

1. INTRODUCTION

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by McCarthy Keville O'Sullivan Ltd. (MKO) on behalf of Wingleaf Ltd., as part of an application for planning permission to Cork County Council to construct a renewable energy development on the site of the original wind farm located in the townlands of Cappaboy Beg, Derreendonee and Curraglass, Co. Cork.

The Proposed Development site is located approximately 5.6km northeast of Kealkill and 5.5km southwest of the village of Ballingearry, with proposed works taking place within the townlands of Derreendonee and Curraglass.

The previous wind turbines at the site were granted planning permission in 2002 and the site was constructed and became operational in 2006. The turbines were removed in June 2018 as they had reached the end of their productive lifespan. The previous development consisted of 10 turbines, with a hub height of 50m and a total tip height of 75m.

Wingleaf Ltd. is now seeking to optimise the site with a renewable energy development comprising 7 turbines with a tip height of up to 178.5 metres. The Proposed Development will ensure that it maximises the amount of renewable energy generated from the wind resource at this site using the most modern wind turbine technologies in order to contribute to Ireland's ambitious renewable energy generation targets as set out in the Climate Action Plan 2019, i.e. 70% renewable energy generation by 2030.

This application includes for a connection to the national grid; with this EIAR assessing a new proposed 38kV Electricity Substation connecting via underground cabling to an existing 38kV overhead line within the EIAR Site Boundary, located in the townland of Curraglass, Co. Cork.

1.2 Legislative Context

European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive'), was has been transposed into Irish planning legislation by the Planning and Development Acts 2000 to 2019 and the Planning and Development Regulations 2001 to 2019. The EIA Directive was amended by Directive 2014/52/EU which has been transposed into Irish law with the recent European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018). Most of the provisions of the new regulations came into operation on the 1st of September 2018 with a number of other provisions coming into operation on the 1st of January 2019.

Accordingly, this EIAR complies with the EIA Directive as amended by Directive 2014/52/EU. To the extent relevant and necessary, regard has been had to the existing provisions of the Planning and Development Act 2000 to 2019 and the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

The European Union Directive 2011/92/EU, amended by EU Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive'), requires Member States to ensure that a competent authority carries out an assessment of the likely significant effects of certain types of project, as listed in the Directive's, prior to development consent being given for the project. The Environmental Impact Assessment (EIA) of the Proposed Development will be undertaken by Cork County Council as the competent authority. The Environmental Impact Assessment (EIA) of the proposed project will be undertaken by Cork County Council as the competent authority.

Article 5 of the EIA Directive as amended by Directive 2014/52/EU provides where an EIA is required, the developer shall prepare and submit an environmental impact assessment report (EIAR). The information to be provided by the developer shall include at least:

- a) *description of the project comprising information on the site, design, size and other relevant features of the project;*
- b) *a description of the likely significant effects of the project on the environment;*
- c) *a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
- d) *a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;*
- e) *non-technical summary of the information referred to in points (a) to (d); and (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.*

In addition, Schedule 6 to the Planning and Development Act 2000 to 2019 sets out the information to be contained in an EIAR, with which this EIAR complies.

MKO was appointed as environmental consultant on the proposed project and commissioned to prepare this EIAR in accordance with the requirements of the EIA Directive as amended by Directive 2014/52/EU.

The relevant classes/scales of development that normally require Environmental Impact Assessment (EIA) are set out in Schedule 5 (Part 2) of the Planning and Development Regulations 2001 to 2019, as amended. The relevant class of development in this case relates to “*installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts*”, as per Item 3(i) of the Schedule. The Proposed Development exceeds 5 turbines and 5 Megawatts in scale, and therefore is subject to EIA.

The EIAR provides information on the receiving environment and assesses the likely significant effects of the project and proposes mitigation measures to avoid or reduce these effects. The function of the EIAR is to provide information to allow the competent authority to conduct the Environmental Impact Assessment (EIA) of the Proposed Development.

All elements of the project, (including the wind turbines and associated infrastructure, substation including battery storage, grid connection, proposed tree felling and replanting and turbine delivery route) have been assessed as part of this EIAR.

1.2.1 EIAR Guidance

The Environmental Protection Agency (EPA) published its ‘*Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*’ in August 2017 (an update for the ‘*Guidelines on the Information to be contained in Environmental Impact Statements*’ (2002)). This document is intended to guide practitioners during the transition to new Regulations transposing the updated Directive. These draft guidelines have also been used in the compiling of this EIAR.

In preparing this EIAR regard has also been taken of the provisions of the ‘*Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment*’, published by the Department of Housing, Planning and Local Government (DHPLG) in August 2018 to the extent these guidelines are relevant having regard to the enactment of the revised EIA Directive.

The European Commission also published a number of guidance documents in December 2017 in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU as amended by 2014/52/EU) including ‘*Guidance on Screening*’, ‘*Guidance on Scoping*’ and ‘*Guidance on the preparation of the Environmental Impact Assessment Report*’. MKO has prepared the EIAR in accordance with these guidelines also.

1.2.2 Wind Energy Development Guidelines for Planning Authorities

The relevant considerations under the ‘*Wind Energy Development Guidelines for Planning Authorities*’ (Department of the Environment, Heritage and Local Government (DOEHLG), 2006) have been taken into account.

The ‘*Wind Energy Development Guidelines for Planning Authorities*’ (DoEHLG, 2006) were the subject of a targeted review in 2013. The proposed changes to the assessment of impacts associated with onshore wind energy developments are outlined in the document ‘*Proposed Revisions to Wind Energy Development Guidelines 2006 – Targeted Review*’ (December 2013). A consultation process in relation to the document is currently being undertaken by the Department of Communications, Climate Action and Environment (DCCAE) and as of December 2019, the proposed changes to the assessment of impacts associated with onshore wind energy developments are outlined in the document ‘*Draft Revised Wind Energy Development Guidelines*’ (December 2019). A consultation process in relation to the 2019 document commenced on the 12/12/2019 and is currently being undertaken by the Department of Housing, Planning and Local Government (DoHPLG).

Should the revised Wind Energy Development Guidelines be adopted in advance of a planning decision being made on the Proposed Development, it will be capable of complying with the revised guidance. The distance to third party sensitive receptors will achieve the proposed 4 times turbine tip height and any revised noise and shadow flicker requirements can be achieved by implementing mitigation through use of the turbine control systems.

1.3 The Applicant

The applicant for the Proposed Development, Wingleaf Ltd, is a subsidiary company of Enerco Energy Ltd., which is an Irish-owned, Cork-based company with extensive experience in the design, construction and operation of wind energy developments throughout Ireland, with projects currently operating or in construction in Counties Cork, Kerry, Limerick, Clare, Galway, Mayo and Donegal.

By the end of Q1 2020, Enerco and its group of companies have over 550 Megawatts (MW) of wind farms in commercial operation and have a further 400MW of projects at various stages in its portfolio to assist in meeting Ireland’s renewable energy targets.

1.4 Brief Description of the Proposed Development

The Proposed Development comprises the construction of up to 7 no. wind turbines and all associated works. The proposed wind turbines will have a maximum blade tip height of up to 178.5 metres.

The full description of the Proposed Development, as per the public planning notices, is as follows:

1. Up to 7 no. wind turbines with an overall blade tip height of up to 178.5 metres and all associated foundations and hard-standing areas;
2. 2 No. borrow pits;
3. 1 No. permanent meteorological mast with a maximum height of up to 112 metres;
4. Upgrade of existing and provision of new site access roads;
5. Upgrade to existing access junction;
6. A 38kV electricity substation, including 4 no. battery storage containers, 1 no. control building with welfare facilities, associated electrical plant and equipment, security fencing, wastewater holding tank,
7. Forestry Felling;
8. A temporary construction compound;
9. Site Drainage;
10. All associated internal underground cabling, including underground grid connection cabling to the existing overhead line; and
11. All associated site development and ancillary works.

