10. AIR AND CLIMATE

10.1 Air Quality

10.1.1 Introduction

This chapter identifies, describes and assesses the potential significant direct and indirect effects on air quality and climate arising from the construction, operation and decommissioning of the Proposed Development. The full description of the Proposed Development is detailed in Chapter 4.

The Proposed Development site is located northeast and southeast of the village of Dysart, approximately 1.5 kilometres away at its closest point and approximately 11 kilometres northwest/west of the town of Athlone, Co. Roscommon. The Proposed Development is located within several townlands as listed in Chapter 1, Section 1.1 of this EIAR.

The primary land-uses within and in the vicinity of the Proposed Development site are small scale agriculture, predominantly livestock grazing, pasture and sileage. Due to the non-industrial nature of the Proposed Development and the general character of the surrounding environment, it was deemed that air quality sampling would be unnecessary for this EIAR. It is assumed that air quality in the existing environment is good, as there are no major sources of air pollution (e.g., heavy industry) in the vicinity of the site. However, it should be noted that the Roadstone Quarry is located adjacent to the Proposed Development site. Further detail on this is included in Section 10.3 below.

The production of energy from wind turbines has no direct emissions unlike emissions released from fossil fuel-based power stations. Harnessing more energy by means of wind farms will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment. Some minor short term or temporary indirect emissions associated with the construction of the Proposed Development include vehicular and dust emissions. Emissions from the construction, operation and decommissioning phases of the project are addressed in Section 10.1.5.

10.1.1.1 Relevant Guidance

The air quality and climate section of this EIAR is carried out in accordance with the 'EIA Directive' as amended by Directive 2014/52/EU and has been prepared in accordance with guidance listed in Section 1.8.1 of Chapter 1: Introduction.

10.1.1.2 Statement of Authority

This section of the EIAR has been prepared by David Naughton and Órla Murphy and reviewed by Michael Watson, of MKO. David is an Environmental Scientist with over five years of consultancy experience with MKO and has been involved in a number of wind energy EIAR applications. David holds a BSc (Hons) in Environmental Science. Órla is a Project Environmental Scientist with over 6 years' experience in the environmental sector where she has acted as Project Manager for a number of EIAR applications for wind energy developments, compiling numerous chapters including chapters on Air and Climate. Órla holds a BSc. in Geography and MSc. in Environmental Protection and Management. Michael Watson is a Project Director with MKO; with over 18 years' experience in the environmental sector. His project experience includes the management and productions of Environmental Impact Statements (EISs)/EIARs, particularly within the wind energy sector.

10.1.2 Air Quality Standards

In 1996, the Air Quality Framework Directive (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999. The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).
- The third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).
- The fourth Daughter Directive, published in 2007, relates to polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air and was transposed into Irish law by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2009 (S.I. No. 58 of 2009).

The Air Quality Framework Directive and the first three Daughter Directives have been replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality) (as amended by Directive EU 2015/1480), which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for $PM_{2.5}$ (fine particles) including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years (for particulate matter PM_{10}) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 10-1 below sets out the limit values of the CAFE Directive, as derived from the Air Quality Framework Daughter Directives. Limit values are presented in micrograms per cubic metre ($\mu g/m^3$) and parts per billion (ppb). The notation PM_{10} is used to describe particulate matter or particles of ten micrometres or less in aerodynamic diameter. $PM_{2.5}$ represents particles measuring less than 2.5 micrometres in aerodynamic diameter.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) as amended by the Air Quality Standards (Amendments) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2016 (S.I. 659 2016). These Regulations supersede the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the Ambient Air Quality Assessment and Management Regulations 1999 (S.I. No. 33 of 1999).

Table 10-1 Limit values of Directive 2008/50/EC, 1999/30/EC and 2000/69/EC (Source: https://www.epa.ie/air/quality/standards/)

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m3)	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of human health	24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Upper assessment threshold for the protection of Human Health	24 hours	75	28	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Lower assessment threshold for the protection of human health	24 hours	50	19	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of vegetation	Calendar year	20	7.5	Annual mean	19th Jul 2001
Sulphur dioxide (SO_2)	Protection of vegetation	1st Oct to 31st Mar	20	7.5	Winter mean	19th Jul 2001
Nitrogen dioxide (NO_2)	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide (NO_2)	Protection of human health	Calendar year	40	21	Annual mean	1st Jan 2010

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m3)	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Nitrogen dioxide (NO_2)	Upper assessment threshold for the protection of human health	1 hour	140	73	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide (NO_2)	Lower assessment threshold for the protection of human health	1 hour	100	52	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen monoxide (NO) and nitrogen dioxide (NO_2)	Protection of ecosystems	Calendar year	30	16	Annual mean	19th Jul 2001
Particulate matter 10 (PM_{10})	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1st Jan 2005
Particulate matter 10 (PM_{10})	Upper assessment threshold for the protection of human health	24 hours	35	-	Not to be exceeded more than 35 times in a calendar year	Based on the indicative limit values for 1 January 2010
Particulate matter 10 (PM_{10})	Lower assessment threshold for the protection of human health	24 hours	25	-	Not to be exceeded more than 35 times in a calendar year	Based on the indicative limit values for 1 January 2010
Particulate matter 2.5 ($PM_{2.5}$)	Protection of human health	Calendar year	40	-	Annual mean	1st Jan 2005

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m3)	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Particulate matter 2.5 ($PM_{2.5}$) Stage 1	Protection of human health	Calendar year	25	-	Annual mean	1st Jan 2015
Particulate matter 2.5 ($PM_{2.5}$) Stage 2	Protection of human health	Calendar year	20	-	Annual mean	1st Jan 2020
Lead (Pb)	Protection of human health	Calendar year	0.5	-	Annual mean	1st Jan 2005
Carbon Monoxide (CO)	Protection of human health	8 hours	10,000	8,620	-	1st Jan 2005
Benzene (C_6H_6)	Protection of human health	Calendar Year	5	1.5	-	1st Jan 2010

* AOT40 is a measure of the overall exposure of plants to ozone. It is the sum of the differences between hourly ozone concentration and 40 ppb for each hour when the concentration exceeds 40 ppb during a relevant growing season, e.g. for forest and crops.

The Ozone Daughter Directive 2002/3/EC is different from the other Daughter Directives in that it sets target values and long-term objectives for ozone rather than limit values. Table 10-2 presents the limit and target values for ozone.

Table 10-2 Target values for Ozone Defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Target Value for 2020
Protection of human health	Maximum daily 8-hour mean	120 mg/m^3 not to be exceeded more than 25 days per calendar year averaged over 3 years	120 mg/m^3
Protection of vegetation	AOT40* calculated from 1-hour values from May to July	18,000 $mg/m^3.h$ averaged over 5 years	6,000 $mg/m^3.h$
Information Threshold	1-hour average	180 mg/m^3	-
Alert Threshold	1-hour average	240 mg/m^3	-

*The sum of the differences between hourly ozone concentration and 40 ppb for each hour when the concentration exceeds 40 ppb during a relevant growing season, e.g. for forest and crops.

10.1.2.1 Air Quality and Health

The EPA report '*Air Quality in Ireland 2020*[1] noted that in Ireland, the premature deaths attributable to poor air quality are estimated at 1,300 people. A more recent European Environmental Agency (EEA) Report, '*Air Quality in Europe – 2021 Report'* highlights the negative effects of air pollution on human health. The report assessed that poor air quality accounted for premature deaths of approximately 307,000 people in Europe in 2019, with regards to deaths relating to $PM_{2.5}$. The estimated impacts on the population in Europe of exposure to NO_2 and O_3 concentrations in 2019 were around 40,400 and 16,800 premature deaths, respectively. From this, 1,300 Irish deaths were attributable to fine particulate matter ($PM_{2.5}$), 30 Irish deaths were attributable to nitrogen oxides (NO_2) and 50 Irish deaths were attributable to Ozone (O_3) (Source: *Air Quality in Europe – 2021 Report',* EEA, 2021). These emissions, along with others including sulphur oxides (SO_2) are produced during fossil fuel-based electricity generation in various amounts, depending on the fuel and technology used.

Whilst there is the potential of such emissions, and also dust emissions to be generated from the site during the construction and operation phases, a number of mitigation measures will be implemented at this site to reduce the impact from dust and vehicle emissions, which are discussed in Section 10.1.5.2 below.

