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ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED DERRYNADARRAGH WIND FARM, CO. KILDARE, OFFALY & LAOIS

VOLUME II - MAIN EIAR

CHAPTER 7 - AIR AND CLIMATE

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7. INTRODUCTION

7.1 Introduction

This chapter identifies, describes and assesses the likely significant direct, indirect and cumulative effects on air quality and climate arising from the construction, operation and decommissioning of the proposed Derrynadarragh Wind Farm.

The proposed wind farm site is located within the jurisdictions of Kildare County Council, Offaly County Council, and Laois County Council, approximately 1.7km south of the village of Bracknagh, 5km northwest of Monasterevin, and approximately 6.5km northeast of Portarlington. A detailed description of the proposed development assessed in the EIAR is contained in Chapter 2.

The key elements of the proposed development as described in Chapter 2 are referred to as follows throughout this chapter:

- The wind farm site (referred to in this EIAR as **'the Site'**);
- The grid connection (referred to in this EIAR as the '**GC'**);
- The turbine delivery route (referred to in this EIAR as the '**TDR'**);
- The 'Biodiversity Enhancement Management Plan Lands' (also referred to in this EIAR as the **'BEMP Lands'**).

The wind farm site includes the wind turbines, internal access tracks, hard standings, onsite substation, internal electrical and communications cabling, temporary construction compound, drainage infrastructure and all associated works related to the construction of the wind farm.

7.1.1 Statement of Authority

This chapter has been prepared by Mr. Cathal Creedon, and reviewed by Brian Cronin, of Fehily Timoney and Company.

Cathal Creedon holds a BA in Geography and History and an MA in Planning and Sustainable Development from University College Cork. He has experience working on various renewable energy projects and is involved in the preparation of Environmental Impact Assessment Reports (EIARs), with a particular focus on planning and land use considerations.

Brian Cronin is a Senior Environmental Scientist with a BSc in Environmental Science from University College Cork and an MSc in Environmental Engineering from Trinity College Dublin. He is member of the Institution of Engineers of Ireland (MIEI). Brian has experience working on various renewable energy projects preparing chapters of the EIAR for wind farms, specialising in air and climate.

7.1.2 Air Quality

In order to protect our health, vegetation and ecosystems, EU Directives have set out air quality standards for Ireland and the other member states for a wide variety of pollutants. These Directives include how we should monitor, assess and manage ambient air quality. The assessment presented in this EIAR has been carried out in accordance with the relevant EU and national legislation. In addition, regard has been had to the relevant local authority Development Plans for Laois, Offaly and Kildare, as the decision-maker is required to consider these plans in determining the application. The Planning and Policy chapter of this EIAR (see Chapter 4) sets out the specific air quality and climate objectives of these Development Plans and confirms that the Proposed Development is consistent with those objectives.

Table 7-1: Limit Values of Directive 2004/107/EC and 2008/50/EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m3)	Limit Value (ppb)	Basis of Application of the Limit Value
SO_2	Protection of human health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year
SO_2	Protection of human health	24 hours	125	47	Not to be exceeded more than 3 times in a calendar year
SO_2	Protection of vegetation	calendar year	20	7.5	Annual mean
SO_2	Protection of vegetation	1 Oct to 31 Mar	20	7.5	Winter mean
NO_2	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year
NO_2	Protection of human health	calendar year	40	21	Annual mean
NO + NO_2	Protection of ecosystems	calendar year	30	16	Annual mean
PM_{10}	Protection of human health	24 hours	50		Not to be exceeded more than 35 times in a calendar year
$PM_{2.5}$	Protection of human health	calendar year	40		Annual mean
$PM_{2.5}$ - stage 1	Protection of human health	calendar year	25		Annual mean
$PM_{2.5}$ - stage 2	Protection of human health	calendar year	20		Annual mean

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m3)	Limit Value (ppb)	Basis of Application of the Limit Value
Lead	Protection of human health	calendar year	0.5		Annual mean
Carbon Monoxide	Protection of human health	8 hours	10,000	8620	Not to be exceeded
Benzene	Protection of human health	calendar year	5	1.5	Annual mean

There are no statutory limits for dust deposition, however, the TA Luft (German Government 'Technical Instructions on Air Quality') (TA Luft 2002) state a guideline value of maximum 350 mg/m2/day.

There are no limit values in relation to ozone,

Air Quality and Health

According to the EPA (Irelands Environment 2020 – Chapter 14 – Environment, Health and Wellbeing), the number of deaths directly linked to air pollution is estimated at 1,300 premature deaths in Ireland annually due to poor air quality (predominantly due to PM2.5), with a figure of 6 to 7 million premature deaths worldwide (UN Environment, 2019 According to the EPA (Irelands Environment 2020 – Chapter 14 – Environment, Health and Wellbeing), the number of deaths directly linked to air pollution is estimated at 1,300 premature deaths in Ireland annually due to poor air quality (predominantly due to PM2.5), with a figure of 6 to 7 million premature deaths worldwide (UN Environment, 2019)[1].

Generally, air quality in Ireland is acceptable. However, in the short term, when compared with WHO guideline values and EEA reference level values; ozone, particulate matter and PHAs are of concern and NO2 is expected to increase as traffic on our roads increase.

The use of fossil fuel-based electricity generation leads to NOx (Nitrogen Oxides) and Sox (Sulphur Oxides) emissions; however, wind generation does not produce any NOx or SOx emissions. An operational substation will not produce these emissions either.

7.1.3 Climate - Overview

Carbon dioxide (CO2) is a greenhouse gas which, if released in excessive amounts, can lead to increases in global temperatures known as 'global warming' or the 'greenhouse effect' which can influence climate change. Once the Proposed Development is constructed it will have a long-term positive impact by providing a sustainable energy source. Should the Proposed Development not be developed, fossil fuel power stations will be the primary alternative to provide the required quantities of electricity. This will further contribute to greenhouse gas and other emissions, and hinder Ireland in its commitment to meet its target to increase electricity production from renewable sources and to reduce greenhouse gas emissions.

[1] EPA, 2020, cited in' Irelands Environment 2020 – Chapter 14 – Environment, Health and Wellbeing', p. 364.

The revised Energy Efficiency Directive and the revised Renewable Energy Directive entered into force in October and November 2023 respectively. These recast directives include a binding renewable energy target for the EU for 2030 of at least 42.5% (and aiming for 45%), up from the 32% target put forward in the 2018 version of the legislation. This legislation will help the EU meet the Paris Agreement goals. In addition, the European Union (Planning and Development) (Renewable Energy) Regulations 2025 have recently been published, providing the national legislative framework to support the implementation of these EU objectives within Ireland's planning system.

The Government published an updated Climate Action Plan 2024 (CAP24) in December 2023. This third updated action plan follows on from the inaugural plan of 2019 which was a result of the Irish Government declaring a climate and biodiversity emergency on 9th May 2019.

The CAP 24 provides a framework for delivering the Government's target of a 51% reduction (relative to 2018) in greenhouse gas (GHG) emissions by 2030. CAP24 follows The Climate Action and Low Carbon Development Act 2015 as amended by 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. The Act provides a governance framework for annual revisions of the Climate Action Plan and the development of a National Long-Term Climate Action Strategy at least once every ten years. As part of this plan, the Government is also committed to reducing emissions by an average 7% per annum by 2030. The Action Plan is underpinned by a series of sectoral emissions reduction ambitions and enabling actions, with a selection of relevant actions that are relevant to the Proposed Development outlined below.