This application is seeking a ten-year permission and 30-year operational life from the date of commissioning of the renewable energy development.

The Proposed Development site was previously an operational wind farm. The existing on-site substation is a live node on the national electricity grid and is linked via an overhead line to Ballylickey Substation approximately 12km southwest of the site. The planning application for the Proposed Development includes for internal underground cabling which amalgamates the electricity generated at a proposed new on-site substation, that will then connect to the existing overhead line via an underground cabling connection in the townland of Curraglass.

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the Proposed Development, will have an operational lifespan greater than the 30-year operational life that is being sought as part of this application.

Modern wind turbine generators typically have an output in the 3 and 5 MW range. For the purposes of this EIAR, a wind turbine model with a rated output of 4.3MW has been chosen as this is considered to be representative of the typical turbine capacity currently available. Therefore, based on 7 no. wind turbines, the proposed wind turbines will have a combined output of approximately 30MW.

The layout of the Proposed Development has been constraints-led, thereby avoiding the environmentally sensitive parts of the site. The roads layout for the Proposed Development makes use of the existing onsite access roads and tracks where possible, with approximately 5 kilometres of existing roadway/tracks, some which will require upgrading and approximately 2.5 kilometres of new access road to be constructed.

The closest property is located approximately 760 metres from the nearest proposed turbine location (T7). There are 4 No. properties located within one kilometre of the proposed turbine locations, all of which are dwellings.

The Cork County Development Plan (CDP) 2014 contains a Wind Energy Strategy (WES) which identifies, in broad strategic terms, three categories of 'Wind Deployment Area' for large scale commercial wind energy developments. These categories are "Acceptable in Principle", "Open to Consideration" and "Normally Discouraged".

All 7 no. turbines proposed are within an area designated as "Open to Consideration" for wind energy development by the CDP. The CDP states that this category has been applied to areas with some capacity to absorb wind development, but which are sensitive enough to require a site-by-site appraisal to ascertain the suitability of the area for development. The use of the Proposed Development site for wind energy generation has previously been established as there was an operational wind farm on the site between 2006 and 2018.

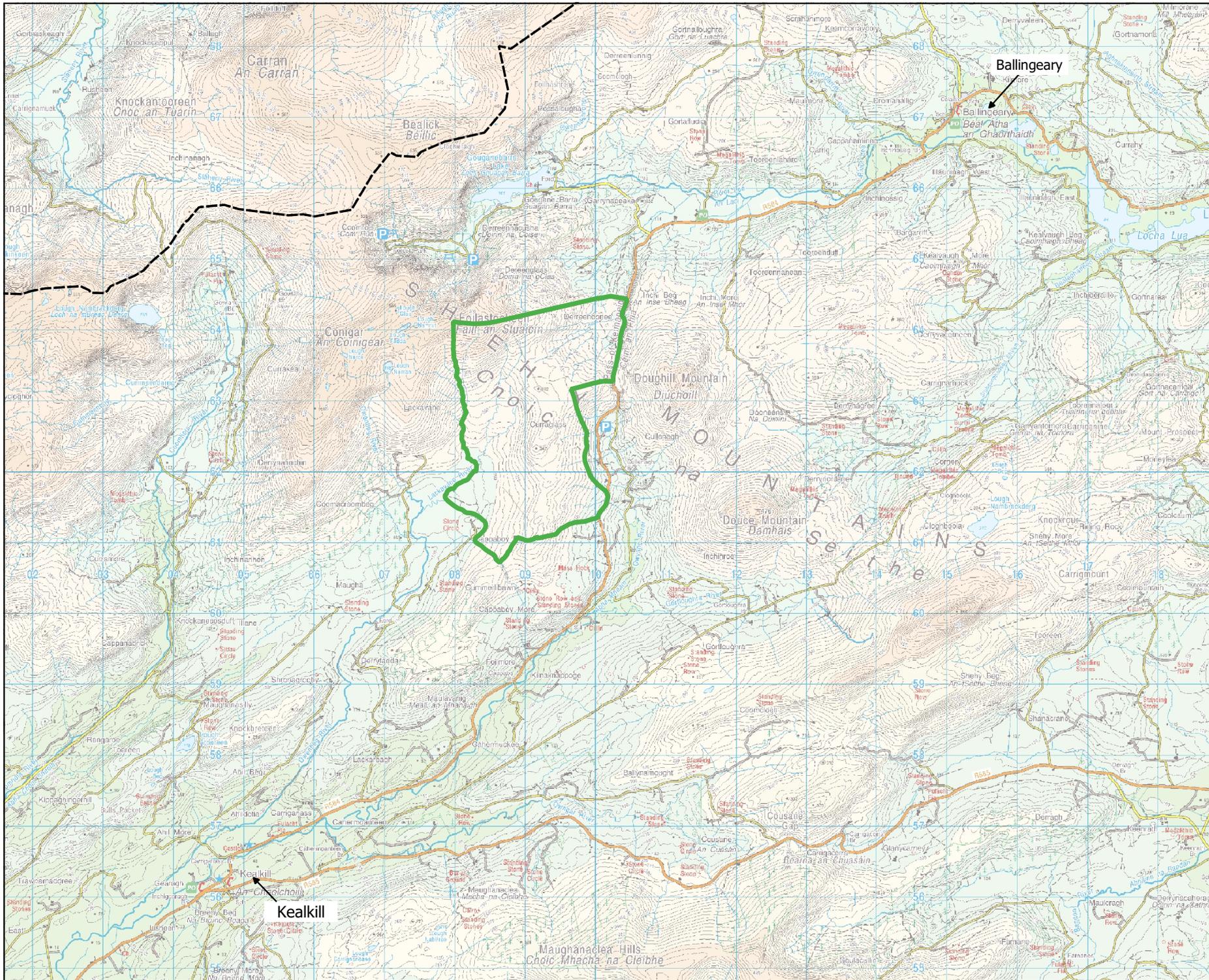
1.4.1 References to Proposed Development Site

For the purposes of this EIAR, where the 'Proposed Development' or 'the site' is referred to, this relates to the primary study area for the development, as delineated in green on Figure 1-1.

Individual topics for assessment purposes, i.e. each chapter, indicate the study area used for that topic. The actual site boundary for the purposes of the planning permission application occupies a smaller area within the primary area.

The EIAR site boundary encompasses an area of approximately 622 hectares, permanent footprint of the Proposed Development measures approximately 7.5 hectares, which represents approximately 1.2% of the primary study area.

The Proposed Development is described in detail in Chapter 4 of this EIAR.



Map Legend

-  EIAR Site Boundary
-  Cork/Kerry County Boundary



Drawing Title

Site Location

Project Title

Curraglass Renewable Energy Development, Co. Cork

Drawn By	Checked By
Órla Murphy	Michael Watson

Project No.	Drawing No.
190301	Figure 1-1

Scale	Date
1:70000	10.02.2020



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1.5 Need for the Proposed Development

1.5.1 Overview

It is now clear that Ireland will not meet its 2020 target for renewable energy with the Sustainable Energy Authority of Ireland (SEAI) reporting in May 2019 that 13 per cent of Ireland's energy will come from renewable sources by 2020, three per cent short of our European target of 16 per cent (SEAI, May 2019). Ireland faces significant challenges through efforts to meet EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. Further detail can be found in Section 2.1 of this EIAR.