10.1.3 Air Quality Zones

The Environmental Protection Agency (EPA) has designated four Air Quality Zones for Ireland:

- Zone A: Dublin City and environs
- Zone B: Cork City and environs
- Zone C: 16 urban areas with population greater than 15,000
- Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Framework Directive and Daughter Directives. The site of the Proposed Development lies within Zone D, which represents rural areas located away from large population centres.

10.1.4 Existing Air Quality

The air quality in the vicinity of the Proposed Development site is typical of that of rural areas in the East of Ireland, i.e., Zone D. The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, 'Air Quality in Ireland 2020'[2] was published by the EPA in 2021. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone D. Values for each of these elements recorded within the Zone D monitoring stations listed in the report, have been averaged to give representative values for Zone D. Similar measurement values for all air quality parameters would be expected for the Proposed Development site as it lies in a rural location, within Zone D.

10.1.4.1 Sulphur Dioxide (SO_2)

The EPA Air Quality in Ireland 2020 summary tables provide statistics for hourly sulphur dioxide concentrations for four Zone D monitoring stations under Table A5 of the EPA report, namely, Cork Harbour, Kilkitt, Askeaton and Letterkenny. The average sulphur dioxide statistics across each of the four monitoring stations listed in Zone D from the 2020 summary tables is presented in Table 10-3.

[1] *EPA (2021). Air Quality in Ireland 2020, https://www.epa.ie/publications/monitoring–assessment/air/Air-Quality-in-Ireland-2020.pdf*
[2] *EPA (2021). Air Quality in Ireland 2020 – Summary Data Tables*
https://www.epa.ie/publications/monitoring–assessment/air/Summary-Data-Tables–2020.pdf

Table 10-3 Average Sulphur Dioxide Data for Zone D Sites in 2020

Parameter	Measurement
Annual Mean	4.15
Hourly values > 350	0.5
Hourly max	135.18
Daily values > 125	0
Daily max	25.55

Neither the upper assessment threshold of 350 µg/m^3, nor the lower threshold of 125 µg/m^3 was exceeded during the 2020 calendar year. During the monitoring period there were no exceedances of the daily limit values (125 µg/m^3) or hourly limit values (350 µg/m^3) for the protection of human health as set out in the CAFE Directive Limit Values (See Table 10-1 above). As can observed from Table 10-3 the average maximum hourly value recorded during the assessment period was 135.18 µg/m^3 while the maximum daily value was 25.55 µg/m^3. It would be expected that SO_2 values at the Proposed Development site would be similar or lower than those recorded for the Zone D sites above.

10.1.4.2 Particulate Matter (PM_{10})

Sources of particulate matter include vehicle exhaust emissions, soil and road surfaces, construction works and industrial emissions. The EPA Air Quality in Ireland 2020 summary tables provide annual mean PM_{10} concentration for twelve Zone D monitoring stations under Table A11 of the EPA report, namely, Tipperary Town, Carrick-on-Shannon, Enniscorthy, Birr, Askeaton, Macroom, Castlebar, Cobh, Claremorris, Kilkitt, Cavan and Roscommon Town. The average Particulate matter (PM_{10}) statistics across each of the twelve monitoring stations listed in Zone D from the 2020 summary tables is presented in Table 10-4.

Table 10-4 Average Particulate Matter (PM_{10}) Data for Zone D Sites in 2020

Parameter	Measurement (ug/m^3)
Annual Mean	11.17
% Data Capture	75
Values > 50 ug/m^3	5 exceedances (Macroom)
Daily Max	46.5

Notes: [1-] PM_{10} daily limit for the protection of human health: No more than 35 days >50 µg/m^3

The daily limit of 50 µg/m^3 for the protection of human health was not exceeded when examining the average Daily Max Values for all Zone D monitoring station listed in Table A11 EPA Air Quality in Ireland 2020 summary tables 46.5 µg/m^3). The CAFE Directive stipulates that this assessment threshold of 50 µg/m^3 should not be exceeded more than 35 times in a calendar year. While there was a maximum of 5 exceedances at the Macroom monitoring station in Cork, this is still below the limit value of 35 times during a calendar year. It would be expected that PM_{10} values at the Proposed Development site would be similar or lower than those recorded for the Zone D sites above due to a more rural location.

10.1.4.3 Nitrogen Dioxide (NO_2)

The EPA Air Quality in Ireland 2020 summary tables provide statistics for hourly nitrogen dioxide concentrations for five Zone D monitoring stations under Table A2 of the EPA report, namely, Emo Court, Birr, Castlebar, Carrick-on-Shannon and Kilkitt. The average Nitrogen Dioxide (NO_2) statistics across each of the five monitoring stations listed in Zone D from the 2020 summary tables is presented in in 2020 is presented in Table 10-5 below.

Table 10-5 Average Nitrogen Dioxide Data for Zone D Sites in 2020

Parameter	Measurement (µg/m^3)
Annual Mean	7.6
NO_2 Values >200	0
Values > 140 (UAT)	0
Values >100 (LAT)	0
Hourly Max.	54

The annual NO_2 value was below the annual mean limit value for the protection of human health of 40 µg/m^3. Furthermore, upper assessment threshold of 140 µg/m^3, nor the lower threshold of 100 µg/m^3 were exceeded during the monitoring period. The CAFE Directive stipulates that these thresholds should not be exceeded more than 18 times in a calendar year. The average hourly maximum NO_2 value of 54 µg/m^3 measured during the monitoring period was below the hourly max threshold of 200 µg/m^3. It would be expected that NO_2 values at the Proposed Development site would be similar or lower than those recorded for the Zone D sites above.

10.1.4.4 Carbon Monoxide (CO)

The EPA Air Quality in Ireland 2020 summary tables provide statistics for rolling 8-hour carbon monoxide concentrations for only one Zone D site, namely Birr air monitoring station, under Table A6 of the EPA report. Carbon Monoxide data from Birr Monitoring Station (Zone D) in 2020 is presented in Table 10-6 below.

Table 10-6 Carbon Monoxide Data for Birr - Zone D Site in 2020

Parameter	Measurement
Annual Mean	0.4 mg/m^3
Median	0.4 mg/m^3
% Data Capture	4.2%
Values > 10	0
Max	1.2 mg/m^3

The average concentration of carbon monoxide was 0.4 mg/m^3. The carbon monoxide limit value for the protection of human health is 10,000 µg/m^3 (or 10mg/m^3). On no occasions were values in excess of the 10 mg limit value set out in Directives 2000/69/EC or 2008/69/EC. It would be expected that Carbon Monoxide values at the Proposed Development site would be similar or lower than those at Birr, due to a more rural location.

10.1.4.5 Ozone (O_3)

The EPA Air Quality in Ireland 2020 summary tables provide statistics for rolling 8-hour ozone concentrations for seven Zone D monitoring stations under Table A7 of the EPA report, namely, Emo Court, Kilkitt, Carnsore Point, Mace Head, Castlebar, Valentia and Malin Head. The average Ozone (O_3) statistics across each of the seven monitoring stations listed in Zone D from the 2020 summary tables is presented in Table 10-7 below.

Table 10-7 Average Ozone Data for Zone D Sites in 2020

Parameter	Measurement
Annual Mean	62 µg/m^3
Median	63 µg/m^3
% Data Capture	98%
No. of days > 1800	0 days

There were no exceedances of the maximum daily eight-hour mean limit of 120 µg/m^3. The legislation stipulates that this limit should not be exceeded on more than 25 days. It would be expected that ozone values at the Proposed Development site would be similar to those recorded for the Zone D sites above.

10.1.4.6 Dust

There are no statutory limits for dust deposition in Ireland. However, EPA guidance suggests that a deposition of 10 mg/m^2/hour can generally be considered as posing a soiling nuisance. This equates to 240 mg/m^2/day. The EPA recommends a maximum daily deposition level of 350 mg/m^2/day when measured according to the TA Luft Standard 2002.

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

The potential dust-related effects on local air quality and the relevant associated mitigation measures are presented in Sections 10.1.5.2.2 and 10.1.5.3.2 below.

