

Chapter 11:

CLIMATE

Table of Contents

List of Figures	236
List of Tables	236
11 CLIMATE	237
11.1 Introduction.....	237
11.2 Methodology.....	237
11.3 Climate Change	237
11.3.1 Kyoto Protocol.....	237
11.3.2 Paris Agreement 2015.....	238
11.3.3 Climate Action and Low Carbon Development (Amendment) Act 2021	238
11.3.4 Climate Action Plan 2023.....	239
11.3.5 Compliance with EU and International Commitments.....	240
11.3.6 Local and Regional Climate.....	242
11.3.7 Land Use	244
11.4 Characteristics of the Development	244
11.4.1 Overburden and Berm Construction	244
11.4.2 Extraction of Material.....	244
11.4.3 Sequence of Extraction	244
11.4.4 Processing of Material	244
11.4.5 Stockpiling of Materials.....	245
11.4.6 Transport to Market	245
11.4.7 Fuel and Chemical Storage	245
11.4.8 Surface and Groundwater Management	245
11.4.9 Working hours and employment.....	245
11.4.10 Utilities and services.....	245
11.4.11 Facilities.....	245
11.5 Impact Assessment.....	246
11.5.1 Construction Impacts	246
11.5.2 Operational Impacts.....	246
11.5.3 Unplanned Events	246
11.5.4 Cumulative Impact	247
11.5.5 Do-Nothing Option	247
11.6 Mitigation Measures	247
11.7 Residual Impacts.....	247
11.8 Determination of Significance of Impact Pre-Mitigation	248
11.9 Summary of Mitigation Measures	248
11.10 Determination of Significance of Impact Following Mitigation	248
11.11 Impact Assessment Conclusion.....	248
11.12 Technical Difficulties	248

List of Figures

Figure 11.1: Profile of GHG Emissions (excluding LULUCF) in 1990 and 2022 by Sector.....	241
Figure 11.2: Total GHG emission projections to 2030.....	242

List of Tables

Table 11.1: Monthly values for temperature and precipitation for Finner Camp 2021,22 & 23	243
Table 11.2: No of days with 10 min wind speeds > 15 m/s (2021-2023 inc.).....	244

11 CLIMATE

11.1 Introduction

This section of the rEIAR assesses potential impacts that the development may have had with regards to climate and climate change. Climate can be thought of as the ‘average weather’ over an extended period of time and so refers to temperature, precipitation and wind. The topic of ‘Climate’ is commonly discussed with reference to ‘Climate Change’ which is any significant change in the measures of climate over an extended period of time. Climate change includes major changes in temperature, precipitation or wind patterns, among others, that occur over several decades or longer.

11.2 Methodology

The methodology for the description of the current climate in the region of the proposed development included a desk study of the available data from Met Eireann, the Environmental Protection Agency (EPA) and other bodies which have a responsibility for Climate records in Ireland and Europe. Met Eireann data from Finner Camp recording station was used to assess the climate in the region of the application site. Finner Camp is the nearest Met Eireann recording station located approximately 17 km to the south of the application site.

11.3 Climate Change

Climate change is a significant change recorded for the climate of a region. Climate change can be caused by natural occurrences such as volcanic eruptions or variations in solar intensity. Recent use of the term climate change more commonly refers to changes in the climate due to anthropogenic activity, namely the build-up of Greenhouse gases (GHGs) in the atmosphere. This build-up of GHGs is caused by emissions associated with human activity such as the burning of fossil fuels for energy, transport and heating.

11.3.1 Kyoto Protocol

The Kyoto Protocol was an historical agreement in that it was the first international agreement in which many of the world's industrial nations concluded a verifiable agreement to reduce their emissions of six greenhouse gases in order to prevent global warming. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialised countries and the European community for reducing emissions. These amount to an average of five per cent against 1990 levels over the five-year period 2008-2012. The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. 184 Parties of the Convention have ratified its Protocol to date. It is an international agreement linked to the United Nations Framework Convention on Climate Change.

The major distinction between the Kyoto Protocol and the United Nations Framework Convention on Climate Change is that while the Convention encouraged industrialised countries to stabilise greenhouse gas emissions, the Protocol commits them to do so. Recognizing that developed countries are principally responsible for the current high levels of emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities.”