In March 2019, the Government announced a renewable electricity target of 70% by 2030. The Proposed Development would likely be operational after 2020 and would therefore contribute to this 2030 target. More recently, the EPA reported that Ireland is set to fall far short of all of its carbon emissions reduction targets for 2030, despite climate action measures in the National Development Plan (EPA, June 2019). The proposed Curraglass Renewable Energy Development is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels

The need for the proposed project is driven by the following factors:

1. *A legal commitment from Ireland to limit greenhouse gas emissions under the Kyoto protocol to reduce global warming;*
2. *A requirement to increase Ireland's national energy security as set out in the Energy White Paper;*
3. *A requirement to diversify Ireland's energy sources, with a view to achievement of national renewable energy targets and an avoidance of significant fines from the EU (the EU Renewables Directive);*
4. *Provision of cost-effective power production for Ireland which would deliver local benefits; and*
5. *Increasing energy price stability in Ireland through reducing an over reliance on imported gas.*

These factors are addressed in further detail below. Section 2.1 in Chapter 2 of this EIAR on Background to the Proposed Development, presents a full description of the international and national renewable energy policy context for the Proposed Development. Section 2.2 addresses climate change, including Ireland's current status with regard to meeting greenhouse gas emission reduction targets.

1.5.2 Climate Change and Greenhouse Gas Emissions

At the Paris climate conference (COP21) in December 2015, 195 countries adopted the first-ever universal, legally binding global climate deal the Paris Agreement. The Paris Agreement sets out a global action plan to avoid dangerous climate change by limiting global warming to well below 2°C above pre-industrial levels. Under the Paris Agreement, the EU and Governments also agreed on the need for global emissions to peak as soon as possible, recognising that this will take longer for developing countries and to undertake rapid reductions thereafter in accordance with the best available science.

The International Panel on Climate Change (IPCC) has put forward its clear assessment that the window for action on climate change is rapidly closing and that renewable energy sources such as wind will have to grow from 30% of global electricity at present to 80% by 2050 if we are to limit global warming to below 2 degrees¹ and in accordance with the COP 21 agreement to limit global warming to well below 2°C above pre-industrial levels.

¹ IPCC Fifth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR5 Report

In this regard, the Government enacted the Climate Action and Low Carbon Development Act 2015 which provides for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy.

The IPCC published an article on the 6th October 2018 titled ‘*Global Warming of 1.5°C*’, which notes the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of mitigation pathways, strengthening of the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. It provided detail on the impact of climate change if emissions are not reduced.

The Energy White Paper notes that:

“The use of renewables in electricity generation in 2014 reduced CO₂ emissions by 2.6 Mt and avoided €255 million in fossil fuel imports”.

It is estimated that the proposed renewable energy development with a potential output of approximately 30 MW from the proposed wind turbines. The Proposed Development will result in the net displacement of approximately 40,158 tonnes of Carbon Dioxide (CO₂) per annum, including accounting for back-up generation. The carbon offsets resulting from the Proposed Development are described in detail in Section 10.2.3 of Chapter 10 of this EIAR: Air and Climate.

1.5.3 Energy Security

At a national level, Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas.

A report by the Sustainable Energy Authority of Ireland (SEAI), published in September 2019, presents national energy statistics on energy production and consumption in Ireland during 2018. Renewable energy sources (which include wind) accounted for 32.5% of Ireland’s gross electricity consumption in 2018, which was well over halfway to Ireland’s 2020 target of 40%. EirGrid in their ‘*All Island Generation Capacity Statement 2019 - 2028*’ (September 2019), states that new wind farms commissioned in Ireland in 2018 brought total wind capacity to over 3666MW, contributing to the increase in the overall RES-E percentage of 32.5% with wind energy accounting for 27.6%.

It is estimated that in 2015 the cost of all energy imports to Ireland was approximately €4.6 billion; this fell to €3.4 billion in 2016 due mainly to reduced gas imports but increased again in 2017 to €4 billion and in 2018 to €5 billion. Irelands import dependency varied between 85% and 90% until 2016, where it fell to 69% with the Corrib gas field starting production and then has fallen further to 66% in 2017, however Ireland is still one of the more import dependent countries in the EU, with the EU average being just over 50%. In 2018, renewables made up 11% of gross final consumption relative to a 2020 target of 16%. This avoided 4.1 million tonnes of CO₂ emissions and €439 million of fossil fuel import (*Energy in Ireland - 2019 Report*, SEAI, December 2019).

Ireland continues to be hugely energy import-dependent leaving it exposed to large energy price fluctuations as a minimum and possibility of fuel shortages if a major energy crisis were to occur. The international fossil fuel market is growing increasingly expensive and is increasingly affected by international politics which can add to price fluctuations. This volatility will be increased as carbon prices increase in the future. This has implications for every Irish citizen.

The SEAI has stated that our heavy dependence on imported fossil fuels, “*is a lost opportunity in terms of keeping this money here in Ireland and further developing our abundant renewable resources*”.

The cost of carbon credits is included in all electricity traded, and the price of electricity generated by coal is particularly vulnerable due to its high carbon emissions per unit of electricity generated. Coal still

²Global Warming of 1.5°C, Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/report/sr15/>

³ Dr Eimear Cotter, Head of Low Carbon Technologies, SEAI - ‘*Energy Security in Ireland 2015*’

generates almost 25% of Ireland’s electricity, but the Programme for Government¹ called for a review of options to replace it with low carbon alternatives within a decade. Any steps to reduce this dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. The use of Ireland’s indigenous energy resources, such as wind, will contribute to a reduction in energy imports.

The Energy White Paper 2015 notes “There will be a substantial increase in the cost of carbon in the short and medium term, through the EU Emissions Trading Scheme”. Any steps to reduce dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. As the White Paper notes:

“In the longer term, fossil fuels will be largely replaced by renewable sources”.

1.5.4 Competitiveness of Wind Energy

While Ireland has a range of renewable resources, as the White Paper states “[Onshore Wind] is a proven technology and Ireland’s abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support.”

In fact, the cost of support is more than offset by the fact that adding large quantities of wind to the wholesale market drives down auction prices in any half hour trading period when the wind is blowing, i.e. for 80% of the hours of the year. Wind is capable of an average capacity factor of 35%², which is its average output throughout the year relative to its maximum output. However, wind is generating power at some level for 80% of the hours of the year. EirGrid’s website has more detailed information. A Poyry study from 2015 showed that reaching our targets in 2020 would reduce wholesale prices by more than costs of new grid infrastructure, backup and the subsidies paid to wind, resulting in a net saving of €43m per year in 2020. The EU has noted that Ireland has one of the lowest costs of supporting renewables mainly because onshore wind is on a par with the cost of power from conventional generation when a full cost benefit analysis is undertaken.

1.5.5 EU 2020 Renewable Energy Targets

The burning of fossil fuels for energy creates greenhouse gases, which contribute significantly to climate change. These and other emissions also create acid rain and air pollution. Sources of renewable energy that are utilised locally with minimal impact on the environment are necessary to meet the challenges of the future. The EU adopted Directive (2009/28/EC) on the Promotion of the Use of Energy from Renewable Sources in April 2009 which includes a common EU framework for the promotion of energy from renewable sources.

The Directive sets a legally binding mandatory national target for the overall share of energy from renewable sources for each Member State. This package is designed to achieve the EU’s overall 20:20:20 environmental target, which consists of a 20% reduction in greenhouse gases, a 20% share of renewable energy in the EU’s total energy consumption and a 20% increase in energy efficiency by 2020. To ensure that the mandatory national targets are achieved, Member States must follow an indicative trajectory towards the achievement of their target as outlined in Ireland’s National Renewable Energy Action Plan (NREAP).

