

1.

INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of Cleanrath Windfarm Ltd. and accompanies an application made to An Bord Pleanála (the Board) for substitute consent under Section 177E of the Planning and Development Act, 2000. The development which is the subject of the application for substitute consent comprises a 9 turbine wind farm and associated works including the grid connection used to export electricity to the national grid and access works into the site to accommodate delivery of turbine components.

The wind farm development has been constructed, has been operational for a short-term period (December 2019 to the end of April 2020) and is now currently operating in Sleep Mode where the turbines are in a controlled mode which is maintained by the turbine manufacturer and are generally not producing electricity pending the outcome of the Substitute Consent process.

This EIAR assesses the potential environmental impacts arising from the Cleanrath wind farm development from the date the substitute consent application is submitted to the Board. The application is also accompanied by a Remedial Environmental Impact Assessment Report (rEIAR) which assesses the potential environmental impacts arising from all phases of the Cleanrath wind farm development and includes the construction, operational (including the short term operation, current Sleep Mode operation and full operation) and decommissioning phases. There is a significant overlap in terms of the information contained within both the EIAR and the rEIAR as it is not always possible or desirable to separate the assessment of effects between the documents.

For completeness, a summary of potential environmental impacts arising from the Cleanrath wind farm development prior to the submission of the substitute application to the Board has been summarised included in this EIAR. The development and all associated works is hereafter referred to as the Cleanrath wind farm development and is located in the townlands listed in Table 1-1. The site location is outlined in Figure 1-1.

Table 1-1 Townlands within which the Cleanrath wind farm development is located

Townland	
Reananerree	Cloontycarthy
Cleanrath North	Derrineanig
Cleanrath South	Milmorane
Coombilane	Rathgaskig
Augeris	Gorteenakilla
Carrignadoura	Gurteenowen
Gurteenflugh	Lyrenageeha
Lackabaun	

1.1

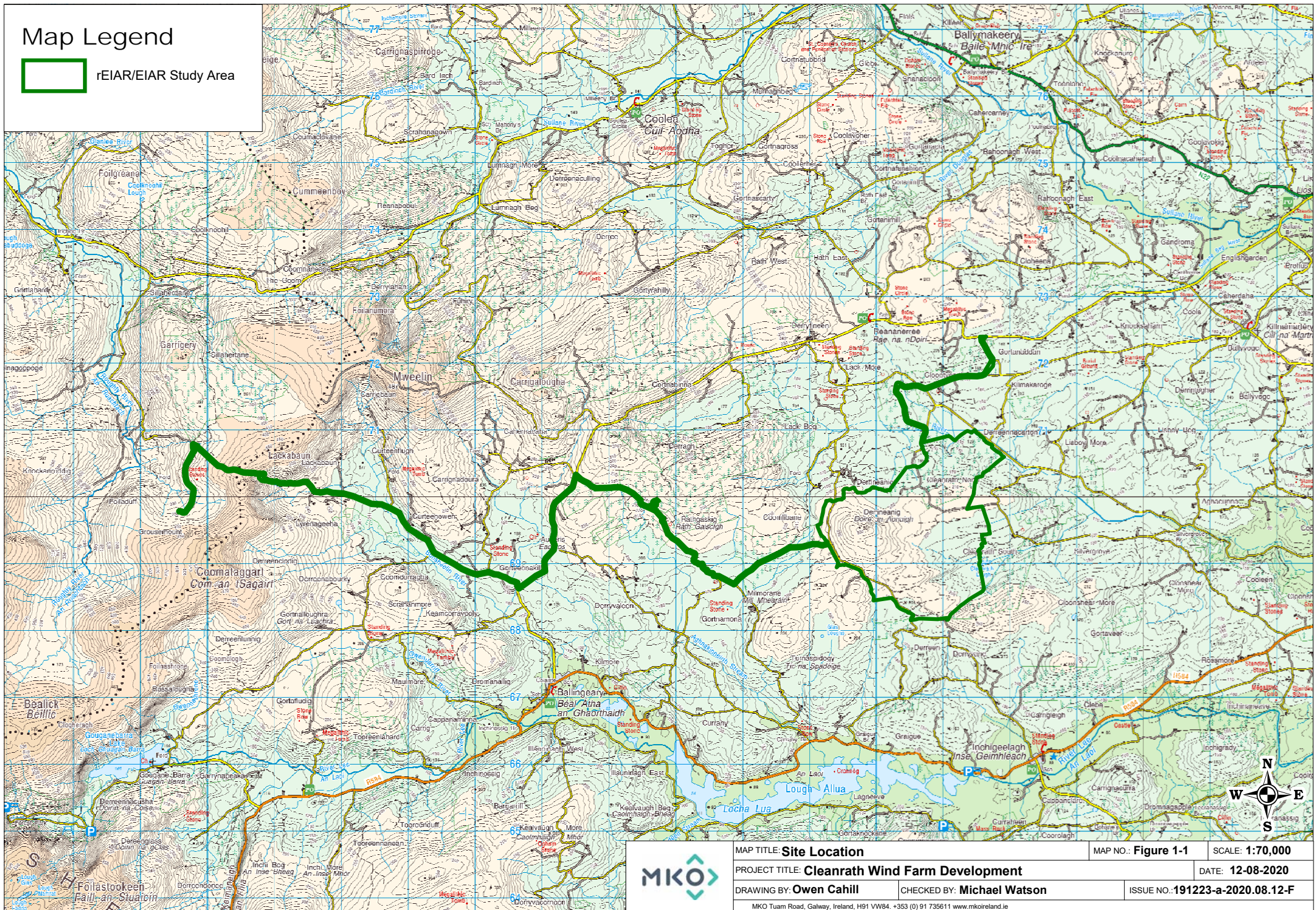
The Applicant

The applicant for substitute consent for the Cleanrath wind farm development is Cleanrath Windfarm Ltd., Lissarda Industrial Estate, Lissarda, County Cork, which is a subsidiary company of Enerco Energy Ltd. (Enerco). Enerco is an Irish-owned, Cork-based company with extensive experience in the

Map Legend



EIR/Study Area



MAP TITLE: Site Location		MAP NO.: Figure 1-1	SCALE: 1:70,000
PROJECT TITLE: Cleanrath Wind Farm Development			DATE: 12-08-2020
DRAWING BY: Owen Cahill	CHECKED BY: Michael Watson	ISSUE NO.: 191223-a-2020.08.12-F	
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design, construction and operation of wind energy developments throughout Ireland, with projects currently operating in Counties Cork, Kerry, Limerick, Clare, Galway & Mayo.