10.1.5 Likely Significant Effects and Associated Mitigation Measures

10.1.5.1 'Do-Nothing' Effect

If the Proposed Development were not to proceed, no changes would be made to the current land-use practice of small-scale agriculture. In doing so, the environmental effects in terms of emissions are likely to be neutral. However, the opportunity to further reduce emissions of carbon dioxide, oxides of nitrogen (NO_x), and sulphur dioxide (SO_2) to the atmosphere would be lost resulting in a continued dependence on electricity derived from fossil fuels, such as coal, oil and gas-fired power stations, rather than renewable energy sources such as the Proposed Development. This will result in an indirect negative impact on air quality nationally, regionally and locally. As detailed in Chapter 1, if the

Proposed Development where to receive a grant of permission, the development would double the current capacity in the county and contribute to County Roscommon's renewable energy targets.

10.1.5.2 Construction Phase

10.1.5.2.1 *Exhaust Emissions*

Turbines and Other Infrastructure

The construction of turbine bases and hardstands, anemometry mast, site roads and other onsite infrastructure (as outlined in Chapter 4 of this EIAR) will require the operation of construction vehicles and plant on site. Exhaust emissions associated with vehicles and plant will arise as a result of construction activities. This potential effect will not be significant and will be restricted to the duration of the construction phase and localised to works locations. Therefore, this is considered a short-term slight negative impact. Mitigation measures to reduce this impact are presented below.

Overburden Storage Areas

The proposed overburden storage areas will also require the use of construction machinery and plant to transport material to these areas, thereby giving rise to exhaust emissions. This is also a short-term slight negative impact, which will be reduced through use of the best practice mitigation measures as presented below.

Substation and Grid Connection

The construction of the proposed onsite substation and the underground Grid Connection cable route to the existing Athlone 110kV substation in Monksland, Athlone, will require the use of construction machinery, thereby giving rise to exhaust emissions. This is a short-term slight negative impact, which will be reduced through use of the best practice mitigation measures as presented below.

Transport to Site

The transport of turbines and construction materials to the site, which will occur on specified routes only (see Section 4.4 in Chapter 4 of this EIAR), will also give rise to exhaust emissions associated with the transport vehicles. This constitutes a slight negative impact in terms of air quality. Mitigation measures in relation to exhaust emissions are presented below.

Waste Disposal

Construction waste will arise on the project mainly from excavation and unavoidable construction waste including material surpluses and damaged materials and packaging waste. Waste management will be carried out in accordance with *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects* (2006) produced by the Department of Environment, Community and Local Government (DoECLGs). The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the Proposed Development site. Therefore, all wastes streams generated on site will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The facility will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements.

Mitigation

- All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.
- Machinery will be switched off when not in use.
- Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority.
- The majority of aggregate materials for the construction of the Proposed Development will be obtained from quarries or batching plants which are local to the Proposed Development. This will significantly reduce the distance for delivery vehicles to travel in accessing the site, thereby reducing the amount of emissions associated with vehicle movements.
- Users of the site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants is kept to a minimum.
- The MRF facility will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements (the closest licensed waste facility to the site is Pollyboy Landfill, Ballinasloe, approximately 13.5 km to the south of the site). The MRF facility to be used will be determined prior to construction.

Residual Impact

Following implementation of the mitigation measures outlined above, residual impacts of exhaust emissions from the construction phase will have a Short-term Imperceptible Negative Impact.

Significance of Effects

Based on the assessment above there will be no significant direct or indirect effects on air quality due to exhaust emissions during the construction of the Proposed Development.

10.1.5.2.2 *Dust Emissions*

Turbines and Other Infrastructure

The construction of turbine bases and hardstands, anemometry mast, site roads and other onsite infrastructure (as outlined in Chapter 4 of this EIAR) will give rise to dust emissions during the construction phase. The potential for impacts on off-site receptors is limited due to the isolated nature of the site. This potential effect will not be significant and will be restricted to the duration of the construction phase. Therefore, this is a short-term slight negative impact. Dust suppression mitigation measures to reduce this impact are presented below.

Overburden Storage Areas

The delivery of overburden material to the onsite designated overburden storage areas will give rise to localised dust emissions. This is a short-term, moderate, negative impact. Mitigation measures to reduce this impact are presented below.

Substation and Grid Connection

The construction of the proposed substation and excavation of the Grid Connection cable route will give rise to localised dust emission during construction. This is a short-term slight negative impact, which will be reduced through use of the best practice mitigation measures as presented below.

Transport to Site

The transport of turbines and construction materials to the Proposed Development site will also give rise to some localised dust emissions during periods of dry weather. This is a short-term slight negative impact. Mitigation measures to reduce the significance of this effect are presented below.

Mitigation

- In periods of extended dry weather, dust suppression may be necessary along haul roads, site roads, substation, temporary construction compounds and overburden storage areas to ensure dust does not cause a nuisance. If necessary, de-silted water will be taken from stilling ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down roads and site compound to prevent the generation of dust where required. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff.
- All plant and materials vehicles shall be stored in dedicated areas (on site).
- Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction.
- Turbines and construction materials will be transported to the site on specified haul routes only.
- The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary.
- The transport of construction materials which may have the potential to generate dust will be undertaken with tarpaulin cover or similar, where necessary.
- The transportation of dry excavated material from the site to the designated on-site overburden storage areas, which may have potential to generate dust will be minimised. If necessary, excavated material will be dampened prior to transport to the overburden storage areas.
- A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-9). The CEMP includes dust suppression measures, such as the implementation of wheel washing, dedicated storage areas for plant and machinery and use of de-silted water from stilling ponds to dampen down roads and site compound to prevent the generation of dust where necessary.

Residual Impact

Following implementation of the mitigation measures outlined above, residual impacts of dust generation from the construction phase will have a Short-term Imperceptible Negative Impact.

Significance of Effects

Based on the assessment above there will be no significant direct or indirect effects on air quality due to dust emissions during the construction of the Proposed Development.

10.1.5.3 Operational Phase

10.1.5.3.1 *Exhaust Emissions*

Exhaust emissions associated with the operational phase of the Proposed Development will arise from machinery and Light Goods Vehicles (LGV) that are intermittently required onsite for maintenance. This will give rise to a long-term imperceptible negative impact.

Mitigation

Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order, thereby minimising any emissions that arise.

Residual Impact

Long-term Imperceptible Negative Impact

Significance of Effects

Based on the assessment above there will be no significant direct or indirect effects on air quality due to the operation of the Proposed Development.

10.1.5.3.2 *Air Quality*

By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Proposed Development will contribute to emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_2), and sulphur dioxide (SO_2). The production of renewable energy from the Proposed Development will have a long-term significant positive impact on air quality. Further details on the carbon dioxide savings associated with the Proposed Development are presented in Section 10.2.3 below.

Residual Impact

Long-term Significant Positive Impact

Significance of Effects

Based on the assessment above there will be a significant positive impact on air quality due to the operation of the Proposed Development.

10.1.5.3.3 *Human Health*

Long-term exposure to chemicals such as SO_2 and NOx are harmful to human health. The production of clean, renewable energy from the Proposed Development will offset the emission of these harmful chemicals by fossil fuel powered sources of electricity and, therefore, will have a long-term slight positive impact on human health. Further information on the impact of the Proposed Development on Human Health is contained in Chapter 5: Population and Human Health.

Residual Impact

Long-term Slight Positive Impact

Significance of Effects

Based on the assessment above there will be a significant positive effect on human health due to the operation of the Proposed Development.

10.1.5.4 Decommissioning Phase

The wind turbines proposed as part of the Proposed Development are expected to have a lifespan of approximately 30 years. Following the end of their useful life, the wind turbines may be replaced with a

new set of turbines, subject to planning permission being obtained, or the site may be decommissioned fully. The substation will remain in place as it will be under the ownership of ESB.

The works required during the decommissioning phase are described in Section 4.10 in Chapter 4: Description of the Proposed Development. Any impact and consequential effect that occurs during the decommissioning phase are predicted to be similar to that which occurs during the construction phase, albeit of less impact. The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase thereby minimising any potential impacts.

A Decommissioning Plan for the Proposed Development, see Appendix 4-10, contains details which will be agreed with the local authority prior to any decommissioning. The potential for effects during the decommissioning phase of the Proposed Development has been fully assessed within each chapter of the EIAR.