Ireland’s mandatory national target is to supply 16% of its overall energy needs from renewable sources by 2020. This target covers energy in the form of electricity (RES-E), heat (RES-H) and transport fuels (RES-T). The contribution of renewables to gross final consumption (GFC) was 11% in 2018, compared to the 2020 target of 16%. (*Energy in Ireland - 2019 Report*, SEAI, December 2019). Furthermore, the Department of Communications, Climate Action and Environment (DCCA) reported in their ‘*Fourth Progress Report on the National Renewable Energy Action Plan*’ December 2017 that Ireland will achieve 13% of its 16% RES target by 2020.

¹ Department of the Environment, Community and Local Government, National Climate Change Policy, available at: <http://www.environ.ie/environment/climate-change/policy/national-climate-policy>

² Baringa (October 2018), 70 by 30 - a 70% Renewable Electricity Vision for Ireland in 2030 (Table A.6), Report available at: <https://www.iwea.com/images/files/70by30-report-final.pdf>

For RES-E alone, Ireland has set a national target of 40% by 2020 as outlined in NREAP. Government policies identify the development of renewable energy, including wind energy, as a primary strategy in implementing national energy policy.

Noted above and further emphasised in the most recent SEAI report, *'Renewable Energy in Ireland – 2019 Report'* (SEAI, January 2019); the share of renewable electricity (RES-E) was recorded at 30.1% in 2017, out of their 40% target; further reporting that Ireland is not on track to meet its 2020 renewable energy target.

More recently, new analysis from EirGrid, has shown that 32% of electricity demand in Ireland during 2018 was met by renewable sources⁶. This shows a positive increase in renewable energy in Ireland from that previously recorded in 2017, but still highlights the progress required to meet our 2020 target.

1.5.6 EU 2030 Renewable Energy Targets

In March 2019, the Minister for Communications, Climate Action, and the Environment, Richard Bruton, announced a renewable electricity target of 70% by 2030 for Ireland. The Joint Committee on Climate Change Action recommended in their recent report, *'Climate Change: A Cross-Party Consensus for Action'* (March 2019)⁷, that new climate change legislation be enacted by the Oireachtas in 2019 to include:

- A target of net zero economy-wide GHG emissions by 2050;
- A provision for a 2030 target, consistent with the GHG emissions reduction pathway to 2050 to be set by 2020 by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
- Provision for five-yearly carbon budgets, consistent with the emissions reduction pathway to 2030 and 2050 targets, to be set by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council; and
- A target for the renewable share of electricity generation of 70% by 2030.

This commitment made by the Department of Communications, Climate Action, and the Environment also forms part of a new Climate Action Plan released in August 2019. The plan, which is further detailed in Chapter 2, Section 2.2.4.7 identifies a need for 8.2GW of onshore wind generation with Ireland needing more than double its current installed capacity of wind generation.

As noted previously, Ireland are not on track for meeting their 2020 renewable energy targets. It is now more critical than ever that we continue to progress renewable energy development in Ireland so that we are successful in meeting our 2030 target. Further detail on the EU 2030 targets is noted in Chapter 2.

1.5.7 Reduction of Carbon Emissions and Other Greenhouse Gases

This production of renewable energy will assist in achieving the Government's and EU's stated goals of ensuring safe and secure energy supplies, promoting an energy future that is sustainable and competitively priced to consumers whilst combating energy price volatility and the effects of climate change. The Energy White Paper in 2015 outlines an ambitious Greenhouse gas reduction target of between 80% to 95% compared to 1990 levels out to 2050. Furthermore, if national carbon emissions targets are divided out amongst each county, each Local Authority may be responsible for meeting its own targets.

In addition to a reduced dependence on oil and other imported fuels, the generation of electricity from wind by the Proposed Development will displace approximately 40,158 tonnes of carbon emissions per annum from the largely carbon-based traditional energy mix, the detail of which is presented in Section 10.2.3 of this EIAR.

⁶ <http://www.eirgridgroup.com/newsroom/renewables-demand-record/index.xml>

⁷ https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_climate_action/reports/2019/2019-03-28_report-climate-change-a-cross-party-consensus-for-action_en.pdf

Recent EU and World Health Organisation reports estimate that poor air quality accounted for premature deaths of almost 600,000 people in Europe in 2012 . In Ireland, the premature deaths attributable to air pollution are estimated at 1,200 people (*‘Ireland’s Environment - An Assessment’*, Environmental Protection Agency, 2016.) The report *‘Ireland’s Environment - An Assessment’* states that the pollutants of most concern are NO_x, (the collective term for the gases nitric oxide and nitrogen dioxide, PM (particulate matter) and O₃ (ozone). The EPA report goes on to state that:

“Ireland has considerable renewable energy resources, only a fraction of which are utilised to address our energy requirements.

Wind, ocean, solar, hydro and geothermal energy do not produce GHG (greenhouse gas) emissions or emissions of air pollutants such as particulates, sulphur dioxide and nitrogen dioxide. Use of these renewable resources can have considerable co-benefits for human health and ecosystems. Meeting energy requirements from renewable resources can provide significant economic and employment benefits at local to national scales.”

The Proposed Development therefore represents an opportunity to further harness Ireland’s significant renewable energy resources, with valuable benefits to air quality and in turn to human health. The consumption of fossil fuels for energy results in the release of particulates, sulphur dioxide and nitrogen dioxide to our air. The use of wind energy, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO₂), oxides of nitrogen (NO_x), and sulphur dioxide SO₂, thereby resulting in cleaner air and associated positive health effects.

1.5.8 Economic Benefits

In addition to helping Ireland avoid significant fines and reducing environmentally damaging emissions, the proposed project will have significant economic benefits. At a national level, Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas. As detailed above, in 2018 the cost of all energy imports to Ireland was approximately €5 billion with imported fossil fuels accounting for 67% of all energy consumed (*‘Energy in Ireland 2019’*, Sustainable Energy Authority of Ireland, 2019).

The SEAI report *‘Energy in Ireland 2019’* indicated that renewable electricity (mostly wind energy) during 2018 and compared to 2017:

- Displaced €430 million in fossil fuel imports; and
- Reduced CO₂ emissions by 4 million tonnes;

The 2014 report *‘The Value of Wind Energy to Ireland’*, published by Pöyry, stated that growth of the wind sector in Ireland could support 23,850 jobs (construction and operational phases) by 2030. If Ireland instead chooses to not develop any more wind, then by 2030 the country will be reliant on natural gas for most of our electricity generation, at a cost of €671 million per annum in fuel import costs.

The Proposed Development will be capable of providing power to over 21,900 households every year, as presented in the calculations in Section 4.3.1.6 of this EIAR.

At a Regional Level, the Proposed Development will help to supply the rising demand for electricity, resulting from renewed economic growth. The EirGrid report *‘All-Island Generation Capacity Statement 2019 – 2028’* (SONI and Eirgrid, 2019) notes that electricity demand on the island of Ireland is expected to grow by between 25% and 47% over the next ten years. Much of this growth is expected to come from new data centres in Ireland.

The Proposed Development will have several significant long-term and short-term benefits for the local economy including job creation, landowner payments, local authority commercial rate payments and a Community Benefit Scheme.

The annual commercial rate payments from the Proposed Development to Cork County Council, will be redirected to the provision of public services within Co. Cork. These services include provisions such as

road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the proposed project will create approximately 70 jobs during the construction, operational and maintenance phases of the Proposed Development. During construction, additional employment will be created in the region through the supply of services and materials to the development. In addition to this, there will also be income generated by local employment from the purchase of local services i.e. travel and lodgings.