CAP24 sets out an objective to more than double Ireland's onshore wind energy capacity to 9 GW by 2030 in order to meet new renewable energy targets and reduce emissions.

The policies and objectives of CAP24 are reflected in the National Energy & Climate Plan (NECP) 2021-2030, which was published in July 2024.

The NECP was prepared to incorporate all planned policies and measures that were identified up to the end of 2019 and will collectively deliver a 42% reduction by 2030 in greenhouse gas emissions (from 2005 levels).

Climate Action Plan 2025 (CAP25), approved in July 2025, builds upon the trajectory established by CAP24, maintaining the central targets while placing greater emphasis on delivery and accountability mechanisms. CAP25 refines existing actions, updates timelines, and places particular focus on:

- Enhancing planning and grid connection processes to expedite renewable energy deployment;
- Strengthening local authority roles through updated guidelines and supports for local energy strategies;
- Increasing transparency in sectoral progress through more granular reporting;
- Integrating climate resilience and adaptation measures more directly into development planning and infrastructure delivery.

CAP25 represents a continued evolution of Ireland's climate governance framework and reaffirms the Government's commitment to achieving legally binding emissions reduction targets.

7.1.4 Carbon Emissions

The carbon balance of proposed wind farm developments in peatland habitats has attracted significant attention in recent years. When developments such as wind farms are proposed for peatland areas, there will be direct impacts and loss of peat in the area of the development footprint. There may also be indirect impacts where it is necessary to install drainage in certain areas to facilitate construction. The works can either directly or indirectly allow the peat to dry out, locally, which permits the full decomposition of the stored organic material with the associated release of the stored carbon as CO2. It is essential therefore that any wind farm development in a peatland area displaces more CO2 produced from fossil fuel sources than it releases during the construction, operation and decommissioning of the wind farm site.

There is approximately 0.1 m – 4.2 m of peat depth on the Site. The Site is not located on active bog or fen habitats; the majority of the peat on site is in the form of bare peat and cutover bog. An assessment of peat stability and peat slide risk, where relevant, is included in the Soils, Geology and Hydrogeology chapter (see Chapter 11). The site is relatively flat lying with drainage channels running typically northeast to southwest. The land uses and types within the proposed development site are a mixture of agricultural fields, mature forestry and cutaway peat. The Proposed Development has been sensitively situated within an upland environment of limited carbon storage habitat value.

The Scottish Carbon Calculator Tool[2] was used to calculate whole life carbon emissions and carbon savings as a result of the proposed development. Input data used in the calculations is presented in Appendix 7.1, Volume III of this EIAR.

7.2 Methodology

7.2.1 Context

The primary land-uses within and in the vicinity of the Site comprise agricultural grassland, wet grassland and cutaway peat.

Due to the non-industrial nature of the proposed development and the immediate rural character of the site, air quality sampling was deemed to be unnecessary for this EIAR. Based on the results of desk studies of land use in the area, air quality in the existing environment is expected to be good, since there are no major sources of air pollution (e.g. heavy industry) in the vicinity of the site.

The production of energy from wind turbines has no direct emissions as is the case for fossil fuel based power stations. 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. Some minor short term or temporary indirect emissions associated with the construction of the Proposed Development include vehicular and dust emissions.

As the operation of wind turbines does not give rise to emissions (with the exception of back-up generators which would not be in use regularly), in respect of air and climate, this chapter focuses on the potential emissions which may arise during the construction and decommissioning phases of the proposed development. In accordance with best practice, the Scottish Windfarm Carbon Assessment Tool was used to predict the carbon savings for the wind farm for an operational period of 35 years.

[2] https://informatics.sepa.org.uk/CarbonCalculator/index.jsp

7.2.2 Air Quality

A review of existing air quality monitoring data undertaken by the Environmental Protection Agency (EPA) was reviewed on the EPA website (airquality.ie) in May 2024 and used to characterise the existing environment.

The impact assessment methodology involved the review and assessment of the construction methods for the proposed wind farm and associated infrastructure to identify the potential for air emissions during construction and decommissioning.

The Impact Assessment for air quality involves establishing the air quality of the existing environment, assessing the potential impacts on the existing air quality as a result of the proposed development, and proposing mitigation measures where necessary. The air quality is defined by the parameters set out in Table 7-1 such as Particulate Matter, SOx and NOx. Air Quality is also defined by dust and there is a particular methodology set out for assessing the impacts associated with dust, which is detailed in 7.2.1.1.

7.2.2.1 Dust

The WHO defines dust as: "Airborne contaminants (which) occur in the gaseous form (gases and vapours) or as aerosols. In scientific terminology, an aerosol is defined as a system of particles suspended in a gaseous medium, usually air in the context of occupational hygiene, is usually air. Aerosols may exist in the form of airborne dusts, sprays, mists, smokes and fumes". In more general terms, dust is an airborne particulate matter ranging in diameter from 10 to 50 microns which is generated by organic and inorganic matter such as coal, grain, metal, ore, rock and wood. Dust can be generated by activities which process organic and inorganic matter. Dust can be stirred up from inert states through weather and wind conditions and deposit on all parts of the study area.

There are no statutory limits for dust deposition in Ireland. However, EPA guidance on air emissions monitoring (AG2) (EPA 2021 suggests that a deposition of 10 mg/m2/hour can generally be considered as posing a soiling nuisance. This equates to 240 mg/m2/day. In accordance with the TA Luft 2002 Standard (TA Luft 2002), the EPA recommends a maximum daily deposition level of 350 mg/m2/day.

Construction dust has the potential to be generated from on-site activities such as excavation and backfilling. The extent of dust generation at any site depends on the type of activity undertaken, the location, the nature of the dust, (i.e. soil, sand, peat) and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the haul route.

To assess the impacts of construction dust emissions, the Institute of Air Quality Management (IAQM) guidance document: *'Guidance on the Assessment of Dust from Demolition and Construction'*[3] was used, as is recommended in Transport Infrastructure Ireland's (TII) Air Quality Assessment of the NRA's *Assessment Criteria for the Impact of Dust Emissions from Construction Activities with Standard Mitigation In Place*[4] was used. This approach involves a number of "steps" to assess the potential impact of dust on nearby receptors and is considered to be best practice.

The guidance involves a stepped approach, where Step 1 is a screening assessment, where the proposed development is screened in or out for the requirement of a full air quality assessment (AQA).

[3] http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf
[4] https://www.tiipublications.ie/library/PE-ENV-01107-01.pdf

Per Step 1, the proposed development will require an AQA if it exceeds any of the below criteria:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGVs flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

If any of the above criteria are exceeded, the AQA proceeds to the following steps. Typically for wind farm projects, the AQA is screened out at Step 1. This screening process will be completed in Section 7.4.

