based carbon calculator are included in Appendix 11-1 of ~~this~~ the 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 Wind Farm have been identified. Embodied carbon refers to the emissions associated with procuring, mining and harvesting raw materials, the transformation of those materials into construction products, transporting them to Site, installation of these materials

75 https://www.coford.ie/media/coford/content/publications/projectreports/carbifor20060808.pdf
76 https://teagasc.ie/news-events/daily/carbon-stocks-and-sequestration-in-hedgerows/
77 https://teagasc.ie/environment/climate-change-air-quality/research/farm-carbon---/
78 https://www.epa.ie/publications/research/climate-change/ccrp-32-for-webFINAL.pdf
79 https://teagasc.ie/news-events/news/assessing-soil-carbon/

during a construction phase, and the subsequent replacement, removal, and disposal of these materials upon decommissioning.[80]

The full life cycle and embodied carbon of the proposed 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 site infrastructure associated with the Proposed Project are considered using the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)[81]. 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~~ the 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 11-1.

11.4.2.1 Calculating Carbon Losses and Savings

11.4.2.1.1 *Carbon Losses*

The Scottish Government online carbon calculator was used to assess the impacts of the Proposed Wind Farm in terms of potential carbon losses and savings taking into account drainage, habitat improvement, and site restoration. The online calculator is pre-loaded with information specific to the CO_2 emissions from the United Kingdom's electricity generation plant, which is used to calculate emissions savings from proposed wind farm projects in the UK. Similar data to that used in the worksheet to calculate the CO_2 emissions from the UK electricity generation plant, was not allowable for input for the Irish electricity generation plant, and so the CO_2 emissions savings from the Proposed Wind Farm have been calculated separately from the online carbon calculator as set out in Section 11.4~~5~~.2.1.2 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, and in particular construction phase transport emissions associated with the movement of aggregate material and ancillary elements to the Site; this includes for infrastructure relating to the Proposed Grid Connection.

A copy of the outputs is provided as Appendix 11-1 of ~~this~~ the EIAR, *'Carbon Calculations'*. Where available and relevant, site-specific information was inserted into the online carbon calculators. Otherwise, default values were used.

The main CO_2 losses due to the Proposed Project are summarised in Table 11-6.

Table 11-7 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)	48,583	49,331

[80] *Irish green Building Council – What is embodied carbon?* <https://www.igbc.ie/what-is-embodied-carbon/>
[81] *Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document* https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf

Origin of Losses	CO_2 Losses (tonnes CO_2 equivalent)	
	Expected	Maximum
Losses due to backup	31,200	36,920
Losses from reduced carbon fixing potential	1,06176	2,044 170
Losses associated with embodied carbon in construction materials (including aggregates and ancillary infrastructure components associated with the Proposed Project)	17,248 19,899	17,248 19,899
Losses associated with traffic and transport movements (for all elements of the Proposed Project)	165 134	165 134
Total	98,272 100,877	105,834 108,328

The worksheet models and online tools calculate that the Proposed Project will give rise to 98,272 100,877 tonnes of CO_2 equivalent losses over its 30-year life. Of this total figure, the proposed wind turbines directly account for 48,583 tonnes, or 489.1%. Losses due to backup account for 31,200 tonnes, or 31.7%. Losses from reduced carbon fixing potential accounts for 1.1% or 1,06176 tonnes. Losses due to embodied carbon accounts for 17,248 19,899 tonnes or 20 17.4% and losses due to construction phase transport emissions accounts for 0.12% or 165 134 tonnes.

The figure of 1,06176 tonnes of CO_2 arising from ground activities associated with the Proposed Project is calculated based on the entire development footprint being "Acid Bog", as this is one of only two choices the model allows (the other being Fen). This approach is based on a precautionary scenario being applied to all carbon loss calculations completed for the Proposed Project. It is noted that the Macaulay Institute Carbon Calculator for Wind Farms on Peatlands only considers two habitat types (acid bog and fen), which are not present on-site. The affected habitats are primarily improved pasture and small areas of scrub and exposed rock, which provide only moderate to low carbon storage capacity in comparison to peat[82,83]. The habitat that will be impacted by the Proposed Wind Farm is predominantly comprised of pastural agricultural land and smaller areas of scrub and exposed rock. Given the absence of peat, the Proposed Wind Farm will not give rise to any impact on peat habitat. The model assumes that the habitat present is acid bog and as such, presents the 1,06176 tonnes CO_2 value above. Therefore, the actual CO_2 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 4.3.1.8 in Chapter 4 of the EIAR, the estimated 1800m of hedgerow that will be removed will be replaced onsite via the planting of 3600m of hedgerow, resulting in a 100% net gain within the Site. Taking into account the hedgerow replanting that will take place, the actual CO_2 losses for reduced carbon fixing potential are expected to be lower than the values detailed in Table 11-6, over the life-time of the Proposed Project. Furthermore, the replanting of hedgerow will result in an improvement to current site conditions due to the more extensive coverage of this habitat type.