There are substantial opportunities available for areas where wind farms and other types of renewable energy developments are located, in the form of Community Gain Funds. Based on the current proposal, a Community Gain Fund in the region of €1.8 million will be made available over the lifetime of the project. The value of this fund will be directly proportional to the level of installed MWs at the site and will support and facilitate projects and initiatives including youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects.

Further details on the proposed Community Gain proposals are presented in Section 4.5 of this EIAR.

1.6 Purpose and Scope of the EIAR

The purpose of this EIAR is to document the current state of the environment in the vicinity of the Proposed Development site and to quantify the likely significant effects of the Proposed Development on the environment in accordance with the requirements of the EIA Directive, as amended. The compilation of this document served to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from the possibility of any negative impacts arising from the Proposed Development.

It is important to distinguish the Environmental Impact Assessment (EIA) to be carried out by Cork County Council, from the EIAR and the accompanying planning application. The EIA is the assessment carried out by the competent authority, which includes an examination that identifies, describes and assesses in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11 of the Environmental Impact Assessment Directive, the direct and indirect effects of the Proposed Development on the following:

- a. population and human health
- b. biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC
- c. land, soil, water, air and climate
- d. material assets, cultural heritage and the landscape
- e. the interaction between the factors referred to in points (a) to (d)

The EIAR submitted by the applicant provides the relevant environmental information to enable the EIA to be carried out by the competent authority. The information to be contained in the EIAR is prescribed Article 5 of the revised EIA Directive described in Section 1.2 above.

1.7 Structure and Content of the EIAR

1.7.1 General Structure

This EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the Proposed Development thereon and the proposed mitigation measures. Background information relating to the Proposed Development, scoping and consultation undertaken and a description of the Proposed Development are presented in separate sections. The grouped format sections describe the impacts of the Proposed Development in terms of human beings, flora and fauna, soils and geology, hydrology and hydrogeology, air and climate, noise and vibration, landscape and visual, cultural heritage and material assets such as traffic and transportation, together with the interaction of the foregoing.

The chapters of this EIAR are as follows:

- > Introduction
- > Background to the Proposed Development
- > Site Selection and Reasonable Alternatives
- > Description of the Proposed Development
- > Population and Human Health
- > Biodiversity (excluding Birds)
- > Birds
- > Land, Soils and Geology
- > Water
- > Air and Climate
- > Noise and Vibration
- > Landscape and Visual
- > Archaeological, Architectural and Cultural Heritage
- > Material Assets (including Traffic and Transport, Telecommunications and Aviation)
- > Interactions of the Foregoing
- > Schedule of Mitigation

The EIAR also includes a Non-Technical Summary, which is a condensed and easily comprehensible version of the EIAR document. The non-technical summary is laid out in a similar format to the main EIAR document and comprises a description of the Proposed Development followed by the existing environment, impacts and mitigation measures presented in the grouped format.

1.7.2

Description of Likely Significant Effects and Impacts

As stated in the ‘*Guidelines on the Information to be contained in Environmental Impact Statements*’ (EPA, 2017), an assessment of the likely impacts of a Proposed Development is a statutory requirement of the EIA process. The statutory criteria for the presentation of the characteristics of potential impacts requires that potential significant impacts are described with reference to the extent, magnitude, complexity, probability, duration, frequency, reversibility and trans-frontier nature (if applicable) of the impact.

The classification of impacts in this EIAR follows the definitions provided in the Glossary of Impacts contained in the following guidance documents produced by the Environmental Protection Agency (EPA):

- > *‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports – Draft August 2017’* (EPA, 2017).
- > *‘Revised Guidelines on the Information to be contained in Environmental Impact Statements – Draft September 2015’* (EPA, 2015)
- > *‘Advice Notes for Preparing Environmental Impact Statements – Draft September 2015’* (EPA, 2015).
- > *‘Advice Notes on Current Practice in the Preparation of Environmental Impact Statements’* (EPA, 2003)
- > *‘Guidelines on the Information to be contained in Environmental Impact Statements’* (EPA, 2002).

Table 1-1 presents the glossary of impacts as published in the EPA guidance documents. Standard definitions are provided in this glossary, which permit the evaluation and classification of the quality, significance, duration and type of impacts associated with a Proposed Development on the receiving environment. The use of pre-existing standardised terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across all disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the Proposed Development on the receiving environment.

Table 1-1 Impact Classification Terminology (EPA, 2017)

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An effect capable of measurement but without significant consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
	Profound	An effect which obliterates sensitive characteristics
Extent & Context	Extent	Describe the size of the area, number of sites and the proportion of a population affected by an effect
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions
Probability	Likely	Effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented
	Unlikely	Effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented
Duration and Frequency	Momentary	Effects lasting from seconds to minutes
	Brief	Effects lasting less than a day

	Temporary	Effects lasting less than a year
	Short-term	Effects lasting one to seven years
	Medium-term	Effects lasting seven to fifteen years
	Long-term	Effects lasting fifteen to sixty years
	Permanent	Effect lasting over sixty years
	Reversible	Effects that can be undone, for example through remediation or restoration
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly - or hourly, daily, weekly, monthly, annually)
Type	Indirect	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing'	The environment as it would be in the future should the subject project not be carried out
	'Worst Case'	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents

Each impact is described in terms of its quality, significance, extent, duration & frequency and type, where possible. A 'Do-Nothing' impact is also predicted in respect of each environmental theme in the EIAR. Residual impacts are also presented following any impact for which mitigation measures are prescribed and any interactions between the impacts are assessed. The remaining impact types are presented as required or applicable throughout the EIAR.

1.8 Project Team

1.8.1 Project Team Responsibilities

The companies and staff listed in Table 1-2 were responsible for completion of the EIAR of the Proposed Development. Further details regarding project team members are provided below.

The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of wind energy developments and in their relevant area of expertise. The qualifications and experience of the principal staff from each company involved in the preparation of this EIAR are summarised in Section 1.8.2 below. Each chapter of this EIAR has been prepared by a competent expert in the subject matter. Further details on project team expertise are provided in the Statement of Authority at the beginning of each impact assessment chapter.

Table 1-2 Project Team

Consultants	Principal Staff Involved in Project	EIAR Input
McCarthy Keville O' Sullivan Ltd. (MKO) Tuam Road Galway H91 VW84	Brian Keville Michael Watson Jimmy Green Órla Murphy Pat Roberts Dervla O' Dowd Meabhann Crowe Paul Sweeney Pdraig Cregg David Naughton John Hynes Laoise Kelly Joanna Mole Owen Cahill James Newell Joseph O'Brien	Project Managers, Scoping and Consultation, Preparation of Natura Impact Statement, Report Sections: <ol style="list-style-type: none"> 1. Introduction 2. Background to the Proposed Development 3. Site Selection and Reasonable Alternatives 4. Description of the Proposed Development 5. Population & Human Health 6. Biodiversity 7. Birds 10. Air & Climate 12. Landscape & Visual 14. Material Assets (non-Traffic) 15. Interaction of the Foregoing 16. Schedule of Mitigation
Hydro Environmental Services 22 Lower Main Street Dungarvan Co. Waterford	Michael Gill David Broderick	Flood Risk Assessment, Drainage Design, Preparation of Report Sections: <ol style="list-style-type: none"> 8. Land, Soils & Geology 9. Water
Gavin and Doherty Geosolutions (GDG) Unit A2, Nutgrove Office Park, Rathfarnham, Dublin 14,	Laura Burke Paul Quigley	Geotechnical site investigations; Peat Stability Assessment and Peat Management Plan

D14 X627		
AWN Consulting The Tecpro Building Clonsgaugh Business & Technology Park Dublin 17	Damien Kelly Dermot Blunnie Mikes Simms	Baseline Noise Survey, Preparation of Report Section <i>10. Noise and Vibration</i>
Tobar Archaeological Services Saleen Middleton Co. Cork	Annette Quinn Miriam Carroll	Archaeological Consultants; Preparation of EIAR Section: <i>13. Archaeological, Architectural and Cultural Heritage</i>
Alan Lipscombe Traffic and Transport Consultants Claran, Headford, Co. Galway	Alan Lipscombe	Swept Path Analysis, Preparation of Report Section: <i>14. Material Assets - Traffic and Transport</i>

1.8.2 Project Team Members

1.8.2.1 MKO

Brian Keville B.Sc. (Env.)