The steps involved in the dust impact assessment, as prescribed by the IAQM, are as follows:

1. Screen the requirement for a dust impact assessment
2. Assess the risk of dust impacts by:
    - 2A The scale and nature of the works – the "magnitude" of the potential dust emission
    - 2B The sensitivity of the study area
    - 2C Combining 2A and 2B into a risk matrix to assess the risk of dust impacts
3. Identify site-specific mitigation measures
4. Examine the residual impacts and whether or not these are likely to have significant effects on air quality
5. Prepare a Dust Assessment Report

Table 6: Risk of Dust Impacts - Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 7: Risk of Dust Impacts - Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8: Risk of Dust Impacts - Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 9: Risk of Dust Impacts - Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Plate 7-1: IAQM Risk Matrices for Determining the Risk of Dust Impacts from Construction Activities.

In line with Step 2C of the IAQM methodology, the determination of dust impact risk for each activity—demolition, earthworks, construction, and trackout—is undertaken by combining the dust emission magnitude (Step 2A) with the sensitivity of the study area (Step 2B) using the IAQM's prescribed risk matrices. These are set out in the IAQM Guidance on the Assessment of Dust from Demolition and Construction (v1.1, 2014) as:

- Table 6: Risk of Dust Impacts – Demolition
- Table 7: Risk of Dust Impacts – Earthworks
- Table 8: Risk of Dust Impacts – Construction
- Table 9: Risk of Dust Impacts – Trackout

These matrices will be used to assign a site-specific risk level (negligible, low, medium, or high) for each activity in Section 7.4.2 and will inform the appropriate mitigation measures outlined in Section 7.5.1.

7.2.3 Climate

A desk-top study assessment was undertaken of available climatic information to characterise the existing environment. The climatic conditions for the wider geographical area have been derived from historical meteorological measurements compiled by Met Éireann at Claremorris weather station which is approximately 20 km north of the Site and associated infrastructure, this is the closest weather station to the Site. These meteorological measurements were accessed May 2024 (source www.met.ie/climate). In terms of climatic impact, the appraisal considered the net impact that operating the Proposed Development will have in terms of CO2 and its displacement of CO2 from other energy sources over the carbon losses caused by its manufacturing, transportation, construction and decommissioning using the Scottish Carbon Calculator tool.

In addition to the CO2 factored for emissions purposes, greenhouse gas (GHG) emissions are also factored into the overall carbon calculation. GHG are associated with the manufacture, transport, construction, operation (linked to backup generation) and decommissioning of wind turbines.

The impact assessment considered the positive impacts the Proposed Development will have on contributing to national targets for the reduction of greenhouse gas emissions

The amount of CO2 that could potentially be avoided on an annual basis due to the Proposed Development is estimated based on the expected output of the wind farm. The net displacement value may increase or decrease somewhat, as the generation mix in Ireland develops, under different fuel price scenarios and as demand changes over time, and as more storage, interconnection and demand side management (smart meters) come online. Refer to Section 7.4.4 for details of the calculations for carbon saving as a result of the Proposed Development.

As mentioned above, monthly meteorological data from Met Eireann was reviewed in May 2024 to gain an understanding of the existing climatic condition of the site. These meteorological measurements were accessed May 2024 (source www.met.ie/climate) and provided measurements of total rainfall, mean temperature, and wind speed for Mullingar weather station.

The long-term climate effect of the Proposed Development was determined using the Scottish National Heritage carbon calculator which accounts for all stages of the Proposed Development, including the embodied carbon from the manufacturing and transportation of materials. The impact assessment also involved a review of activities associated with the construction, operational and decommissioning phases to determine impacts on both the micro and macro climates of the site.

7.2.3.1 Carbon Emissions

The updated Scottish National Heritage carbon calculator was developed to in 2008 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. The tool provides a straightforward method for estimating the impacts of wind farms on the carbon dynamics of peatlands. The tool also provides guidance when figure inputs are unknown. The carbon calculator, whilst designed for Scottish wind farm developments is used for assessing Irish wind farm developments due to the similarity in development sites, i.e. high ground on peatlands which contain forestry in a similar climate. In lieu of a specific tool available for calculating the carbon emissions from a wind farm development based in Ireland, the Scottish on-line carbon calculator was used. Whilst designed for Scottish wind farm developments, it is used for assessing Irish wind farm developments due to the similarity in development sites, i.e. high ground on peatlands which contain forestry in a similar climate. The tool has become an 'industry standard' for the purposes of environmental impact assessment on climate for wind farm developments in Ireland. In our professional opinion this methodology constitutes best practice for carbon assessments in Ireland.

The calculator was created to calculate the loss of carbon from acidic bog or fen habitat and defines peat soils as soils with a surface horizon greater than 50 cm deep. The calculator takes into account the carbon fixing potential from peatland plants (which is small) and calculates the total area of peat excavation and the total area of peat affected by drainage, using the annual gains due to carbon fixing potential and the time required for any habitat restoration. Carbon stored within the peat itself represents a large potential source of carbon which can be lost during excavation and drainage. Forestry on proposed wind farm sites can affect wind energy yields and therefore clear felling is generally required. 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. The calculator also takes into account the carbon emissions from the life cycle analysis of the wind turbines and the back up source in order to calculate carbon savings and carbon payback times of a wind farm. Site specific capacity factor is also required to provide a realistic payback time for a site. The calculator also takes into account a grid mix emission factor. The calculator uses default values from the Intergovernmental Panel on Climate Change (IPCC, 1997) as well as site specific equations from scientific literature to calculate carbon loss.

In keeping with guidance, specific figures have been inputted wherever possible and where this information was not available the guidance provided by the calculator was used. The assumption to use the fossil fuel generation emission factor was made based on the reality that additional wind generation will displace fossil fuel generation (Scot. Gov., 2018). With regards to the windfarm characteristics the following presumptions for the Site were made: the lifetime of the windfarm is 35 years, the capacity factor is 31% and the fraction of output to back up is 1.75% (i.e. 5% of capacity factor).

An average depth of peatland was provided for the entire site (2.28 m) and turbine areas (1.58 m). Guidance figures were used for the unknown parameters such as carbon content for dry peat and dry bulk density. Also, whilst 6.01ha of forestry is to be clear felled, forestry will be replanted elsewhere, and the carbon calculator does not take this into account. It is therefore likely that the calculated carbon loss figure for the Proposed Development will be slightly higher than the actual carbon loss for the site Proposed Development.

The Scottish Government on-line carbon calculator as outlined above, was used to assess the impacts of the Proposed Development in terms of potential carbon losses and savings taking into account the whole life of the wind farm development including materials manufacture, transport and installation and all construction activities including peat removal, drainage, and forestry felling. A copy of the outputs is provided as Appendix 7.1, Volume III of this EIAR. A summary of the main CO2 losses due to the Proposed Development are summarised in Table 7-9.

No other technical difficulties or limitations were encountered in the production of this EIAR chapter.

7.3 Existing Environment

7.3.1 Air Quality

European air quality legislation requires that each member state be defined in terms of Zones and Agglomerations for air quality, with Ireland divided into four zones. The EPA has designated four zones within Ireland :

- Zone A: Dublin City and its environs
- Zone B: Cork City and its environs
- Zone C: 24 cities and towns (such as Galway, Limerick and Waterford cities and towns such as Naas, Newbridge, Celbridge, Leixlip) with a population of greater than 15,000
- Zone D: covers the remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Framework Directive and Daughter Directives. The site of the Proposed Development, including the GCR are located in Zone D.

