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## **Chapter 10 Air and Climate**

### **Ballynisky Wind Farm**

**Ballynisky Green Energy Ltd.**

**December 2025**

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**MWP, Engineering and Environmental Consultants**

**Address:** Park House, Bessboro Road, Blackrock, Cork, T12 X251

**www.mwp.ie**



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## 10. Air and Climate

### 10.1 Introduction

This chapter describes the potential effects the construction, operation and decommissioning of the proposed development will have on air quality and climate. A full description of the proposed development and all associated elements is provided in **Chapter 03 Description of the Proposed Development** of this **EIAR**. The nature and probability of effects on air quality and climate arising from the overall development has been assessed. The assessment comprises:

- A review of the existing receiving environment;
- Prediction and characterisation of likely impacts;
- Evaluation of effects significance; and
- Consideration of mitigation measures, where appropriate.

#### 10.1.1 Competency of Assessor

The chapter and assessment was prepared by Kieran Barry BEng (Civil/Structural Engineering), PgDip (Environmental Protection), MEnvSc. Kieran is an experienced Environmental Consultant at Malachy Walsh and Partners (MWP), having worked for 8 years in the environmental sector. Kieran works on a variety of infrastructure projects conducting environmental assessments and supporting the delivery of a number of environmental deliverables including Environmental Impact Assessment (EIA) Screening Reports, feasibility and constraints studies, route option assessments and Environmental Impact Assessment Reports (EIAR).

The assessment was reviewed by Kate Cain, Environmental Scientist with MWP. Kate holds a BSc in Environmental Management and is a qualified and accomplished Environmental Consultant with over 13 years' experience in projects and auditing within the environmental management field. Kate has authored EIARs, Detailed Site Assessments, Remediation Plans, Environmental Reports and Construction and Environmental Management Plans for a wide range of projects.

#### 10.1.2 Guidelines and Legislation

The assessment has been prepared in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022), as well as guidelines and legislation outlined in **Section 10.1.2.1 to 10.1.2.4**.

##### 10.1.2.1 Air Quality

The statutory ambient air quality standards in Ireland are set out in the Ambient Air Quality Standards Regulations 2022, which incorporate the ambient air quality limits set out in Directive 2008/50/EC of the European Parliament and of the Council (21st May 2008) on ambient air quality and cleaner air for Europe (hereafter referred to as the CAFÉ Directive) (as amended by Directive EU 2015/1480), for a range of air pollutants.

In addition to the specific statutory air quality standards, the assessment has been prepared in accordance with national guidelines, where available, in addition to international standards and guidelines. These are summarised below:

- *Clean Air Strategy (Government of Ireland 2023);*
- *Guidance on the assessment of dust from demolition and construction (IAQM 2024);*
- *Air Quality Assessment of Proposed National Roads - Standard (TII 2022a);*

- *Limerick City and County Council's Climate Change Adaptation Strategy 2019-2024*;
- *Limerick Development Plan 2022-2028 (Background Paper: Energy, Climate Change, Flooding and Transition to a Low Carbon Economy)*;
- *Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (TII 2022b)*;
- *Guidelines for Assessment of Ecological Impacts of National Roads Schemes (TII 2009)*;
- *UK Department of Environment Food and Rural Affairs (DEFRA) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG (16) (DEFRA 2018)*;
- *UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) – LA 105 Air Quality (UKHA 2019)*; and
- *World Health Organization (WHO) Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide Global Update 2005 (WHO 2005)*.

### 10.1.2.2 Climate

The assessment has made reference to national guidelines, where available, in addition to international standards and guidelines relating to the assessment of Green House Gas (GHG) emissions and associated climatic impact from road schemes which are applicable to the proposed development. These are summarised below:

- *Climate Action and Low Carbon Development Act (Act. No. 46 of 2015)*;
- *DCCAIE (2017) National Adaption Plan*;
- *DCCAIE (2024) Climate Action Plan 2025*;
- *Department of Transport, Tourism and Sport (DTTAS) (2019) Transport – Climate Change Sectoral Adoption Plan*;
- *Climate Action and Low Carbon Development (Amendment) Act 2021 (No.32 of 2021) (hereafter referred to as The 2021 Climate Act)*;
- *Limerick City and County Council's Climate Change Adaptation Strategy 2019-2024*;
- *Limerick Development Plan 2022-2028 (Background Paper: Energy, Climate Change, Flooding and Transition to a Low Carbon Economy)*;
- *Limerick Development Plan 2022-2028*;
- *European Commission (EC) (2014) 2030 Climate and Energy Policy Framework*;
- *UKHA (2019) Design Manual for Roads and Bridges: A 114 – Climate*;
- *Glasgow Climate Pact (COP26)*;
- *Summary of Global Climate Action at COP 27 (UNFCCC, 2022)*;
- *Kyoto Protocol (United Nations Framework Convention on Climate Change (UNFCCC, 1997)*; and
- *Paris Agreement (UNFCCC, 2015)*.

### 10.1.2.3 Local Policy and Guidelines

The Limerick City and County Council's Climate Change Adaptation Strategy 2019-2024 outlines the climate change objectives that will be implemented to adapt to the effects of climate change and to safeguard the biophysical infrastructure and well-being of the people and communities of the County. The overriding objective for Limerick City and County Council in the preparation of the Climate Change Adaptation Strategy 2019-2024 is to mainstream climate adaptation in all the functions and activities of the local authority.

Following on from the main objective, there are a series of climate adaptation themes. Under each theme, there are a number of objectives, each with a number of linked actions. There are six themes in total:

1. Extreme Weather Event Response;
2. Land Use and Planning;
3. Infrastructure, Built Environment and Service Provision;
4. Environment;
5. Economic Development Activities; and
6. Emerging Issues.

Theme six speaks to encouraging climate adaptation projects and aims to improve the energy performance of buildings and promote renewable energy use in an urban context.

The Regional Spatial and Economic Strategy (RSES) for the Southern Region lists objectives that relate directly to renewable energy. The RSES recognises and supports the many opportunities for wind as a major source of renewable energy. Opportunities for both commercial and community wind energy projects should be harnessed, having regard to the requirements of Department of Housing, Planning and Local Government (DoHPLG) Guidelines on Wind Energy. The following objectives form part of the renewable energy chapter of the RSES:

- RPO 95 – Sustainable Renewable Energy Generation:
  - It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation.
- RPO 96 – Integrating Renewable Energy Sources:
  - It is an objective to support the sustainable development, maintenance and upgrading of electricity and gas network grid infrastructure to integrate renewable energy sources and ensure our national and regional energy system remains safe, secure and ready to meet increased demand as the regional economy grows.
- RPO 97 – Power Stations and Renewable Energy:
  - It is an objective to support the sustainable technology upgrading and conversion of power stations in the Region to increase capacity for use of energy efficient and renewable energy sources.
- RPO 98 – Regional Renewable Energy Strategy:
  - It is an objective to support the development of a Regional Renewable Energy Strategy with relevant stakeholders.
- RPO 99 – Renewable Wind Energy:
  - It is an objective to support the sustainable development of renewable wind energy (on shore and offshore) at appropriate locations and related grid infrastructure in the Region in compliance with national Wind Energy Guidelines.
- RPO 100 – Indigenous Renewable Energy Production and Grid Injection:
  - It is an objective to support the integration of indigenous renewable energy production and grid injection.

- RPO 101 – International Hub for Energy Innovation:
  - It is an objective to support continued innovation and research in the energy sector and to develop a role as an international hub for energy innovation.
- RPO 102 – Energy Research Funding:
  - It is an objective to support initiatives for energy research funding within our Region to accelerate diversification away from fossil fuels to green energy, including the potential of wind, wave, solar, biomass, biofuels, biogas and hydrogen in the Region.
- RPO 103 – Interconnection Infrastructure:
  - It is an objective to support the sustainable development of interconnection infrastructure, in particular the potential for the sustainable development of an international connection between Ireland and France in the Region.
- RPO 104 – Energy Storage and Carbon Capture:
  - It is an objective to support investment in initiatives to develop innovation, advances in technology and pilot projects for the sustainable development of energy storage and carbon capture within the Region and to work with key stakeholders in developing sustainable forestry, including initiatives for native tree planting and better management of peatland and soil management to support carbon sequestration and enhancement of biodiversity.

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## 10.2 Methodology

The methodology adopted for this assessment accords with relevant guidance and best practice.

At a local level the existing air quality was characterised. The nature, scale and duration of the construction works was examined and its potential to significantly impact on local air quality was assessed. Mitigation measures are described to minimise the potential effects.

The local climate was characterised based on 30-year averages measured at a representative weather observatory. The compatibility of the proposed development with the 2025 national Climate Action Plan (CAP) was examined. Climate is a global rather than a national consideration, therefore current reports on the state of the climate have been summarised.

### 10.2.1 Scope of the Assessment

The aim of this assessment is to consider whether the proposed development including wind turbines, grid connection, and site infrastructure would be likely to result in significant air quality and climate impacts. The cumulative effect of the proposed development in combination with neighbouring existing, proposed and permitted developments is then assessed to determine any likely significant air quality and climate impacts.

The potential impacts and likely effects of the decommissioning phase will be of similar magnitude, if not slightly less, than the construction phase. Therefore, the outcome of the construction phase assessment should be taken as representative of the decommissioning phase impacts.

## 10.2.2 Assessment Criteria

### 10.2.2.1 Air Quality

In the EU, Directives set down Air Quality Standards to protect human health, vegetation and ecosystems. The Ambient Air Quality and Cleaner Air for Europe (CAFÉ) Directive (2008/50/EC) (as amended by Directive EU 2015/1480) was published in May 2008 and was transposed into Irish legislation by the Air Quality Standards 2011 (S.I. No 180 of 2011).

There will be some pollutants named in the CAFÉ directive arising from plant and machinery exhaust emissions associated with the construction of the proposed development. These include carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and particulate matter (PM<sub>10</sub>). However, these emissions will be minor and temporary, will be quickly dispersed and will not exceed the limit values set out in the CAFÉ Directive 2008/50/EC (**Appendix 10A of Volume III**).

#### Dust

There is greater potential for temporary disturbance to nearby receptors to occur as a result of fugitive dust from the excavation and transport of soil and materials during construction.

Transport Infrastructure Ireland (TII) published new guidance in 2022 for assessing dust effects at a local level from road construction 'Air Quality Assessment of Proposed National Roads – Standard' (TII, 2022A) and 'Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document' (TII, 2022B). The assessment of dust has been carried out in accordance with these publications. The TII Guidance in relation to dust is in accordance with the latest 2024 IAQM Guidelines on construction dust assessments, Guidance on the assessment of dust from demolition and construction.

This assessment of dust effects therefore focuses on identifying the existing baseline levels of PM<sub>10</sub> and PM<sub>2.5</sub> in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the effect of the construction phase of the proposed development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities with the proposed development based on the guidance issued by the IAQM (2024).

#### Traffic

TII guidance documents (TII, 2022A/2022B) state that the following scoping criteria shall be used to determine whether the air quality impacts of a project can be scoped out or require an assessment based on changes between 'Do-Something' traffic scenario (with the proposed development) compared to the 'Do-Minimum' traffic scenario (without the proposed development):

- Road alignment will change by 5m or more;
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
- Heavy duty vehicle (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200 AADT or more; or
- Daily average speed change by 10 kph or more; and
- Peak hour speed will change by 20kph or more.