Brian Keville has over 17 years' professional experience as an environmental consultant having graduated from the National University of Ireland, Galway with a first class honours degree in Environmental Science. Brian was one of the founding directors of environmental consultancy, Keville & O'Sullivan Associates Ltd., prior to the company merging in 2008 to form McCarthy Keville O'Sullivan Ltd., and whom recently rebranded as MKO (March 2019). Brian's professional experience has focused on project and environmental management, and environmental impact assessments. Brian has acted as project manager and lead-consultant on numerous environmental impact assessments, across various Irish counties and planning authority areas. These projects have included large infrastructural projects such as roads, ports and municipal services projects, through to commercial, mixed-use, industrial and renewable energy projects. The majority of this work has required liaison and co-ordination with government agencies and bodies, technical project teams, sub-consultants and clients.

Michael Watson, MA; Miema CEnv PGeo

Michael Watson is Project Director and head of the Environment Team in MKO. Michael has over 18 years' experience in the environmental sector. Following the completion of his Master's Degree in Environmental Resource Management, Geography, from National University of Ireland, Maynooth he worked for the Geological Survey of Ireland and then a prominent private environmental &

hydrogeological consultancy prior to joining MKO in 2014. Michael's professional experience includes managing Environmental Impact Assessments, EPA License applications, hydrogeological assessments, environmental due diligence and general environmental assessment on behalf of clients in the wind farm, waste management, public sector, commercial and industrial sectors nationally. Michael's key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Michael is a key member of the MKO senior management team and as head of the Environment Team has responsibilities to mentor various grades of team members, foster a positive and promote continuous professional development for employees. Michael also has a Bachelor of Arts Degree in Geography and Economics from NUI Maynooth, is a Member of IEMA, a Chartered Environmentalist (CEnv) and Professional Geologist (PGeo).

Jimmy Green BA, MRUP; MIPI

Jimmy Green holds the position of Senior Planner in MKO and has a wide range of experience in project management and coordination, planning research, analysis, and retail planning. Jimmy holds a BA(Hons) Degree in Human and Physical Geography from National University Ireland Galway, a Masters Degree in Regional and Urban Planning from University College Dublin, and an Advanced Diploma in Planning and Environmental Law from Kings Inns. Jimmy has extensive planning experience in both the public and private sectors having worked as an Assistant Planner in Donegal County Council and subsequently as both an Executive and Senior Executive Planner in Galway County Council prior to joining private practice in October 2004. Since moving into the private sector he has provided consulting services to a wide range of private and public sector clients, and his experience includes planning application project management, environmental impact assessment preparation, retail impact assessment, development potential reporting, submissions to Development Plans/Local Area Plans. Over the last decade Jimmy has been involved in dozens of renewable energy developments from site identification, through feasibility, all stages of the planning permission process (from application, through to appeals and Judicial Review) including several Strategic Infrastructure Developments), as well as co-ordinating condition compliance and due diligence reporting. Jimmy is also a corporate member of the Irish Planning Institute.

Órla Murphy M.Sc., B.Sc.

Órla Murphy is a Project Environmental Scientist with McCarthy O'Sullivan Ltd. with over 4 years of experience in private consultancy. Órla holds BSc (Hons) in Geography from Queens University Belfast & a MSc in Environmental Protection and Management from the University of Edinburgh. Prior to taking up her position with McCarthy Keville O'Sullivan in January 2018, Órla worked as an Environmental Project Assistant with ITP Energised in Scotland. Órla's key strengths and areas of expertise are in Environmental Protection and Management, EIA, Project Management, Renewable Energy and Peatland Management, where she has carried out research projects and site work relating to restoration and management of peatland sites in both Scotland and Northern Ireland. On joining MKO Órla has been involved on a range of renewable energy infrastructure projects. In her role as a project manager, Órla works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Within MKO, Órla plays a role in the management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

Pat Roberts B.Sc. (Env.)

Pat Roberts is a Senior Ecologist and director of the Ecology team with McCarthy O'Sullivan Ltd. with over 12 years post graduate experience of providing ecological services in relation to a wide range of developments at the planning, construction and monitoring stages. Pat holds B.Sc.(Hons) in Environmental Science. Pat has extensive experience of providing ecological consultancy on large scale industrial and civil engineering projects. He is highly experienced in the completion of ecological baseline surveys and impact assessment at the planning stage. He has worked closely with construction personnel at the set-up stage of numerous construction sites to implement and monitor any prescribed best practice measures. He has designed numerous Environmental Operating Plans and prepared many environmental method statements in close conjunction with project teams and contractors. He has worked extensively on the identification, control and management of invasive species on numerous construction sites. Prior to taking up his position with MKO in June 2005, Pat worked in Ireland, USA

and UK as a Tree Surgeon and as a nature conservation warden with the National Trust (UK) and the US National Park Service. Pats key strengths include his depth of knowledge and experience of a wide range of ecological and biodiversity topics and also in his ability to understand the requirements of the client in a wide range of situations. He currently manages the ecological team within MKO and ensures that the outputs from that team are of a very high standard and meet the requirements of the clients and relevant legislation and guidelines. He is a full member of the Chartered Institute of Ecologists and Environmental Managers (CIEEM)

Dervla O'Dowd B.Sc. (Env.)

Dervla O'Dowd is a Senior Ecologist and Project Manager with McCarthy O'Sullivan Ltd. with twelve years of experience in environmental consultancy. Dervla graduated with a first class honours B.Sc. in Environmental Science from NUI, Galway in 2005 and joined Keville O'Sullivan Associates in the same year. Dervla has gained extensive experience in the project management and ecological assessment of the impacts of various infrastructural projects including wind energy projects, water supply schemes, road schemes and housing developments nationwide and has also been involved in the compilation of Environmental Impact Statements, with emphasis on sections such as Flora & Fauna, and acted as EIS/EIAR co-ordinator on many of these projects. Dervla has also provided site supervision for infrastructural works within designated conservation areas, in particular within aquatic habitats, and has also been involved in the development of environmental/ecological educational resource materials and major ecological surveys of inland waterways. Currently, Dervla is responsible for coordinating ecological work, in particular ornithological surveys required on major infrastructural projects, with emphasis on wind energy projects. Dervla's key strengths and areas of expertise are in project management, project strategy, business development and survey co-ordination to ensure the efficient operation of the Ornithology team's field survey schedule. Dervla holds full membership of the Chartered Institute of Ecology and Environmental Management and current Safe Pass card.

Meabhann Crowe M.Sc, BA (Hons), MRTPI

Meabhann Crowe is a Project Planner with McCarthy O'Sullivan Ltd with over 10 years private sector experience. She is a fully chartered member of the Royal Town Planning Institute (MRTPI). Meabhann holds a BA (Hons) in Geography, Sociological and Political Science and a Masters in Urban and Regional Planning. Prior to taking up her position with McCarthy Keville O'Sullivan in October 2018, Meabhann was employed as an Associate Director with Colliers International in their Edinburgh office, prior to which she was employed for several years with Halliday Fraser Munro. In her time in the industry Meabhann has been active on a number of instructions across a broad spectrum of mixed-use, residential, commercial, renewable energy and retail projects.