The air quality in each zone is monitored by the EPA and classified with respect to upper and lower assessment thresholds based on measurements over the previous five years. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold. The Air Quality in Ireland Report 2022 (EPA 2023) noted that Ireland's overall air quality was good, however there are localised issues across the country impacting negatively on the air quality. The report showed that: particulate matter PM2.5, originating primarily from the domestic burning of solid fuels, and NO2, primarily an emission from road transport; are the main threats to good air quality in Ireland. The WHO published new air quality guidelines (AQGs) in 2021 based on the impacts of pollutants on human health. So far Ireland is failing to meet these guidelines. It is estimated that there are approximately 1,300 premature deaths annually in Ireland due to poor air quality from fine particulate matter (PM2.5). The Air Quality Index for Health map on the EPA website, shows that the current air quality within the Site, GCR and TDR is classed as good.

The EPA undertakes continuous ambient air monitoring at various stations in Ireland. Although no data is available on air quality for the Proposed Development site, it is expected that the air quality data from the nearest stations to the Proposed Development are representative of the air quality at the Site. In the case of the Proposed Development, the closest EPA monitoring station is Station 102, Edenderry Library, Co. Offaly (approximately 10 km west of the Proposed Development site). Station 102 monitors N_{O2}, S_{O2}, PM_{10} and $PM_{2.5}$.

A summary of data collected at these monitoring stations is found in the following sections. The EPA allows a maximum of 6 months' of data to be exported to CSV files. Therefore, data for 8th November 2024 to 8th May 2025 has been used to create the summary tables below.

7.3.1.1 Particulate Matter (PM10)

Particulate matter are very small particles which can be either solid or liquid. Some of these particles occur naturally, while many are man-made. Particulate matter is referred to as PM. The number following the PM is used to show how small the PM is. The EPA monitors two types of PM and compare levels to limit values in the CAFE (Clean Air for Europe) Directive and WHO guidelines. These are PM10 and PM2.5.

Particulate matter (PM10) data for the 8th November 2024 to 8th May 2025 monitoring period at Station 102 is presented in table 7-2. The maximum daily value of PM10 recorded during the period was 58.28 µg.m-3 which is above the threshold of 50 µg.m-3 which must not be exceeded any more than 35 times in a year. Of the 6 months of data examined, this threshold was exceeded three times on 11th January 2025, the 26th and 27th of November 2024 also, which is representative of less than 18 exceedances over a six-month period (equivalent to the annual limit of 35 exceedances per year). Therefore, it is assumed that the PM10 concentrations throughout the year are compliant with the CAFE Directive. The mean daily value recorded during the period was 18.28 µg.m-3 which does not exceed the threshold in the CAFE Directive of 40 µg.m-3 annual mean concentration. However, the World Health Organisation (WHO) have set more conservative limits for PM10 concentration with an annual mean limit value of 15 µg.m-3. As the mean daily value at Station 102 is 18.28 µg.m-3, the local PM10 concentration at Edenderry Library is exceeding the WHO limit. It is worth noting that PM10 concentration at Edenderry Library is likely to be higher than the concentration at the proposed development site as Edenderry Library is set in a more urban environment therefore it is possible that PM10 concentration at the proposed development site does not exceed the WHO limit.

Table 7-2: Particulate Matter (PM10) data from Station 102, Edenderry Library 08/11/2024-08/05/2025

Parameter	Measurement
No. of Days	182
No of measure values	182
Percentage coverage	100%
Maximum daily value	58.28 µg.m-3
Mean daily value	18.28 µg.m-3

7.3.1.2 Particulate Matter (PM2.5)

Particulate matter (PM2.5) data for the 8th November 2024 to 8th May 2025 monitoring period at Station 102 is presented in Table 7-3. The mean daily PM2.5 concentration is below the threshold value (mean daily value of 14.62 µg.m-3) and is therefore compliant with the CAFE Directive. However, the World Health Organisation (WHO) have set more conservative limits for PM2.5 concentration with an annual mean limit value of 5 µg.m-3. As the mean daily value at Station 102 is 14.62 µg.m-3, the local PM2.5 concentration at Edenderry Library is exceeding the WHO limit. It is worth noting that PM2.5 concentration at Edenderry Library is likely to be higher than the concentration at the proposed development site as Edenderry Library is set in a more urban environment therefore it is possible that PM2.5 concentration at the proposed development site does not exceed the WHO limit.

Table 7-3: Particulate Matter (PM2.5) data from Station 102, Edenderry Library 08/11/2024-08/05/2025

Parameter	Measurement
No. of Days	182
No of measure values	182
Percentage coverage	100%
Maximum daily value	55.66 µg.m-3
Mean daily value	14.62 µg.m-3

7.3.1.3 Sulphur Dioxide (SO2)

Sulphur Dioxide for the period of the 8th November 2024 to 8th May 2025 recorded at Station 102, Edenderry Library is presented in Table 7-4. Neither the hourly limit value nor the 24-hour limit value as set out in the CAFE Directive were exceeded during the monitoring period.

Table 7-4: Sulphur Dioxide Data from Station 102, Edenderry Library 08/11/2024-08/05/2025

Parameter	Measurement
Number of Hours	4154
No. of measured values	4154
Percentage Coverage	99%
Maximum hourly value	45.98 µg.m-3
98 percentile for hourly values	8.55 µg.m-3
Mean hourly value	2.35 µg.m-3
Maximum 24 hour mean	10.87 µg.m-3
98 percentile for 24-hour mean	6.73 µg.m-3

7.3.1.4 Nitrogen Dioxide (NO2)

Nitrogen dioxide for the 8th November 2024 to 8th May 2025 monitoring period in at Station 102 is presented in Table 7-5. The hourly limit values for the protection of human health were not exceeded during the assessment. Neither the hourly threshold (200 µg.m-3) nor the annual mean threshold (40 µg.m-3) values were exceeded during the monitoring period.

Table 7-5: Nitrogen Dioxide Data from Station 102, Edenderry Library 08/11/2024-08/05/2025

Parameter	Measurement
No. of Hours	4154
No of measure values	4154
Percentage coverage	99%
Maximum hourly value (NO2)	64.25 µg.m^{-3}
98 percentile for hourly rates (NO2)	37.14 µg.m^{-3}
Mean hourly value (NO2)	11.39 µg.m^{-3}

7.3.2 Climate

Climate is defined by the EPA as "the average weather over a period of time". Climate change is a term that is used to describe a "significant change in the measures of climate, such as temperature, rainfall, or wind, lasting for an extended period – decades or longer. [5]" There is scientific evidence[6] which suggests that the current climate is rapidly warming, having reached approximately 1°C above pre-industrial levels in 2017, increasing at a rate of 0.2 °C per decade. Warmer weather places pressure on flora and fauna which cannot adapt to a rapidly changing environment. In Ireland, the pressure on flora and fauna is mitigated due to the dominant influence of the Gulf Stream on Ireland's climate. Consequently, Ireland does not suffer from the extremes of temperature experienced by many other countries at similar latitudes.

The climatic conditions for the wider geographical area have been derived from historical meteorological measurements compiled by Met Éireann at Mullingar weather station which is approximately 38 km north of the Site and associated infrastructure. These meteorological conditions are presented in Table 7-6 and 7-7 from the period January 2022 – September 2025 (source www.met.ie/climate). The long-term average (LTA) for the Mullingar weather station runs from November 1943 to current date. The Mullingar station is the closest and most appropriate long-term meteorological station available for characterising climatic conditions at the Site, and is therefore considered suitable for use in this assessment.