Under the Kyoto Protocol, Ireland was required to limit total national GHG emissions to 3.14 Mtonnes of CO₂eq over the 5-year period 2008-2012 which is equivalent to 62.8Mtonnes of CO₂eq per annum. The Kyoto Protocol limit was calculated as being 13% above Ireland's 1990 baseline which was established and fixed at 55.61 Mtonnes CO₂eq following an in-depth review

of Ireland's 2006 GHG inventory submission to the UNFCCC (United Nations Framework Convention of Climate Change). In December 2012 the Kyoto Protocol was amended. The amendment was referred to as the 'Doha Amendment to the Kyoto Protocol' which included the following amendments.

- New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1st January 2013 to 31st December 2020.
- A revised list of greenhouse gases (GHG) to be reported on by the Parties in the second commitment period.
- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated to the second commitment period.

During the second commitment period, parties committed to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period between 2013 and 2020. This placed binding targets on Ireland regarding climate change, with penalties for non-compliance.

11.3.2 Paris Agreement 2015

A legally binding global agreement on climate change was agreed in Paris on 12th December 2015. The Paris Agreement put in place the necessary framework for all countries to take ambitious mitigation action. It sets out a long-term goal to put the world on track to limit global warming to well below 2 degrees Centigrade above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 degrees. It aims to tackle 95% of global emissions through 188 Nationally Determined Contributions (NDCs). The agreement also places significant importance on actions needed, both nationally and globally, to help people adapt to climate change.

Ireland will contribute to the Paris Agreement via the NDC tabled by the EU in March 2015 on behalf of Member States, which commits to at least a 40% reduction in EU-wide emissions by 2030 (compared with 1990 levels): this is based on reductions in the Emissions Trading Scheme (ETS) and non-ETS sectors of 43% and 30% respectively (compared to 2005). In July 2016, the European Commission presented a legislative proposal, The Effort Sharing Regulation (ESR) setting out binding annual GHG targets for Member States for the period 2021 to 2030. Under the ESR, targets have been proposed for Member States based on GDP per capita and the cost-effectiveness of domestic emissions reductions within individual Member States. The final agreement sets a target of 30% reduction in greenhouse gas emissions (compared to 2005 levels) by 2030 for Ireland. This will be Ireland's contribution to the overall EU objective to reduce its emissions in the non-ETS sectors by 30% by 2030 compared to 2005. The ESR was provisionally agreed by the European Council and the European Parliament in December 2017 and was formally adopted in May 2018.

It is clear that meeting its climate change obligations will be a huge challenge for Ireland. It will require substantial investment by both the public and private sectors, as well as a broad range of non-financial policy tools, including regulations, standards, education initiatives and targeted information campaigns. Work is ongoing to cost various suites of measures that could meet the 2030 target as cost-effectively as possible.

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

The Climate Action and Low Carbon Development (Amendment) Act 2021 came into effect on the 7th of September 2021 and amended the Climate Action and Low Carbon Development Act 2015 (No. 46). The preamble to the amended Act describes it as:

An Act to provide for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral

economy by no later than the end of the year 2050 and to thereby promote climate justice, and just transition; to make certain changes to the Climate Change Advisory Council; to provide for carbon budgets and a sectoral emissions ceiling to apply to different sectors of the economy; to provide for reporting by Ministers of the Government to a joint committee of the Houses of the Oireachtas; to provide for local authority climate action plans; for those and other purposes to amend the Climate Action and Low Carbon Development Act 2015; to provide that local authorities shall, when making development plans, take account of their climate action plans and, for that purpose to amend the Planning and Development Act 2000;

The Act also made provision for updates to be made to the Climate Action Plan 2019, which has been updated twice since, in 2021 and in 2023. Section 19 includes the following amendment to the Planning and Development Act 2000 (as amended):

“reduce anthropogenic greenhouse gas emissions and address the necessity of adaptation to climate change, taking account of the local authority climate action plan (within the meaning of section 14B of the Climate Action and Low Carbon Development Act 2015), where such a plan has been made for the area in question”.

11.3.4 Climate Action Plan 2023

The ‘Climate Action Plan 2023 is the second annual update to Ireland’s Climate Action Plan 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050, as we committed to in the Programme for Government’.

The desired outcomes from citizen engagement on the Action Plan were: -

- Our communities are healthy and secure, enjoy cleaner air and water, and where homes are warmer and cheaper to heat;
- Thousands of new jobs are created by investing in areas like offshore wind, retrofit and cutting-edge agriculture;
- We cut our dependence on imported fossil fuels, and power comes from our own indigenous renewable resources including wind and solar;
- Walking and cycling are safe and accessible, public transport is cleaner and more frequent, and the rollout of electric vehicles is supported nationwide;
- Farmers have certainty that their industry has a viable future where farmers can continue producing world-class food with an even lower carbon footprint.