If the above criteria are not met, then a quantitative assessment of construction traffic can be scoped out and the effects are considered to be not significant. The construction stage traffic, as described in **Chapter 14 Material Assets**, is below the above criteria and therefore no further detailed impact assessment is required.

### 10.2.2.2 Climate Change

In order to demonstrate that the carbon savings associated with the proposed development will significantly out-weigh any potential carbon losses, a methodology made available by the Scottish Government (2019) in tabular spreadsheet format titled “Calculating carbon savings from wind farms on Scottish peatlands” was applied to this development.

This ‘carbon calculator’ is the Scottish Government’s tool provided to support the process of determining the carbon impact of wind farm developments in Scotland. The purpose of the tool is to assess, in a comprehensive and consistent way, the carbon impact of wind farm developments. This is done by comparing the carbon costs of wind farm developments with the carbon savings attributable to the wind farm.

As there is no comparable Irish version it is considered appropriate to adopt the Scottish methodology which has been tried and tested and subject to audit by the Scottish Environmental Protection Agency. This method is accepted as best practice in Ireland and has been adopted for this chapter and assesses potential carbon savings and losses from the proposed development, refer to **Section 10.5.3.3**.

It is important to note that there is no peat within the footprint of the proposed development, refer to **Chapter 09 Land and Soils**. Only elements of the carbon calculator tool relating to the manufacture (lifecycle) of the wind turbines have been used to estimate the carbon savings associated with the wind farm.

## 10.2.3 Study Area

### 10.2.3.3 Air Quality

From an air quality point of view, dust emissions are the main air quality pollutant of concern.

The study area for the assessment of construction dust has been applied, using criteria proposed within the IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2024), and extends:

- Up to 250m beyond the proposed development site boundary and 50m from the construction traffic route for human health receptors; 250m from the proposed development site entrance; and
- to 50m beyond the proposed development site boundary and 50m from the construction traffic route for ecological receptors and 250m from the proposed development site entrances.

In addition to the study area with respect to construction dust, additional areas must also be considered with respect to emissions from vehicles and machinery on impacted construction areas within the proposed development site boundary and surrounding public roads. The construction stage traffic, as described in **Chapter 14 Material Assets**, found that the level of traffic changes are below the criteria set out in **Section 10.2.2.1** and therefore no further detailed air quality impact assessment is required with respect to vehicle traffic.

### 10.2.3.4 Climate

The study area focus is on GHG emissions associated with the proposed development infrastructure footprint within the proposed development site boundary. The receptors to GHG emissions is the local, national, European and global climate.

## 10.2.4 Statement on Limitations and Difficulties Encountered

It is not possible to quantify exactly what impact the proposed development will have on Climate Change and Air Quality beyond the site boundary. However, it has been possible to determine the significance of the impact. It is universally accepted that replacing fossil fuel generated electricity with wind generated and other forms of renewable electricity has a positive rather than negative effect nationally and globally on air quality and climate. The information provided in this

chapter is considered sufficient to enable an informed decision to be made on whether the proposed development is likely to have a significant effect on air quality and climate.

### 10.3 Existing Environment

The proposed development site is located in the townlands of Ballynisky, Graigoor, Ballyegny More, Kilbradran, Ballysteen, Dunmoylan, Lisbane and Carrons near Coolcappa, Co. Limerick. It lies approximately 9km north of Newcastle West and 6km northwest of Rathkeale.

The site is rural in nature, with landcover comprising mainly agricultural land, farm holdings and residential dwellings in the vicinity of the development area. Access to the site will be via the Local Road network. The R521 between Foynes and Newcastle West is located to the west of the site. The R521 links the N21 National Primary Road to the southeast and the N69 to the north. The R521 can also be accessed at Ardagh from the R523 south of Rathkeale.

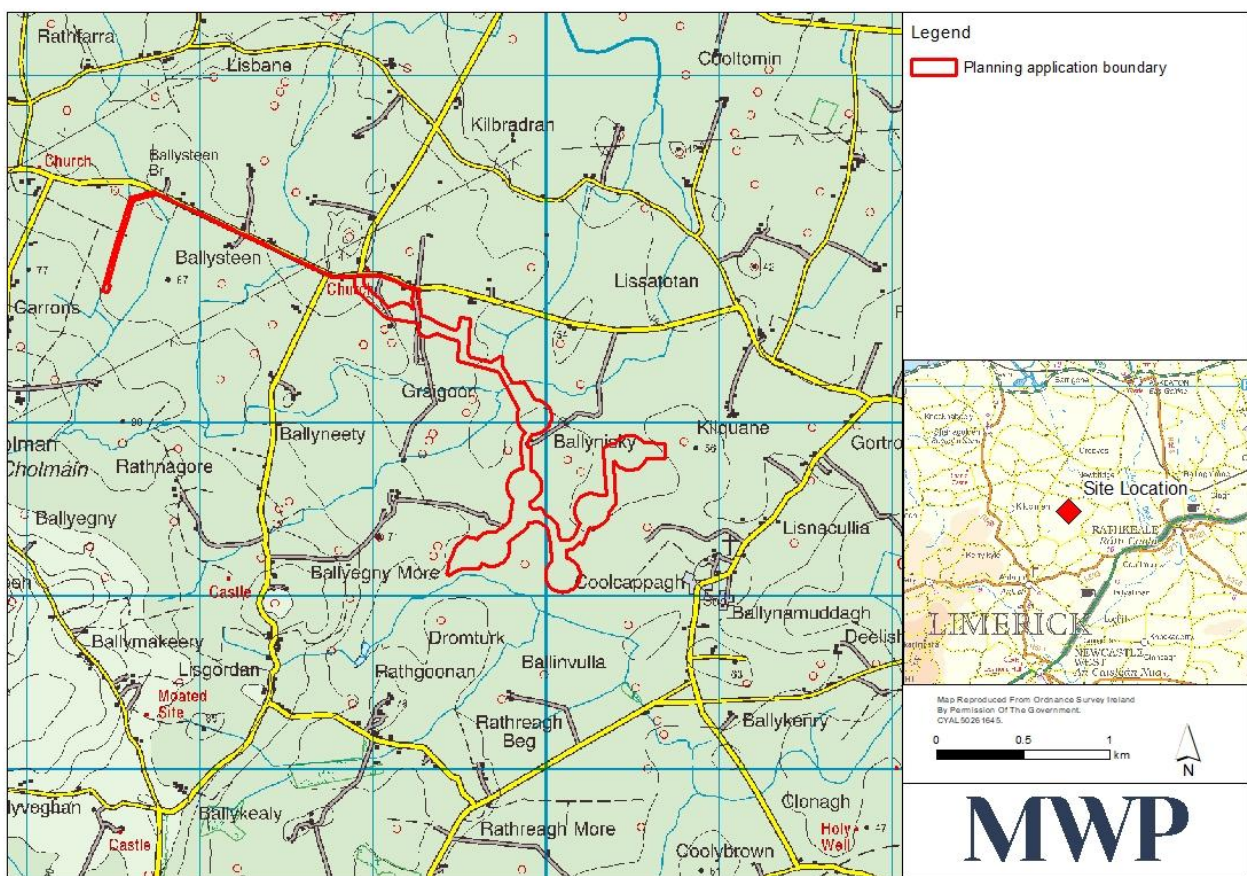


Figure 10-1: Site Location

There are several large urban centres within approximately 30km of the proposed development site, the largest of which is Limerick City which lies approximately 30km to the northeast (population 102,287, CSO 2022). The town of Newcastle West (population 7,209, CSO 2022) lies approximately 9km south and the town of Rathkeale (population 1,231, CSO 2022) is located approximately 6km to the east. Along with local traffic (CO<sub>2</sub>, NO<sub>x</sub>) and agricultural practices on nearby farmland (CH<sub>4</sub>), these urban centres are the largest nearby potential sources of pollution.

Another significant source of air emissions is Aughinish Alumina, which is located approximately 7.5km north west of the proposed development.

Representative Environmental Protection Agency (EPA) ambient air quality data has been used to characterise the existing air quality in the area.

## 10.4 Existing Environment Air Quality

### 10.4.1 EPA Air Quality Sensitivity of the Receiving Environment

The Environmental Protection Agency's (EPA) Air Quality Index for Health (AQIH) is a number from one to ten that describes the current air quality in a region. There are six regions as follows: Dublin, Cork, Large Towns (>15,000 population), Small Towns (5,000 – 15,000 population), Rural East and Rural West.

The AQIH is based on measurements of five air pollutants, all of which can harm health. The five pollutants are:

- Ozone gas;
- Nitrogen dioxide gas;
- Sulphur dioxide gas;
- PM<sub>2.5</sub> particles; and
- PM<sub>10</sub> particles.

The AQIH is calculated on an hourly basis using representative sampling from each region. Each region is ranked 1 – 10, with 1 being 'Good' and 10 being 'Very Poor' based on the worst-case pollutant in that region.

There is no accompanying health message for at risk groups and the general population in areas classed as Good. Outdoor activities can be enjoyed as usual.

In areas of Fair to Poor air quality i.e., AQIH ranking 4 to 10 certain types of outdoor activity should be restricted or avoided for at risk individuals and the general population depending on the AQIH ranking.

The AQIH is calculated every hour. The index was accessed via the EPA's website (<https://gis.epa.ie/EPAMaps/>) on the 19th December 2025. The air quality for the region where the development is proposed (Rural West AQIH Region 6) is currently ranked as '1 - Good'.

The nearest air quality station to the site is located at Askeaton, Co Limerick (Station 74). This station monitors Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), and Particulate Matter (PM<sub>10</sub>, PM<sub>2.5</sub>) and is located downwind of the major sulphur dioxide sources in the Shannon estuary. Monitoring is carried out using a continuous monitor for sulphur dioxide.

The station updates every 8 to 24 hours with the calculated Air Quality Index for Health (AQIH). As of 19th December 2025, the air quality index characterised by this station was classified as 'Good'.