By early 2020, Enerco had installed a generating capacity of approximately 550 MW, with 180 MW under construction and a further 400MW of projects at various stages in its portfolio to assist in meeting Ireland's renewable energy targets.

1.2

Planning Background

There is a significant planning history associated with the Cleanrath wind farm development which is summarised in Chapter 2 of this EIAR. By way of introduction, it is sufficient to state that, in May 2017, An Bord Pleanála granted permission (on appeal from a decision made by Cork County Council) for a wind energy development comprising 11 no. turbines and associated works (including substation and all grid connection works) at the site of the Cleanrath wind farm development (ABP Ref. PL04.246742) (hereafter referred to as the 2017 Permission). An Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) was completed by the Board as part of its consideration of the appeal. The decision to grant permission was made on the 19th May 2017 and subject to 22 no. conditions.

Judicial review proceedings were instituted in July 2017 challenging the decision of the Board to grant permission. In May 2018, the High Court refused the application for judicial review and leave for appeal. However, the Supreme Court allowed an appeal and in a judgement, dated the 12th December 2019, it stated (at paragraph 57 of its judgment): “it is necessary to quash the decision of the Board granting permission”.

An application for leave to apply for substitute consent was made by Cleanrath Windfarm Ltd on the 19th December 2019 and said leave was granted by the Board on the 5th May 2020 based on the following reasons and considerations:

(a) the development is one where an Environmental Impact Assessment and Appropriate Assessment are required,

(b) the permission granted for the development by the Board (appeal reference number PL 04.246742, planning register reference number 15/6966) may be in breach of law, invalid or otherwise defective in a material respect pursuant to a final judgment of the Supreme Court [No. 167/18] by reason of a procedural error, and

(c) exceptional circumstances exist by reference, in particular, to the following:

- *the fact that the regularisation of the development would not circumvent the purpose or objectives of the Environmental Impact Assessment Directive or the Habitats directive,*
- *that the applicant could reasonably have had a belief that the development was not unauthorised,*
- *that the ability to carry out an Environmental Impact Assessment and Appropriate Assessment, and provide for public participation in such assessments, has not been substantially impaired, and*
- *that the actual or likely significant effects on the environment or adverse effects on the integrity of a European Site, if any, can be remedied.*

In the period between the permission being granted by the Board (on 19 May 2017) and the date of this application for substitute consent, development authorised by the 2017 Permission has been carried out to the extent that 9 of the 11 turbines that were granted permission have been completed along with their ancillary infrastructure.

The Supreme Court Order

The Judicial Review proceedings referred to above culminated in an Order of the Supreme Court dated the 19th June 2020 whereby the order quashing the decision to grant the 2017 permission was stayed pending the decision of the Board on this application for substitute consent, on the undertaking of Cleanrath Windfarm Ltd. not to operate the wind farm development other than in accordance with the terms of the letter from its solicitor dated the 30th day of April 2020.

In that letter, it was confirmed that:

- With effect from 1st May 2020, Cleanrath Windfarm Limited will not operate the Cleanrath wind farm development pending the decision of An Bord Pleanála on the substitute consent procedure received by the Board on 20th December 2019;
- No electricity whatever will be generated by the nine constructed Cleanrath wind farm turbines for export to the national grid (other than in the context of the Eirgrid testing and the 10% protection mode, as set out below). However, Cleanrath Windfarm Limited will run the Cleanrath turbines in “sleep mode” (FM05), whereby the rotors may turn very slowly and which will not generate any electricity for export.
- In circumstances where there is a series of tests that EirGrid plc, as the Transmission Systems Operator (TSO), needs to carry out on the turbines – including Grid Code Compliance tests – , completed in three or four phases over the course of the year (each phase taking 2 or 3 days) and where EirGrid requires that the turbines are in a fully operational mode and exporting to the grid for the duration of each test phase, in order to enable all testing to be undertaken by EirGrid, the turbines will be required to be made fully operational for a maximum of 15 days over the period up to 30th April 2021;
- The grid connection between both the Cleanrath and Derragh wind farm developments and the national grid is authorised by the 2017 permission, whilst the construction of the Derragh turbines and onsite infrastructure is authorised pursuant to a separate grant of permission (ref. no. PL02.245082). In order to enable the continuation of export to the national grid of electricity generated by the operation of the six turbines located at the Derragh windfarm development (which has been ongoing since late 2019), it will be necessary to utilise the grid connection authorised under the 2017 permission. In these circumstances, no electricity whatever will be generated from the Cleanrath wind farm turbines and exported to the national grid (other than for the purposes of the Eirgrid testing and the 10% protection mode referenced above). Rather, only electricity generated from the Derragh windfarm turbines will be exported to the national grid via the grid connection from the Derragh substation.

Purpose and Scope of the EIAR

As part of the Environmental Impact Assessment process, the developer of the project must prepare and submit an Environmental Impact Assessment Report (hereafter referred to as the EIAR). This is the first step of the EIA process, as mentioned in Article 1(2)(g) of European Union Directive 2011/92/EU, as amended by Directive 2014/52/EU on assessment of the effects of certain public and private Projects on the environment (“the EIA Directive”). The EIAR is the document prepared by the developer that presents the output of the assessment. It contains information regarding the project, the likely significant effect of the Project, the Baseline scenario, the reasonable alternatives considered by the developer, the features and Measures to mitigate adverse significant effects as well as a Non-Technical Summary and any additional information specified in Annex IV of the EIA Directive.

Article 5 of the EIA Directive sets out what must be included in the EIAR, and how to ensure that it is both of a sufficient high quality and complete. This EIAR provides a statement of the likely significant effects associated with the Cleanrath wind farm development from the date upon which the application for substitute consent is submitted to the Board (i.e., August 2020). Although elements of this prospective

assessment overlaps with elements of the retrospective assessment provided in the rEIAR, for completeness and the avoidance of doubt, this separate EIAR for future phases of the development has been prepared in order to allow An Bord Pleanála to complete an EIA for the prospective elements of the Cleanrath wind farm development

It is important to distinguish the Environmental Impact Assessment (EIA) that will be carried out by An Bord Pleanála on the application for substitute consent from this EIAR. The EIA process is composed of different steps: including preparation of the EIA Report, publicity and consultation and decision-making. 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 Cleanrath wind farm development on the following:

Population and Human Health, Biodiversity, Land & Soils, Water, Air, Climate, Material Assets, Cultural Heritage, Landscape and Interactions between these factors

1.5

Purpose and Scope of the rEIAR

The application for Substitute Consent is also accompanied by a Remedial Environmental Impact Assessment Report (rEIAR). The purpose of the rEIAR prepared as part of the substitute consent application is to document the likely significant effects, if any, on the environment, which have occurred, or which are occurring or which can reasonably be expected to occur because the development was carried out. To this end it includes an assessment of all phases of the development - construction, operational and decommissioning.