Meabhann brings particular expertise in initial development feasibility appraisals and development strategies. Her experience in managing large multi-disciplinary teams in the preparation of local and major planning applications across residential and mixed-use and retail developments means she has a wealth of knowledge to draw on in the early stages of development. She has particular experience in preparing and managing site strategies which include both responding to emerging planning policy whilst also preparing and progressing planning applications and appeals.

Paul Sweeney BA. MSc.

Paul Sweeney is a Graduate Planner with MKO having joined the team in April 2018. Paul holds a BA (Hons) in Geography and English and a Masters in Planning and Sustainable Development from University College Cork where he graduated in 2017. Since joining MKO, Paul has started to develop experience in a range of sectors through various projects and planning issues with a current focus within the Environmental and Energy sector.

Padraig Cregg M.Sc, B.Sc (Hons)

Padraig Cregg is a Senior Ornithologist with McCarthy O'Sullivan Ltd. with over 7 years of experience in both private practice and NGOs. Padraig holds a BSc (Hons) in Zoology and Masters in Evolutionary and Behavioural Ecology. Prior to taking up his position with McCarthy Keville O'Sullivan in December 2018, Padraig worked as a Senior Ornithologist and held previous posts with TOBIN Consulting Engineers, Energised Environments Ltd in Scotland, WSP Environment and Energy Ltd in Scotland and

BirdWatch Ireland. Pdraig has specialist knowledge in designing, executing and project managing ornithological assessments, primarily in the renewable industry. Pdraig's key strengths and areas of expertise are in ornithology and ecology surveying and in writing Natura Impact Statements (NIS) and the Biodiversity chapter of Environmental Impact Assessment Reports (EIAR) to accompany planning applications. Since joining MKO Pdraig has been involved in designing, executing and project managing the ornithological assessment on over 20 proposed wind farm developments. He has played a key role in project managing these planning applications through the statutory planning system, with more projects in the pipeline. Within MKO Pdraig plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIAR and NIS Reports.

David Naughton B.Sc. (Env.)

David Naughton is an Environmental Scientist with MKO ltd. with over three years of experience. David graduated with an honours B.Sc. degree in Environmental Science from NUIG in 2016. David has experience as an Environmental Clerk of Works (ECoW) including monitoring, oversight and reporting of the implementation of all planning and environmental requirements for on-site developments. David has a wide range of ecological experience including bird surveys, vegetation surveys, terrestrial invertebrate surveys, freshwater invertebrate surveys, river surveys for salmonids and other fish species, small mammal surveys and habitat identification. David is also very accomplished in GIS software systems for use in interpreting ecological data. David has experience in report writing and has been involved the production of several EIS/EIARs for various windfarm projects as well as numerous interim bird survey reports issued to clients on an ongoing basis. David has also been responsible for the production of collision risk modelling for bird activities at several windfarm sites over the past year, many of which have been peer reviewed by experts in CRM and were found to be appropriate. David's key strengths and areas of expertise are applications of GIS systems, including viewshed analysis and collision risk modelling, project management, survey planning and analysing & interpreting large scale datasets. Since joining MKO David has been involved in a wide range of various projects, acting as project manager for many bird survey projects while providing a pivotal contact link between clients and field surveyors.

Margaux Pierrel M.Sc

Margaux Pierrel is an Ornithologist with MKO with over 3 years of experience in both private practice and working for public authorities. Margaux holds an engineering diploma (M.Sc.) from the National Engineering School of VetAgro Sup, Clermont-Ferrand (France) with a specialisation in environment, rural development and agronomy. Prior to taking up her position with MKO in September 2019, Margaux worked as an ecologist with Inis Environmental Ltd. and held previous posts with the National Parks and Wildlife Service, Vincent Wildlife Trust and Wildlife Sense (Greece). Margaux is a field engineer with specialist knowledge in providing ecological input into a range of development projects, undertaking ornithological fieldwork surveys and processing data in line with best practice. Margaux's key strengths and areas of expertise are in ornithological and ecological surveys, project co-ordination and communication. Since joining MKO, Margaux has been involved in carrying out ornithological surveys on energy infrastructure sites, generally windfarms projects, as part of the Ornithology team.

John Hynes M.Sc. (Ecology), B.Sc.

John Hynes is a Senior Ecologist with McCarthy O'Sullivan Ltd. with over 7 years of experience in both private practice and local authorities. John holds a B.SC in Environmental Science and a M.Sc. in Applied Ecology. Prior to taking up his position with MKO in March 2014, John worked as an Ecologist with Ryan Hanley Consulting Ltd. and Galway County Council. John has specialist knowledge in Flora and Fauna field surveys. Geographic Information Systems, data analysis, Appropriate Assessment, Ecological Impact Assessment and Environmental Impact Assessment. John's key strengths and areas of expertise are in project management. GIS and impact assessment. Since joining MKO John has been involved as a Senior Ecologist on a significant range of energy infrastructure, commercial, national roads and private/public development projects. Within MKO John plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIS/EIAR Reports. John has project managed a range of strategy and development projects across the Ireland and holds CIEEM membership.

Laoise Kelly B.Sc

Laoise is a Project Ecologist with MKO with over 6 years of experience in both private practice and local authorities. Laoise holds a B.Sc. (Hons) in Environmental Science. Prior to taking up her position with McCarthy Keville O'Sullivan in September 2014, Laoise worked as a freshwater field and lab technician with Waterford County Council. She also has experience working with a number of conservation organisations including the Great Basin Institute, Nevada, the Wildlife Rehabilitation Trust, Bat Conservation Ireland and BirdWatch Ireland. Laoise's key strengths and areas of expertise are in terrestrial flora and fauna ecology including habitat mapping and bat surveys as well as freshwater macroinvertebrate surveys. Since joining MKO Laoise has been overseeing project management of invasive species surveys and management plans as well as carrying out site supervision of large scale projects in the form of Ecological Clerk of Works. Within MKO Laoise plays a large role in carrying out Stage 1 and Stage 2 Appropriate Assessment Reports and contributing to Environmental Impact Statements. Laoise has been involved with a number of projects nationwide and holds membership with the Chartered Institute of Ecology and Environmental Management as well as Bat Conservation Ireland and the Irish Wildlife Trust.

Joanna Mole BSc PGDipLA MSc CMLI

Joanna Mole is a Landscape and Visual Impact Assessment Specialist and Chartered Landscape Architect with McCarthy O'Sullivan Ltd. with over 16 years of experience in both private practice and local authorities. Joanna holds a BSc (Hons) in Landscape Design & Plant Science from Sheffield University, a Postgraduate Diploma in Landscape Architecture from Leeds Beckett University, and a MSc in Renewable Energy Systems Technology from Loughborough University. Prior to taking up her position with MKO in October 2017, Joanna worked as a Landscape Architect with Kav-Banof in Israel and held previous posts with CSR in Cork, LMK in Limerick, Geo Architects in Israel and Groundwork Bridgend in South Wales. Joanna is a Chartered Landscape Architect with specialist knowledge in Landscape and Visual Impact assessments for projects ranging from individual houses to large windfarms, cycle route design and landscape contract management. Since joining MKO Joanna has been involved in projects such as energy infrastructure, extraction industry and residential projects. Joanna holds chartered membership of the British Landscape Institute since 1998 and has been an examiner for British Landscape Institute professional practice exam.

Owen Cahill B.Sc., M.Sc.