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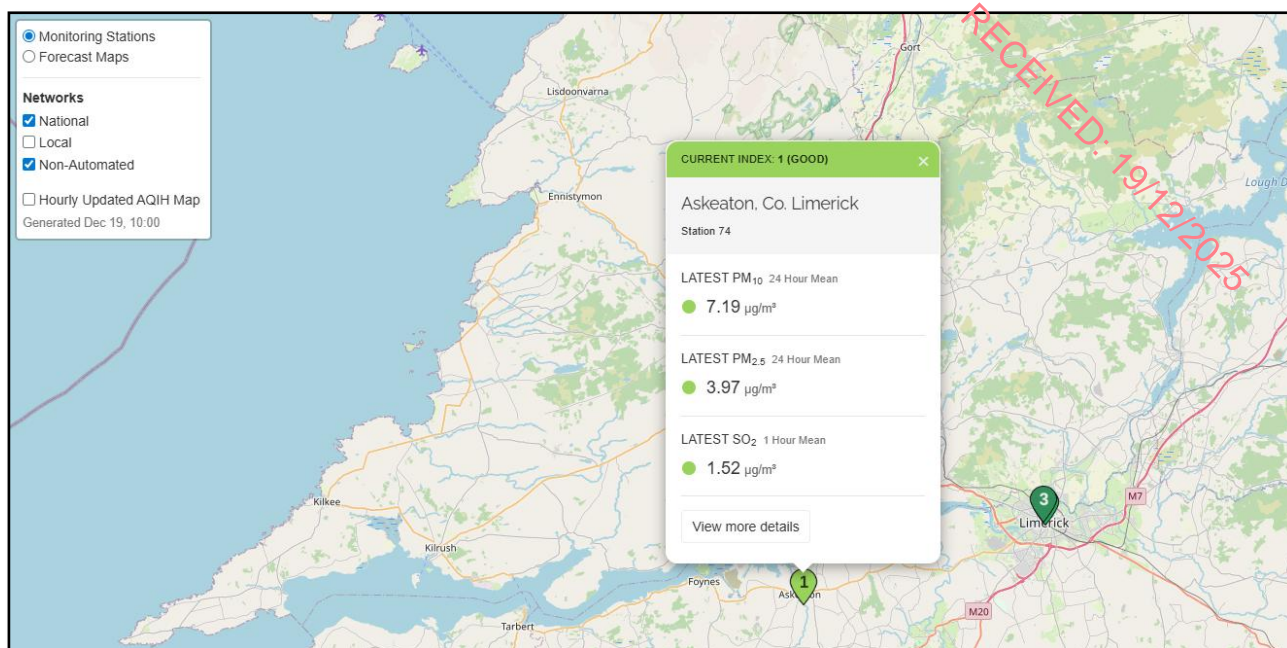


Figure 10-2: Existing Air Quality Index for Health (AQIH) (www.epa.ie)

In terms of annual air quality data, monitoring programmes have been undertaken in recent years by the EPA. The most recent annual report on air quality, Air Quality Monitoring Report (EPA 2023), details the range and scope of monitoring undertaken throughout Ireland. As part of the implementation of the Air Quality Standards Regulations (S.I. No. 739/2022), four air quality zones have been defined in Ireland for air quality management and assessment purposes. Zone A is defined as Dublin and its environs, Zone B is defined as Cork City, Zone C is defined as 23 urban areas with a population greater than 15,000 and Zone D is defined as the remainder of the country. The rural area which the proposed development is located is classed as Zone D.

Annual mean values for CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> for Zone D areas for the period 2017 to 2023 are shown in **Table 10-1**.

Table 10-1: Ambient Air Quality Mean Values & Limits

Averaging Period	Mean Value (Years 2017 – 2023)	Limit Type	Ambient Air Quality Limits
Annual Mean CO	0.3 to 0.8 mg/m <sup>3</sup>	8-hour limit (on a rolling basis)	10µg/m <sup>3</sup>
Annual Mean NO <sub>2</sub>	2 µg/m <sup>3</sup> to 17 µg/m <sup>3</sup>	Hourly limit for protection of human health – not to be exceeded more than 18 times/year	200µg/m <sup>3</sup>
Annual Mean SO <sub>2</sub>	0.7 µg/m <sup>3</sup> to 11.8 µg/m <sup>3</sup>	Hourly limit for protection of human health – not to be exceeded more than 24 times/year	350µg/m <sup>3</sup>
		Daily limit for protection of human health – not to be exceeded more than 3 times/year	125µg/m <sup>3</sup>

Averaging Period	Mean Value (Years 2017 – 2023)	Limit Type	Ambient Air Quality Limits
		Critical limit for the protection of vegetation and natural ecosystems (calendar year and winter)	20µg/m <sup>3</sup>
Annual Mean PM <sub>2.5</sub>	4 µg/m <sup>3</sup> to 23 µg/m <sup>3</sup>	Annual limit for protection of human health	25µg/m <sup>3</sup>
Annual Mean PM <sub>10</sub>	7 µg/m <sup>3</sup> to 28 µg/m <sup>3</sup>	24-hour limit for protection of human health – not to be exceeded more than 35 times/year	50µg/m <sup>3</sup>
		Annual limit for protection of human health	40µg/m <sup>3</sup>

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In summary, existing baseline levels of CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> are well below ambient air quality limit values in the vicinity of the proposed development.

#### 10.4.2 Dust Sensitivity of the Receiving Environment

In line with IAQM Guidelines, the sensitivity of the area must first be assessed. Both receptor sensitivity and proximity to the proposed development are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity, while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

For the purposes of this assessment, the area of the wind farm site, including wind turbine areas, and meteorological mast, are the main sources of dust during construction and are assessed separately to the Grid Route Connection (Option A), which is a linear element outside the main development area. Grid Connection Route (Option B) is within the area of the wind turbine site and is not considered to give rise to significant effects in isolation. These works are assessed within this Chapter as part of the overall works within the wind farm site.

There will be some dust potential from turbine delivery route accommodation works however, these works are small in scale, temporary and sections of accommodation work areas will be spread out and therefore there will be no significant dust impacts. It was therefore considered that no detailed dust assessment was required for turbine delivery accommodation works so the dust sensitivity of the receiving environment at the locations of the turbine delivery accommodation works is therefore not described in this section.

In terms of receptor sensitivity to dust soiling, the closest receptor to the main wind farm site is approximately 170m from the substation, while the turbines are located at considerably greater distances to surrounding receptors, as shown in **Figure 10-3**. Given that there are no other receptors within 200m of the wind farm, the worst-case sensitivity of the area to dust soiling is therefore considered to be **Low** as per IAQM guidance criteria set out in **Table 10-2**.

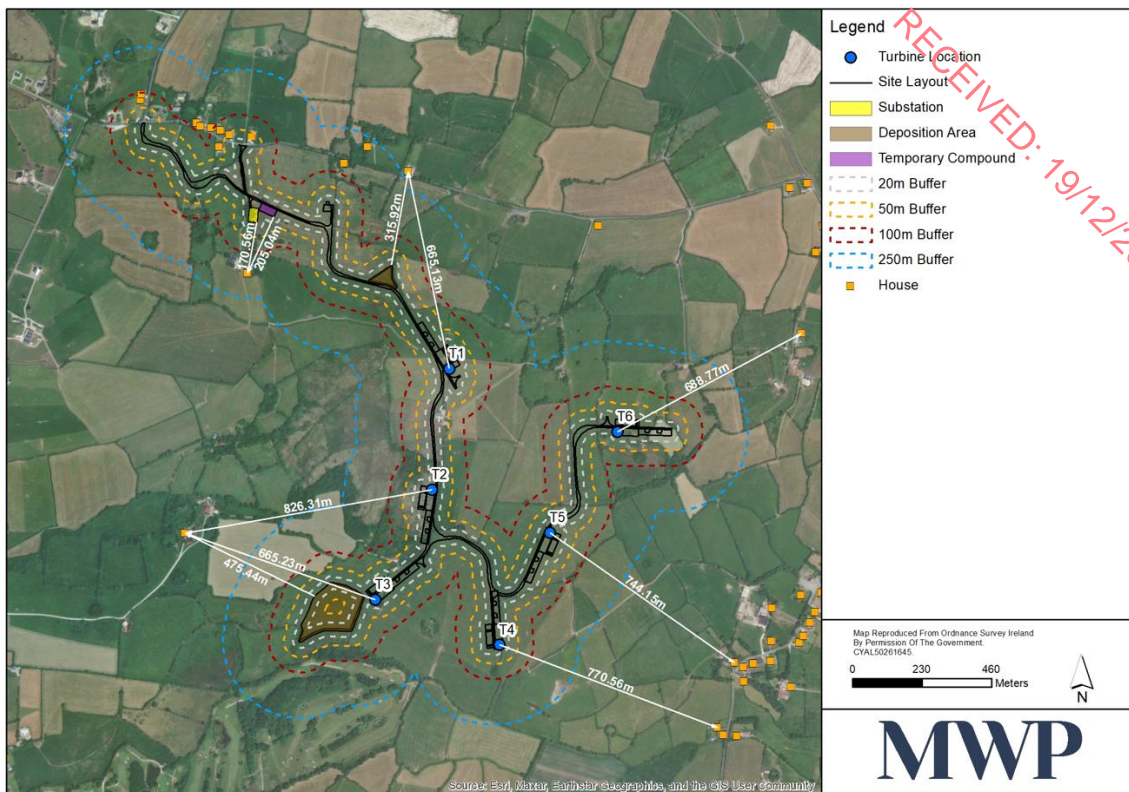


Figure 10-3: Main Wind Farm Area and Nearest Dwellings

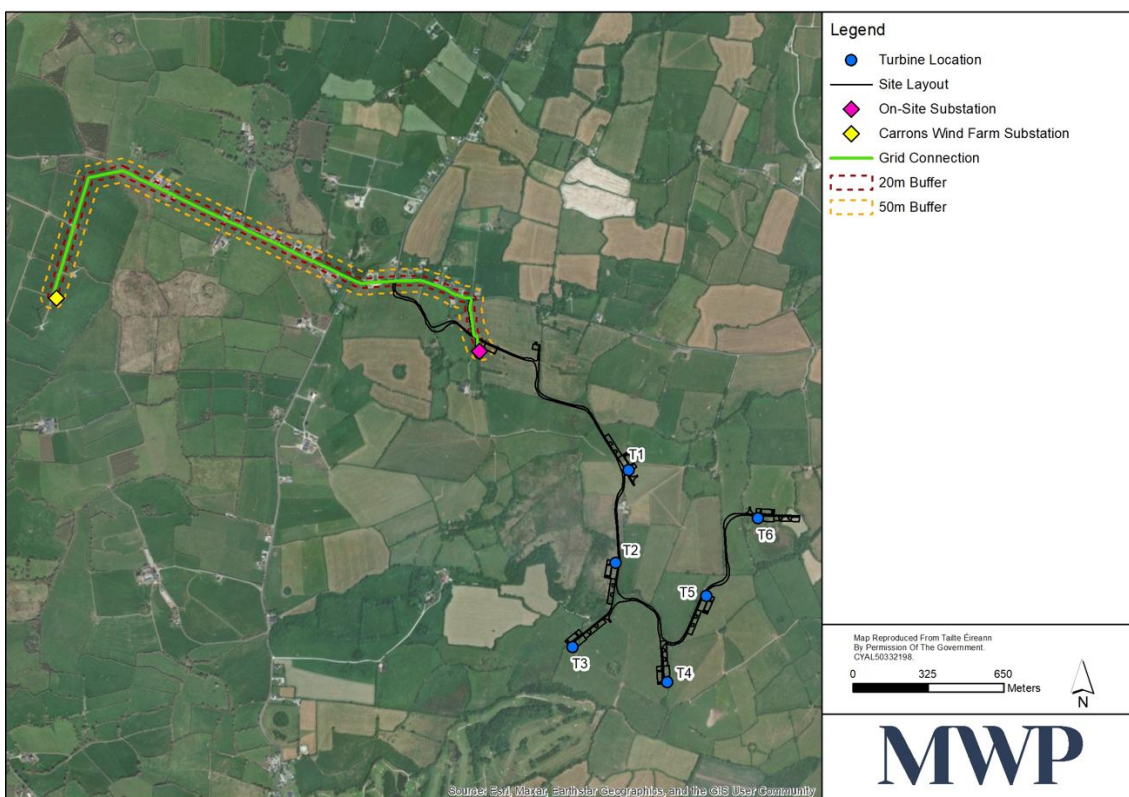


Figure 10-4: Grid Connection (Option A)

There are residential receptors along the roadside of the proposed grid connection route (Option A), refer to **Figure 10-4**. Approximately 9 receptors are located within a 20m buffer zone of this grid connection, and approximately 18 properties are located within 50m of this grid connection. Due to the linear nature of the grid connection works which will be completed in sections, not all properties will be impacted at once, therefore it is considered to be no more than 1 to 10 no. receptors impacted at any time. The worst-case sensitivity of this grid connection to dust soiling is therefore considered to be **Medium** as per IAQM guidance criteria set out in **Table 10-2**, given that 1-10 no. receptors will potentially be impacted at any time, within 20m of the above grid connection works.