The Plan notes that ‘Achieving further emissions reductions between now and 2030 requires a major step up in how we accelerate and increase the deployment of renewable energy to replace fossil fuels, deliver a flexible system to support renewables, and manage electricity demand’.

The Climate Action Plan specifically targets the primary source of heating homes and all residential units within the proposed development will be heated using energy efficient heat pumps without reliance on fossil fuels. Homes will be efficient with an A2 BER rating ensuring compliance with NZEB Regulations and the objectives of the Climate Action Plan.

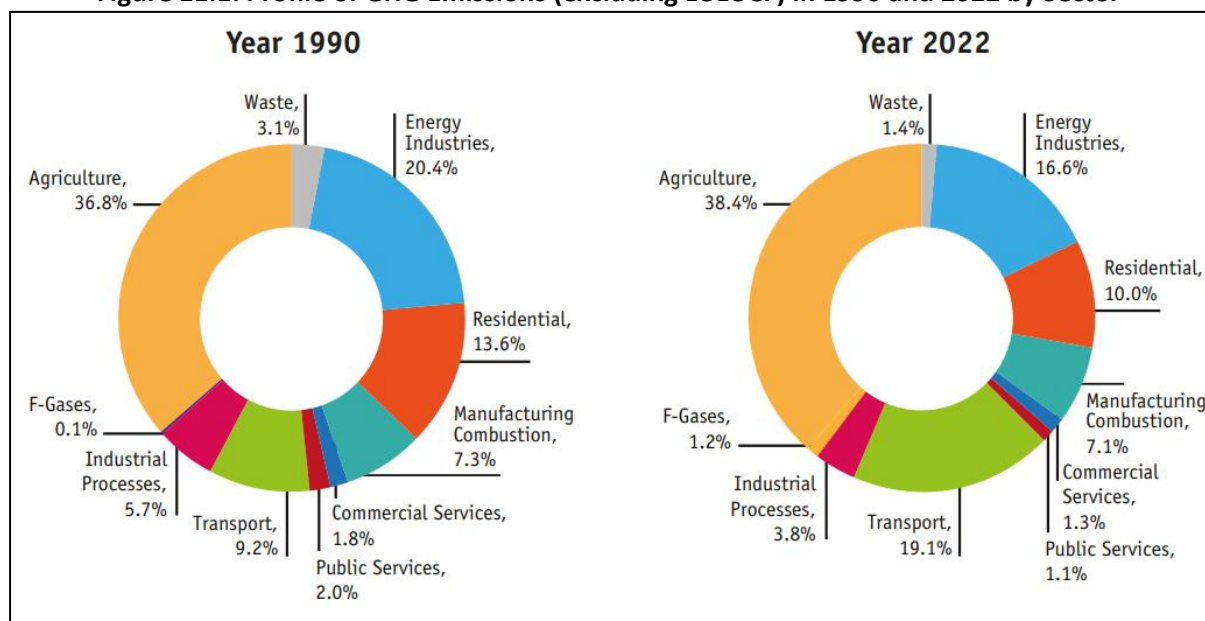
The Plan specifies various actions relating to pedestrian and cycling routes including the roll-out of cycle and greenway networks and the wider reviews of policy in relation to prioritising the safety of cycling and walking. There are pedestrian links and cycle paths planned through the site to link the development with Letterkenny town centre encouraging more sustainable transport modes in line with the aims of the Climate Action Plan.

11.3.5 Compliance with EU and International Commitments

The latest data available is taken from the publication 'Ireland's Provisional Greenhouse Gas Emissions 1990-2022' produced by the EPA in July 2023. Key findings in the report are listed below.