10.2 Climate

All relevant legislation and policy in relation to climate is outlined in detail in Chapter 2 of this EIAR. A summary of the same is provided in the following sections.

10.2.1 Climate Change and Greenhouse Gases

Although variation in climate is thought to be a natural process, the rate at which the climate is changing has been accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of greenhouse gases in the atmosphere. These greenhouse gases come primarily from the combustion of fossil fuels in energy use. Changing climate patterns are thought to increase the frequency of extreme weather conditions such as storms, floods and droughts. In addition, warmer weather trends can place pressure on animals and plants that cannot adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

10.2.1.1 Greenhouse Gas Emission Targets

Ireland is a Party to the Kyoto Protocol, which is an international agreement that sets limitations and reduction targets for greenhouse gases for developed countries. It is a protocol to the United Nations Framework for the Convention on Climate Change. The Kyoto Protocol came into effect in 2005, as a result of which, emission reduction targets agreed by developed countries, including Ireland, are now binding.

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

10.2.1.1.1 *Doha Amendment to the Kyoto Protocol*

In Doha, Qatar, on 8th December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

- New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1 January 2013 to 31 December 2020;

- A revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period; and
- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

During the first commitment period, 37 industrialised countries and the European Community committed to reduce GHG emissions to an average of 5% below 1990 levels. During the second commitment period, Parties committed to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020. The composition of Parties in the second commitment period is different from the first; however, Ireland and the EU signed up to both the first and second commitment periods.

Under the protocol, countries must meet their targets primarily through national measures, although market-based mechanisms (such as international emissions trading) can also be utilised.

10.2.1.1.2 COP21 Paris Agreement

COP21 was the 21st session of the Conference of the Parties (COP) to the United Nations Convention. Every year since 1995, the COP has gathered the 196 Parties (195 countries and the European Union) that have ratified the Convention in a different country, to evaluate its implementation and negotiate new commitments. COP21 was organised by the United Nations in Paris and held from 30th November to 12th December 2015.

COP21 closed on 12th December 2015 with the adoption of the first international climate agreement (concluded by 195 countries and applicable to all). The twelve-page text, made up of a preamble and 29 articles, provides for a limitation of the temperature rise to below 2°C above pre-industrial levels and even to tend towards 1.5°C. It is flexible and takes into account the needs and capacities of each country. It is balanced as regards adaptation and mitigation, and durable, with a periodical ratcheting-up of ambitions.

10.2.1.1.3 COP25 Climate Change Conference

The 25th United Nations Climate Change conference COP25 was held in Madrid and ran from December 2nd to December 13th, 2019. While largely regarded as an unsuccessful conference, the European Union launched its most ambitious plan, 'The European Green New Deal' which aims to lower CO2 emissions to zero by 2050. The deal includes proposals to reduce emissions from the transport, agriculture and energy sectors and will affect the technology chemicals, textiles, cement and steel industries. Measures such as fines and pay-outs by member states who rely on coal power will be in place to encourage the switch to renewable clean energies such as wind. On the 4th of March 2020, the European Commission put forward the proposal for a European climate law. This aims to establish the framework for achieving EU climate neutrality. It aims to provide a direction by setting a pathway to climate neutrality and to this end, aims to set in legislation the EU's 2050 climate-neutrality objective.

10.2.1.1.4 COP26 Climate Change Conference Glasgow

COP26 took place in Glasgow, Scotland between the 31st October and 12th November 2021. The summit was centred around the fact that "climate change is the greatest risk facing us all." The UK, as hosts for the summit, have developed a ten point plan to deliver a green industrial revolution, seeking to lead the world in tackling and adapting to climate change.

The key items COP26 seeks to achieve are:

- Secure global net zero by mid-century and keep 1.5 degrees within reach
- Adapt to protect communities and natural habitats
- Mobilise finance

- Work together to deliver

All world leaders at the summit confirmed the need to urgently address the gaps in ambition and work together to achieve climate action.

The summit highlighted that the Paris Agreement is working, with leaders outlining national targets and efforts to further reduce emissions. There was a clear commitment to working together to achieve climate aims, with significant announcements including:

- "Over 40 leaders joined the Breakthrough Agenda, a 10-year plan to work together to create green jobs and growth globally, making clean technologies and solutions the most affordable, accessible and attractive option before 2030 – beginning with power, road transport, steel, hydrogen and agriculture.
- Over 120 countries covering more than 90% of the world's forests endorsed the Glasgow Leaders' Declaration on Forests & Land Use committing to work collectively to halt and reverse forest loss and land degradation by 2030, backed by the biggest ever commitment of public funds for forest conservation and a global roadmap to make 75% of forest commodity supply chains sustainable.
- A Just Energy Transition Partnership was announced to support South Africa's decarbonisation efforts; a powerful example of collaboration between an emerging economy and international partners.
- The launch of the Global Methane Pledge saw over 100 countries committing collectively to reduce global methane emissions by 30% by 2030."

10.2.1.2 European Green Deal – European Climate Law (2021)

The European Green Deal, initially introduced by the European Commission in December 2019, sets out the 'blueprint' for a transformational change of the 27-country bloc from a high- to a low-carbon economy, without reducing prosperity and while improving people's quality of life, through cleaner air and water, better health and a thriving natural world. The Green Deal is intended to work through a framework of regulation and legislation setting clear overarching targets, e.g. **a bloc-wide goal of net zero carbon emissions by 2050 and a 55% cut in emissions by 2030 (compared with 1990 levels).** This is a substantial increase compared to the existing target, upwards from the previous target of at least 40% (2030 Climate & Energy Framework), and furthermore, these targets demonstrate the ambition necessary to keep the global temperature increase to well below 2°C and pursue efforts to keep it to 1.5°C as per the Paris Agreement. With regard to the energy sector, the Green Deal focuses on 3 no. key principles for the clean energy transition, which will help reduce greenhouse gas emissions and enhance the quality of life for citizens:

- Ensuring a secure and affordable EU energy supply;
- Developing a fully integrated, interconnected and digitalised EU energy market; and
- Prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources (e.g. the subject development)
- The European Climate Law 2021 writes into law the objectives set out above in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. Climate neutrality by 2050 means achieving net zero greenhouse gas emissions for EU countries as a whole, mainly by cutting emissions, investing in green technologies and protecting the natural environment. The Climate Law includes:
- A legal objective for the Union to reach climate neutrality by 2050;
- An ambitious 2030 climate target of at least 55% reduction of net emissions of greenhouse gases as compared to 1990, with clarity on the contribution of emission reductions and removals;
- A process for setting a 2040 climate target, taking into account an indicative greenhouse gas budget for 2030-2050 to be published by the Commission;
- A commitment to negative emissions after 2050;

- The establishment of European Scientific Advisory Board on Climate Change, that will provide independent scientific advice;
- Stronger provisions on adaptation to climate change; and
- Strong coherence across Union policies with the climate neutrality objective

The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part. All 27 no. EU Member States have committed to turning the EU into the first climate neutral continent by 2050. One third of the 1.8 trillion-euro investments from the NextGenerationEU Recovery Plan, and the EU's seven-year budget, will finance the European Green Deal. On 14th July 2021, the European Commission adopted a set of proposals to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Achieving these emission reductions in the next decade which is crucial to Europe becoming the world's first climate-neutral continent by 2050 would clearly be assisted by the Proposed Development.

10.2.1.3 Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change released their *Sixth Assessment Report Climate Change 2021: The Physical Science Basis*[3] in August 2021 which categorically states the rise in global temperatures and increase in frequency and severity of natural disasters experienced across the world is related to human activity. It indicates that climate change has and will negatively impact all aspects of human life and unless immediate action is taken. It states that the aim to curtail global temperature rise to 1.5 degrees is now not possible however, maintaining just a 2-degree rise may be possible, only with immediate and large-scale action is taken to reduce greenhouse gas emissions. The report is hopeful that if global emissions can be cut in half by 2030 and that if net zero emissions can be achieved by 2050 the rise in temperatures can be halted and possibly reversed. This report is a stark warning that de-carbonisation must be increased additional efforts made to reduce carbon emissions across all sectors.