**Table 10-2: Sensitivity of the Area to Dust Soil Effects on People and Property (Source: IAQM 2024)**

Receptor Sensitivity	Number of Receptors	Distance from source (m)			
		<20	<50	<100	<200
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

**Human Health Impact Sensitivity of the Receiving Environment**

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria takes into consideration the current annual mean PM<sub>10</sub> concentration, receptor sensitivity and the number of receptors affected within various distance bands from the construction works. The annual mean PM<sub>10</sub> concentration for Zone D was 7 µg/m<sup>3</sup> to 28 µg/m<sup>3</sup>, refer to **Table 10-1**. Taking a conservative approach, the value of 28 µg/m<sup>3</sup> is taken as the Annual Mean PM<sub>10</sub> concentration. Given the annual mean PM<sub>10</sub> concentration, the worst-case sensitivity of residential receptors to human health impacts from the main wind farm area dust, as per IAQM guidance criteria set out in **Table 10-3** is considered to be **Low**, given that there are only three receptors within 350m. For the separately assessed grid connection works proposed under Option A, the sensitivity of the receptors, as per IAQM guidance criteria set out in **Table 10-3** are considered to be **Medium**, given that there are no more than 1-10 receptors within 20m of works.

**Table 10-3: Sensitivity of the Area to Human Health Impacts (Source: IAQM 2024)**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentration	Number of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m <sup>3</sup>	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m <sup>3</sup>	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentration	Number of Receptors	Distance from source (m)					
			<20	<50	<100	<200	<350	
Medium	24-28µg/m <sup>3</sup>	>100	High	Medium	Low	Low	Low	
		10-100	High	Medium	Low	Low	Low	
		1-10	Medium	Low	Low	Low	Low	
	>24µg/m <sup>3</sup>	>100	Medium	Low	Low	Low	Low	
		10-100	Low	Low	Low	Low	Low	
		1-10	Low	Low	Low	Low	Low	
	Medium	<32 µg/m <sup>3</sup>	>10	High	Medium	Low	Low	Low
			1-10	Medium	Low	Low	Low	Low
		28-32µg/m <sup>3</sup>	>10	Medium	Low	Low	Low	Low
1-10			Low	Low	Low	Low	Low	
24-28		>10	Low	Low	Low	Low	Low	
		1-10	Low	Low	Low	Low	Low	
<24		>10	Low	Low	Low	Low	Low	
		1-10	Low	Low	Low	Low	Low	
Low	-	≥1	Low	Low	Low	Low	Low	

### Ecological Impact Sensitivity of the Receiving Environment

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to ecological impacts from dust. The criteria take into consideration whether the receiving environment is classified as a Special Area of Conservation (SAC), a Special Protected Area (SPA), a Natural Heritage Area (NHA) or a proposed Natural Heritage Area (pNHA) as dictated by the EU Habitats Directive or whether the site is a local natura reserve or home to a sensitive plant or animal species. The proposed development site is not located in the immediate vicinity of any such designated site. The nearest designated site is the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, which is located approximately 3.5km south west of the proposed development. The sensitivity of the area to ecological impacts, as per IAQM guidance criteria set out in **Table 10-4**, can therefore be considered **Low**.

**Table 10-4: Sensitivity of the Area to Ecological Impacts**

Sensitivity of Area	Distance from the Source (m)	
	<20	<50
High	Medium	Medium
Medium	Medium	Low
Low	Low	Low

### 10.4.3 Sensitivity of the Receiving Global Climate

#### 10.4.3.1 Global Climate

Climate change is considered in a global rather than local context. Every year, the World Meteorological Organisation (WMO) issues a report on the state of the global climate. It is based on data provided by National Meteorological and Hydrological Services and other national and international organisations. Some of the key messages in the latest available annual report, 'State of the Global Climate 2024' are as follows:

- Observed concentrations of carbon dioxide, methane, and nitrous oxide reached record high levels in 2023, the latest year for which consolidated global values are available. Real-time data from specific locations show that levels of the three greenhouse gases continued to increase in 2024;
- The global mean near-surface temperature in 2024 was 1.55 ( $\pm 0.12$ )°C above the 1850–1900 average. 2024 was the warmest year in the 175-year observational record, surpassing the previous warmest year, 2023 at 1.45 °C ( $\pm 0.12$ )°C above the 1850–1900 average. Each of the past ten years, 2015–2024, were individually the ten warmest years on record for global mean temperature.
- Ocean heat content reached its highest level in the 65-year observational record in 2024;
- It is expected that warming will continue – a change which is irreversible on centennial to millennial timescales, and climate projections show that ocean warming will continue over the rest of the twenty-first century and beyond, even for low emission scenarios;
- In 2024, global mean sea level reached a record high in the satellite record (since 1993), reflecting continued ocean warming as well as the melting of glaciers and ice sheets. The rate of global mean sea level rise in the past ten years (2015–2024) was more than twice the rate of sea level rise in the first decade of the satellite record (1993–2002);
- Acidification of the ocean surface has continued over the past 39 years as shown by the steady decrease of global average ocean surface pH. Regionally, ocean acidification is not increasing uniformly.
- Antarctic sea-ice extent remained well below normal, with the annual maximum and minimum sea ice extents being the second lowest on record;
- In every month between June 2023 and December 2024, monthly average global temperatures exceeded all monthly records prior to 2023;
- Over 824,000 people were displaced due to high-impact weather and climate-related disasters, the highest annual figure since 2008;
- At least 18 countries faced worsening food insecurity due to combined impacts of climate events, conflict, and market shocks. Eight countries had at least 1 million more people facing acute food insecurity in 2024 than during the 2023 annual maximum;
- Tropical cyclones were responsible for many of the highest-impact events of 2024. Typhoon *Yagi* in early September made landfall in northern Vietnam after first crossing the Philippines and the southernmost parts of China;
- In the U.S., Hurricanes *Helene* and *Milton* hit Florida's west coast as major storms, causing severe damage. Both hurricanes had economic impacts of tens of billions of dollars. *Helene* led to extreme flooding in the south-east and over 200 deaths, the deadliest since Katrina; and
- Extensive wildfires in Canada and the United States led to significant carbon emissions (second highest since 2003) and loss of area burned (one of the five highest since 1983).

#### 10.4.3.1 IPCC: AR6 Synthesis Report – Climate Change 2023

The Synthesis Report (SYR) of the IPCC Sixth Assessment Report (AR6) summarises the state of knowledge of climate change, its widespread impacts and risks, and climate change mitigation and adaptation. It integrates the main findings of

the Sixth Assessment Report (AR6) based on contributions from the three Working Groups<sup>1</sup>, and the three Special Reports<sup>2</sup>.

The report recognises the interdependence of climate, ecosystems and biodiversity, and human societies. It recognises the value of diverse forms of knowledge and the close linkages between climate change adaptation, mitigation, ecosystem health, human well-being and sustainable development. The report reflects the increasing diversity of actors involved in climate action.

Some key findings<sup>3</sup> of the report are as follows and are categorised next, under 'Current Status and Trends, Future Climate Change, Risks and Long-Term Responses, Responses in the Near Term'. Each finding is grounded in an evaluation of underlying evidence and agreement.

## A. Current Status and Trends

### Observed Warning and its Causes

- **A.1** Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850-1900 temperatures in 2011-2020. Global greenhouse gas emissions have continued to increase, with unequal historical and ongoing contributions arising from unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption, and production across regions, between and within countries, and among individuals (high confidence).

### Observed Changes and Impacts

- **A.2** Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts and related losses and damages to nature and people (high confidence). Vulnerable communities who have historically contributed the least to current climate change are disproportionately affected (high confidence).

### Current Progress in Adaption and Gaps and Challenges

- **A.3** Adaption planning and implementation has progressed across all sectors and regions, with documented benefits and varying effectiveness. Despite progress, adaption gaps exist, and will continue to grow at current rates of implementation. Hard and soft limits to adaption have been reached in some ecosystems and regions. Maladaptation is happening in some sectors and regions. Current global financial flows for adaption are insufficient for, and constrain implementation of adaption options, especially in developing countries (high confidence).

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<sup>1</sup> The three Working Group contributions to AR6 are: AR6 Climate Change 2021: The Physical Science Basis; AR6 Climate Change 2022: Impacts, Adaption and Vulnerability; and AR6 Climate Change 2022: Mitigation of Climate Change. Their assessments cover scientific literature accepted for publication respectively by 31 January 2021, 1 September 2021 and 11 October 2021.

<sup>2</sup> . The three Special Reports are: Global Warming of 1.5° (2018): an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty; Climate Change and Land (2019): an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems; and The Ocean and Cryosphere in a Changing Climate (2019). The Special Reports cover scientific literature accepted for publication respectively by 15 May 2018, 7 April 2019, and 15 May 2019.

<sup>3</sup> The IPCC calibrated language uses five qualifiers to express a level of confidence: very low, low, medium, high and very high, and typeset in italics, for example *medium confidence*. The following terms are used to indicate the assessed likelihood of an outcome or a result: virtually certain 99-100% probability, very likely 90-100%, likely 66-100%, more likely than not >50-100%, about as likely as not 33-66%, unlikely 0-33%, very unlikely 0-10%, exceptionally unlikely 0-1%. Additional terms (extremely likely 95-100%; more likely than not >50-100%; and extremely unlikely 0-5%) are also used when appropriate. Assessed likelihood is typeset in italics, e.g., *very likely*. This is consistent with AR5 and the other AR6 Reports.

## Current Progress in Adaption and Gaps and Challenges

- **A.4** Policies and laws addressing mitigation have consistently expanded since AR5. Global GHG emissions in 2030 implied by nationally determined contributions (NDCs) announced by October 2021 make it likely that warming will exceed 1.5°C during the 21st century and make it harder to limit warming below 2°C. There are gaps between projected emissions from implemented policies and those from NDCs. Finance flows fall short of the levels needed to meet climate goals across all sectors and regions (high confidence).

## B. Future Climate Change, Risks and Long-Term Responses

### Future Climate Change

- **B.1** Continued greenhouse gas emissions will lead to increasing global warming, with the best estimate of reaching 1.5°C in the near term in considered scenarios and modelled pathways. Every increment of global warming will intensify multiple and concurrent hazards (high confidence). Deep, rapid, and sustained reductions in greenhouse gas emissions would lead to a discernible slowdown in global warming within two decades, and also to discernible changes in atmospheric composition within a few years (high confidence).

### Climate Change Impacts and Climate-Related Risks

- **B.2** For any given warming level, many climate-related risks are higher than assessed in AR5, and project long-term impacts are up to multiple times higher than currently observed (high confidence). Risks and projected adverse impacts, and related losses and damages from climate change escalate with every increment of global warming (very high confidence). Climatic and non-climatic risks will increasingly interact, creating compound and cascading risks that are more complex and difficult to manage (high confidence).

### Likelihood and Risks of Unavoidable, Irreversible or Abrupt Changes

- **B.3** Some future changes are unavoidable and/or irreversible but can be limited by deep, rapid and sustained global greenhouse emissions reduction. The likelihood of abrupt and/or irreversible changes increases with higher global warming levels. Similarly, the probability of low-likelihood outcomes associated with potentially very large adverse impacts increases with higher global warming levels (high confidence).