Table 7-6: Total rainfall in millimetres for MULLINGAR

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2025	59.8	70.6	24.0	86.1	64.5	92.0	77.1	50.4	18.1				542.6
2024	83.1	91.9	117.3	97.0	57.1	49.4	65.6	82.7	47.5	59.9	75.2	64.8	891.5
2023	81.1	29.8	141.4	82.8	36.4	53.3	178.8	114.3	132.9	104.5	71.2	132.0	1158.5
2022	47.6	131.8	46.2	48.7	53.4	100.6	31.6	35.2	104.1	208.8	109.3	84.5	1001.8
LTA	91.4	76.4	69.2	69.5	66.1	75.1	79.5	84.9	76.9	99.6	98.1	99.6	986.3

[5] https://www.epa.ie/climate/communicatingclimatescience/whatisclimatechange/

[6] IPCC Special Report "Global Warming of 1.5°C": https://www.ipcc.ch/sr15/download/#chapter

Table 7-7: Mean temperature in degrees Celsius for MULLINGAR

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2025	4.1	5.9	7.5	10.0	11.9	14.5	16.3	16.1	13.4				10.9
2024	4.4	7.0	7.0	8.6	13.0	12.7	14.5	14.5	12.3	10.5	7.6	6.5	9.9
2023	5.3	6.8	6.9	8.7	12.3	15.9	14.5	15.3	14.3	10.8	6.8	6.5	10.4
2022	5.1	6.2	6.6	8.1	12.0	13.5	16.2	15.5	12.9	11.3	8.2	3.4	9.9
LTA	4.7	5.0	6.2	8.2	10.8	13.4	15.0	14.6	12.7	9.7	6.8	4.9	9

7.4 Impact Assessment

7.4.1 Do-Nothing Impact

If the Proposed Development does not proceed, local air quality and the microclimate will remain unchanged. On a national scale, there will be an increase in greenhouse gas emissions if increasing future electricity needs are not met by alternative renewable sources which has the potential to contribute to air pollution and climate change. The opportunity to contribute to Ireland's commitments under the Kyoto Protocol and to meet national targets as set out in the Climate Action Plan would also be lost.

While immediate forestry felling 6.01 ha of forestry would not be required clear felling forms part of the cycle of commercial forestry and without the Proposed Development clear felling would occur as normal, if at a later date.

7.4.2 Air Quality

7.4.2.1 Construction Phase Impacts

The principal sources of potential air emissions during the construction of the Proposed Development will be from the Site, GCR and TDR; from dust arising from earthworks, tree felling activities, trench excavation along cable routes, construction of the new access tracks, the temporary storage of excavated materials, the construction of the proposed substation, the movement of construction vehicles, loading and unloading of aggregates/materials and the movement of material around the site.

Dust emissions can lead to elevated PM10 and PM2.5 concentrations and may also cause dust soiling. The amount of dust generated and emitted from a working site and the likely effect on the study area varies according to:

- The type and quantity of material and working methods
- Distance between site activities and sensitive receptors
- Climate/local meteorology and topography

Table 7-8: IAQM descriptions for the magnitude of an earthworks project

Source	
Scale	**Description**
Large	Total site area greater than 10,000 m2, potentially dusty soil type, more than 10 heavy earth-moving vehicles active at any one time, formation of bunds greater than 8 m in height, total material moved greater than 100,000 tonnes.
Medium	Total site area greater 2,500 m2, moderately dusty soil type, 5-10 heavy earth-moving vehicles active at any one time, formation of bunds 4 to 8 m in height, total material moved 20,000 tonnes to 100,000 tonnes.
Small	Total site area less than 2,500m2, soil type with large grain size (e.g. sand), less than 5 heavy earth-moving vehicles active at any one time, formation of bunds less than 4 m in height, total material moved less than 20,000 tonnes, earthworks during wetter months.

Source: IAQM, 2014[3]

Applying the IAQM criteria in Table 7-8, the overall construction of the Proposed Development is considered a large scale construction site as the site area is greater than 10,000 m2 and the total material moved will likely exceed 100,000 tonnes. The “magnitude” of the potential emissions is therefore “large”.

In line with the IAQM (2014) guidance, the sensitivity of the study area is classified based on receptor type, number, proximity to the source, and potential impacts. These are classified as High Sensitivity", "Medium Sensitivity" and "Low Sensitivity". These classifications are used in conjunction with the dust emission magnitude to determine the overall risk of dust impacts during construction.

Due to the small number of receptors (208 receptors within 2km of the site), and distance from the source of the dust emissions, with the closest residential dwelling being approximately 770m from Turbine 1, the “sensitivity” of the area is considered to be “low”, as per the criteria set out in the guidance (DMRB, 2007).

Combining the large magnitude of the earthworks with the low sensitivity, the IAQM guidance indicates that the Risk of Dust Impacts are “Low Risk” for the Proposed Development. This will apply during the construction stage. Not likely to be a significant effect.

Construction vehicles and plant emissions have the potential to increase concentrations of compounds such as NO2, Benzene and PM10 in the receiving environment. While nearby sensitive receptors may experience short-term, intermittent exposure to these emissions, the rural setting of the Proposed Development — characterised by open space and low background pollution — will facilitate rapid dispersion of pollutants. As a result, any air quality effects are expected to be slight, localised, and likely non-significant.

There will be no likely significant effect on air quality due to traffic from the Proposed Development as the effects will fall below the screening criteria set out in the UK DMRB guidance (UK Highways Agency 2007), on which the TII guidance (specified in the methodology of this chapter in Section 7.2.1) is based.

This UK DMRB guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a Proposed Development and should be included in the local air quality assessment:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGVs flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

On the road network as detailed in Chapter 14 Traffic and Transportation, there will be an increase in traffic volumes over a construction period of 24 months (expected based on the nature and scale of the proposed works). Traffic volumes in Chapter 14 are described in terms of Light Goods Vehicles (LGVs) such as cars, 4x4s and vans used by the workers and supervisory staff involved in the construction works, and Heavy Goods Vehicles (HGVs) transporting materials to and from the site, including road making materials, concrete, building materials, drainage/ducting materials, cabling, electrical components and excavated material.

The construction phase for the Proposed Development will lead to 24,861 additional HGV trips (two-way) over the duration of the construction works. Calculations of HGV movements associated with the construction of the proposed development indicate an average daily increase of 40 HGV trips per day over a construction period of 24 months. This increases to an average of 68 HGV trips per day during the peak month which occurs in months 10 - 12 of the programme for HGV traffic.

An average workforce of 30 persons is anticipated, increasing to 40 persons during peak periods. This is estimated to give rise to an increase of LGV traffic of 43 trips per day on average rising to 54 trips during peak construction periods which occur for LGV traffic during months 21 to 24.

The combined HGV and LGV average daily increase is 83 trips per day throughout the construction programme.

For context, this figure is significantly below the threshold of 1,000 annual average daily traffic (AADT) referenced in standard traffic and air quality assessment criteria, below which construction traffic impacts are generally considered to be not significant. The relatively low volume of additional traffic is not expected to result in a likely significant effect on or air quality.

None of the criteria set out in the UK DMRB are met. Therefore, the air quality assessment model is not required in this instance. Given the relatively low levels of increase in traffic at the site, and finding of no significant effects in traffic chapter then no effect on air quality will arise.