[82] https://www.epa.ie/publications/research/land-use-soils-and-transport/EPA-RR-204-final-web.pdf
[83] https://www.ria.ie/assets/uploads/2024/06/potential_of_irish_grassland_soils_to_sequeter_atmosperic_carbon.pdf

The figure of ~~17,248~~ 19,899 tonnes of CO_2 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 ~~165~~ 134 tonnes of CO_2 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 11-1.

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 30-year useful life. As detailed in the Decommissioning Plan, Appendix 4-7, 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 options in terms of having potential effects on the environment. The associated foundations will be reinstated and revegetated with an appropriate seed mix and the resumption of natural drainage processes that will have existed prior to any construction. The electrical and fibre optic cabling that connects each turbine to the proposed onsite 110kV electrical substation will be removed from the cable ducting. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible with no environmental impact associated with leaving the ducting in-situ. Taking into account the proposals incorporated in the Decommissioning Plan, the actual CO_2 losses are expected to be lower than the values detailed in Table 11-6.

11.4.2.1.2 *Carbon Savings*

According to the model described above, the Proposed Project will give rise to total losses of ~~98,272~~ 100,877 tonnes of carbon dioxide.

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

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

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

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

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

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

For the purposes of this calculation, the rated capacity of the Proposed Project is assumed to be 56 MW (based on 8 No. 7 MW turbines).

A load factor of 0.35 (or 35%) has been used for the Proposed Project[84].

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

[84] *Eirgrid, 2022 Enduring Connection Policy 2.2 Constraints Report for Solar and Wind* ECP-2-2-Solar-and-Wind-Constraints-Report-Area-B-v1.0.pdf (eirgridgroup.com)
The Proposed Project is located within the B wind region for Ireland with an associated 2020 capacity factor of 35%.

A conservative figure for the carbon load of electricity generated by natural gas in Ireland was sourced from Sustainable Energy Authority Ireland (SEAI) ~~December 2022 report, '*Energy in Ireland.*'~~ website.[85] The provisional emission factor for electricity generated in Ireland in ~~2022~~ 2024 was 204.3 ~~96~~ g CO_2/kWh.

The calculation for carbon savings is therefore as follows:

$$CO_2 \text{ (in tonnes)} = \frac{(56 \times 0.35 \times 8{,}760 \times \text{~~296~~ 204.3})}{1000}$$

$$= \text{~~50,822~~35,077 tonnes per annum}$$

Based on this calculation, ~~50,822~~ 35,077 tonnes of carbon dioxide will be displaced per annum from the largely carbon-based traditional energy mix by the Proposed Wind Farm. Over the proposed 30-year lifetime of the development, therefore, ~~1,524,660~~ 1,052,310 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation.

Based on the Scottish Government carbon calculator as presented above in Section 11.4~~5~~.2.1.1, ~~98,272~~ 100,877 tonnes of CO_2 will be lost to the atmosphere due to changes in the ground conditions and due to the construction and operation of the Proposed Wind Farm. This represents ~~6%~~ 10% of the total amount of carbon dioxide emissions that will be offset by the Proposed Project. The ~~98,272~~ 101,868 tonnes of CO_2 that will be lost to the atmosphere due to changes in ground conditions and due to the construction and operation of the Proposed Project will be offset by the Proposed Project in approximately ~~23~~ 34.5 months of operation.

As detailed in Section 11.4.2. above, hedgerow replanting will take place as part of the Proposed Project. As detailed in Section 4.3.1.8 of the EIAR, the estimated 1800m of hedgerow that will be removed will be replaced onsite via the planting of 3600m of hedgerow, resulting in a 100% net gain within the Site. 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 and therefore is not considered in Section 11.5.3 below. The lack of consistent national-level field data and methodologies limits the ability to make accurate projections on carbon sequestration potential for hedgerows, grasslands, and other habitat types. Furthermore, the carbon storage capacity of restored habitats will vary over time as vegetation matures and land use and the baseline environment change. The precautionary approach used in the EIAR applied the excavation of peat as a proxy for potential carbon loss arising from removal of habitats during the construction phase, despite there being no peat present within the Proposed Wind Farm site. Therefore, while it can be assumed that replanting of hedgerows and provision of wet grassland on the site will result in an increased capacity of carbon storage due to the carbon storage potential that exists within these habitats[86], to ensure an accurate assessment of effects within the EIAR the quantification of these potential carbon savings (via an increase in carbon storage potential) associated with these measures has not been included.