The operational phase considered in the rEIAR includes for the initial operational period between December 2019 and the end of April 2020 and also the restricted operation of the Cleanrath wind farm development (in conformity with the undertaking given to the Supreme Court to operate the development in “Sleep Mode” other than for testing etc.) from 1st May 2020 to the date upon which the application for substitute consent was submitted (i.e. August 2020). The operation of the grid connection to facilitate the connection of both Cleanrath and Derragh wind farms is also considered in the rEIAR.

The rEIAR also contains information regarding the Project, the likely significant effect of the Project, the Baseline scenario, the reasonable alternatives considered by the developer, the features and Measures to mitigate adverse significant effects as well as a Non-Technical Summary and any additional information specified in Annex IV of the EIA Directive.

The rEIAR submitted by the applicant provides the relevant environmental information to enable the retrospective EIA to be carried out by the competent authority.

The monitoring results and reporting completed during the construction and operational phases of the Cleanrath wind farm development have informed the assessment of the impacts and effects in the rEIAR and in the accompanying remedial Natura Impact Statement [rNIS]. As set out in the rEIAR, the Cleanrath wind farm development did not cause any significant environmental effects. Moreover, and as set out in the rNIS, the Cleanrath wind farm development did not cause any adverse effect on the integrity of any European sites during the construction or the operational phase. This EIAR draws upon the information and conclusions arrived at in the rEIAR and rNIS for the purpose of assessing the likely significant effects of the Cleanrath wind farm development moving forward from August 2020. Where potential impacts are not dependant on the August 2020 timeframe a precautionary or worst case assessment has been completed.

1.6

Brief Description of the Cleanrath wind farm development

This section provides an overview of the Cleanrath wind farm development. Chapter 2 Planning Policy describes in detail the Planning History of the site and Chapter 4 Description, provides the detail with regards the various components of the Cleanrath wind farm development.

1.6.1

Overview of the Cleanrath wind farm development

The development permitted development under the decision to grant permission made in May 2017 (under ref. no. PL 04.246742) comprised:

- Up to Eleven no. turbines with a maximum ground to blade tip height of up to 150m;
- Upgrading of existing and provision of new internal access roads;
- Wind anemometry mast (up to 100m height);
- Two no. borrow pits;
- Underground electrical cabling;
- Underground grid connection electrical cabling and all associated infrastructure;
- Junction accommodation works and temporary roadway to facilitate the turbine delivery route;
- Electricity Substation;
- Construction compound;
- Upgrading of site access junctions,
- Permanent signage, and
- All ancillary works.

The development which was actually completed and/or commenced pursuant to the 2017 permission comprised;

- 9 No. wind turbines with a ground to blade tip height of 150 metres and all associated foundations and hard-standing areas.
- All associated underground electrical (33kV & 38kV) and communications cabling connecting the turbines to the national electricity grid.
- Upgrade of existing access junctions and roads.
- Upgrade of existing and provision of new site access roads.
- Borrow pit.
- Temporary construction compound.
- Accommodation works along the turbine delivery route
- Temporary roadway to facilitate turbine delivery.
- Forestry Felling
- Site Drainage;
- All associated site development and ancillary works.

The future development components, which comprise the focus of this EIAR comprise,

- The current 'Sleep Mode' operations
- Future full operation of the wind farm
- Ongoing Maintenance
- Peatland Habitat Restoration
- Monitoring
- Decommissioning (early or post full operational period)

The installed turbines on the Cleanrath wind farm development are Nordex N117, which has a ground-to-blade tip height of 150m. The construction phase of the Cleanrath wind farm development was

carried out following the agreement of all compliance issues arising under the conditions attached to the grant of permission with Cork County Council. The works were completed in accordance with an agreed Construction & Environmental Management Plan (CEMP) including environmental, hydrological, archaeological and ecological onsite supervision and monitoring from competent experts in their fields.

In the circumstances set out above, the Cleanrath wind farm development operated from December 2019 up to May 2020. During this period, the turbines generated electricity from the site to the national grid whilst the manufacturer carried out necessary checks on and testing of the turbines and related equipment and infrastructure. Since May 2020 the wind farm has entered into and operated under what is referred to as Sleep Mode. In this limited mode of operation, the turbines are controlled by the turbine manufacturer and are generally not producing electricity. In normal circumstances, the blades are allowed to rotate facing the wind without generation of electricity.

The layout of the Cleanrath wind farm development was chosen following careful consideration of constraints, thereby avoiding environmentally sensitive areas. The roads layout for the Cleanrath wind farm development made use of the existing onsite access roads and tracks where possible, with approximately 1.3 kilometres of existing roadway upgraded and approximately 4.8 kilometres of new access road installed during construction.

The Study Area for the Cleanrath wind farm development measures approximately 525 hectares. Where the 'Study Area' is referred to in this EIAR, this means the Study Area for the remedial Environmental Impact Assessment Report. The actual site or "red line" boundary for the purposes of the substitute consent application will occupy a smaller area. The permanent footprint of the Cleanrath wind farm development measures approximately 9.5 hectares, which represents approximately 1.8% of the total EIAR Study Area.

The Cleanrath wind farm development is connected to the national grid via an underground cable connection running from the Cleanrath wind farm development to the existing Coomataggart Substation, located approximately 10 kilometres to the west of the Cleanrath wind farm development, in the townland of Grousemount, Kilgarvan, Co. Kerry. The underground cabling follows the route of the existing public road corridor for the majority of the route and follows the routes of existing access roads to the now-constructed Coomataggart substation.

Approximately 12.32 hectares of forestry was felled under licence from the Forest Service to accommodate the infrastructure of the Cleanrath wind farm development and in compliance with mitigation measures prescribed in the previous EIS and agreed in the CEMP to protect local bat species. Details regarding the area felled are outlined in Chapter 4. The Forest Service policy on the granting of felling licences requires replanting of forestry on a hectare by hectare basis. Some replanting will take place on the site of the Cleanrath wind farm development. In addition, two sites have been replanted in accordance with their Technical Approval for afforestation which were granted by The Forest Service the details of which outlined in Chapter 4.

Concurrent with the submission of the planning application for the development of the Cleanrath wind farm infrastructure and grid connection located within the Cork County Council functional area, a separate planning application was also submitted to Kerry County Council in relation to approximately 2 kilometres of the underground electrical grid connection works within its functional area (Pl. Ref. 15/1164 refers).