- 2022 total national greenhouse gas emissions (excluding LULUCF) are estimated to have decreased by 1.9% on 2021 levels to 60.76 million tonnes carbon dioxide equivalent (Mt CO₂eq). A substantial decrease in Residential sector emissions, combined with emissions decreases from Industry, Agriculture and Electricity generation outweighed increased emissions from the Transport sector. The overall emissions reduction, while welcome, falls short of the reductions required to achieve National and new EU targets.
- The provisional estimates of greenhouse gas emissions indicate that Ireland will exceed its 2022 annual limit, without the use of flexibilities, set under the EU's Effort Sharing Regulation (ESR) by 3.72 Mt CO₂eq. The limit will be exceeded by 1 Mt CO₂eq using both available flexibilities.
- Provisional National total emissions (including LULUCF) for 2021 and 2022 at 137.36 Mt CO₂eq have used 47% of the 295 Mt CO₂eq Carbon Budget for the five-year period 2021-2025. This leaves 53% of the budget available for the succeeding three years, requiring a substantial 12.4 per cent annual emissions reduction from 2023-2025 to stay within budget.
- In the Electricity sector, with 49% of the 2021-25 emissions budget already used, annual emissions reductions of 17% are now required from 2023-25 to stay within budget. Annual emissions reductions of 9%, 8%, 7% and 5% are required from 2023-25 in the Industry, Agriculture, Residential buildings and Transport sectors respectively.
- There were substantial reductions in coal, oil and peat used in electricity generation (-16%, -29% and -25% respectively). Renewable electricity generation increased from 35% in 2021, to 39% in 2022. Overall emissions from the Energy Industries sector only declined by 1.8% in 2022 however, as use of natural gas increased by 13%. The emissions intensity of power generation decreased from 348g CO₂/kWh in 2021 to 331g CO₂/kWh in 2022.
- A decrease of 14% in fertiliser nitrogen use in 2022 resulted in -0.44 Mt CO₂eq less emissions from agricultural soils. Agriculture emissions overall decreased by 1.2% or 0.29 Mt CO₂eq in 2022, as increased numbers of livestock including dairy cows (+0.9%), other cattle (+0.3%) and sheep (+4.2%) partially offset the reduced fertiliser use. Total milk production increased by 0.7% in 2022, with milk output per cow decreasing slightly (-0.2%).
- Greenhouse gas emissions from the Transport sector increased by 6% or 0.66 Mt CO₂eq in 2022, having already increased by 6.6% in 2021. Transport emissions in 2022 are over 95% of the 'pre COVID' level from 2019 and will need to avoid returning to that level if the 2021-25 sectoral ceiling is to be achieved. Although not included in national total emissions, international aviation emissions are estimated and showed a 130% increase, resulting in an additional 1.7 Mt CO₂eq.
- Greenhouse gas emissions from the Residential sector decreased substantially in 2022 (-12.7% or 0.89 Mt CO₂eq), as fuel use reduced driven by extremely high prices due to the Ukraine war and a milder winter compared to 2021. A shift away from more emission intensive fuels such as coal and peat, due to new, nationwide solid fuel regulations, likely also played a role as coal and peat use declined by 33.1% and 12.7% respectively.

Figure 11.1 below illustrates the change in contribution by sector to GHG from 1990 to 2022.

Figure 11.1: Profile of GHG Emissions (excluding LULUCF) in 1990 and 2022 by Sector

(from EPA provisional report)

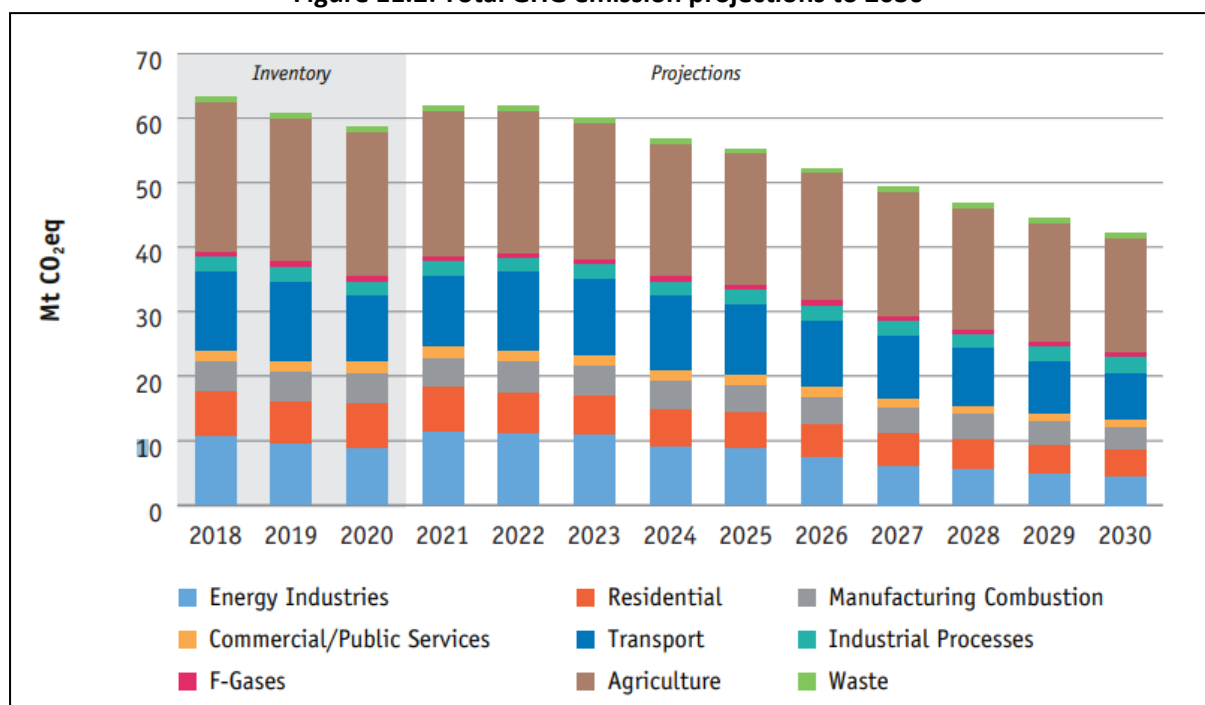
GHG emission projections for the period 2021 – 2040 have been made and published by the EPA in July 2022 ‘Ireland’s Greenhouse Gas Emissions Projections 2021-2040’. Key findings in the report are listed below.