### Adaptation Options and their Limits in a Warmer World

- **B.4** Adaption options that are feasible and effective today will become constrained and less effective with increasing global warming. With increasing global warming, losses and damages will increase and additional human and natural systems will reach adaption limits. Maladaptation can be avoided by flexible, multi-sectoral, inclusive, long-term planning and implementation of adaptation actions, with co-benefits to many sectors and systems (high confidence).

### Carbon Budgets and Net Zero Emissions

- **B.5** Limiting human-caused global warming requires net zero CO<sub>2</sub> emissions. Cumulative carbon emissions until the time of reaching net-zero CO<sub>2</sub> emissions and the level of greenhouse gas emission reductions this decade, largely determine whether warming can be limited to 1.5°C or 2°C (high confidence). Projected CO<sub>2</sub> emissions from existing fossil fuel infrastructure without additional abatement would exceed the remaining carbon budget for 1.5°C (50%) (high confidence).

### Mitigation Pathways

- **B.6** All global modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot, and those that limit warming to 2°C (>67%), involve rapid and deep and, in most cases, immediate greenhouse emissions

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reductions in all sectors this decade. Global net zero CO<sub>2</sub> emissions are reached for these pathway categories, in the early 2050s and around the early 2070s, respectively (high confidence).

#### **Overshoot: Exceeding a Warming Level and Returning**

- **B.7** If warming exceeds a specified level such as 1.5°C, it could gradually be reduced again by achieving and sustaining net adverse global CO<sub>2</sub> emissions. This would require additional deployment of carbon dioxide removal, compared to pathways without overshoot, leading to greater feasibility and sustainability concerns. Overshoot entails adverse impacts, some irreversible, and additional risks for human and natural systems, all growing with the magnitude and duration of overshoot (high confidence).

### **C. Responses in the Near Term**

#### **Urgency of Near-Term Integrated Climate Action**

- **C.1** Climate change is a threat to human well-being and planetary health (very high confidence). There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all (very high confidence). Climate resilient development integrates adaptation and mitigation to advance sustainable development for all and is enabled by increased international cooperation, including improved access to adequate financial resources, particularly for vulnerable regions, sectors and groups, and inclusive governance and coordinated policies (high confidence). The choices and actions implemented in this decade will have impacts now and for thousands of years (high confidence).

#### **The Benefits of Near-Term Action**

- **C.2** Deep, rapid and sustained mitigation and accelerated implementation of adaption actions in this decade would reduce projected losses and damages for humans and ecosystems (very high confidence), and deliver many co-benefits, especially for air quality and health (high confidence). Delayed mitigation and adaptation action would lock-in high emissions infrastructure, raise risks of stranded assets and cost-escalation, reduce feasibility, and increase losses and damages (high confidence). Near-term actions involve high up-front investments and potentially disruptive changes that can be lessened by a range of enabling policies (high confidence).

#### **Mitigation and Adaption Options across Systems**

- **C.3** Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a liveable and sustainable future for all. These system transitions involve a significant upscaling of a wide portfolio of mitigation and adaption options. Feasible, effective, and low-cost options for mitigation and adaptation are already available, with differences across systems and regions (high confidence);
- **C.4** Accelerated and equitable action in mitigating and adapting to climate change impacts is critical to sustainable development. Mitigation and adaptation actions have more synergies than trade-offs with Sustainable Development Goals. Synergies and trade-offs depend on context and scale of implementation (high confidence);
- **C.5** Prioritising equity, climate justice, social justice, inclusion and just transition processes can enable adaptation and ambitious mitigation actions and climate resilient development. Adaptation outcomes are enhanced by increased support to regions and people with the highest vulnerability to climatic hazards. Integrating climate adaptation into social protection programs improves resilience. Many options are available for reducing emission-intensive consumption, including through behavioural and lifestyle changes, with co-benefits for social well-being (high confidence);
- **C.6** Effective climate action is enabled by political commitment, well-aligned multilevel governance, institutional frameworks, laws, policies and strategies and enhanced access to finance and technology. Clear goals,

coordination across multiple policy domains, and inclusive governance processes facilitate effective climate action. Regulatory and economic instruments can support deep emissions reductions and climate resilience if scaled up and applied widely. Climate resilient development, benefits from drawing on diverse knowledge (high confidence); and

- **C.7** Finance, technology, and international cooperation are critical enablers for accelerated climate action. If climate goals are to be achieved, both adaptation and mitigation financing would need to increase many-fold. There is sufficient global capital to close the global investment gaps but there are barriers to redirect capital to climate action. Enhancing technology innovation systems is key to accelerate the widespread adoption of technologies and practices. Enhancing international cooperation is possible through multiple channels.

#### 10.4.3.2 National Oceanic and Atmospheric Administration Monthly Report November 2025

According to monthly reports published by the National Oceanic and Atmospheric Administration, the November 2025 average global surface temperature was the third warmest for November, with 1.18°C (2.12°F) and third warmest for the period September to November. It was also the second warmest January to November since records began in 1850.

The ten warmest Novembers have all occurred since 2015, with the most recent three years, 2023, 2024, and 2025, comprising the top three. It was also the 49th consecutive November with above average temperatures.

In November 2025, unusually high temperatures gripped large portions of the globe. Temperature departures exceeding 3.0°C (5.4°F) occurred across much of the Arctic, Northern Hemisphere land surfaces, and parts of eastern Antarctica and southern Africa. Meanwhile, widespread departures of at least 1.0°C (1.8°F) affected the western Pacific, parts of the eastern and southeastern Pacific, and the Atlantic.

In total, about 4.1% of the world's surface experienced a record-high November temperature. These records included small pockets across North America, Africa, Asia, Australia, and across the western Pacific and Southern Oceans. In contrast, distinct cold pockets—with temperatures at least 2.0°C (3.6°F) below average—were observed in the northeastern half of Russia.

The following was also noted in November 2025:

- The United States experienced its third-warmest autumn on record. The season was exceptionally warm across the country, with every state recording an average autumn temperature more than 1.0°F above average. Notably, seven of the 50 states set a new autumn temperature record.
- According to the Finnish Meteorological Institute, many of Finland's weather stations experienced their second-warmest autumn on record.
- Hong Kong had a mean September–November temperature of 26.3°C (79.3°F), the third warmest such period on record.
- Autumn 2025 was Japan's third warmest since national records began in 1898, at 1.37°C (2.47°F) above average. Only autumns of 2023 and 2024 were warmer.
- New Zealand had its warmest spring since national records began in 1909. The national September–November temperature of 13.5°C (56.3°F) was 1.3°C (2.3°F) above the 1991–2020 average.

#### 10.4.3.3 United in Science Report 2024

The United in Science 2024 report, is compiled by the World Meteorological Organisation (WMO), on behalf of the United Nations Secretary-General to bring together the latest climate science related updates from groups of key global partner organisations including WMO, Global Carbon Project (GCP), Intergovernmental Panel on Climate Change (IPCC), United Nations Environment Programme (UNEP), World Health Organization (WHO), the Met Office (United Kingdom, UK), the jointly sponsored WMO/Intergovernmental Oceanographic Commission (IOC) of UNESCO/International Science Council

(ISC), and World Climate Research Programme (WCRP). It presents the very latest scientific data and findings related to climate change to inform global policy and action. Key messages in the report include:

### State of the Science

- Total global greenhouse gas (GHG) emissions increased by 1.2% from 2021 to 2022, setting a record of 57.4 billion tons of carbon dioxide equivalent.
- The year 2023 was the warmest on record by a large margin, and during the first half of 2024 the world has experienced exceptionally high global temperatures and many extreme weather events with devastating impacts on society.
- If current mitigation policies are continued, it is estimated with a 66% probability that global warming will be kept to a maximum of 3°C throughout the century.
- There is an 86% chance of at least one year in the next five years exceeding 2023 as the warmest year on record and an 80% chance that the global mean near-surface temperature will exceed 1.5 °C above pre-industrial levels at least one of the next five years.

### SDG 2 Zero Hunger

Projections estimate that nearly 670 million people may still face hunger in 2030, in part due to more frequent and intense extreme weather events that are disrupting each pillar of food security (availability, access, utilization and stability).

- Weather-, climate- and water-related sciences underpin services that enable farmers to make climate-informed decisions that enhance food and nutrition security; and
- To effectively support the achievement of SDG 2, global investments are needed in weather-, climate- and water-related sciences and services along agrifood value chains.

### SDG 3 Good Health and Well-being

- Transdisciplinary research is fundamental to analysing, monitoring and addressing climate-sensitive health risks and climate impacts on the health sector;
- Climate change and extreme events are projected to significantly increase ill health and premature deaths, as well as population exposure to heatwaves and heat-related morbidity and mortality; and
- Scaling up investments in climate-resilient and low-carbon health systems, and progress towards universal health coverage are critical for the achievement of SDG 3.

### SDG 6 Clean Water and Sanitation

Climate change is exacerbating water-related hazards and altering the Earth's water cycle, making it increasingly difficult to achieve SDG 6.

- More than 60% of countries face challenges due to inadequate and declining hydrological monitoring capabilities; and
- More scientific collaboration, financial investments and data and information exchange will be key for policymakers to make informed decisions to accelerate implementation of SDG 6.

### SDG 7 Affordable and Clean Energy

- Extreme weather events and anthropogenic climate change threaten the achievement of SDG 7 by changing energy supply capability and demand profiles, making the clean energy transition more unpredictable and potentially more expensive;
- More timely and accurate weather-, climate- and water-related data, science and services will improve energy planning and operations; and
- Challenges remain in uneven and/or low data quality and limited availability and affordability of data and services.

### SDG 11 Sustainable Cities and Communities

Cities are responsible for a high proportion of global greenhouse gas (GHG) emissions and are highly vulnerable to the impacts of climate change and extreme weather events, which threaten the achievement of SDG 11.

- Integrated urban weather, climate, water and environmental services, grounded in best-available science, are helping cities to achieve SDG 11; and
- Observations, high-resolution forecasting models and multi-hazard early warning systems are the fundamental basis for integrated urban services.

### SDG 13 Climate Action

- The accumulation of heat in the climate system resulting from human emissions of greenhouse gases (GHGs) has caused widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere, which threaten to reverse progress towards achieving all the SDGs;
- Weather-, climate- and water-related science underpin ambitious climate action and the mobilization of climate finance, particularly in lower-income countries; and
- Stakeholder engagement, through means such as citizen science, provides an opportunity to strengthen weather-, climate- and water-related sciences to advance progress towards achieving SDG 13.

### SDG 14 Life Below Water

- Climate- and human-related impacts are threatening our oceans, affecting marine ecosystems and the communities that rely on them for food and livelihood security;
- Climate- related ocean science enhances our understanding of climate impacts on the ocean and contributes to strategies for sustainably managing and protecting marine ecosystems; and
- The United Nations Decade of Ocean Science for Sustainable Development provides an unprecedented opportunity to mobilize the scientific community and accelerate ocean-related science.

### SDG 17 Partnerships for the Goals

- Half of countries report not having multi-hazard early warning systems (MHEWSs) in place and, where they do exist, there are significant gaps in coverage;
- Weather-, climate- and water-related sciences underpin effective MHEWSs by enhancing the physical understanding of hazards, growing the understanding of the associated risks and impacts, and enabling the detection, monitoring and forecasting of hazards; and
- Partnerships across diverse stakeholders, including the weather-, climate- and water-related science communities, are essential to deliver Early Warnings for All and achieve the SDGs.