The application for the 2017 Permission made provision for the development of grid connection infrastructure arising from the amalgamation of the power generated from the Cleanrath wind farm development and the nearby Derragh wind farm development. This involved the cabling from the Cleanrath wind farm development looping into the Derragh site where the power is combined at the Derragh substation and exported to the national electricity grid at Coomataggart substation (Co. Kerry) along the underground cable route included and assessed in the 2017 Permission. The Derragh substation, which was amended and re-located within the Derragh wind farm site (granted permission

under Pl. Ref. 17/5126), facilitated this amalgamation of the power from the wind farms and therefore the Derragh substation is assessed as part of the project.

The works carried out on the Cleanrath wind farm development site also incorporate a minor amendment to the underground electrical cabling and provision of an additional operational access/inspection road for the wind farm. Permission for these alterations to the development authorised under the 2017 Permission was granted by the Planning Authority (Cork County Council) under Pl. Ref. 18/4458.

Following the grants of permission issuing, the developer engaged with the relevant Planning Authority in relation to all relevant condition compliance requirements and subsequently construction of the permitted wind farm and all associated works commenced. The works that have been carried out are those which have been built in accordance with planning permission issued by An Bord Pleanála (PL04.246742), Kerry County Council (Pl. Ref. 15/1164) and Cork County Council (Pl. Ref. 17/5126 & 18/4458).

In the interests of clarity, the full extent of the works that have been carried out are set out in Figure 1-2. Again, for the reasons set out above, it should be noted that the electrical substation permitted by the Board under PL04.246742 on the Cleanrath wind farm development site has not been constructed. This piece of infrastructure was not necessary as a revised substation was authorised at the Derragh wind farm by Cork County Council under Pl. Ref. 17/5126 as discussed above.

Moreover, it is important to note that some elements of the development authorised by the Board under the 2017 Permission have not been constructed at the Cleanrath wind farm and these do not form part of the prospective EIA as consent is not being sought for them. The elements that have not been constructed include 2no. wind turbines, permanent met mast, on-site substation and access roads & underground cabling not required as a result of the omitted infrastructure. Figure 1-2 shows the elements that have not been constructed in blue.

Whilst this application for substitute consent relates only to the development permitted pursuant to the 2017 Permission, all other aspects of the Cleanrath wind farm project have been considered and assessed.

1.7









Legislative Context

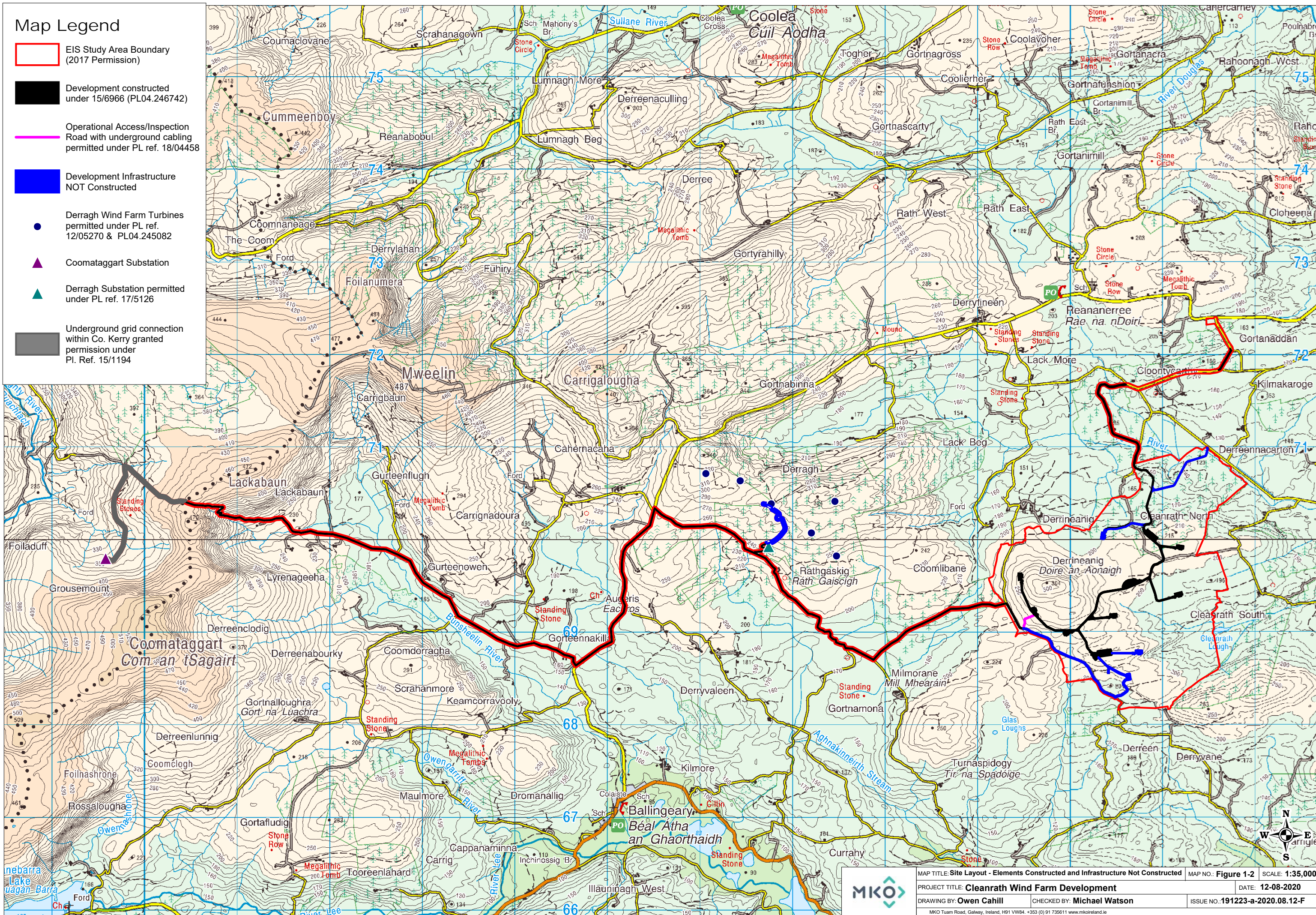
The obligations under the EIA Directive – European Union Directive 2011/92/EU, as amended by Directive 2014/52/EU on assessment of the effects of certain public and private Projects on the environment – have been transposed into Irish planning legislation pursuant to the provisions of Part X of the Planning and Development Acts 2000 to 2020 and Part 10 of the Planning and Development Regulations 2001 to 2020.

In circumstances where Directive 2014/52/EU is in force and the provisions of the European Union (Planning and Development)(Environmental Impact Assessment) Regulations 2018 [S.I. No. 296 of 2018], as amended, have been commenced, this EIAR complies with all applicable requirements of EU and Irish law.