- Urgent implementation of all climate plans and policies, plus further new measures, are needed for Ireland to meet the 51 per cent emissions reduction target and put Ireland on track for climate neutrality by 2050.
- Ireland can meet its non-ETS EU targets of a 30 per cent emission reduction by 2030 (compared to 2005) assuming implementation of planned policies and measures and the use of the flexibilities available. These include a land use flexibility using the Climate Action Plan 2021 afforestation rate of 8,000 hectares per annum.
- The gap between the ‘Existing Measures’ and Additional Measures scenarios in these projections highlights that the current pace of implementation will not achieve the change required to meet the Climate Act targets. Faster implementation of ‘Additional Measures’ is needed to close this gap.
- Carbon budgets proposed by the Climate Change Advisory Council have recently been approved by the Oireachtas for the periods 2021-25, 2026-30 and 2031- 35. The Projections highlight that there is currently a significant gap between the budgets and the projected emissions over the budget periods. This gap will need to be addressed very quickly if Ireland is to stay within the Carbon Budgets.
- Under the Additional Measures scenario, renewable energy is projected to increase to 78 per cent of electricity generation by 2030 with emissions from the Energy Industry decreasing by 10 per cent per annum from 2021-30. Increased coal use from 2021 and growing energy demand, including from data centres, threaten to negatively impact achievement of National targets, particularly for the first carbon budget period.
- Under the Existing Measures scenario emissions are projected to increase by 1.9 per cent over the 2020-2030 period. A methane emissions reduction of almost 30 per cent is required to achieve a 22 per cent reduction in Agriculture emissions compared to 2018, as committed to in the 2021 Climate Action Plan. The sector must clearly set out how this will be achieved to address uncertainty regarding its ability to deliver even the lower end of the range of its sectoral targets within the ever-shortening timeframe to 2030.

- The end of COVID travel restrictions is projected to result in transport emissions increasing by 18-19 per cent from 2020 to 2022. Emissions from the sector are projected to reduce to 39 per cent below 2018 levels by 2030 and achieve a 31.7 per cent renewable transport share if the additional measures in plans and policies are implemented, this includes over 940,000 electric vehicles on the road by 2030, increased biofuel blend rates and measures to support more sustainable transport.
- Spending more time at home due to hybrid working and the increasing cost of fossil fuels highlights the need for our houses to become far more efficient. Implementing currently planned measures for the installation of 680,000 heat-pumps by 2030 as well as retrofitting 500,000 homes is projected to achieve a 41.5 per cent reduction in residential emissions in 2030 (compared to 2018).

Total GHG emissions projections by sector under the 'with additional measures' scenario to the year 2030 are represented graphically below in Figure 11.2.

Figure 11.2: Total GHG emission projections to 2030



(from EPA GHG projections 2021-2040)

11.3.6 Local and Regional Climate

Ireland has a typical maritime climate, with relatively mild and moist winters and cool, cloudy summers. The climate of the application site is typical of the Irish climate. The climate is influenced by warm maritime air associated with Gulf Stream which has the effect of moderating the climate, and results in high average humidity across the country. The area of highest precipitation is along the western coast.