Some receptors have the potential for dust soiling due to trucks travelling along local routes. This is a likely, temporary, slight impact which is not considered to be a significant effect.

Plant and machinery such as generators, excavators etc. will be required at various stages of the construction works. These will be relatively small units which will be operated on an intermittent basis. Although there will be an emission from these units, given their scale and the length of operation time, the impacts of emissions from these units will be imperceptible and are not considered likely to give rise to significant effects.

In general, air quality impacts during the construction phase of the Proposed Development are predicted to be short-term, localised, and minor in nature. No likely significant effects on air quality are anticipated during the construction phase. As described in Chapter 2, temporary accommodation works will be required at selected locations along the TDR to facilitate the delivery of large components to the site. This will include some temporary hardcore surfacing at roundabouts or areas of oversail, and overhead utilities and obstructions will need to be removed at several locations to provide adequate overhead clearance.

The majority of the temporary accommodation works associated with the TDR will be fully reinstated following the construction stage, with the exception of the permanent Bridge Crossing at Philipstown Bridge (see Node 29/30 within Table 2-8 of Chapter 2). The majority of the temporary accommodation works will result in a likely, imperceptible, brief to temporary, negative effect on air quality (non-significant) due to the dust emissions from laying hardstanding surfaces and the vehicular emissions during the works. The construction of the permanent bridge will result in a likely, slight, temporary negative effect on air quality (non-significant) due to the dust and vehicular emissions associated with the works.

7.4.2.2 Operational Phase Impacts

Once the proposed wind farm and grid connection are constructed there will be no significant direct emissions to atmosphere. A diesel generator will be located at the proposed wind farm substation; however, this will only be operated as a back-up/emergency power supply.

Emissions from the diesel generator will therefore be infrequent. During use, a diesel generator will emit carbon dioxide, nitrogen oxide and particulate matter, however, due to the low usage, the effect will likely be imperceptible (therefore non-significant).

Maintenance vehicles will access the proposed wind farm site during the operational period, however, due to the low traffic movements involved (See Chapter 14, Section 14.6, the impact will be imperceptible. The operational phase of the wind farm will result in positive impacts on air quality due to the displacement of fossil fuels as an energy source.

Maintenance vehicles will also access the joint bays for periodic maintenance and carry out point works along the proposed grid connection route to address any issues during the operational period. However, given the low and infrequent traffic movements involved, the impact will be imperceptible. Non routine maintenance to turbines may also be required. A small team may be deployed to site in a crane and maintenance vehicles. Given the low and infrequent traffic movements involved, the impact will be imperceptible. The operational phase of the grid connection which connects to and operates the proposed wind farm will result in positive impacts on air quality due to the displacement of fossil fuels as an energy source.

7.4.2.3 Decommissioning Phase Impacts

In terms of decommissioning, there will be truck movements associated with removing the wind turbines, earthmoving to cover foundations and landscaping resulting in vehicular emissions and also dust. However, the number of truck movements will be significantly less than the construction phase and will likely result in a slight temporary effect There will also be emissions from machinery on site including for the movement of soil to cover the foundations, however, this is not likely to result in significant impacts.

During the decommissioning phase, the proposed grid connection infrastructure including substations and ancillary electrical equipment will form part of the national grid and shall be left in situ. The internal ducts of the proposed development, all internal access roads, and turbine hardstandings will be left in situ, resulting in no additional truck movements and no effect from emissions from machinery along the grid connection route.

7.4.3 Climate

There is the potential for greenhouse gas emissions to the atmosphere during the construction, operation and decommissioning phases of the Site and GC such as those arising from construction vehicles, the use of on-site generators, pumps, back-up generators and excavation works. The potential climatic effects arising from these emissions are assessed hereunder with respect to micro and macro climates.

7.4.3.1 Microclimate

The likely significance of effects associated with the conversion of vegetated surfaces to un-vegetated surfaces is assessed through the consideration of the area of the land experiencing such a change.

The total area of proposed new permanent hardstanding surface is approximately 3% of the wind farm site and consequently there will be no direct or indirect effect on air temperature and microclimate because of the relatively small proportion of new permanent hardstanding surface proposed.

There will also be the loss of 6.01 ha of forestry. Felling is required to accommodate the construction of wind farm infrastructure and as part of environmental mitigation measures for bat species.

There will be no direct or indirect effect on site temperature and microclimate due to clear felling because clear felling forms part of the cycle of commercial forestry and without the Proposed Development clear felling would occur as normal.

7.4.3.2 Macroclimate

Carbon dioxide (CO2) is a greenhouse gas which if released in excessive amounts can lead to increases in global temperatures known as 'global warming' or 'greenhouse effect' which can influence climate change. See Section 7.4.4 Carbon Balance below for details regarding the carbon savings that have been calculated for the Proposed Development.

The Proposed Development has the potential to offset the carbon emissions associated with fossil fuel power stations, which are the primary providers of electricity in Ireland. Offsetting these carbon emissions would have a significant positive effect on the Kildare and Offaly County Council in meeting their CDP and CAP targets: and a slight, positive effect on Ireland meeting its various climate targets set out in Section 7.1.3 of this Chapter and in Chapter 4 – Policy. The likely effect on Climate Change on a global scale would be imperceptible and as such non-significant.

The Proposed Development provides Ireland an indigenous form of sustainable electricity and will contribute to the security of supply against our dependence on imports in addition to the overarching positive effects on the macroclimate.

The vulnerability of the Proposed Development to future changes in the climate and its capacity to adapt to possible climate change impacts over the course of its lifetime has been considered. Additional capacity has been included for watercourse crossing designs to account for future climate conditions. For further information, please refer to the Site-Specific Flood Risk Assessment (SSFRA) located in Appendix 12.1, Volume III of the EIAR.

7.4.3.3 Carbon Balance

In terms of carbon losses and savings, the online Scottish Windfarm Carbon Assessment Tool (https://informatics.sepa.org.uk/CarbonCalculator/index.jsp) was used to estimate carbon savings as a result of the proposed construction and operation of the wind farm. Appendix 7.1, Volume III details the inputs to the model.

Based on the Scottish Windfarm Carbon Assessment Tool, embodied carbon emissions associated with the manufacturing and transportation of turbines, together with emissions from construction and decommissioning activities, have been assessed. These processes are estimated to result in the release of approximately 56,338 tonnes of CO2 will be released to the atmosphere. This is based on the assessment of the Vestas (Model : V162), with a Maximum Export Capacity (MEC) of 7.2 MW. This represents 3.6% of the total amount of CO2 emissions that will be offset by the Proposed Development. Losses during the construction and decommissioning phases will be due to reduced carbon fixing potential, losses from soil organic matter and losses due to felling forestry. Values for turbine life and felling of forestry are presented in Table 7-9.

In total, it is estimated that 1,564,395 tonnes of CO2 will be displaced over the proposed thirty five-year lifetime of the wind farm during operation i.e. 44,697 tonnes of CO2 per annum, which assists in realising the ambitious goals of the Climate Action Plan 2024 and the Climate Action Plan 2025 carries that forward, reaffirming those exact targets as key milestones in Ireland's climate strategy. From an operational perspective, the proposed development will displace the emission of CO2 from other less clean forms of energy generation and will assist Ireland in meeting its renewable energy targets and obligations. The burning of fossil fuels for energy creates greenhouse gases, which contributes significantly to climate change. These and other emissions also create acid rain and air pollution.