The Environmental Impact Assessment (EIA) of the application for substitute consent in respect of the Cleanrath wind farm development will be undertaken by An Bord Pleanála, as the competent authority.

Map Legend

-  EIS Study Area Boundary
(2017 Permission)
-  Development constructed
under 15/6966 (PL04.246742)
-  Operational Access/Inspection
Road with underground cabling
permitted under PL ref. 18/04458
-  Development Infrastructure
NOT Constructed
-  Derragh Wind Farm Turbines
permitted under PL ref.
12/05270 & PL04.245082
-  Coomatagart Substation
-  Derragh Substation permitted
under PL ref. 17/5126
-  Underground grid connection
within Co. Kerry granted
permission under
PL Ref. 15/1194



Article 5 of the EIA Directive now 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) 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) a 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 Regulations 2000 to 2020 sets out the information to be contained in an EIAR, with which this EIAR complies.

MKO has been involved in this project from the preparation of a response to further information back in a 2011 application for the site so therefore is intimately familiar with the Cleanrath wind farm development and continues to act as environmental consultant in respect of the Cleanrath wind farm development and has been commissioned to prepare this EIAR in accordance with the updated requirements of the EIA Directive.

The relevant classes/scales of development that normally require Environmental Impact Assessment (EIA) are set out in Annexes I and II to the EIA Directive and Schedule 5 of the Planning and Development Regulations 2001 to 2020. 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 in Part 2 of Schedule 5 to the Regulations. The Cleanrath wind farm development exceeds 5 turbines and 5 Megawatts in scale and, therefore, is subject to EIA.

The EIAR provides information in respect of the Project, the likely significant effects of the Project, the baseline environment, the alternatives which were considered by the developer, the features and measures to mitigate adverse significant effects as well as a Non-Technical Summary and additional information specified in Annex IV of the EIA Directive. As stated above, the function of the EIAR is to provide information to allow the competent authority to conduct the Environmental Impact Assessment (EIA) of the Cleanrath wind farm development.

All elements pertaining to the prospective development of the Cleanrath wind farm development have been considered, including future operation of the wind turbines and associated infrastructure and the grid connection infrastructure, as well as works involved in felling & replanting and turbine delivery route and, ultimately, decommissioning have been assessed as part of this EIAR.

1.7.1 EIAR Guidance

The Environmental Protection Agency (EPA) published its ‘Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports’ (EPA, August 2017), which is intended to guide practitioners preparing an EIAR in line with the requirements set out in the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).

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). MKO has prepared the EIAR in accordance with ‘*Guidance on the preparation of the Environmental Impact Assessment Report*’, in particular.

1.7.2

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 also been taken into account during the preparation of this EIAR.

The ‘*Wind Energy Development Guidelines for Planning Authorities*’ (DoEHLG, 2006) are currently the subject of a targeted review. 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), the ‘*Review of the Wind Energy Development Guidelines 2006 – Preferred Draft Approach*’ (June 2017), and the Draft Revised Wind Energy Development Guidelines (December 2019). A consultation process in relation to the 2019 document was undertaken by the Department of Housing, Planning and Local Government (DoHPLG) and commenced on the 12th of December 2019. The consultation period closed on 19th February 2020.

In the event that revised Wind Energy Guidelines are adopted in advance of a decision being made on the application for substitute consent in respect of the Cleanrath wind farm development, with any concomitant change in respect of either noise and shadow flicker thresholds, if necessary, the Cleanrath wind farm development is capable of being operated in a manner which complies with any revised requirements. In addition, the currently proposed set-back distances from dwellings has being achieved. Further detail on this is provided in the relevant chapters.

1.8

Need for the Cleanrath wind farm development

1.8.1

Overview

It has now evident 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). Indeed, Ireland faces significant challenges to meet EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050.

In March 2019, the Government announced a renewable electricity target of 70% by 2030 as part of the governments Climate Action Plan. In circumstances where substitute consent is granted, the Cleanrath wind farm development would be operational after 2020 and would therefore contribute to attaining 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 Cleanrath wind farm development, if consented, will contribute to addressing these challenges as well as addressing the country’s over-dependence on imported fossil fuels.

The need for the Cleanrath wind farm development 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. Chapter 2 of this EIAR on Background to the Cleanrath wind farm development, presents a full description of the international, European Union, national, regional and local renewable energy policy context for the Cleanrath wind farm development and also addresses climate change, including Ireland's current status with regard to meeting greenhouse gas emission reduction targets.

1.8.2 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.

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 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"*.

The Cleanrath wind farm development with a generating capacity of 26.4 MW from the wind turbines will result in the net displacement of approximately 35,339 tonnes of Carbon Dioxide (CO2) per annum, including accounting for back-up generation. The carbon offsets resulting from the Cleanrath wind farm development are described in detail in Section 10.2.3 of Chapter 10 of this EIAR: Air and Climate.

1.8.3 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. In 2015, the cost of all energy imports to Ireland was

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

approximately €4.6 billion, with Ireland being one of the most energy import-dependent countries in the European Union, importing 88% of its fuel that year, up from 85% in 2014. This fell to €3.4 billion in 2016 (due mainly to reduced gas imports) but rose to approximately €4 billion in 2017 (the most recent period for which figures are available). Ireland's import dependency in 2017 was 66%, down 22% from 2015, however, Ireland is still one of the more import dependent countries in the EU, with the EU average being just over 50% ('Energy in Ireland 2018', Sustainable Energy Authority of Ireland, 2018).

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 generates almost 25% of Ireland's electricity, but the Programme for Government² 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".

1.8.4 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 has a capacity factor of 35%, 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.

² 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>

1.8.5

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). 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.

1.8.6

Reduction of Carbon Emissions and Other Greenhouses 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 power by the Cleanrath wind farm development will displace approximately 35,339 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.

Recent EU and World Health Organisation reports estimate that poor air quality accounted for premature deaths of almost 600,000 people in Europe in 2012³. 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 EPA 2016 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."

³ www.euro.who.int/en/health-topics/environment-and-health/air-quality/news/news/2014/03/almost-600-000-deaths-due-to-air-pollution-in-europe-new-who-global-report

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 Cleanrath wind farm 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.

1.8.7 Economic Benefits

In addition to helping Ireland avoid significant fines and reducing environmentally damaging emissions, the Cleanrath wind farm development 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 2017 the cost of all energy imports to Ireland was approximately €4 billion with imported fossil fuels accounting for 66% of all energy consumed (‘Energy in Ireland 2018’, Sustainable Energy Authority of Ireland, 2018).

The SEAI report ‘Energy in Ireland 2018’ indicated that renewable electricity (mostly wind energy) during 2017 and compared to 2016:

- Displaced €278 million in fossil fuel imports;
- Reduced CO₂ emissions by 3.3 million tonnes; and
- Did not add to consumer bills.