Owen is an Environmental Engineer with McCarthy O'Sullivan Ltd. with over 11 years of experience in the environmental management and construction industries. Owen holds BSc. (Hons) and MSc. in Construction Management and a Masters in Environmental Engineering. Prior to taking up his position with MKO in October 2013, Owen worked as an Environmental Officer with Kepak and prior to which he held a post with Pentland Macdonald Contaminated Land & Water Specialist in Northern Ireland. Prior to working in planning and environmental consultancy, Owen was employed within the construction industry where he gained significant experience on a variety of civil, residential and commercial projects. Owen's wide ranging multi sector experience has provided him with specialist knowledge and understanding of the challenges in the planning and delivery of developments with the minimum environmental impact and with practicality and constructability in mind. Owen's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy & solar energy construction & environmental management planning and waste permit management. Since joining MKO Owen has been involved as a Project Manager on a range of energy infrastructure, commercial, residential, waste facility and quarry projects as well as managing the licensing requirements of a number of EPA licensed facilities. Within MKO Owen plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIS/EIAR Reports. Owen has project managed the Environmental Impact Assessment of a range of development projects across the Ireland and holds Affiliate Membership with the Institute of Environmental Management & Assessment and is currently awaiting interview and assessment to become a Full Member and Chartered Environmentalist.

James Newell

James holds the position of CAD and Information Technology Technician with MKO since joining the Company in May 2006. Prior to joining MKO, he worked as a graphic designer and illustrator for over

eight years. In recent years James' role has extended to include all wind farm visual modelling completed by the company. He is proficient in the use of MapInfo GIS software in addition to AutoCAD and other design and graphics packages.

Joseph O'Brien

Joseph O'Brien holds the position of CAD Technician. Joseph holds a BA Honours Level 8 Modelmaking, Design and Digital Effect, Institute of Art Design and Technology (IADT), Dun Laoghaire & City & Guilds Level 3 2D & 3D AutoCAD certificates. Joseph's role entails various wind and solar farm projects which require various skills such as mapping, aerial registration and detailed design drawings for projects. Prior to joining us, Joseph worked as a free-lance Modelmaker and CAD Technician. His previous experience included designing various models and props through CAD and then making them for various conventions such as Dublin Comic Con and Arcade Con.

1.8.2.2 **Hydro Environmental Services Ltd.**

Michael Gill

Michael Gill is an Environmental Engineer with over ten years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms in Ireland. He has also managed EIA/EIAR assessments for infrastructure projects and private residential and commercial developments. In addition, he has substantial experience in wastewater engineering and site suitability assessments, contaminated land investigation and assessment, wetland hydrology/hydrogeology, water resource assessments, surface water drainage design and SUDs design, and surface water/groundwater interactions.

David Broderick

David Broderick is a hydrogeologist with over seven years' experience in both the public and private sectors. Having spent two years working in the Geological Survey of Ireland working mainly on groundwater and source protection studies. David moved into the private sector. David has a strong background in groundwater resource assessment and hydrogeological/hydrological investigations in relation to developments such as quarries and wind farms. David has completed numerous geology and water sections for input into EIAs for a range of commercial developments.

1.8.2.3 **Gavin and Doherty Geosolutions**

Laura Burke (BE, M.Sc, MIEI CEng)

Laura is a Chartered Engineer with seven years' experience in design, site representation, construction supervision and ground investigation for roads and onshore wind projects. Her main areas of expertise include geology, geotechnics, roads and renewable energy. She has experience in public consultation for route selection and construction phases of highways projects in UK and Ireland.

Paul Quigley (B.E., CEng, MIEI)

Paul is a technical Director and chartered engineer with 22 years of experience in geotechnical engineering. He has worked on a wide variety of projects for employers, contractors and third parties gaining a range of experience including earthworks for major infrastructure schemes in Ireland and overseas, flood protection schemes, retaining wall and basement projects, ground investigations and forensic reviews of failures. Paul is experienced in design and construction of large infrastructure projects within blanket and raised bogs including Corrib gas field, Co. Mayo, Slagbooly Wind Farm, Sullom Oil Terminal, Shetlands and the BGE Galway Mayo Pipeline. Paul has delivered a number of publications on the topic of peat stabilisation and construction in raised and blanket peatlands. He is a reviewer for the ICE Geotechnical Engineering Journal, a member of XVI ECSMGE Scientific committee and a former Chairman of the Geotechnical Society of Ireland.

1.8.2.4 **AWN Consulting Ltd.**

Damian Kelly

Damian Kelly (Director (Acoustics)) holds a BSc from DCU and an MSc from QUB. He has extensive experience as an acoustic consultant working in the field since 1997 and is a member of the Institute of Acoustics. He is currently a sitting member of the Irish committee of this organisation. He has extensive knowledge in the field of noise modelling and prediction having developed many of the largest and most complex examples of proprietary noise models prepared in Ireland to date. Damian has prepared an extensive number of wind farm noise impact assessments throughout the country.

Dermot Blunnie

Dermot Blunnie (Senior Acoustic Consultant) holds a BEng (Hons) in Sound Engineering, MSc in Applied Acoustics and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has been working in the field of acoustics since 2008 and is a member of the Institute of Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA). He has extensive knowledge and experience in relation to commissioning noise monitoring and impact assessment of wind farms as well as a detailed knowledge of acoustic standards and proprietary noise modelling software packages. He has commissioned noise surveys and completed noise impact assessments for numerous wind farm projects within Ireland

Mike Simms

Mike Simms (Senior Acoustic Consultant) holds a Bachelor of Mechanical Engineering and Master of Engineering Science from University College Dublin he also holds a Diploma in Acoustics and Noise Control from the University of Ulster at Jordanstown. He has 16 years' experience in the field of environmental acoustics, in particular using computer-based noise modelling for environmental noise assessments.

1.8.2.5 **Tobar Archaeological Services**

Tobar Archaeological Services is a Cork-based company in its 16th year in business. They offer professional nationwide services ranging from pre-planning assessments to archaeological excavation, and cater for clients in state agencies, private and public sectors.

Tobar's Directors, Annette Quinn and Miriam Carroll, are licensed by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs to carry out excavations in Ireland and have carried out work directly for the National Monuments Services of the Department of the Environment, Heritage and Local Government. Tobar Archaeological Services has a proven track record and extensive experience in the wind farm industry from EIS/EIAR stage through to construction stage when archaeological monitoring is frequently required.

1.8.2.6 **Alan Lipscombe Traffic and Transport Consultants**

Alan Lipscombe (B.Eng. Hons.) MIHT

In January 2007, Alan Lipscombe set up an independent traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the NUI Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic and transport modelling and is an accomplished analyst who has experience of a wide variety of modelling packages and methods.

1.9 Difficulties Encountered

There were no technical difficulties encountered during the preparation of this EIAR.

1.10 Viewing and Purchasing of the EIAR

Copies of this EIAR will be available online, including the Non-Technical Summary (NTS), on the Planning Section of the Cork County Council website, <https://www.corkcoco.ie/en/planning> under the relevant Planning Reference Number (to be assigned on lodgement of the application).

This EIAR and all associated documentation will also be available for viewing at the offices of Cork County Council. The EIAR may be inspected free of charge or purchased by any member of the public during normal office hours at the following address:

Cork County Council,
Planning Section,
Norton House,
Cork Road,
Skibbereen,
Co. Cork
P81 AT28

The EIAR will also be available to view online via the Department of Planning, Housing and Local Government's EIA Portal, which will provide a link to the planning authority's website on which the application details are contained. This EIA Portal was recently set up by the Department as an electronic notification to the public of requests for development consent which are accompanied by an EIAR. (<https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal>).