Data from Met Eireann's Finner Camp weather station for mean monthly temperature, and monthly rainfall for the past three complete years is shown in Table 11.1.

Table 11.1: Monthly values for temperature and precipitation for Finner Camp 2021,2022 & 2023

Monthly values for FINNER up to 30-Jul-2024

Total rainfall in millimetres for FINNER

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
2024	105.5	83.0	82.4	79.5	56.3	67.7	86.7				
2023	114.4	47.9	93.2	64.7	36.9	74.4	158.1	109.5	108.4	92.0	136.9
2022	70.2	180.2	53.7	77.0	77.4	94.8	73.6	54.1	75.9	176.4	97.7
2021	132.5	96.1	111.9	33.8	83.2	58.9	91.7	123.6	69.2	112.1	74.8
LTA	130.4	95.4	103.8	75.9	77.2	72.3	91.0	105.7	102.4	136.8	128.6

Mean temperature in degrees Celsius for FINNER

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	5.5	7.6	7.4	8.8	12.8	12.4	14.2					
2023	6.3	7.8	7.2	9.2	12.4	16.8	14.8	15.4	14.7	11.6	7.7	7.6
2022	7.0	7.0	7.4	8.9	12.3	13.4	15.3	15.5	13.8	12.0	9.0	4.4
2021	4.2	5.9	7.6	7.3	9.7	13.1	16.8	15.3	14.8	11.6	9.2	7.5
LTA	5.1	5.3	6.8	8.3	10.9	13.3	15.1	14.8	13.1	10.3	7.6	5.5

(Met Eireann)

Long term averages are calculated from the latest complete 30-year data set. The latest available long-term average is calculated from data recorded between 1991-2020. The long-term average annual precipitation value for Finner Camp is 1,249.9 mm. The long-term average annual mean temperature for Finner Camp is 9.7 degrees Celsius.

According to Met Eireann the average hourly wind speed in Donegal experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 5.6 months, from October 11 to March 29, with average wind speeds of more than 14.0 miles per hour. The calmer time of year lasts for 6.4 months, from March 29 to October 11. Table 11.2 show the number of days with mean wind speeds exceeding 15 m/s for 10 minutes or more for the years 2018-2020 inclusive.

Table 11.2: No of days with 10 min wind speeds > 15 m/s (2021-2023 inc.).

Number of days with a maximum 10-min. mean wind speed $\geq 15\text{m/s}$												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	8	2	3	4	0	1	n/a	n/a	n/a	n/a		
2023	4	2	1	3	0	0	0	0	2	0	2	10
2022	4	13	0	1	0	1	0	0	2	0	4	1
2021	0	4	7	0	0	0	0	0	0	2	6	8

(Met Eireann)

11.3.7 Land Use

The site is located in rural area with one-off houses, farmsteads, agricultural land and forestry plantations. Land use is predominantly agriculture with grazing of sheep and cattle on improved grassland.

11.4 Characteristics of the Development

The site area is 3.45 hectares and is irregular in shape runs generally uphill from southwest to northeast with the lowest point at c. 54 mOD in the central western part of the site and the highest point in the east on top of the screening berms at c. 73 mOD. The quarry contains a central access road leading to the main quarry deck where stockpiles of product are stored on pallets and tonne bags awaiting collection. This central area is also used to park vehicles and to access the working quarry faces.

11.4.1 Overburden and Berm Construction

Overburden removed from areas of extraction have been used to create screening berms along the eastern and northwestern boundaries of the site. These berms have largely re-vegetated and provide screening for quarrying activities.

11.4.2 Extraction of Material

Extraction of the product is by mechanical means using a ripping claw on an excavator. Occasionally boulders have to be broken down further using an impact breaker mounted on an excavator down into smaller more manageable pieces. In the distant past, the applicant states that occasionally blasting occurred on site to win rock. The practice was discontinued after it was seen to induce unwanted fracture patterns into the rock lessening its value as cut-stone product. No blasting is planned for the site.

11.4.3 Sequence of Extraction

There are a number of lithologies present in the quarry. The dominant rocks are brown sandstone and a blue sandstone. Historically these have been extracted from west to east within the site. Current extraction areas are in the central eastern part of the site.