#### 10.4.3.4 Local Climate

There are a total of 25 synoptic stations located throughout Ireland. These stations are operated by Met Éireann. The parameters measured and recorded at these stations include rainfall, temperature, wind speed and direction, relative humidity, solar radiation, clouds, atmospheric pressure, sunshine hours, evaporation, and visibility. The nearest synoptic station to the proposed development is at Shannon Airport which is approximately 18km north east of the proposed development. The climate of the proposed development is best represented by data collected at this station. The average monthly precipitation, rainfall, and wind speeds for the 30 year period between 1991 and 2020 are summarised in **Table 10-5**.

Table 10-5: Shannon Airport 1991-2020 Averages

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
<b>TEMPERATURE (degrees Celsius)</b>													
mean temperature	6.1	6.3	7.5	9.6	12	14.5	16	15.8	14.1	11.2	8.3	6.4	10.7
<b>SUNSHINE (hours)</b>													
mean daily duration	1.7	2.4	3.6	5.4	5.9	5.5	4.4	4.6	3.9	3	2.1	1.5	3.7
<b>RAINFALL (mm)</b>													
mean monthly total	103.8	86.7	75.8	62.3	63.1	69.6	75.8	87.6	77.4	95.5	106.6	115.4	1019.7
greatest daily total	38.2	33.8	34.8	40.2	25.0	45.3	39.5	51.0	52.3	36.9	29.4	33.5	52.3
<b>WIND (knots)</b>													
mean monthly speed	10	10.1	9.6	9.2	9	8.5	8.4	8.3	8.4	8.9	9.1	9.7	9.1
max. gust	75	86	63	66	52	51	52	61	58	66	69	83	86
<b>WEATHER (mean no. of days with..)</b>													
snow or sleet	1.5	1.8	1.2	0.3	0	0	0	0	0	0	0.1	1	5.9
hail	3.1	3.4	2.8	2	0.7	0	0	0.1	0.1	0.5	1	2.3	16
thunder	0.9	0.4	0.3	0.3	0.5	0.4	0.7	0.5	0.2	0.3	0.3	0.4	5.2
fog	3.4	2.2	2.4	1.8	1.3	1	0.9	1.6	2.8	3.1	4	3.8	28.3

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## 10.5 Likely Significant Effects

### 10.5.1 Do Nothing Scenario

If the proposed development were not to proceed, an opportunity to offset Greenhouse Gas Emissions (GHG) emissions from fossil fuel-based energy sources will be lost. The potential for Ireland to reach its renewable energy targets set out in the National Climate Action Plan and to contribute to climate change mitigation will be reduced.

Emissions of CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub> from coal, oil and gas fired power plants that would otherwise have been displaced will continue, resulting in a continued deterioration in air quality.

Poor air quality in our urban centres is a growing concern. As stated on the EPA's website: The WHO estimates show that more than 400,000 premature deaths are attributable to poor air quality in Europe annually. In Ireland, the number of premature deaths attributable to poor air quality (which is contributed to by the burning of fossil fuels) is estimated at 1,300 people. The World Health Organisation (WHO) has described air pollution as the 'single biggest environmental health risk'.

This can be categorised as a **likely, indirect, long term, significant, adverse** effect, should the proposed development not proceed.

## 10.5.2 Construction Phase

During the construction phase there will be emissions from vehicle exhausts. The movement of machinery, construction vehicles and the use of generators during the construction phase will generate exhaust fumes containing predominantly carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and particulate matter (PM<sub>10</sub>).

Dust will be generated from moving and transporting soil and materials in and around the construction site and on public roads. Weather conditions will play an important role in the quantity of dust generated. The potential for fugitive dust emissions is greatest during periods of prolonged dry weather.

### 10.5.2.1 Air Quality - Dust Emissions

In terms of air quality, the greatest likelihood of effects during the construction stage will be from dust emissions associated with the construction works. The key works likely to be associated with dust emissions include earthworks and excavation activities, construction of hardstanding areas and movement of vehicles on and off site. Dust emissions during the decommissioning phase will be lower than the construction phase given that there is no requirement for excavations, refer to **Section 10.5.4**.

#### *Earthworks*

Earthworks will primarily involve excavation, haulage, tipping, landscaping and stockpiling. The dust emission magnitude from earthworks, as per IAQM guidance can be classified as small, medium or large and are described as follows:

- Large: Total site area > 10,000m<sup>2</sup>, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8m in height, total material moved >100,000 tonnes;
- Medium: Total site area 2,500m<sup>2</sup> – 10,000m<sup>2</sup>, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4-8m in height, total material moved 20,000 – 100,000 tonnes; and
- Small: Total site area >2,500m<sup>2</sup>, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <20,000 tonnes, earthworks during wetter months.

Combining the magnitude of works with the previously established sensitivity of the area, refer to **Section 10.4.2**, the potential risk of dust impacts as a result of earthworks can be determined with use of the IAQM guidance risk rating matrix, refer to **Table 10-6**.

The dust magnitude for the proposed earthwork activities can be classified as **Large**, as the total area of site works is over 10,000m<sup>2</sup> for the Wind Farm area and the potential magnitude of impact according to IAQM guidance (IAQM 2024) is **Medium** for the grid connection works under Grid Route Connection Option A, given that the total site area for works will be between 2,500m<sup>2</sup> and 10,000m<sup>2</sup>.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-6**, the risk of dust impacts as a result of the main wind farm earthworks prior to mitigation is **Low** with respect to dust soiling, human health and ecological impacts, refer to **Table 10-7**.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-6**, the risk of dust impacts as a result of the grid connection works as part of Grid Route Connection Option A prior to mitigation is **Medium** with respect to dust soiling and human health. The risk of dust impacts from grid connection works (Option A) to ecological receptors is considered **Low**, refer to **Table 10-8**.

Impacts relating to Grid Route Connection Option B are covered under the wind farm area assessment, as these works are confined within the main wind farm area and assessed as part of the overall works within the wind farm site.

**Table 10-6: Criteria for Rating Risk of Dust Impacts – Earthworks**

Receptor Sensitivity	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 10-7: Risk of Dust Effects – Main Wind Farm Earthworks**

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust Related Effects
Dust Soiling	Low	Large	Low Risk
Human Health	Low		Low Risk
Ecological	Low		Low Risk

**Table 10-8: Risk of Dust Effects - Grid Connection (Option A) Earthworks**

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust Related Effects
Dust Soiling	Medium	Medium	Medium Risk
Human Health	Medium		Medium Risk
Ecological	Low		Low Risk

**Construction**

Dust emission magnitudes from the construction of buildings, as per IAQM guidance, can be classified as small, medium and large and are described as follows:

- Large: Total building volume >100,000m<sup>3</sup>, on-site concrete batching, sandblasting;
- Medium: Total building volume 25,000m<sup>3</sup>-100,000m<sup>3</sup>, potentially dusty construction material (e.g. concrete), on-site concrete batching; and
- Small: Total building volume <25,000m<sup>3</sup>, construction material with low likelihood of dust release (e.g. metal cladding or timber).

Combining the magnitude of works with the previously established sensitivity of the area, refer to **Section 10.4.2**, the potential risk of dust impacts as a result of construction can be determined with use of the IAQM guidance risk rating matrix, refer to **Table 10-9**.

The dust emission magnitude for the main wind farm construction activities can be classified as **Medium** given that the volume of material is between 25,000m<sup>3</sup> and 100,000m<sup>3</sup> and is **Small** for the grid connection presented as Grid Route Connection Option A, given that construction volumes will be below 25,000m<sup>3</sup>.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-9**, the risk of dust impacts as a result of the main wind farm construction works prior to mitigation is **Low** with respect to dust soiling, human health and ecological impacts, refer to **Table 10-10**.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-9**, the risk of dust impacts as a result of the standalone grid connection works (Option A) prior to mitigation is **Low** with respect to dust soiling and human health. Grid Connection Route (Option B) is within the area of the wind turbine site and is not considered to give rise to significant effects in isolation. With respect to ecological impacts, dust impacts from the construction of this grid connection is considered **Negligible**, refer to **Table 10-11**.

Table 10-9: Criteria for Rating of Dust Effects – Construction

Receptor Sensitivity	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 10-10: Risk of Dust Effects – Main Wind Farm Construction

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Construction	Risk of Dust Related Effects
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk
Ecological	Low		Low Risk

Table 10-11: Risk of Dust Effects – Grid Connection (Option A) Construction

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Construction	Risk of Dust Related Effects
Dust Soiling	Medium	Small	Low Risk
Human Health	Medium		Low Risk
Ecological	Low		Negligible

**Trackout**

Trackout refers to the movement of dust and dirt from a construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. The factors which determine the magnitude of dust emissions are vehicle size, vehicle speed, vehicle numbers, geology and duration. Dust emission magnitudes from trackout, as per IAQM guidance, can be classified as small, medium or large and have been described as follows:

- Large: >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- Medium: 10-50 HDV (>3/5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and
- Small: <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Combining the magnitude of works with the previously established sensitivity of the area, refer to **Section 10.4.2**, the potential risk of dust impacts as a result of trackout can be determined with use of the IAQM guidance risk rating matrix, refer to **Table 10-12**.

During construction, the primary source of dust emissions with potential to impact sensitive receptors will be movement of vehicles on and off site. Materials with the highest potential for dust emissions will be concrete and aggregates for the construction of hardstanding areas and access tracks. However, only ready-mix concrete will be used on site and all concrete will be delivered in enclosed trucks which will reduce the potential for dust emissions.

The max amount of daily outward HGV movements for the main wind farm development will be above 50 HGVs and therefore trackout activities can be considered of **Large** magnitude, refer to **Chapter 14 Material Assets** of this **EIAR**. For the construction of grid route connection (Option A), there will be less than 10 outward HGV movements predicted and therefore trackout activities can be considered to be of **Small** magnitude.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-12**, the risk of dust impacts as a result of the main wind farm trackout activities prior to mitigation is **Low** with respect to dust soiling, human health and ecological impacts, refer to **Table 10-13**.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-12**, the risk of dust impacts as a result of the grid connection works along route Option A prior to mitigation is **Low** with respect to dust soiling and human health, while risk of ecological impacts as a result of dust from these grid connection activities is considered **Negligible**, refer to **Table 10-14**.

**Table 10-12: Criteria for Rating of Dust Effects – Trackout**

Receptor Sensitivity	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 10-13: Risk of Dust Effects – Main Wind Farm Trackout**

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust Related Effects
Dust Soiling	Low	Large	Low Risk
Human Health	Low		Low Risk
Ecological	Low		Low Risk

**Table 10-14: Risk of Dust Effects – Grid Connection (Option A) Trackout**

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Trackout	Risk of Dust Related Effects
Dust Soiling	Medium	Small	Low Risk
Human Health	Medium		Low Risk
Ecological	Low		Negligible

**Summary of Dust Emission Risk**

The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity to prevent significant effects occurring. The pre-mitigation Dust Risk Summary Table for the Wind Farm construction phase is shown in **Table 10-15**. The Dust Risk Summary Table for the grid connection construction phase of the route presented as Option A is shown in **Table 10-16**. Overall, to ensure that no dust disturbance occurs during the earthworks, construction and trackout activities, a range of dust mitigation measures associated with high risk of dust effects will be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter in **Section 10.6.1** are implemented, fugitive emissions of dust from the proposed development will be insignificant and pose minimal disturbance at nearby receptors.