Greenhouse gas (GHG) emissions resulting from the provision of energy services have contributed significantly to the historic increase in atmospheric GHG concentrations with most of the observed increase in global average temperature since the mid-20th century is very likely due to the observed increase in anthropogenic GHG emissions with the consumption of fossil fuels accounts for the majority of global anthropogenic GHG emissions[4]. There are multiple options for lowering GHG emissions from the energy system while still satisfying the global demand for energy services. Wind energy has significant potential to reduce GHG emissions. Moreover, attempts to measure the relative impacts of various electricity supply technologies suggest that wind energy generally has a comparatively small environmental footprint.[5]

10.2.1.4 Climate Change Performance Index

Established in 2005, the Climate Change Performance Index (CCPI) is an independent monitoring tool which tracks countries climate protection performance. It assesses individual countries based on: climate policies, energy usage per capita, renewable energy implementation and Greenhouse Gas Emissions (GHG) and ranks their performance in each category and overall. The 2021 CCPI was published in December 2020 and presented at the COP25. While the CCPI 2021 indicated signs of potential reductions in global emissions, no country achieved its Paris Climate targets and therefore the first three places of the ranking system remain unoccupied.

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[3] *Working Group 1 (Aug 2021) Climate Change 2021 The Physical Science Basis, 1IPCC AR6. Available at: https://www.ipcc.ch/report/ar6/wg1/*
[4] *Edenhofer et al 2011, Renewable Energy Sources and Climate Change Mitigation: Summary for Policy makers and Technical Summary. Technical Support Unit Working Group III Potsdam Institute for Climate Impact Research (PIK) Published for the IPCC. Available at: https://www.ipcc.ch/site/assets/uploads/2018/03/SRREN_FD_SPM_final-1.pdf*
[5] *ibid*

Ireland, ranked 41st in 2019, has climbed 2 places to 39th for 2020, and remains as a "low" performer in international performance. However, it remains at "very low" at a national performance level. The CCPI report states that while some improvements have been made, GHG per capita emissions are at a high level and "significant challenges lie ahead in closing Ireland's emission gap, meeting the current (2030) target and aligning Ireland's emission trajectory with a net zero goal for 2050. Ireland is one of the worst performing countries in the GHG Emissions category. Recognising Ireland's Climate Action Plan (2019), the CCPI states:

> *"the government must go much further in implementing policies across all sectors that drive sustained emissions reductions over the next decade. Near-term ambition needs to be ratcheted up quickly by specifying deep cuts in fossil fuel and reactive nitrogen usage to put Ireland on a net zero emissions pathway aligned with the Paris temperature goals".*

10.2.2 National Legislation and Policy

10.2.2.1.1 *Climate Action Plan*

The Climate Action Plan (CAP 2019) was published on the 1st of August 2019 by the Department of Communications, Climate Action and Environment and featured 183 action plans which set out how Ireland would meet its EU targets to reduce its carbon emissions by 30% between 2021 and 2030 and laid the foundations for achieving net zero carbon emissions by 2050.

The Climate Action Plan 2021 (CAP 2021) was published on the 4th November 2021 by the Department of the Environment, Climate and Communications. The CAP sets out an ambitious course of action over the coming years to ensure that Ireland achieves its legally binding target (the Climate Action and Low Carbon Development (Amendment) Act 2021) of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030, and in doing so, prevent / mitigate the potentially devastating consequences of climate change on Ireland's environment, society, economic and natural resources.

The overall aim of the CAP 2021 is to deliver a 'step-change' in Ireland's emissions performance over the coming decade in line with European Green Deal such that EU targets for 2030, and beyond, are met and the country will in a position to successfully achieve its mid-century decarbonisation objectives.

10.2.2.1.2 *Climate Action and Low Carbon Development (Amendment) Act, 2021*

The Climate Action and Low Carbon Development (Amendment) Act 2021, which was signed into law on the 23rd July 2021, legally binds Ireland to achieve Net-Zero emissions no later than 2050, and to a 51% reduction in emissions by 2030. The Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change. As indicated by the premise of the legislation, the reduction of emissions is a key proponent of the Climate Action and Low Carbon Development (Amendment) Bill 2021 and incorporates the following key provisions:

- Embeds the process of setting binding and ambitious emissions-reductions targets in law;
- Provides for a national climate objective, which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally-sustainable and climate-neutral economy;
- Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% over the period to 2030, relative to a baseline of 2018;
- The role of the Climate Change Advisory Council has been strengthened;
- The government must adopt carbon budgets that are consistent with the Paris agreement and other international obligations;
- Actions for each sector will be detailed in the Climate Action Plan which must be updated annually; and

- Local Authorities must prepare individual Climate Action Plans which will include both mitigation and adaptation measures and will be updated every five years.

If planning consent is favourably granted by the Board for Proposed Development, the project represents a significant opportunity be a nationally important wind energy generator, contributing to the 51% reduction in emissions being sought, which is as outlined above a legally binding requirement. The Proposed Development is therefore considered compliant with the relevant planning policies and objectives set out at both the European (e.g. European Green Deal) and National tiers of governance in this regard.

10.2.2.1.3 Emissions Projections

Ireland's 2020 target under the EU Effort Sharing Decision (ESD[6]) is to achieve a 20% reduction on 2005 levels of non-Emissions Trading Scheme (non-ETS) sector emissions (agriculture, transport, residential, commercial, non-energy intensive industry, and waste). Ireland is set to miss its target for compliance with the ESD as our non-ETS emissions are projected to be 7% below 2005 levels in 2020 under both projected scenarios compared to the target of 20% below 2005 levels by 2020. This projection includes the impact of COVID on the 2020 emissions which due to national lockdowns saw Transport emissions decline but Agriculture emissions largely unaffected. Ireland is projected to exceed the 2020 ESD targets despite the impact of the pandemic.

The Environmental Protection Agency (EPA) publish Ireland's Greenhouse Gas Emission Projections and at the time of writing, the most recent report, *'Ireland's Greenhouse Gas Emissions Projections 2020–2040'* was published in June 2021. The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2020, 2030 and 2040 set under the EU ESD and Effort Sharing Regulation (ESR[7]).

The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario assumes that no additional policies and measures, beyond those already in place by the end of 2019 (latest national greenhouse gas emission inventory), are implemented. The WAM scenario assumes that in addition to the existing measures, there is also full implementation of planned government policies and measures to reduce emissions such as those in the 2021 Climate Action Plan.

The EPA Emission Projections Update notes the following key trends:

- Total emissions are projected to decrease from the latest 2018 levels by 2% and 6% by 2030 under the "With Existing Measures" scenario.
- Under the "With Additional Measures" scenario, emissions are estimated to decrease by 23% by 2030.
- Ireland's non-Emissions Trading Scheme (ETS) emissions are projected to be 5% and 6% below 2005 levels in 2020 under the 'With Existing Measures' and 'With Additional Measures' scenarios, respectively. The target for Ireland is a 20% reduction.
- Ireland exceeded its annual binding limits in 2016, 2017 and 2018.
- Over the period 2013 – 2020, Ireland is projected to cumulatively exceed its compliance obligations by 13.4 Mt CO_2 (metric tonnes of Carbon Dioxide) equivalent under the 'With Existing Measures' scenario and 12.6 Mt CO_2 equivalent under the 'With Additional Measures' scenario. Reporting on Ireland's compliance obligations status for this period have not yet been published.

The report concludes:

[6] *DECISION No 406/2009/EC of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020*
[7] *REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action*

- *"Projections indicate that Ireland will exceed the carbon budget over the period 2021-2030 by 51 Mt CO_2 equivalent assuming LULUCF flexibilities described in the Regulation are fully utilised."*
- *"To determine compliance under the Effort Sharing Decision, any overachievement of the binding emission limit in a particular year (between 2013 and 2020) can be banked and used towards compliance in a future year. However, even using this mechanism Ireland will still be in non-compliance according to the latest projections."*
- *"A significant reduction in emissions over the longer term is projected as a result of the expansion of renewables (e.g., wind), assumed to reach 55% by 2030 under the 'With Existing Measures' scenario and 70% by 2030 under the 'With Additional Measures' scenario"*
- *"The projects reflect plans to bring Ireland onto a lower carbon trajectory in the longer term. However, Ireland still faces significant challenges in meeting EU 2030 targets in the non-ETS sector and national 2050 reduction targets in the electricity generation, built environment and transport sectors. Progress in achieving targets is dependent on the level of implementation of current and future plans."*

In November 2020 the EPA also published '*Ireland's Provisional Greenhouse Gas Emissions 1990-2019*'. The provisional estimates of Ireland's greenhouse gas figures for the years 1990-2019 are based on the SEAI's final energy balances released in November 2020. The key findings from the report are as follows:

- *"In 2019, Ireland's total national greenhouse gas emissions are estimated to have declined by 4.5% on 2018 levels to 59.9 Mt CO2 equivalent*"
- The Provisional estimates of greenhouse gas emissions for the period 1990- 2019 indicate that Ireland will exceed its 2019 annual limit set under the EU's Effort Sharing Decision (ESD) by 6.98 Mt CO2eq.
- Emissions in the Energy Industries sector show a decrease of 11.2% or 1.19 Mt CO2eq in 2019, which is attributable to a 69% decrease in coal and an 8% decrease in peat used in electricity generation. Electricity generated from wind increased by 16.0% in 2019.