11.5 Likely Significant Effects and Associated Mitigation Measures

11.5.1 'Do-Nothing' Effect

If the Proposed Project were not to proceed, the existing uses of small-scale agriculture would continue. The opportunity to harness the wind energy resource of County Galway would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption

[85] https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors
[86] https://teagasc.ie/news-events/daily/carbon-stocks-and-sequestration-in-hedgerows/

of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment and investment would also be lost.

11.5.2 Construction Phase

11.5.2.1 Greenhouse Gas Emissions

Identification of Effect

Proposed Wind Farm

The construction of turbines and associated foundations and hard-standing areas, Meteorological Mast, Access Roads, Temporary Construction Compound, Underground Cabling, Spoil Management Areas, Site Drainage, 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 Proposed Wind Farm site. Greenhouse gas emissions, e.g., carbon dioxide (CO_2), 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, and will be restricted to the duration of the construction phase. Mitigation measures to reduce this effect are presented below.

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 Proposed Wind Farm, which has ensured the utilisation of as much of the existing roads within the Proposed Project as possible to gain access to the proposed turbine locations and minimise the construction of additional roads. This effect will be long-term and imperceptible only, given the quantity of greenhouse gases that will be emitted to the atmosphere.

Proposed Grid Connection

The construction of the permanent onsite 110kV substation, temporary construction compound, and underground cabling will require the operation of construction vehicles and plant on and off-site, and the transport of workers to and from the Proposed Grid Connection underground cabling route. Greenhouse gas associated with vehicles and plant, such as carbon dioxide, (CO_2), carbon monoxide, and nitrogen oxides will arise as a result of construction activities. This effect will be short-term and slight only, given the quantity of greenhouse gases that will be emitted to the atmosphere, and will be restricted to the duration of the construction phase. Mitigation measures to reduce this impact are presented below.

Transport to Proposed Wind Farm

The transport of turbines and construction materials to the Site, which will occur on specified routes only (see Section 4.4 in Chapter 4 of ~~this~~ the EIAR), will also give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be short-term and slight only, given the quantity of greenhouse gases that will be emitted, and will be restricted to the duration of the construction phase. Mitigation measures to reduce this impact are presented below.

Waste Disposal

Construction waste will arise from the Proposed Project mainly from excavation and unavoidable construction waste including material surpluses, damaged materials and packaging waste. This potential effect 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. 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

- 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 produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.
- All plant and materials vehicles shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use.
- 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.
- Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction.
- The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered.
    - This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.
    - The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.
- A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5).
- Aggregate materials for the construction of the Proposed Project will be obtained from nearby licensed quarries. This will reduce journey distances of the 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 impacts of greenhouse gas emissions arising from the construction phase of the Proposed Wind Farm and Proposed Grid Connection will have a short-term imperceptible negative effect and will be restricted to duration of the construction phase. 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.

When considering these greenhouse gas emissions within the context of the national Electricity Sector Emissions Ceilings detailed in Section 11.23.2.5, 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 11.45.2.1.2, the Proposed Wind Farm will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 30-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.

Significance of Effects

Based on the assessment above there will be no significant effects as a result of the Proposed Project.

11.5.3 Operational Phase

11.5.3.1 Greenhouse Gas Emissions

Identification of Effect

Proposed Wind Farm

The Proposed Wind Farm will generate electricity from a renewable source. As detailed in Section 11.45.2.1.2 above, the Proposed Wind Farm will offset greenhouse gas emissions associated with fossil fuel-based electricity generation, over its proposed 30-year lifespan. For the purposes of ~~this~~ the EIAR, a rated output of 7MW per turbine has been chosen to calculate the generating potential of the Proposed Wind Farm, which would result in an estimated installed capacity of 56MW, displacing approximately ~~50,822~~ 35,077 tonnes of carbon dioxide per annum from traditional carbon-based electricity generation. This will have a long-term significant positive effect on climate.

Some potential long-term imperceptible negative effects that may occur during the operational phase of the Proposed Wind Farm are the release of carbon dioxide to the atmosphere due to maintenance and monitoring activities.

Transport to the Proposed Grid Connection

There will be periodic site visits from maintenance and monitoring crews on site for maintenance activities relating to Proposed Grid Connection infrastructure periodically throughout the operational phase, the impacts described in Section 11.56.2.1 will be the same.