**Table 10-15: Summary of Main Wind Farm Construction Phase Dust Effect Risk Used to Define Site Specific Mitigation**

Potential Effect	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Low Risk	Low Risk
Human Health	Low Risk	Low Risk	Low Risk
Ecological	Low Risk	Low Risk	Low Risk

**Table 10-16: Summary of Grid Connection (Option A) Construction Phase Dust Effect Risk Used to Define Site Specific Mitigation**

Potential Effect	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Low Risk	Low Risk
Human Health	Medium Risk	Low Risk	Low Risk
Ecological	Low Risk	Negligible	Negligible

As previously outlined, impacts relating to Grid Route Connection Option B are covered under the wind farm area assessment, as these works are confined within the main wind farm area.

**Effect Rating**

Table 10-17 shows the significance of the main wind farm construction phase dust effects in relation to dust soiling, human health and ecological receptors. Table 10-18 shows the significance of the Option A grid route connection construction phase dust effects in relation to human health and ecological receptors.

Overall, in the absence of mitigation, dust effects from the proposed development construction phase works are predicted to be **adverse, slight to moderate, temporary to short-term** and **direct** on dust sensitive receptors.

**Table 10-17: Construction Effect 1 - Main Wind Farm Dust Emissions on Sensitive Receptors**

Construction Effect 1: Main Wind Farm Dust emissions on Sensitive Receptors						
	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria	Likelihood
Dust Soiling	Adverse	Slight	Local	Temporary to Short-Term	Direct	Likely
Human Health	Adverse	Slight	Local	Temporary to Short-Term	Direct	Likely
Ecological	Adverse	Slight	Local	Temporary to Short-Term	Direct	Likely

**Table 10-18: Construction Effect 2 - Grid Connection (Option A) Dust Emissions on Sensitive Receptors**

Construction Effect 2: Grid Connection (Option A) Dust emissions on Sensitive Receptors						
	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria	Likelihood
Dust Soiling	Adverse	Slight to Moderate	Local	Temporary to Short-Term	Direct	Likely
Human Health	Adverse	Slight to Moderate	Local	Temporary to Short-Term	Direct	Likely
Ecological	Adverse	Slight	Local	Temporary to Short-Term	Direct	Likely

**10.5.2.2 Vehicle Emissions**

Traffic levels, summarised in Chapter 14 Material Assets of this EIAR, during the construction phase are below the TII criteria (refer to Section 10.2.2.1) and therefore a detailed quantitative assessment of construction traffic was not required.

Exhaust emissions from construction and delivery vehicles during the construction period of 12-16 months therefore are unlikely to have an adverse effect on local air quality and will not have a significant effect on local, regional or national Air Quality Standards given the scale of the high levels of dispersion, and the limited duration of works.

Overall, there will be no significant effect on air quality and climate at sensitive receptors for the short-term duration of the construction phase.

**Effect Rating**

Construction stage traffic will have an **adverse, imperceptible, local, short-term** and **direct** effect on air quality.

**Table 10-19: Construction Effect 3 - Traffic Emissions on Air Quality**

Construction Effect 3: Traffic Emissions on Air Quality						
	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria	Likelihood
<b>Pre - Mitigation</b>	Adverse	Imperceptible	Local	Short-Term	Direct	Likely

**10.5.3 Operational Phase**

During the operational phase, there will be no significant adverse impacts on air quality from dust and traffic emissions given the only activity on site will consist of occasional maintenance. The level of traffic will be insignificant therefore a detailed air quality assessment was not required. The following sections assess how the proposed development effects the climate.

**10.5.3.1 Compatibility with Climate Policy and Targets**

In recognition of the need to limit global temperatures, the Paris Agreement came into existence in 2015. It follows on from the Kyoto Protocol with the intention of accelerating progress towards decarbonisation, climate resilient and sustainable societies. The primary aim of the Paris Agreement is to limit global temperature rise to well below 2 degrees Celsius.

To align with the goals of the Paris Agreement, one of the main aims of the Climate Action Plan 2025 is for 80% of electricity in Ireland to come from renewable resources by 2030.

The proposed development is aligned with current energy and climate policy, aims and objectives, which primarily seek to increase the production of electricity from renewable sources. The proposed development, along with other renewable electricity generating projects across the country will help contribute to the 80% renewable electricity target.

**10.5.3.2 2025 Climate Action Plan**

The current national Climate Action Plan (2025) (CAP) sets out a detailed sectoral roadmap designed to deliver a 51% reduction in greenhouse gas (GHG) emissions by 2030. The GHG reduction target will require significant reductions from all sectors including the renewable energy sector. By its very nature, the proposed development will contribute to achieving this target and move Ireland one step closer towards decarbonisation and ultimately a net zero GHG emissions society.

The proposed development is fully compatible with the provisions relating to renewable energy set out in the CAP, summarised as follows:

- The proposed development will contribute to the CAPs objectives to achieve a 51% reduction in Ireland’s overall GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050;

- The proposed development will contribute to the CAPs objectives to decarbonise the electricity sector by taking advantage of our significant renewable energy resources;
- The proposed development will contribute to the CAPs objectives to increase the share of electricity demand generated from renewable sources to 80%; and
- The proposed development will contribute to the objectives of the CAP to expand and reinforce the grid through the addition of a substation and associated gridlines.

The proposed development will lead to a reduction in greenhouse gas emissions by using a least cost technology recognised in the CAP 2025. The proposed development is expected to have a capacity of approximately 27MW. This would provide approximately 70,956MWh of renewable electricity per year, enough to power approx. 16,894 no. Irish homes, based on average electricity use per home of 4,200 kWh annually (according to data from the Commission for Regulation of Utilities).

In the context of the developments compatibility with climate policy and targets, there will be an **indirect, long-term, significant, positive, extensive** effect.

### 10.5.3.3 Carbon Savings and Losses from the Wind Farm

Once operational, the electricity generated by the wind farm will displace electricity that would otherwise have been produced by burning fossil fuels. This will also displace the associated greenhouse gas emissions. However, there will be some carbon losses due to the manufacturing process of the wind turbines.

In order to demonstrate that the carbon savings will significantly outweigh any potential carbon losses, a methodology made available by the Scottish Government in an excel worksheet titled ‘*Calculating carbon savings from wind farms on Scottish peatlands*’ was applied to this development.

As discussed earlier, this is an established methodology which has been approved by the Scottish government and Scottish Environmental Protection Agency (EPA). Submissions made by developers using this tool are regularly audited by the Scottish EPA. In the absence of an Irish equivalent, it is considered appropriate to use this tool for the proposed development.

The theoretical worst case carbon losses due to the proposed development are presented in **Table 10-20**. The results are theoretically worst case, and the actual results are expected to be much lower than those calculated. The calculations show 22,422 tonnes of CO<sub>2</sub> equivalent losses over the wind farm’s 35-year life span.

**Table 10-20: CO<sub>2</sub> Losses due to Wind Farm**

Source	CO <sub>2</sub> Losses (tonnes CO <sub>2</sub> equivalent)
Losses due to turbine manufacture, construction & decommissioning	22,422
Losses due to felling forestry	0
<b>Total</b>	<b>22,422</b>

The calculation spreadsheet uses counterfactual emission factors to calculate the payback period. There is no clear guidance on the appropriate emission factors to use in Ireland. A grid mix emission factor of 0.375 t CO<sub>2</sub> MWh<sup>-1</sup> sourced from the SEAI document ‘*Energy Related CO<sub>2</sub> emissions in Ireland 2005 to 2018*’ was used as the counterfactual emission factor. This resulted in a payback time of 0.8 years (Refer to **Volume III, Appendix 10B**). Therefore, for the remaining 34.2 years of operation, the proposed development will be directly responsible for significant carbon saving. The wind farm will save approximately 26,609 tonnes CO<sub>2</sub> (based on a 4.5MW turbine wind farm providing 70,956MWh of annual renewable electricity) per year.

Once operational, there will be no direct emissions to the atmosphere from the development, except for vehicles which will periodically visit the proposed development site for maintenance, however emissions associated with this low level

of vehicles are considered insignificant. The carbon calculations demonstrate that significant CO<sub>2</sub> will be offset by the proposed development and will further assist Ireland's CO<sub>2</sub> reduction commitments under the Paris Agreement and Ireland's Climate Action Plan 2025. The electricity generated will assist to displace electricity otherwise generated from coal, oil and gas fired power plants, thus reducing emissions from these power plants.

In the context of the proposed development, there will be a **long-term, significant, positive** effect.

**Table 10-21: Operational Phase Effect Carbon Savings**

Operational Effect: Carbon Savings						
	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria	Likelihood
Whole Wind Farm Development	Positive	Significant	National	Long-Term	Indirect	Likely

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### 10.5.4 Decommissioning Phase

The scale of works involved during the decommissioning phase will primarily involve the dismantling and removal of the wind farm infrastructure off-site and the dust generating activities will be greatly reduced when compared to the construction phase.

#### 10.5.4.4 Air Quality – Dust Emissions

In terms of air quality, the greatest likelihood of effects during the decommission phase will be from dust emissions, however the scale of works involved during the decommissioning phase will primarily involve the dismantling and removal of the wind farm infrastructure off-site and the dust generating activities will be greatly reduced when compared to the construction phase.

#### **Demolition**

Dust emission magnitudes from demolition works, as per IAQM guidance, can be classified as small, medium or large and have been described as follows:

- Large: Total building volume >50,000m<sup>3</sup>, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- Medium: Total building volume 20,000m<sup>3</sup> – 50,000m<sup>3</sup>, potentially dusty construction material, demolition activities 10-20m above ground level; and
- Small: Total building volume <20,000m<sup>3</sup>, construction material with low volume for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Combining the magnitude of works with the previously established sensitivity of the area, refer to **Section 10.4.2**, the potential risk of dust impacts as a result of decommissioning works can be determined with use of the IAQM guidance risk rating matrix, refer to **Table 10-22**.

The dismantling and removal of wind turbines is a specialist operation, which will be undertaken by the turbine supplier that completed the installation where possible. Turbine dismantling will be undertaken in reverse order to the methodology employed during their construction.

On the dismantling of turbines, it is not intended to remove the concrete foundation from the ground. It is considered that foundation removal would be the least preferred option in terms of effects to the environment. The turbine

foundations will therefore be backfilled and covered with soil material. As there is no usable soil or overburden material on the site after construction, this material will be sourced locally and imported to site on heavy good vehicles. The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation.

The exact details of the decommissioning phase will be detailed as part of a Decommissioning Plan which will be finalised with the local authority prior to decommissioning. Taking a conservative approach, the demolition phase dust magnitude is taken as **Medium** for the purposes of this assessment. No demolition works are required for the grid connection during the decommissioning phase, however wind turbines will be decommissioned and dismantled after the turbines' operational life period.

With respect to the IAQM guidance criteria table for rating of risk, refer to **Table 10-22**, the risk of dust impacts as a result of the main wind farm decommissioning works prior to mitigation is **Medium** with respect to dust soiling, human health and ecological impacts, refer to **Table 10-23**.

**Table 10-22: Criteria for Rating Risk of Dust Effects – Demolition**

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium Risk	Low Risk
Medium	Medium	Medium Risk	Low Risk
Low	Low	Low Risk	Negligible

**Table 10-23: Risk of Dust Effects – Demolition**

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust Related Effects
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk
Ecological	Low		Low Risk

As is the case with the construction stage, the exhaust emissions from decommissioning vehicles are unlikely to have an adverse effect on local air quality and will not have a significant effect on local, regional or national Air Quality Standards given the scale of the high levels of dispersion, and the limited duration of works.