11.4.4 Processing of Material

Won rock is then transported using excavator bucket or telehandler to the guillotine area. Rock is then guillotined by hand and stacked on pallets ready for collection. Some rock pieces are cut with a circular saw to size and then stacked on pallets ready for collection.

11.4.5 Products

The main products produced are cut stone and dimension stone. Most of the product is used for facing houses with some product used for garden features, and ornamental features. Stone not utilised for cut stone is used to level out previous extraction areas. Historically, the lower value stone was used as aggregate. In the 1960's aggregate was used as fill for the construction of the nearby N56 national route.

11.4.6 Stockpiling of Materials

Cut stone and dimension stone are stored on site either on pallets or in tonne bags awaiting collection from the customer.

11.4.7 Transport to Market

There are no delivery lorries associated with the quarry activity as customers usually collect the product directly from the site. On average, there is one lorry pick-up (rigid or articulated) from site. Product is loaded onto the lorry using the on-site telehandler. There are also occasional smaller loads collected from the site by customers. These are usually done in smaller pick-up 3.5 T lorries or using vans and trailers. On average there is one of these smaller collections per week.

11.4.8 Fuel and Chemical Storage

Fuels and lubricants are stored in a bunded area within the applicant's workshop offsite. All re-fueling operations are carried out with strict adherence to pollution prevention protocols.

11.4.9 Surface and Groundwater Management

Protection of the wider surface water environment is achieved on site is settlement ponds. The main settlement pond is in the central southern portion of the site which captures runoff from the main extraction area. Another smaller linear settlement pond is located on the northeastern boundary and captures runoff in the immediate area. The settlement ponds discharge to separate tributaries of the Eany Water River which discharges to the sea at Inver Bay approximately 3 km southwest of the subject site. The guillotining and cutting area is serviced by a sump which collects all runoff. Water is recycled from this sump and sludge periodically emptied and used to supplement the screening berms.

11.4.10 Working hours and employment

Normal quarrying operations are confined to the hours of 8.00 am to 5.00 pm, Monday to Friday. The quarry is shut on Saturdays, Sundays and Public Holidays. The applicant provides employment for approximately 2-3 people directly.

11.4.11 Utilities and services

There is no electricity supply or mains water supply to the site. There is no telecommunications connection to the site.

11.4.12 Facilities

There is no weighbridge on site. Canteen, toilet and welfare facilities are provided at the applicant home approximately 130 m west of the quarry entrance.

Further details on the characteristics of development are provided in Chapter 3, *Project Description*, of this rEIAR.

11.5 Impact Assessment

There was an initial construction phase and then extraction and processing has taken place. The potential impacts for the construction and operational phases are outlined below.

11.5.1 Construction Impacts

11.5.1.1 Plant and Vehicle Emissions

The operation of plant and movement of vehicles will generate exhaust emissions. These emissions are an inevitable consequence of construction. The quantities of exhaust emissions and CO₂ released from construction activities will not result in an adverse impact to the local micro-climate or the broader macro climate. These impacts will be temporary as construction of site infrastructure and screening berms took less than 12 months. Emissions associated with the development are assessed as imperceptible.

11.5.2 Operational Impacts

11.5.2.1 Plant and Vehicle Emissions

The operation of plant and movement of vehicles generate exhaust emissions. These emissions are an inevitable consequence of the production of quarry product. Inevitably over the lifetime of the development plant and quarry vehicles needed replaced. Priority was given to energy efficient low emission vehicles and plant when considering new replacement plant and vehicles.

The development of the site as a quarry supplying quality product to the local market is likely to have reduced emissions by reducing the distance customers have to travel to source product. This may have an overall positive effect of emissions levels in a regional context. Overall, the development is assessed as having a slightly positive impact.

11.5.2.2 Loss of Vegetation

There has been an inevitable loss of vegetation with clearance for site infrastructure and to facilitate extraction. This will be offset with the landscaping plan for the site which will increase biodiversity in the overall site and introduce a tree planting scheme for carbon sequestration. Some of the screening berms host semi-mature native trees and there is a mature area of trees in the southern and western boundaries of the site. Overall, the impact is assessed as long term neutral.

11.5.3 Unplanned Events

The proposed development must also be assessed in relation to unplanned events in terms of vulnerability to the risks of major accidents or disasters relevant to the project. The types of event considered are floods, extreme temperatures and storms.