10.2.2.1.4 United Nations Sustainable Development Summit 2019

Transforming our World: the 2030 Agenda for Sustainable Development which includes 17 Sustainable Development Goals (SDGs) and 169 targets was adopted by all UN Member States at a UN summit held in New York in 2015. The agenda is universally applicable with all countries having a shared responsibility to achieve the goals and targets which came into effect on January 1st, 2016. The goals and targets are to be actions over the 15-year period, are integrated and indivisible i.e., all must be implemented together by each Member State. On 24 and 25 September 2019, Heads of State and Government gathered at the United Nations Headquarters in New York to follow up and comprehensively review progress in the implementation of the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs). The event was the first UN summit on the SDGs since the adoption of the 2030 Agenda in September 2015.

The Sustainable Development Goals National Implementation Plan 2018-2020 was published by the Department of Communications, Climate Action & Environment in partnerships with OSI, Esri Ireland and the Central Statistics Office. The Plan sets out how Ireland will work to achieve the goals and targets of the Agenda for Sustainable Development both domestically and internationally. Relevant SDGs and how they are implemented into Irish National plans and policies can be found in Table 10-8. It should be noted that the Department (now the Department of the Environment, Climate and Communications) are in the process of developing the Second SDG National Implementation Plan which will set out arrangements for interdepartmental coordination, stakeholder engagement and actions needed for further SDG Implementation from 2021 to 2023.

Table 10-8 United Nations Sustainable Development Goals adopted in 2015. https://sustainabledevelopment.un.org/sdgs

SDG	Targets	International Progress to Date (2019/2020)	National Relevant Policy
SDG 7 Affordable and Clean Energy: *Ensure access to affordable, reliable, sustainable and modern energy for all*	› By 2030, ensure universal access to affordable, reliable and modern energy services › By 2030, increase substantially the share of renewable energy in the global energy mix › By 2030, double the global rate of improvement in energy efficiency › By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology › By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	The renewable energy share of total final energy consumption gradually increased from 17 per cent in 2015 to 17.3 per cent in 2017, though much faster change is required to meet climate goals. Global primary energy intensity (ratio of energy used per unit of GDP) was 5.0 in 2017, which is a 1.7% annual improvement from 2016, but the lowest annual improvement since 2010. Meeting the SDG target for 2030 will require an improvement rate of at least 3% per year from now until 2030. Development Goal 7.	*Ireland's Transition to a Low Carbon Energy Future 2015-2030* *Strategy to Combat Energy Poverty in Ireland* *Ireland's Transition to a Low Carbon Energy Future 2015-2030* *National Mitigation Plan* *National Energy Efficiency Action Plan for Ireland # 4 2017-2020* *Better Energy Programme* *One World, One Future* *The Global Island*
SDG 13 Climate Action: *Take urgent action to combat climate change and its impacts** **Acknowledging that the United Nations Framework Convention on Climate Change is the primary*	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries Integrate climate change measures into national policies, strategies and planning Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention	In 2017, greenhouse gas concentrations reached new highs, with globally averaged mole fractions of CO_2 at 405.5 parts per million (ppm), up from 400.1 ppm in 2015, and at 146 per cent of pre-industrial levels. Moving towards 2030 emission objectives compatible with the 2°C and 1.5°C pathways require a peak	*National Adaptation Framework* *Building on Recovery: Infrastructure and Capital Investment 2016-2021* *National Mitigation Plan*

SDG	Targets	International Progress to Date (2019/2020)	National Relevant Policy
international, intergovernmental forum for negotiating the global response to climate change.	on Climate Change to a goal of mobilising jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	to be achieved as soon as possible, followed by rapid reductions. During the period 1998–2017, direct economic losses from disasters were estimated at almost $3 trillion. Climate-related and geophysical disasters claimed an estimated 1.3 million lives. As of March 2020, 189 parties had ratified the Paris Agreement. Parties to the Paris Agreement are expected to prepare, communicate and maintain successive nationally determined contributions, and 186 parties had communicated their first nationally determined contributions to the secretariat of the United Nations Framework Convention on Climate Change, while three parties had communicated its second. Under the Agreement, all parties are required to submit new nationally determined contributions, containing revised and much more ambitious targets, by 2020. Global climate finance flows increased by 17 per cent in the period 2015–2016 compared with the period 2013–2014. As of December 2019, 81 countries are seeking support from the Green Climate Fund for national adaptation plans and other adaptation planning processes, with a	*National Biodiversity Action Plan 2017-2021* *National Policy Position on Climate Action and Low Carbon Development*

SDG	Targets	International Progress to Date (2019/2020)	National Relevant Policy
		combined value of $203.8 million.	

10.2.2.1.5 *Programme for Government*

The Programme for Government was published in October 2020 and last updated April 2021. In relation to climate change the programme recognises that the next ten years are a critical period in addressing the climate crisis. It is an ambition of the programme to more than halve carbon emissions over the course of the decade (2020-2030). The programme notes that the government are committed to reducing greenhouse gas emissions by an average 7% per annum over the next decade in a push to achieve a net zero emissions by the year 2050. The programme also recognises the severity of the climate challenge as it clarifies that:

> *"Climate change is the single greatest threat facing humanity"*

With regards to energy the programme notes that the government will implement a new National Energy Efficiency Action Plan to reduce energy use, including behavioural and awareness aspects of energy efficiency such as building and data management. Further, the government are also committed to the rapid decarbonisation of the energy sector, along with this it is noted that the necessary steps will be taken to deliver at least 70% of renewable electricity by the year 2030. Some of the measures to achieve this will include the following:

- Hold the first Renewable Electricity Support Scheme (RESS) auction by the end of 2020, with auctions held each year thereafter, including the first RESS auction for offshore wind in 2021.
- Produce a whole-of-government plan setting out how at least 70% renewable electricity generation by 2030 will be delivered and how the necessary skills base, supply chains, legislation, and infrastructure to enable it will be delivered. This new plan will make recommendations for how the deployment of renewable electricity can be sped.
- Finalise and publish the Wind Energy Guidelines, having regard to the public consultation that has taken place.
- Continue Eirgrid's programme 'Delivering a Secure, Sustainable Electricity System' (DS3).
- Strengthen the policy framework to incentivise electricity storage and interconnection.
- Support the clustering of regional and sectoral centres of excellence in the development of low-carbon technologies.

10.2.3 Climate and Weather in the Existing Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The nearest meteorological monitoring station, with data over a 30-year period (1979-2008), is the Mullingar weather station which is located 52km east of the Proposed Development. Meteorological data for this period at this location can be found in Table 10-9. The wettest months are October, December and January, while July is usually the driest month. July is also the warmest month with an average peak temperature of 19.2° Celsius. The mean annual temperature recorded at Mullingar was 12.9° Celsius.