Transport to the Proposed Wind Farm

In the unlikely event that a turbine blade is damaged and must be replaced during the operational phase, the impacts described in Section 11.56.2.1 will be the same. Emissions resulting from routine maintenance at Proposed Wind Farm site are included in the 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

- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.

- Operational personnel will be instructed at induction that under no circumstances can waste be disposed of on-site. It will also be made clear that the burning of waste material on-site is forbidden.
- ~~As detailed in Appendix 6-4 a Biodiversity Management and Enhancement Plan for the Proposed Wind Farm has identified enhancement activities such as the planting of native woodland and hedgerows and improvement of grassland habitats.~~

Residual Effect

Following implementation of the mitigation measures above, residual effects of greenhouse gas emissions arising from the operational phase of the Proposed Project ~~Following implementation of the biodiversity enhancement outlined above, the loss of carbon fixing vegetation over the lifetime of the Proposed Project will be partially offset by the biodiversity enhancement plan and using the precautionary principle,~~ will have a potential long-term imperceptible negative effect on Climate. Furthermore, the Proposed Project will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 30-year lifespan of the Proposed Project. Therefore, while there will be greenhouse gas emissions associated with the operation of the Proposed Project, this will be offset by the operation of the Proposed Project within its operational life.

Please note, as identified above in Section 11.4.2.1.2, 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 the replanting of 3600m of hedgerow will result in an increased capacity of carbon storage due to the carbon storage potential that exists within these habitats[87], to ensure this assessment is completed 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.

During the operational stage, the Proposed Wind Farm and the Proposed Grid Connection will have a long term, significant, positive residual effect on climate. This is further detailed in Chapter 10 Air Quality and Chapter 5 Population and Human Health as the Proposed Project will have the opportunity to improve human health due to the reduction of fossil fuel usage and the provision of renewable energy to the Irish national grid.

Based on the above assessment, the Proposed Project will have a long-term moderate positive effect on Climate as a result of reduced greenhouse gas emissions.

Significance of Effects

Based on the assessment above there will be no significant effects as a result of the Proposed Project.

11.5.4 Decommissioning Phase

The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of approximately 30 to 35 years. Following the end of the operational life of the wind farm, the wind turbines may be retained and the operational life extended or replaced with a new set of turbines, subject to planning permission being obtained. In the event that neither of the above options are implemented, the Proposed Wind Farm will be decommissioned fully as agreed with the Planning Authority. The Grid Connection will remain in place as it will be under the control of EirGrid and will form a permanent part of the national electricity grid.

The works required during the decommissioning phase are described in Section 4.10 in Chapter 4: Description of the Proposed Project. Any impact and consequential effect that occurs during the

[87] https://teagasc.ie/news-events/daily/carbon-stocks-and-sequestration-in-hedgerows/

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 is included as Appendix 4-6 of ~~this~~ the EIAR, the detail of which will be agreed with the local authority prior to any decommissioning. The potential for effects during the decommissioning phase of the Proposed Project has been fully assessed in the EIAR.

11.6 Cumulative Assessment

Potential cumulative effects on climate between the Proposed Project and other permitted or proposed projects and plans in the area, (wind energy or otherwise), as set out in Section 2.8 in Chapter 2 of ~~this~~ the EIAR, were also considered as part of this assessment. The developments considered as part of the cumulative effect assessment are described in Section 2.8 of ~~this~~ the EIAR.

The nature of the Proposed Project is such that, once operational, it will have a long-term, moderate, positive impact on climate.

During the construction phase of the Proposed Project and other permitted or proposed projects and plans in the area as set out in Section 2.8 in Chapter 2 of ~~this~~ the 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 will be restricted to the duration of the construction phase, and as such will give rise to emission over a short-term duration. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from construction phase activities will have a permanent imperceptible negative effect on Climate. However, as noted above, the Proposed Project will offset the ~~98,272~~ 101,868 tonnes of CO_2 associated with the construction and operational phase that will be lost to the atmosphere (Section 11.4~~5~~.2.1.1) in approximately ~~23~~ 34.5 months of operation.

When considering these greenhouse gas emissions within the context of the Electricity Sector Emissions Ceilings detailed in Section 11.2~~3~~.2.5, 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~~5~~.2.1.2, the Proposed Wind Farm will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 30-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 Sectoral Emissions Ceiling and will be offset within the early operational life of the Proposed Wind Farm (Section 11.4~~5~~.2.1.2). Thus, there will be no negative cumulative effects arising on climate from the Proposed Project when considered in combination with other permitted or proposed projects and plans in the area as set out in Section 2.8 in Chapter 2 of ~~this~~ the EIAR.

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