For the Proposed Development with 9 no. turbines assuming a turbine power rating of 7.2 MW, and operational period of 35 years, the payback time for the manufacture, construction and decommissioning phases (including carbon losses from soil, felling of forestry etc.) of the Proposed Development is estimated at approximately 1.6 years. Should further restoration measures be put in place, the total carbon emissions and carbon payback time would be reduced.

The calculator only takes into account the loss of forestry from felling (carbon release) and the loss of forestry growth (carbon sequestration) associated with the Proposed Development and does not take into account the replanting of forestry outside of the site (there is no option of including external replant lands). Therefore, it is possible that the carbon loss calculations for the Proposed Development are slightly overestimated in this regard. Permanent felling of approximately 6.01ha of coniferous forestry is required for turbine delivery route accommodation works, no additional felling is required for any other part of the Proposed Development. It should be noted that the clear-felling of trees in the State requires a felling licence. A felling licence will include the provision of relevant replant lands (afforestation area) to be planted in lieu of the proposed tree felling on the site. A total of 6.5ha of new forestry will be replanted in accordance with the Forestry Act, 2014 at the alternative site to compensate the loss of forestry at the Site which will offset 2,777 tonnes of CO2 lost due to the felling of forestry. This replanting is not factored into the carbon assessment.

Table 7-9: Carbon Balance Results

Origin of Losses	Total CO2 Losses (tonnes C02 equivalent)	
	Expected	Maximum
Turbine manufacture, construction and decommissioning	56,338	56,338
Losses due to Backup	42,914	60,080
Losses from soil organic matter	21,885	43,443
Felling of Forestry	2,777	2,777
Other	116	244
Total Expected Losses	124,030	163,149
Emissions Savings	**Expected C02 emission savings (tonnes CO2 per Annum)**	
fossil fuel mix electricity generation	76,019	76,019
Energy output from windfarm	**MWhr/year**	
Estimated Annual Output	175,971	175,971
Carbon payback time	**Years**	
Fossil fuel mix of electricity generation	1.6	2.1

7.4.4 Major Accidents and Disasters.

In line with the 2022 EPA Guidelines on the information to be contained in EIARs, consideration has also been given to the potential for the Proposed Development to (i) cause major accidents or disasters, and (ii) be vulnerable to such accidents or disasters (for example, lightning strikes). In relation to air quality and climate, no such risks arise: the Proposed Development would not give rise to accidents or disasters with the potential to significantly affect air quality, nor is the Proposed Development vulnerable to such events in a way that would result in significant air quality or climate impacts.

7.4.5 Cumulative Impacts

The geographic extent of the cumulative assessment is considered on a case-by-case basis, in line with the Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017).

Projects within 20 km of the Site have been considered for cumulative impacts in relation to air quality as the majority of impacts identified are relating to the construction phase dust and traffic emissions.

A 20 km distance is considered a suitable zone of influence considering the emissions associated with proposed development will be focused on the construction site and significant emissions beyond the construction site are not envisaged as concentrations of the pollutants will have dissipated. Emissions relating to the TDR have been considered, however, these have been screened out of the cumulative assessment as emissions associated with the transport of turbines and construction works relating to the upgrade of TDR nodes are non-significant.

There are a number of projects and activities which are either existing (operational), permitted, under construction, or proposed within the vicinity of the Site. Windfarms within 20 km of the Site are as set out in in Table 7-10 below. It is noted that Ballydermot Wind Farm and Cushina Wind Farm are currently only at pre-application stage and therefore no cumulative construction effects are predicted to arise in combination with the Proposed Development.

Table 7-10: Cumulative Impacts

Wind Farm Name	Number of Turbines	Distance and Direction from Proposed Site	Status
Cloncreen Wind Farm	21	10.6km to the north of the site	Operational since 2022.
Mount Lucas Wind Farm	28	11.1km to the north of the site	Operational since 2015.
Cushaling Wind Farm	9	12km to the north-east of the site	Permitted since 2020 & construction started in 2022.
Moanvane Wind Farm	12	18.6km to the west of the site	Permitted since 2018 & construction started in 2022.
Yellow River Wind Farm	29	c.19km to the north of the site	Permitted since 2022 & construction began in 2022, with an expected completion date in 2025.
Dernacart Wind Farm	8	c.15km west of the site	High Court Ruled in favour of this development in June 2025. An Bord Pleanala (now An Coimisiun Pleanala) approved the development in January 2024 (Appeal Case Ref: 310312)
Treascon Solar Farm	n/a	c.2Km southwest of the site	Permitted July 2024, construction not started yet. (Planning ref: 318436)
Cappakeel Solar Farm	n/a	c.11km south of the site	Granted by LPA in September 2025 (Ref: 2560148), Appealed, Pending Decision by ACP (Ref: PL-500061-LS)
Clonarrow Wind Farm	4	c.12km to the north of the site	Currently in Planning and awaiting decision (Planning Ref: 2560189)

Wind Farm Name	Number of Turbines	Distance and Direction from Proposed Site	Status
Ballydermott Wind Farm	47	c.7.7km to the south east of the site	Pre-Application Stage
Cushina Wind Farm	11	c.4.3km north west of the site	Pre-Application Stage

7.4.5.1 Construction

Air Quality

As established above in section 7.4.2, there are no significant effects on air quality during the construction phase from:

Exhaust emissions during the construction of turbines, substation and all other infrastructure Exhaust emissions during the construction of borrow pits. Exhaust emissions through the transportation of materials to the Wind Farm Site Dust emissions during the construction of turbines, substation and all other infrastructure Dust emissions during the construction of borrow pits. Dust emissions through the transportation of materials to the Wind Farm Site, Carbon dioxide (CO2), oxides of nitrogen (NOx), and sulphur dioxide (SO2) emissions through plant and vehicle emissions.

Therefore, it is considered there will be no cumulative effects on air quality should other proposed or consented plans and project within the surrounding landscape be constructed in parallel with the Proposed Development.

Climate

As established above in section 7.4.3, there are no significant effects on climate during the construction phase from:

Construction of turbines, substation and all other infrastructure construction of borrow pits. Transportation of materials to the Wind Farm Site. Therefore, it is considered there will be no cumulative effects on climate and greenhouse gas emission should other proposed or consented plans and projects within the surrounding landscape be constructed in parallel with the Proposed Development.

7.4.5.2 Operational Phase

Air Quality

As established above in section 7.4.2, there are no significant effects on air quality during the operational phase from:

Exhaust emissions from maintenance and amenity visitors to the site, Dust emissions from maintenance and amenity visitors to the site. Therefore, it is considered there will be no cumulative effects on air quality should other proposed or consented plans and projects within the surrounding landscape be operational in parallel with the Proposed Development.