Table 10-9 Data from Met Éireann Weather Station at Mullingar 1979-2008: Monthly and Annual Mean and Extreme Values

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE (degrees Celsius)													
mean daily max	7.4	7.9	9.8	12.1	14.9	17.3	19.2	18.9	16.7	13.2	9.9	7.9	**12.9**
mean daily min	1.5	1.5	2.8	4.1	6.3	9.2	11.1	10.8	8.9	6.2	3.5	2.2	**5.7**
mean temperature	4.5	4.7	6.3	8.1	10.6	13.2	15.2	14.8	12.8	9.7	6.7	5.0	**9.3**
absolute max.	13.8	15.4	19.1	21.6	25.0	28.3	29.7	29.1	25.0	20.1	17.3	14.6	**29.7**
min. maximum	-3.2	-0.6	1.4	4.1	0.0	10.1	10.9	11.4	10.6	6.3	2.7	-1.7	**-3.2**
max. minimum	11.6	11.5	11.5	12.5	12.7	15.3	17.4	18.0	16.8	15.4	12.5	12.4	**18.0**
absolute min.	-14.9	-6.6	-8.0	-4.4	-2.6	0.2	3.8	2.1	0.0	-4.4	-6.9	-12.4	**-14.9**
mean num. of days with air frost	9.9	8.9	5.5	3.1	0.4	0.0	0.0	0.0	0.0	1.5	5.4	8.2	**43.0**
mean num. of days with ground frost	17.9	16.2	14.0	10.8	5.1	0.8	0.0	0.1	1.7	6.3	12.1	15.4	**100.4**
mean 5cm soil	3.3	3.3	5.0	8.1	11.8	14.8	16.3	15.5	12.8	8.9	5.7	4.1	**9.1**
mean 10cm soil	3.7	3.7	5.1	7.6	11.0	14.1	15.8	15.2	12.8	9.3	6.2	4.5	**9.1**
mean 20cm soil	4.3	4.4	5.8	8.1	11.4	14.3	16.1	15.8	13.7	10.3	7.2	5.2	**9.7**
RELATIVE HUMIDITY (%)													
mean at 0900UTC	90.8	89.8	87.6	81.9	78.3	79.7	82.1	84.8	87.6	89.9	91.7	91.8	**86.3**
mean at 1500UTC	83.4	77.8	72.8	68.1	67.1	69.1	69.9	70.6	72.1	77.0	82.2	85.9	**74.7**
SUNSHINE (hours)													
mean daily duration	1.8	2.5	3.2	4.9	5.8	5.0	4.6	4.6	3.9	3.2	2.2	1.6	**3.6**
greatest daily duration	8.2	9.9	10.9	13.6	15.4	15.9	15.3	14.4	12.2	10.1	8.6	7.3	**15.9**
mean num. of days with no sun	10.3	7.2	5.3	2.9	1.9	2.2	1.8	1.9	3.3	5.7	8.4	11.0	**62.0**
RAINFALL (mm)													
mean monthly total	91.7	72.0	78.3	62.1	68.7	70.5	61.8	80.8	73.8	102.1	82.4	97.1	**941.3**
greatest daily total	30.3	24.7	29.5	27.6	26.1	52.9	26.6	58.2	42.1	48.8	43.7	38.8	**58.2**
mean num. of days with >= 0.2mm	19	17	20	15	16	16	16	17	17	19	18	19	**209**
mean num. of days with >= 1.0mm	15	13	15	11	12	11	11	13	12	14	13	14	**154**
mean num. of days with >= 5.0mm	6	5	5	4	5	4	3	5	4	6	6	7	**60**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
WIND (knots)													
mean monthly speed	9.0	9.1	9.1	7.7	7.3	6.7	6.4	6.3	6.7	7.5	7.8	8.3	**7.6**
max. gust	67	71	59	56	58	48	48	50	51	59	62	73	**58.5**
max. mean 10-minute speed	38	36	36	30	34	26	27	28	32	36	32	39	**32.8**
mean num. of days with gales	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	**0.8**
WEATHER (mean no. of days with)													
snow or sleet	5.0	4.4	3.5	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.4	2.7	**17.8**
snow lying at 0900UTC	2.7	0.9	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	**5.7**
hail	0.6	0.9	2.0	2.0	1.1	0.2	0.1	0.1	0.1	0.5	0.2	0.3	**8.1**
thunder	0.1	0.2	0.2	0.3	0.9	0.9	1.2	0.8	0.1	0.1	0.1	0.1	**4.9**
fog	3.4	3.0	2.4	2.0	1.8	1.3	1.9	2.9	4.0	4.1	4.1	4.3	**35.1**

10.2.4 Calculating Carbon Losses and Savings from the Proposed Development

10.2.4.1 Background

In addition to the combustion of fossil fuels, greenhouse gases are also released through natural processes such as the decomposition of organic material (which is composed of carbon). Certain types of wind farm sites, such as bogs and peatlands are known to store large amounts of carbon. There is no peat present within the development footprint at the site of the Proposed Development

The site of the Proposed Development is underlain by sandstone till and rock outcrops, with none of the Proposed Development footprint being located on a peatland. For this reason, the carbon balance between the use of a renewable energy and the loss of carbon stored in the peat is not assessed in this section of the EIAR. Carbon dioxide is released in the manufacture and transportation of turbines to the site, and therefore a carbon loss/saving calculation for the Proposed Development has been undertaken.

10.2.4.2 Methodology for Calculating Losses

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macauley Institute with support from the Rural and Environment Research and Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating carbon savings from wind farms on Scottish peat lands'*, was developed to calculate the impact of wind energy developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. This provides a transparent and easy to follow method for estimating the impacts of wind farms on the carbon dynamics of peatlands. Previously guidance produced by Scottish Natural Heritage in 2003 had been widely employed to determine carbon payback in the absence of any more detailed methods.

Given the absence of peat underlying the site, the Proposed Development will not give rise to any impact on peat habitat. The Macauley Institute methodology states that the total volume of peat impacted by the construction of the wind farm is strongly correlated to the extent of the peatland affected by drainage at the site. Therefore, in calculating the carbon loss/saving of the Proposed Development, all potential carbon losses associated with constructing a wind farm on peatland environments were discounted, but the carbon losses as a result of the manufacture, transportation and erection of the proposed turbines was included in the calculation, including as a result of the removal of vegetation.

Clear-felling of existing forestry surrounding turbine locations is often necessary on wind farm sites to avoid reductions in the wind energy yield of wind farm proposals. However, given the absence of forestry on the Proposed Development site, all potential carbon losses associated with felling forestry within a wind farm were also discounted from the carbon loss calculations.

10.2.4.3 Calculating Carbon Losses and Savings

10.2.4.3.1 *Carbon Losses*

The Macauley Institute method for calculating carbon losses from wind farm projects was used to assess the impacts of the proposed Wind Farm in terms of potential carbon losses and savings taking into account drainage, habitat improvement and site restoration.

The worksheet made available as part of the '*Calculating carbon savings from wind farms on Scottish peat lands'* report, was downloaded and used to input the necessary data. A copy of this worksheet is provided as Appendix 10-1 of this EIAR. Where available and relevant, site-specific information was inserted into the worksheet. Otherwise, default values were used.

The worksheet was pre-loaded with information specific to the CO_2 emissions from the United Kingdom's electricity generation plant, which is used to calculate emissions savings from proposed wind farm projects in the UK. Similar data to that used in the worksheet to calculate the CO_2 emissions from the UK electricity generation plant, was not allowable for input for the Irish electricity generation plant, and so the CO_2 emissions savings from the Proposed Development have been calculated separately from the worksheet as set out in Section 10.2.3.3.2 below.

The main CO_2 losses due to the Proposed Development are summarised in Table 10-10.

Table 10-10 CO_2 Losses from the Proposed Development

Origin of Losses	CO_2 Losses (tonnes CO_2 equivalent)	
	Expected	Maximum
Losses due to turbine life (e.g. manufacture, construction, decommissioning)	105,299	105,299
Losses due to backup	70,956	70,956
Losses due to reduced carbon fixing potential	2,840	4,942
Total	179,095	181,197

The worksheet model calculates that the Proposed Development will give rise to 179,095 tonnes of CO_2 equivalent losses over its 30-year life. Of this total figure, the proposed wind turbines directly account for 105,299 tonnes, or 58.8%. Losses due to backup account for 70,956 tonnes, or 39.6%. Losses from soil reduced carbon fixing potential accounts for the remaining 1.6% or 2,840 tonnes. It should be noted that there is no peat or forestry located on the Proposed Development site and therefore the figures provided above are highly precautionary and represent a worst-case scenario.