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 Cleanrath wind farm development will be capable of providing power to over 19,272 households every year, as presented in the calculations in Section 4.3.1 of this EIAR.

At a Regional Level, the Cleanrath wind farm development will help to supply the rising demand for electricity, resulting from renewed economic growth. The EirGrid report ‘All-island Generation Capacity Statement 2017 – 2026’ (SONI & Eirgrid, 2017) notes that electricity demand on the island of Ireland is expected to grow by 17% over the next ten years. Much of this growth is expected to come from new data centres in Ireland.

The Cleanrath wind farm development has had and will continue to 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 Cleanrath wind farm 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.

The Cleanrath wind farm development created in excess of 80 jobs during the construction, operational and maintenance phases of the Cleanrath wind farm development. During construction, additional

employment will have been created in the region through the supply of services and materials to the development. In addition to this, there will also have been 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. An initial contribution of c€150,000 has been made available to the local community and as this project has been constructed and did operate for a short period over €100,000 in funds have already been distributed to the community. The annual contribution to the community is estimated at c€30,000 each year for the lifetime of the project, when it is in full operational mode.

Based on the current proposal, the Community Gain Fund in the region of €1 million will be made available over the lifetime of the Cleanrath wind farm development. The value of the fund is 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 Community Gain proposals are presented in Section 4.6 of this EIAR.

1.9 Structure and Content of the EIAR

1.9.1 General Structure

This EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the Cleanrath wind farm development thereon and the proposed mitigation measures. Background information relating to the Cleanrath wind farm development, scoping and consultation undertaken and a description of the Cleanrath wind farm development are presented in separate sections. The grouped format sections describe the impacts of the Cleanrath wind farm development in terms of human beings and population, 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 Cleanrath wind farm development
- Consideration of Reasonable Alternatives by the developer
- Description of the Cleanrath wind farm development
- Population & Human Health
- Biodiversity (excluding Birds)
- Ornithology
- Land, Soils and Geology
- Hydrology and Hydrogeology
- Air and Climate
- Noise and Vibration
- Landscape and Visual
- Cultural Heritage
- Material Assets (including Roads and Traffic, Telecommunications and Aviation)
- Interactions of the Foregoing
- Schedule of Mitigation and Monitoring Measures

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 Cleanrath wind farm development followed by the existing environment, impacts and mitigation measures presented in the grouped format.

The photomontage booklet pertaining to Chapter 13: Landscape and Visual is included as Volume 2.

Appendices to the chapters listed above are included in Volume 3 of this EIAR.

1.9.2

Description of Likely Significant Effects and Impacts

As stated in the Draft ‘*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*’ (EPA, 2017), an assessment of the likely impacts of a Cleanrath wind farm development is a 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 European Commission (EC) and the Environmental Protection Agency (EPA):

- ‘*Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*’ (EC, 2017)
- ‘*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 1-2, below, 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 Cleanrath wind farm 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 Cleanrath wind farm development on the receiving environment.

Table 1-2 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 and 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

Impact Characteristic	Term	Description
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 and 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. The remaining impact types are presented as required or applicable throughout the EIAR.

Any potential interactions between the various aspects of the environment assessed throughout this EIAR are presented in Chapter 15: Interaction of the Foregoing.

1.10 Project Team

1.10.1 Project Team Responsibilities

The companies and staff listed in Table 1-3 EIAR Project Team were responsible for completion of the EIAR and rEIAR in respect of the Cleanrath wind farm 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 1.10.2 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 1-3 EIAR Project Team

Consultants	Principal Staff Involved in Project	EIAR Input
MKO Tuam Road Galway	Brian Keville Michael Watson Jimmy Green Eoin McCarthy Owen Cahill Pat Roberts Dervla O’ Dowd Padraig Cregg John Hynes David McNicholas Sarah Mullan Julie O’Sullivan David Naughton Ian Hynes Joanna Mole Jack Workman Jordan Baxter James Newell Joseph O’Brien	Project Managers, Scoping and Consultation, Preparation of Natura Impact Statement and the following Chapters: > 1. Introduction > 2. Background to the Cleanrath wind farm development > 3. Consideration of Reasonable Alternatives by the developer > 4. Description of the Cleanrath wind farm development > 5. Population and Human Health > 6. Biodiversity > 7. Ornithology > 10. Air and Climate > 12. Landscape and Visual > 14. Material Assets (non-Traffic) > 15. Interaction of the Foregoing > 16. Schedule of Mitigation Measures

Consultants	Principal Staff Involved in Project	EIAR Input
Hydro Environmental Services 22 Lower Main Street Dungarvan Co. Waterford	Michael Gill David Broderick Adam Keegan	Flood Risk Assessment, Drainage Design and Preparation of the following Chapters: > 8. Land, Soils and Geology > 9. Hydrology and Hydrogeology
Fehily Timoney & Company (formerly called AGECE Ltd) The Grainstore Singletons Lane Bagnelstown Co. Carlow	Gerry Kane Paul Jennings	Preparation of Peat Stability Assessment
Ionic The Hyde Building, The Park, Carrickmines, Dublin 18	Cormac O'Dubhthaigh	Project Engineers
AWN Consulting The Tecpro Building Clonsgaugh Business & Technology Park Dublin 17	Damian Kelly Dermot Blunnie Mike Simms	Baseline Noise Survey and Preparation of Chapter 11: Noise and Vibration
Tobar Archaeological Services Saleen Middleton Co. Cork	Annette Quinn Miriam Carroll	Preparation of Chapter 12: Archaeological, Architectural and Cultural Heritage

Consultants	Principal Staff Involved in Project	EIAR Input
Alan Lipscombe Traffic and Transport Consultants Claran, Headford, Co. Galway	Alan Lipscombe	Preparation of Chapter 14: Material Assets - Traffic and Transport
Tom Gittings - Ecological Consultant Ecological Consultant 3 Coastguard Cottages Roches Point Whitegate Co. Cork	Dr. Tom Gittings	Input and Review of Ornithological and Ecological scope of works; peer review of Biodiversity and Ornithology chapters of the rEIAR/EIAR.

1.10.2 Project Team Members

1.10.2.1 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 and 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 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, preparation of linguistic impact statements and submissions to Development Plans/Local Area Plans. Jimmy has a Bachelor of Arts Degree in Human and Physical Geography from National University Ireland Galway and a Masters in Regional and Urban Planning from University College Dublin. Jimmy is also a corporate member of the Irish Planning Institute.

Eoin McCarthy B.Sc. (Env.)