Climate

As established above in section 7.4.3 there is a long-term positive indirect effect on Air Quality during the operational phase. There will be emission savings of carbon dioxide (CO2), oxides of nitrogen (NOx), and sulphur dioxide (SO2). The production of renewable energy from the Proposed Development will have a long-term significant positive impact on air quality due to the offsetting of approximately 44,697 tonnes of Carbon Dioxide (CO2) per annum (Against EU FFC and supply renewable energy of approximately 41,898 Irish households with electricity per year. This is a significant long-term Moderate Positive indirect effect on Air Quality. The nature of the Proposed Development and other wind energy developments both within 20 kilometres and on the island of Ireland are such that, once operational, they will have a Cumulative Long-term, Significant, Positive effect on the air quality and climate and would assist the national and international objectives for offsetting CO2 emissions and achieving a climate neutral Ireland by 2050 as set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

Overall, no significant adverse cumulative effects on air quality and climate are predicted. The Proposed Development, when considered cumulatively with other projects in the area, is expected to contribute positively to climate objectives through the long-term displacement of fossil fuel-based energy generation with renewable energy.

7.5 Mitigation Measures

The impact assessment has not identified any likely significant negative effects on air quality and climate. Therefore, while mitigation measures are not required, they are provided here as best practice.

7.5.1 Air Quality

7.5.1.1 Construction Phase

Construction Environmental Management Plan (CEMP) has been prepared and is included in Volume III, Appendix 2.1. This includes for the following mitigation measures during the construction phase of the proposed development relevant to air quality:

- The internal access tracks will be constructed prior to the commencement of other major construction activities. These roads will be finished with graded aggregate which compacts, preventing dust;
- A water bowser will be used to spray work areas (wind turbine area and grid connection route) and haul roads, especially during periods of excavations works coinciding with dry periods of weather, in order to suppress dust migration from the site;
- All loads which could cause a dust nuisance will be covered to minimise the potential for fugitive emissions during transport;
- Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable;
- The access and egress of construction vehicles will be controlled and directed to designated locations, along defined routes, with all vehicles required to comply with onsite speed limits;
- Construction vehicles and machinery will be serviced and in good working order;
- Wheel washing facilities will be provided within the site near the site entrance point of the Site as described in Chapter 2, and all vehicles entering or leaving the site will be required to use these facilities;

- The developer in association with the contractor will be required to implement the dust control plan as part of the CEMP. In the event the Planning Authority decides to grant permission for the Proposed Development, the final CEMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the Planning Authority.
- Receptors which have the potential to receive dusting and soiling temporary works at TDR nodes located adjacent to dwellings; and dwellings directly adjacent to the GCR construction that experience dust soiling, where appropriate, and with the agreement of the landowner, will have the facades of their dwelling cleaned if required should soiling occur;
- Ensure all construction vehicles will be required to switch off engines when stationary and no idling of vehicles will be permitted; and
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery.

7.5.1.2 Operational Phase

As the operation of the Proposed Development will not have any likely significant impacts on air quality, mitigation measures are considered unnecessary.

7.5.1.3 Decommissioning Phase

While no likely significant effects have been identified in respect of air quality from the Proposed Development during the decommissioning phase, the same, mitigation measures with respect to dust control and minimisation will be implemented. The proposed access tracks across the Site are proposed to be left in situ following decommissioning and no mitigation measures are proposed. In terms of the underground grid cable and substation, these will be left in situ and so no mitigation measures are proposed.

7.5.2 Climate

It is considered that the Proposed Development will have an overall likely positive non-significant effect in terms of carbon reduction and climate change. It will assist Ireland in meeting the EU's latest renewable energy targets set out in the Renewable Energy Directive (2023) which contains a binding target for 2030 of at least 42.5%, but aiming for 45%. Also, it will aid in increasing the onshore wind capacity, as per the Climate Action Plan 2024. In terms of renewable energy, the target increase set in the Climate Action Plan 2024 in electricity generated from renewable sources is to increase to 80% by 2030, with 9GW of onshore wind capacity, and CAP 25 carries that forward, reaffirming those exact targets as key milestones in Ireland's climate strategy.

As no likely significant effects on climate are predicted during construction, operation and decommissioning no mitigation measures are necessary or proposed. In terms of the operational phase, the operation of the Proposed Development will have a positive effect on climate due to the displacement of fossil fuels and will have a significant long-term positive impact on climate change policy and legislation at a local, regional, and national level.

7.6 Residual Impacts

7.6.1 Air Quality

Following the implementation of the above mitigation measures, the Wind Farm, GCR and TDR work areas will result in slight to moderate residual impacts arising from fugitive dust emissions during construction activities involving excavations, felling or earthmoving. These will be localised in nature and as they will be associated with particular elements of the construction phase, they will be temporary in nature and will not result in any permanent residual impacts.

Impacts related to vehicle emissions and dust will reduce significantly following construction and no significant effects are anticipated. There will be a low level of maintenance traffic during the operational period, which will have an imperceptible impact.

Impacts on air quality due to vehicle emissions and dust during the decommissioning phase are expected to be similar in nature to the construction phase but of a smaller magnitude. They will be temporary in nature and result in slight residual impacts, therefore likely non-significant effect. There will be no permanent residual impacts due to the decommissioning phase.

During operations, the Proposed Development will result in the avoidance of emissions from fossil fuel generators which is a positive effect on air quality.

7.6.2 Climate

Section 7.4.3 assessed the potential effects on climate caused by the Proposed Development through microclimate and macroclimate. At the microclimate level, the Proposed Development encompasses approximately 3 % of the entire site area with hardstanding surfaces (hardstandings, access tracks, structures). The assessment found that a 3 % increase in hardstanding are would not negatively impact the vegetation necessary to maintain a microclimate. In addition, the minimal felling of forestry required will not have an impact on microclimate. In terms of macroclimate, it is estimated that an annual average output of 175,971 MWhr for the Proposed Development will result in the net displacement of 44,697 tonnes of CO2 per annum. This results in a positive impact by removing the GHG emissions that would have otherwise been part of the output of traditional energy manufacturing (i.e. biomass, peat, etc). Potential impacts to climate can have the potential to affect human health and the environment. No direct or indirect impact on air temperature, microclimate or macroclimate has been associated with the development of the Site due to the location of the site which is predominately a rural agricultural location with the exception of existing public roadways.

There are no potential direct or indirect impacts on air temperature, microclimate and macroclimate associated with the GCR. Due to the nature of construction along the GCR which works as a “rolling” construction site, no works will be concentrated in any one area of the route. Therefore, the construction phase of the Proposed Development will not have a significant effect on climate.

Should the Proposed Development not be developed, fossil fuel power stations will likely be the primary alternative to provide the required quantities of electricity. This will further contribute to greenhouse gas and other air pollutant emissions, as well as hindering Ireland in its commitment to meet its target to increase electricity production from renewable sources and to reduce greenhouse gas emissions.

There will be residual positive impacts from the operation of the Proposed Development in terms of the displacement of fossil fuel energy generation with renewable energy. These residual impacts are considered to be significant at both a national and international level, as the Proposed Development will contribute to renewable energy targets, greenhouse gas emission reductions, and climate change mitigation.

7.7 Conclusion

There are no likely significant effects expected on Air Quality or Climate as a result of the construction, operation and decommissioning of the proposed development.

There are no likely significant cumulative effects expected on Air Quality and Climate as a result of other existing or proposed developments.

There will be a likely long term positive residual effect on air quality and climate as a result of the development due to the displacement of fossil fuels.

The mitigation measures identified in this Chapter will be adopted and implemented by the Contractor and have been incorporated into the construction stage CEMP included in Appendix 2.1.

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