The figure of 2,840 tonnes of CO_2 arising from ground activities associated with the Proposed Development is calculated based on the entire development footprint being "Acid Bog", as this is one of only two choices the model allows (the other being Fen). The habitat that will be impacted by the Proposed Development footprint is predominantly comprised of improved agricultural grassland with no peat on site, rather than the acid bog assumed by the model that gives rise to the 2,840 tonnes CO_2 figure. Therefore, the actual CO_2 losses are expected to be lower than this value.

The figures discussed above are based on the assumption that the hydrology of the site and habitats within the site are restored on decommissioning of the Proposed Development after its expected 30-year useful life. As a worst-case scenario, the model was also used to calculate the CO_2 losses from the Proposed Development if the hydrology and habitats of the site were not to be restored, as may be the case if the turbines were replaced with newer models, rather than decommissioned entirely and taking account of the future peat extraction activities. This worst-case scenario would increase the expected carbon losses by an additional 2,102 tonnes, or 1% to 181,197 tonnes. Any failure to restore the site habitats or hydrology for the reasons outlined above would be further offset by the carbon-neutral renewable energy that the new turbines would generate.

10.2.4.3.2 Carbon Savings

According to the model described above, the Proposed Development will give rise to total losses of 179,095 tonnes of carbon dioxide.

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

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

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

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

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

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

For the purposes of this calculation, the rated capacity of the Proposed Development is assumed to be 120 MW (based on 20 No. 6.0 MW turbines).

A load factor of 0.35 (or 35%) has been used for the Proposed Development.

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

The most recent data for the carbon load of electricity generated in Ireland is for 2017, and was published in Sustainable Energy Authority Ireland's (SEAI) December 2018 report, '*Energy in Ireland 2018*'. The emission factor for electricity in Ireland in 2017 was 436.6 g CO_2/kWh.

The calculation for carbon savings is therefore as follows:

$$CO_2 \text{ (in tonnes)} = \frac{(120 \times 0.35 \times 8{,}760 \times 436.6)}{1000}$$

$$= 160{,}634 \text{ tonnes per annum}$$

Based on this calculation, 160,634 tonnes of carbon dioxide will be displaced per annum from the largely carbon-based traditional energy mix by the Proposed Development. Over the proposed thirty-year lifetime of the development, therefore, 4,819,016 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation.

Based on the Macauley Institute model as presented above in Section 10.2.4.3.2, 179,095 tonnes of CO_2 will be lost to the atmosphere due to changes in the soil and ground conditions and due to the construction and operation of the Proposed Development. This represents 3.7% of the total amount of carbon dioxide emissions that will be offset by the Proposed Development. The 179,095 tonnes of CO_2 that will be lost to the atmosphere due to changes in soil and ground conditions and due to the construction and operation of the Proposed Development will be offset by the Proposed Development in approximately 14 months of operation.

10.2.5 Likely Significant Effects and Associated Mitigation Measures

10.2.5.1 'Do-Nothing' Effect

If the Proposed Development were not to proceed, no changes would be made to the current land-use practice of small-scale agriculture.

If the Proposed Development were not to proceed, greenhouse gas emissions, e.g., carbon dioxide (CO_2), carbon monoxide and nitrogen oxides associated with construction vehicles and plant would not arise. However, the opportunity to further significantly reduce emissions of greenhouse gas emissions, including carbon dioxide (CO_2), oxides of nitrogen (NO_2), and sulphur dioxide (SO_2), to the atmosphere would be lost. The opportunity to contribute to Ireland's commitments under the Kyoto Protocol and EU law would also be lost. This would be a long-term slight negative impact.

10.2.5.2 Construction Phase

10.2.5.2.1 *Greenhouse Gas Emissions*

Turbines and Other Infrastructure

The construction of turbine bases and hardstands, anemometry mast bases, site roads and all associated infrastructure will require the operation of construction vehicles and plant on site. Greenhouse gas emissions, e.g., carbon dioxide (CO_2), carbon monoxide and nitrogen oxides associated with vehicles and plant will arise as a result of the construction and demolition activities. This potential impact will be slight, given the insignificant quantity of greenhouse gases that will be emitted, and will be restricted to the duration of the construction phase. Therefore, this is a short-term slight negative impact. Mitigation measures to reduce this impact are presented below.

Grid Connection

The construction of 1 No. 110 kV substation and excavation of associated cable trenches will require the use of construction machinery giving rise to greenhouse emissions. This is a short-term slight negative impact, which will be reduced through use of the best practice mitigation measures as presented below.

Transport to Site

The transport of turbines and construction materials to the site, which will occur on specified routes only (see Section 4.4 in Chapter 4 of this EIAR), will also give rise to greenhouse gas emissions associated with the transport vehicles. This constitutes a slight negative impact in terms of air quality. Mitigation measures in relation to greenhouse gas emissions are presented below.

Mitigation

- All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.
- Turbine components and construction materials will be transported to the site on specified routes only unless otherwise agreed with the Planning Authority.
- The majority of aggregate materials for the construction of the Proposed Development will be obtained from the quarries which are local to the Proposed Development site. This will significantly reduce the distance that delivery vehicles will have to travel in

accessing the site, thereby reducing the amount of emissions associated with vehicle movements.

Residual Impact

Short-term Imperceptible Negative Impact on climate as a result of greenhouse gas emissions.

Significance of Effects

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

10.2.5.3 Operational Phase

10.2.5.3.1 *Greenhouse Gas Emissions*

The Proposed Development will generate energy from a renewable source. This energy generated will offset energy and the associated emission of greenhouse gases from electricity-generating stations dependent on fossil fuels, thereby having a positive effect on climate. The Proposed Development will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 30-year lifespan of the proposed Wind Farm. The Proposed Development will assist in reducing carbon dioxide (CO_2) emissions that would otherwise arise if the same energy that the proposed Wind Farm will generate were otherwise to be generated by conventional fossil fuel plants. This is a long-term significant positive effect.

Residual Impact

Long-term Moderate Positive Impact on Climate as a result of reduced greenhouse gas emissions.

Significance of Effects

Based on the assessment above there will be long-term moderate, positive effects.

10.2.5.4 Decommissioning Phase

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

10.3 Cumulative and In Combination Assessment

The Proposed Development (Wind Farm and Grid Connection as detailed in Chapter 4) will likely include overlap during the constriction period. Impacts on air quality and climate during the construction period are minor in nature as detailed above in Sections 10.1.5.2 and 10.2.5.2, and therefore do not give rise to significant cumulative effects.

Potential in combination effects on air quality and climate between the Proposed Development and other projects in the surrounding area (as detailed in Section 2.6 of the EIAR) were also considered as part of this assessment. Those projects considered as part of the cumulative assessment in regard to air and climate are detailed below.

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

Other Wind Farms

During the construction phase of the Proposed Development, there will be minor emissions from construction plant and machinery and potential dust emissions associated with the construction activities in combination with the other wind farm projects within 20 kilometres as described in Section 2.6 that are being constructed. Two of these projects are constructed and one project is still in planning. Once the mitigation proposals, as outlined in Sections 10.1.5.2 and 10.2.4.2 are implemented during the construction phase of the Proposed Development, there will be no cumulative negative effect on air and climate.

There will be no net carbon dioxide (CO_2) emissions from operation of the proposed Wind Farm Development. Emissions of carbon dioxide (CO_2), oxides of nitrogen (NO_2), sulphur dioxide (SO_2) or dust emissions during the operational phase of the Proposed Development will be minimal, relating to the use of operation and maintenance vehicles onsite, and therefore there will be no measurable negative cumulative effect with other projects on air quality and climate.

The nature of the Proposed Development and other wind energy developments within 20 kilometres are such that, once operational, they will have a cumulative long-term, significant, positive effect on the air quality and climate.

Roadstone Quarry

The Roadstone Quarry at Cam located to the south of the R363 is approximately 100m from the closest infrastructure proposed as part of the Seven Hills Wind Farm development. Works at the quarry will continue throughout the construction and operation of the Proposed Development. The potential dust emissions and air pollutants and any cumulative effects that could potentially arise from both projects has been considered. The Roadstone Quarry is obliged to operate within specific emission limits and parameters as per conditions attached to its grant of permission. This ensures that there are no significant impacts on air quality. When assessed in combination with the Proposed Development; once the mitigation proposals, as outlined in Sections 10.1.5.2 and 10.2.4.2 are implemented during the construction phase of the Proposed Development, there will be no cumulative negative effect on air and climate.