- **Flooding.** Extreme rainfall events are becoming more common. This site has been assessed in a basic flood risk assessment as part of Section 8, Water, and found to be not at risk of flooding.
- **Extreme Temperatures.** Operational procedures have been in place for times when the temperature is low enough to cause freezing including gritting areas and re-scheduling potentially hazardous dispatches of material. The quarry does not operate when a 'red' level weather warning is issued by Met Eireann.
- **Storm Events.** Extreme windy conditions could potentially lead to damage to infrastructure and buildings. Plant and buildings on the application site have been regularly inspected for structural integrity. Loose items that may be moved by high winds are secured. The quarry does not be operational when a 'red' level weather warning is issued by Met Eireann.

11.5.4 Cumulative Impact

The application site must also be considered in association with other developments located within or close to the application site.

11.5.4.1 Other Developments

There are no other authorised developments in the vicinity of the application site which would result in a significant cumulative impact. A search of the planning portal of the Donegal County Council website revealed no planned development which may result in significant cumulative impact in the vicinity of the application site. The application site is situated in a rural environment where the two main land uses are livestock farming and private commercial forestry. Agriculture is a significant contributor to Ireland's GHG emissions, but the type of agriculture practiced in the vicinity of the application site is low intensity livestock farming. The many private forestry stands in the area surrounding the application site will be acting as a carbon sink for greenhouse gases.

There are other quarries of a similar scale operating within 3 km of the site. However, due to the small-scale nature of these enterprises, there is not expected to be any significant cumulative negative effect from the adjacent quarries.

11.5.5 Do-Nothing Option

If the proposed is not granted substitute consent, then the site will close. Employment from the operational phase will not continue. The likely significant secondary benefit to the wider local economy with the development of the project will not occur with the do-nothing option.

Any benefit from a reduction in greenhouse gas emissions from the proposed activities are likely to be outweighed by increased greenhouse gas emission relating to customers in the locality/region having to source quarry products from much further afield. A reduction in the greenhouse gas emissions at the application site is likely to result in an increase in greenhouse gas emissions at an alternative quarry (or quarries).

11.6 Mitigation Measures

The following mitigation measures have been practiced at the development to reduce greenhouse gas emissions in order to limit the effects of the development on the local and regional climate.

- Strict adherence to good operational practice such as switching off plant and vehicles when not in use.
- All plant and vehicles regularly serviced to ensure they are running as efficiently as possible.
- Energy consumption ratings considered when upgrading new vehicles associated with the site.
- Regular energy audits in order to assess energy requirements and areas where energy usage can be reduced. This will lead to a reduction in greenhouse gas emissions.
- Landscaping plan (section 15) to offset vegetation loss and increase net biodiversity.

11.7 Residual Impacts

Residual impacts are those that remain after the implementation of the mitigation measures. No residual impacts are expected, other than the slight positive impact on climate due to the reduced travel distance customers are to travel for quarry product.

11.8 Determination of Significance of Impact Pre-Mitigation

Impact	Receptor	Description of Impact (Character/Magnitude/ Duration/Probability/ Consequences) Negligible - High	Existing Environment (Significance / Sensitivity) Negligible -High	Significance Imperceptible - Profound
Plant & Vehicle emissions during construction and operational phases	Climate	Low-Negligible	Medium	Not Significant
Loss of vegetation	Climate	Low	Medium	Slight

11.9 Summary of Mitigation Measures

Summary of Mitigation Measures Implemented
Strict adherence to good operational practice such as switching off plant and vehicles when not in use
All plant and vehicles regularly serviced to ensure they are running as efficiently as possible.
Energy consumption ratings and emission levels considered when upgrading new vehicles associated with the site.
Regular energy audits implemented to assess energy requirements and areas where energy usage can be reduced. This will lead to a reduction in greenhouse gas emissions.
Landscaping plan (section 15) to offset vegetation loss and increase net biodiversity.

11.10 Determination of Significance of Impact Following Mitigation

Impact	Receptor	Description of Impact (Character/Magnitude/ Duration/Probability/ Consequences) Negligible - High	Existing Environment (Significance / Sensitivity) Negligible -High	Significance Imperceptible - Profound
Plant & Vehicle emissions during construction and operational phases	Climate	Low-Negligible	Medium	Imperceptible
Loss of vegetation	Climate	Low	Medium	Neutral

11.11 Impact Assessment Conclusion

There is expected to be a slight positive impact on climate following the implementation of the recommended mitigation measures.

11.12 Technical Difficulties

There were no technical difficulties encountered.