Eoin is Senior Environmental Scientist with MKO with over 8 years of experience in private consultancy. Eoin holds B.Sc. (Hons) in Environmental Science from NUI, Galway. Eoin took up his position with McCarthy Keville O'Sullivan in June 2011. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment. Eoin's main area of expertise in terms of project management is in the wind energy sector. He has overseen some of the largest SID Wind Energy Projects in Ireland in recent years. In his role as project manager, Eoin 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. He has held the role of project manager on over 500MW worth of wind energy projects, with more projects in the pipeline. Within MKO Eoin plays a large 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.

Owen Cahill B.Sc. M.Sc. MIEMA CEnv

Owen is an Environmental Engineer with MKO 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 Specialists 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 and solar energy construction and 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 Reports. Owen has project managed the Environmental Impact Assessment of a range of development projects across the Ireland and holds Full Membership with the Institute of Environmental Management & Assessment (IEMA) and is a Chartered Environmentalist (CEnv).

Pat Roberts B.Sc. (Env.)

Pat Roberts is a Senior Ecologist and director of the Ecology team with MKO 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. Pat's 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 MKO 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 and Fauna, and acted as EIS 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.

Padraig Cregg B.Sc. (Zoo.), M.Sc. (Eco.)

Padraig Cregg is a Senior Ornithologist with MKO with over 8 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. Padraig has specialist knowledge in designing, executing and project managing ornithological assessments, primarily in the renewable industry. Padraig'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 Padraig 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 Padraig 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.

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

John Hynes is a Senior Ecologist with MKO 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 Reports. John has project managed a range of strategy and development projects across the Ireland and holds CIEEM membership.

David McNicholas B.Sc. (Env.), M.Sc. (EHSM)

David McNicholas is a Senior Ecologist at McCarthy Keville O'Sullivan, Planning & Environmental Consultants. David holds a BSc (First Class Hons) Environmental Science and an MSc (Hons) Environmental, Health and Safety Management. David has 9 years' professional ecological consultancy experience. David specialises in the preparation of EIAs, EcIAs and NISs including ecological surveys and monitoring. David has worked on all phases of wind farm development from feasibility/ scoping, ecological surveys, preparation of full EIS chapters, construction phase environmental monitoring and post-construction ecological monitoring. David has worked as an Ecological Clerk of Works (ECoW) during the construction phase of ten large scale wind farms in Ireland and Northern Ireland, gained significant experience on the implementation of the environmental and ecological measures. David is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

Sarah Mullan, PhD., B.Sc., M.Sc.

Sarah Mullen is an Ecologist with MKO with 3 years of experience in consultancy. Sarah holds a B.Sc. (Hons) in Botany, an M.Sc. in Biodiversity and Conservation and a Ph.D. in Botany, in which she investigated the role of biodiversity in the functioning of plant-pollinator interactions in semi-natural grassland habitats. Prior to taking up her position with McCarthy Keville O'Sullivan in September 2018, Sarah worked as an Ecologist with Ryan Hanley Ltd. where she gained experience in multidisciplinary ecological surveys, ecological impact assessment and appropriate assessment. Sarah also has experience working with Indigo Development and Change, a conservation focused NGO in South Africa and with the German branch of the Global Biodiversity Information Facility (GBIF) in the Museum für Naturkunde in Berlin. Sarah's key strengths and areas of expertise are in terrestrial flora and fauna ecology, including vegetation surveys, habitat mapping, invasive species surveys, mammal surveys, Appropriate Assessment and Ecological Impact Assessment. Since joining MKO Sarah has been involved as an ecologist on various energy infrastructure, commercial and water services projects. Within MKO Sarah plays a large role in preparing Ecological Impact Assessment reports and Stage 1 and Stage 2 Appropriate Assessment reports. Sarah holds membership with the Chartered Institute of Ecology and Environmental Management.

Julie O’Sullivan, B.Sc. M.Sc.

Julie is an Ecologist with MKO. She holds a BSc (Hons) in Biology from University College London and a Masters in Ecological Assessment from University College Cork. Prior to taking up her position with MKO, Julie gained experience in practical habitat management and developed a range of field skills in plant, habitat, bird and bat surveying through working with several conservation organisations in the UK and Ireland including the RSPB, Cumbria Wildlife Trust and Bat Conservation Trust. Julie has experience surveying birds through her involvement with the RSPB in Northern Ireland. Julie is trained in bat survey, terrestrial invertebrate and freshwater macroinvertebrate sampling and in taking vegetation relevés of vascular plants and bryophytes. She also has experience in habitat identification, habitat mapping, Annex I habitat quality assessment and Phase 1 habitat survey. Julie has worked within our Ornithology Team on several renewable energy developments, utilising a broad range of bird survey methodologies including vantage point surveys, breeding raptor, adapted brown and shepherd and waterfowl distribution surveys. Julie was part of a team of bird usage surveyors working on the Shannon/Fergus Estuary. Within MKO Julie is responsible for independently carrying out and planning Ornithological field surveys in accordance with required Scottish Natural Heritage standards as part of the ornithology team, and for carrying out bat surveys, habitat surveys, and Appropriate Assessment screenings as part of the ecology team.

David Naughton B.Sc. (Env.)

David Naughton is an Ecologist with two years of professional experience, working within the Ornithology Department for MKO. David graduated with an honours B.Sc. degree in Environmental Science from NUIG in 2016. 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 and 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.

Ian Hynes B.Sc. (Env.)

Ian Hynes is a Graduate Ecologist with McCarthy Keville and O’Sullivan Ltd., joining in December of 2017. Ian holds a B.Sc. (Hons) in Environmental Science from National University of Ireland, Galway. Ian has a broad knowledge of ecology including invertebrate surveys and identification, vegetation surveys, small mammal surveys and habitat identification. Ian also has over 4 years of experience using GIS software systems including ArcGIS and QGIS and MapInfo to present ecological data. As part of his final year thesis Ian gained valuable experience in report writing, data input, invertebrate and plant identification. Ian also liaised with members of the AranLIFE project and local landowners on Inis Oirr, Aran Islands in the summer of 2016 while completing his thesis. Ian’s key strengths are in Data management and GIS/MapInfo software. Since joining the Ornithology team at McCarthy Keville & O’Sullivan Ltd. He has been involved in a number of windfarm projects, utilising his skills to compile data and create maps for surveys and figures.

Joanna Mole BSc PGDipLA MSc CMLI

Joanna Mole is a Landscape and Visual Impact Assessment Specialist and Chartered Landscape Architect with MKO 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.

Jack Workman B.Sc., M.Sc.