The risk rating of dust impacts from decommissioning is rated as **medium** and therefore in the absence of mitigation, dust effects from the proposed development decommissioning phase works are predicted to be **adverse, moderate, temporary to short-term** and **direct** on dust sensitive receptors.

**Table 10-24: Decommissioning Effect 1 - Dust Emissions on Sensitive Receptors**

Decommissioning Effect 1: Dust emissions on Sensitive Receptors						
	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria	Likelihood
<b>Dust Soiling</b>	Adverse	Moderate	Local	Temporary to Short-Term	Direct	Likely
<b>Human Health</b>	Adverse	Moderate	Local	Temporary to Short-Term	Direct	Likely
<b>Ecological</b>	Adverse	Moderate	Local	Temporary to Short-Term	Direct	Likely

### 10.5.4.5 Vehicle Emissions

Emissions from plant and machinery exhausts during the decommissioning phase will be lower than anticipated for the construction phase, as there will be less vehicles involved.

Overall, as with the construction phase, there will be no significant effect on air quality and climate at sensitive receptors for the temporary duration of the decommissioning phase.

#### Effect Rating

Decommissioning stage traffic will have an **adverse, imperceptible, local, short-term** and **direct** effect on air quality and climate.

**Table 10-25: Construction Effect 3: Traffic Emissions on Air Quality**

Construction Effect 3: Traffic Emissions on Air Quality						
	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria	Likelihood
<b>Pre - Mitigation</b>	Adverse	Imperceptible	Local	Short-Term	Direct	Likely

### 10.5.5 Cumulative Effects

Most planning applications in the region relate to small scale residential infrastructure plans and are listed in **Chapter 02 Background** of this **EIAR**.

In terms of significant development, the proposed development is located 4.5km east of the Grouse Lodge Wind Farm and 2.5km east of Carrons Wind Farm.

Harmony Solar Rathkeale Ltd have been granted a 10 year planning permission for the development of a solar farm on a site of 63.4Ha located approximately 3.5km northeast of the proposed development.

The Limerick City and Council online planning databases and the An Coimisiún Pleanála website were consulted to identify battery energy storage developments within 20km of the proposed development. One battery storage application has been granted in Limerick and it is associated with the Kilathmoy wind farm.

#### Construction Stage

From an air quality point of view, the most likely cumulative effect from another development would arise from construction phase dust emissions. The nearest development of significant scale to the proposed development is the Harmony Solar Rathkeale Ltd solar farm, which is located approximately 3.5km northeast of the proposed development. There are a number of other developments within 5km of the proposed development however these developments are considered a sufficient distance away and are not considered likely to cause cumulative effects to air quality, particularly dust emissions.

The Planning and Environmental Report for Ardgoulbeg Solar Farm (Harmony Solar Rathkeale Ltd) found that the potential for generating dust during the construction phase would be considered “Low Risk”, using the IAQM guidance for assessment. The effect of exposure of vehicle emissions was predicted to be slight, and short duration as the setting is rural and will allow for emissions to rapidly dilute in the open air.

Therefore, there are no significant adverse cumulative effects on air and climate from the proposed development in combination with other developments.

## Operational Stage

Should this wind farm and other renewable electricity generation projects become operational, the combined beneficial cumulative effects will be greater than those described in this chapter. The tonnes of CO<sub>2</sub> emissions avoided and the improvement to air quality, especially in towns and cities, will be greatly enhanced. Therefore, the potential cumulative effect with other renewable energy projects will be **long term, significant and positive** on air quality and climate as there is no emission to the atmosphere from the proposed development during the operational phase.

There will be no significant emissions to effect air quality or GHG emissions to effect climate once the wind farm is operational, except for occasional operational and maintenance vehicles exhausts. This effect will be **imperceptible**. Therefore, there will be no measurable significant adverse cumulative effect with other developments.

## Decommissioning Stage

During the decommissioning stage there is potential for cumulative effects should developments in the vicinity of the proposed development occur at the same time as decommissioning, however as the decommissioning phase is predicted to occur after the operational phase completion (35 years), the nature of these potential future developments is not known.

The scale of works involved during the decommissioning phase will primarily involve the dismantling and removal of the wind farm infrastructure off-site and the dust generating activities will be greatly reduced when compared to the construction phase. Similarly, emissions from plant and machinery exhausts will be lower than those anticipated for the construction phase. Where possible materials will be recovered and recycled, minimising the energy required for disposal.

As there are no significant effects to air and climate predicted during the decommissioning stage, no significant cumulative effects from the proposed development, in combination with potential developments in the vicinity of the proposed development area are predicted.

## 10.6 Mitigation Measures

Best practice will be adhered to during the construction phase in order to minimise fugitive dust emissions in particular.

Outlined below is a series of mitigation measures and good working practices to ensure that any potential impacts during the construction phase are minimised and to ensure there will be no adverse impact on the receiving environment. The mitigation measures have been sourced from National and International best practice guidance documents for the implementation of dust management plans such as;

- *'Control of Dust from Construction and Demolition Activities'*, UK British Research Establishment (BRE);
- *'Environmental Good Practice on Site'*, Construction Industry Research and Information Association (CIRIA);
- *'Environmental Management Plans'*, Institute of Environmental Management and Assessment (IEMA); and
- *'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan'* National Roads Authority of Ireland (NRA).

### 10.6.1 Construction Phase

#### 10.6.1.1 Dust Generation

Construction phase generated dust will be minimised by the following measures, which are also incorporated into the site-specific **Construction and Environmental Management Plan (Volume III, Appendix 3D)**:

- The use of water as a dust suppressant, e.g., a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise;
- Public roads will be inspected regularly for cleanliness and cleaned as necessary;

- All loads entering and leaving the site will be covered during dry periods if dust becomes a disturbance on site;
- Control of vehicle speeds passing over access tracks and crane hardstanding areas within the site;
- Wheel wash facilities will be implemented at the site entrance from the public road to facilitate removal of any material collected by vehicles entering or leaving the site and preventing its deposition on public roads;
- Site stockpiling of materials will be laid out to minimise exposure to wind; and
- Daily site inspections at the wind farm and grid connection will take place to examine dust measures and their effectiveness.

#### 10.6.1.2 Construction Traffic Emissions

Construction traffic emissions will be reduced using the following measures:

- Ensure regular maintenance of plant and equipment. Carry out periodic technical inspection of vehicles to ensure they perform most efficiently;
- Implementation of the **Traffic Management Plan (Volume III, Appendix 14A)** to minimise congestion; and
- All site vehicles and machinery will be switched off when not in use - no idling.

#### 10.6.2 Operational Phase

The proposed development will displace 26,609 tonnes annually of CO<sub>2</sub> over its lifetime. This is a long-term beneficial effect. It is not expected that any negative impacts to the climate will occur during the operational phase, therefore no mitigation measures are required.

#### 10.6.3 Decommissioning Phase

Impacts resulting from the decommissioning phase are expected to be similar in nature, but smaller in scale in comparison to the construction phase. Therefore, similar mitigation measures such as those related to dust and construction vehicles will be implemented.

### 10.7 Risk of Major Accidents and Disasters

Given the temporary nature of the construction stage and the scale of the proposed development, as well as the environmental protection measures that will be implemented from the outset, the risk of disasters (typically considered to be natural catastrophes e.g., very severe weather event) or accidents (e.g., fuel spill, traffic accident, landslide) is considered low.

Best construction practice including that for health and safety will be employed to minimise the risk of any accidents occurring. All work on site will be carried out in compliance with the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations 2013 and all relevant Legislation and Work Practice to ensure that the construction areas, site environs and public roads remain safe for all users.

During the operational life of the wind farm, particularly in the context of climate change, there is the potential for increased storm events and severe weather. Wind turbines are designed for specific wind parameters and will shut down automatically during high wind speed events. Therefore, the potential effects of climate change on the operational development may involve curtailment where the turbines will be restricted from operation due to severe winds but does not present a likely risk of a major accident and disaster.

Flood Maps (<http://www.floodmaps.ie/View/Default.aspx>) indicate that where the Ahacronane River flows through the site, there is a risk of flooding in some locations, considered to be 1 in 100 or an AEP of 1%. The **Flood Risk Assessment (FRA)** which was prepared for the proposed development identified that the access track bridge crossing and a portion

of the hardstand area for Turbine 1 are located in flood zone A and B where the AEP is between 0.1 and 1% (between 1 in 100 or 1 in 1000 year events). The remaining site area is not at risk of flooding. The Flood Risk Assessment (**FRA**) is available in **Appendix 8A** of **Volume III**. The bridge crossing has been designed to ensure that the river flow is not restricted in a 1:100 year flood event. The details of the design including hydraulic modelling and flow estimation compiled by MWP are included in the Technical Analysis Report for the Bridge Design in **Appendix 1** of the **FRA**.

## 10.8 Residual Impacts

Once operational, there will be **no significant adverse residual air quality impacts** or **significant adverse residual impacts**. The operation of the wind farm will displace CO<sub>2</sub> emissions and air pollutants that would otherwise have been produced by fossil fuel generated electricity.

This development, in combination with other renewable energy projects deemed necessary in the National Climate Action Plan, will result in a **long term, significant, positive impact** on air quality and climate.

## 10.9 References

- Clean Air Strategy (Government of Ireland 2023);
- Guidance on the assessment of dust from demolition and construction (IAQM 2024);
- Air Quality Assessment of Proposed National Roads - Standard (TII 2022a);
- Limerick City and County Council's Climate Change Adaptation Strategy 2019-2024;
- Limerick Development Plan 2022-2028 (Background Paper: Energy, Climate Change, Flooding and Transition to a Low Carbon Economy);
- Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (TII 2022b);
- Baringa Partners LLP (2018) A 70% Renewable Electricity Vision for Ireland in 2030. Baringa Partners LLP;
- Construction Industry Research and Information Association (CIRA) (2015) Environmental Good Practice on Site. CIRA;
- Department of Climate, Communications, and the Environment (DCCAE) (2024). Climate Action Plan. DCCAE;
- Scottish Government (2019) Calculating carbon savings from Wind Farms on Scottish peatlands. Scottish Government;
- Sustainable Energy Authority of Ireland (SEAI) (2023), Energy in Ireland. SEAI;
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- UK British Research Establishment (BRE) (2003) Control of Dust from Construction and Demolition Activities. BRE;
- United in Science Report 2023, Viewed 05/08/2025, <[https://www.ipcc.ch/report/sixth-assessment-report-cycle/>](https://www.unep.org/resources/report/united-science-2023#:~:text=%2D%20July%202023%20was%20the%20hottest,Sustainable%20Development%20Goals%20(SDGs).></a>></p><p>AR6 Synthesis Report – Climate Change 2023, Viewed 05/07/2024 < <a href=)
- Environmental Protection Agency, 2024, Viewed 05/08/2025 <[www.epa.ie/irelandsenvironment/air/](http://www.epa.ie/irelandsenvironment/air/)>
- NOAA June 2025 Report, Viewed 05/08/2025, <<https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202506>>
- Office of Public Works (OPW), 2024, Viewed 05/07/2024, <<http://www.floodmaps.ie/View/Default.aspx>>
- World Meteorological Organisation <https://library.wmo.int/records/item/68835-state-of-the-global-climate-2023>, viewed 05/07/2024.

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