Jack is an Environmental Scientist with MKO. Jack's primary role at MKO is producing the LVIA chapter of EIA reports. Jack holds an MSc. in Coastal and Marine Environments and a graduate membership with the Chartered Institute of Water and Environmental Management. Prior to taking up his position with MKO, Jack worked as a Geospatial Analyst and Research Assistant with NUIG and also held posts in the coastal engineering sector with Royal Haskoning DHV and Saltwater Technologies. Jack has specialist knowledge in LVIA, coastal and marine environmental science and UAV remote sensing. Jack's key strengths and areas of expertise are in geospatial analysis, planning, and Environmental Impact Assessment reporting. Since joining MKO, Jack has been involved in a range of renewable energy infrastructure projects, working as part of a large multi-disciplinary team.

Jordan Baxter BA. MSc.

Jordan Baxter is a Graduate Planner with MKO with over 2 years of experience in private consultancy practice. Jordan holds a BA in Psychology and a Master's in Planning and Development from Queen's University Belfast. Jordan is a Licentiate Member of the RTPI with specialist knowledge in national, regional and local planning policy and guidance, development management and strategic planning analysis for energy infrastructure. Within MKO, Jordan works as part of a larger multi-disciplinary team to coordinate the development of planning applications for renewable energy infrastructure for submission to both local and national Planning Authorities. Jordan has both managed and contributed on a range of infrastructure projects across Ireland and the UK and is currently progressing towards chartered membership with the RTPI.

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 joined MKO in 2016 and 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.

1.10.2.2 Hydro Environmental Services

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/EIS 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.

Adam Keegan

Adam Keegan is a hydrogeologist with two years of experience in the environmental sector in Ireland. Adam has been involved in Environmental Impact Assessment Reports (EIARs) for numerous projects including wind farms, grid connections, quarries and small housing developments. Adam holds an MSc in Hydrogeology and Water Resource Management. Adam has worked on several wind farm EIAR projects, including Croagh WF, Lyrenacarriga WF (SID), Cleanrath WF, Carrownagowan WF (SID), and Fossy WF.

1.10.2.3 Fehily Timoney & Company

Fehily Timoney & Company Ltd. (FT) recently acquired AGECE Ltd. adding to their growing geotechnical team. The geotechnical aspects of the project, which have been incorporated into the Land, Soils and Geology Chapter and the Hydrology and Hydrogeology Chapter of the EIAR, were completed by Fehily Timoney & Company Ltd. FT (previously AGECE) has extensive experience in the production of Peat Stability Assessments for wind energy developments. They provide specialist geotechnical engineering and engineering geology advice to local authorities, contractors and consultants, particularly for infrastructure projects forming part of the National Development Plan and also for private commercial and residential developments as they move on to sites with more complex ground conditions.

Gerry Kane

Gerry Kane joined AGECE Ltd. (now part of Fehily Timoney & Company Ltd.) as a Geotechnical Engineer in 2008. Gerry graduated from IT Carlow in 2008 with a BEng (Hons) degree in Civil Engineering. Gerry is a Geotechnical Engineer with over seven years' experience in geotechnical design and analysis, supervision and interpretation of ground investigations, foundation and earthwork design, supervision of construction of bulk earthworks and structure foundations, slope stability analysis, desk studies and walkover surveys. Previous and current experience in the wind energy field has included work for wind farm developments in Ireland, Northern Ireland, Scotland, Wales and England. This work has covered Peat Stability Assessment Reports, Soils and Geology Chapters of EIAR's, site assessments for wind farm developments and the investigation of peat failures at wind farm sites.

Paul Jennings

Paul Jennings is a Senior Geotechnical Engineer and Director of AGECE with over 25 years' experience of design and construction of sub-surface structures, foundations, earthworks, infrastructure and earth-retaining structures; planning, supervision and interpretation of ground investigation; and providing expert geotechnical advice and reporting. Paul has particular experience in providing expert advice for slope stability problems, soft ground engineering, infrastructure, deep-excavations and forensic investigation of landslides.

1.10.2.4 Ionic Consulting

Cormac O'Dubhthaigh

Cormac has managed the Civil and Structural Engineering Department at Ionic Consulting since 2009. He has been involved in all civil engineering aspects of wind farm projects in Ireland and internationally. Cormac specialises in structural design of turbine foundations and has a background in the design of bridges and buildings in leading consultancy firms in Ireland and Australia. He graduated with a degree in Civil Engineering in 1994 and later completed a Master's Degree in Structural Engineering, both in UCD

1.10.2.5 AWN Consulting Ltd.

Damian Kelly

Damian Kelly (Technical Director) holds a B.Sc. from DCU and a M.Sc. from QUB. He has over 20 years' experience as an acoustic consultant and is a Member of the Institute of Acoustics. 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. He has extensive modelling experience in relation to wind farm, industrial and road infrastructure projects. He is a sitting member of the committee of the Irish Branch of the Institute of Acoustics.

Dermot Blunnie

Dermot Blunnie (Senior Acoustic Consultant) holds a BEng. from the University of South Wales, a M.Sc. from the University of Derby and IOA Diploma in Acoustics and Noise Control from the Institute of Acoustics. He has over 11 years' experience as an acoustic consultant and is a member of the Institute of Acoustics. 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.

1.10.2.6 Tobar Archaeological Services

Tobar Archaeological Services is a Cork-based company entering its ninth 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 EIAR stage through to construction stage when archaeological monitoring is frequently required.

1.10.2.7 **Alan Lipscombe Traffic and Transport Consultants**

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, including for numerous wind farm developments, and is an accomplished analyst who has experience of a wide variety of modelling packages and methods.

1.10.2.8 **Dr. Tom Gittings – Ecological Consultant**

Dr Tom Gittings has been trading as an independent ecological consultant since 2001. He has over 24 years' experience as a professional ecologist and is a full member of the Chartered Institute of Ecology and Environmental Management. Tom completed his PhD in Entomology in 1994. From 1995-2001 Tom worked for the RPS Group environmental consultancy, as an Ecological Consultant (1995-1998), Associate Ecologist/Office Manager (1998-2000) and Technical Director (2000-2001). From 2001-2009, Tom carried out research into forest and wetland biodiversity in University College Cork. During this period, Tom also developed a portfolio of independent consultancy work, and, since 2010, he has worked as a full-time independent consultant. Tom has extensive experience in a wide range of ecological disciplines and applications. He has carried out numerous specialist ecological surveys and assessments as well as project managing large-scale Environmental and Ecological Impact Assessments. Since 2010, a major focus of his work has been carrying out research into waterbird interactions with aquaculture and shellfisheries and preparing Appropriate Assessments of coastal SPAs using the results of this research. Other major areas of his work in recent years have included bird surveys for windfarms and powerlines, large-scale habitat surveys, and specialist entomological and ornithological surveys.