Environmental Impact Assessment Report

Proposed Clonberne Wind Farm, Development, Co. Galway

Chapter 1 - Introduction

DOCUMENT DETAILS

Client:	**Clonberne Windfarm Limited**
Project Title:	**Proposed Clonberne Wind Farm, Development, Co. Galway**
Project Number:	**180740**
Document Title:	**Environmental Impact Assessment Report**
Document File Name:	**Ch 1. Introduction F - 2024.06.20 - 180740**
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Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Final	20/06/2024	JF	OC

1. INTRODUCTION

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of Clonberne Windfarm Limited, who intend to apply to An Bord Pleánala for planning permission to construct a renewable energy development which will comprise 11 No. wind turbines, and associated infrastructure in the townland of Clonberne, and adjacent townlands, in Co. Galway, and an on-site substation and associated works, including underground cabling to connect to the National Grid. The Proposed Project comprises a single grid connection option due to the site's proximity to the existing Cashla – Flagford 220kV overhead line.

Due to the nature of the proposed renewable energy development, which will have a potential generating capacity of greater than 50 megawatts (MW) and the proposed grid connection to the existing 220kV overhead line requires the provision of 220kV infrastructure which will form part of the national electricity transmission network, two separate planning applications are required.

A planning application will be submitted to An Bord Pleanála seeking permission for the proposed 11 No. wind turbines and associated infrastructure with a potential generating capacity of greater than 50 megawatts (MW). The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Act 2000, as amended (being *'An installation for the harnessing of wind power for energy production (a wind farm) with more than 25 turbines or having a total output greater than 50 megawatts'*) and is therefore being submitted directly to An Bord Pleanála as a Strategic Infrastructure Development (SID) in accordance with Section 37E of the Planning and Development Act, 2000 as amended. This approach has been confirmed following consultations with the Board under the provisions of Section 37B of the Planning and Development Act 2000 as amended (case reference ABP-307058-20).

A second planning application regarding the grid connection infrastructure and associated works will be submitted to An Bord Pleanála in accordance with Section 182A of the Planning and Development Act 2000, as amended. This approach has been confirmed following consultations with the Board under the provisions of, Section 182E of the Planning and Development Acts 2000 as amended (case reference ABP- 314729-22).

This EIAR, along with a NIS, will assess the Proposed Project, the Proposed Wind Farm, and the Proposed Grid Connection. This EIAR and NIS will accompany the planning permission applications for the Proposed Wind Farm and Proposed Grid Connection which will be made to An Bord Pleanála in accordance with the provisions of Section 37A and Section 182A of the Planning and Development Act 2000[AC1], as amended. Both the EIAR and NIS contain the information necessary for An Bord Pleanála to complete the Appropriate Assessment and Environmental Impact Assessment as required for these planning permission applications.

Full details of the pre-application consultation undertaken with regards both planning applications can be found in Section 2.6 in Chapter 2 of this EIAR.

1.1.1 References to Proposed Project

For the purposes of this EIAR:

- Where the 'Proposed Project' is referred to, this relates to all the project components described in detail in Chapter 4 of this EIAR i.e., Wind Farm and Grid Connection as detailed in Sections 1.4.1 and 1.4.2 below and is shown in Figure 1-1.

- Where 'the Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hard-standing areas, borrow pit, access roads, temporary construction compounds, turbine delivery accommodation works, peatland enhancement area, underground cabling, peat, spoil and overburden management, site drainage, tree felling and all ancillary works and apparatus. The planning application for the Proposed Wind Farm Site is made to An Bord Pleanála in accordance with the provisions of Section 37E of the Planning and Development Act 2000, as amended. The Proposed Wind Farm Site is shown in Figure 1-2.
- Where 'Proposed Grid Connection' is referred to, this refers to the onsite substation, and associated underground 220kV cabling connecting into the existing Cashla – Flagford 220kV overhead line at Laughil, subject to a planning application under Section 182A of the Planning and Development Act, 2000, as amended. The Proposed Grid Connection is shown in Figure 1-3.

This EIAR, along with a NIS, will assess the Proposed Project, the Proposed Wind Farm, and the Proposed Grid Connection. This EIAR and NIS will accompany the planning permission application for the Wind Farm which will be made to An Bord Pleanála in accordance with the provisions of Section 37A of the Planning and Development Act 2000, as amended. Both the EIAR and NIS contain the information necessary for An Bord Pleanála to complete the Appropriate Assessment and Environmental Impact Assessment as required for this planning permission application. The Proposed Grid Connection is an integral part of the Proposed Project and is assessed in this EIAR, however, it will be subject to a separate planning permission application. The planning permission application for the Proposed Grid Connection will be made to An Bord Pleanála in accordance with the provisions of 182A of the Planning and Development Act 2000, as amended.

Both the EIAR and NIS take into account the combined impacts of these individual elements of the Proposed Project.

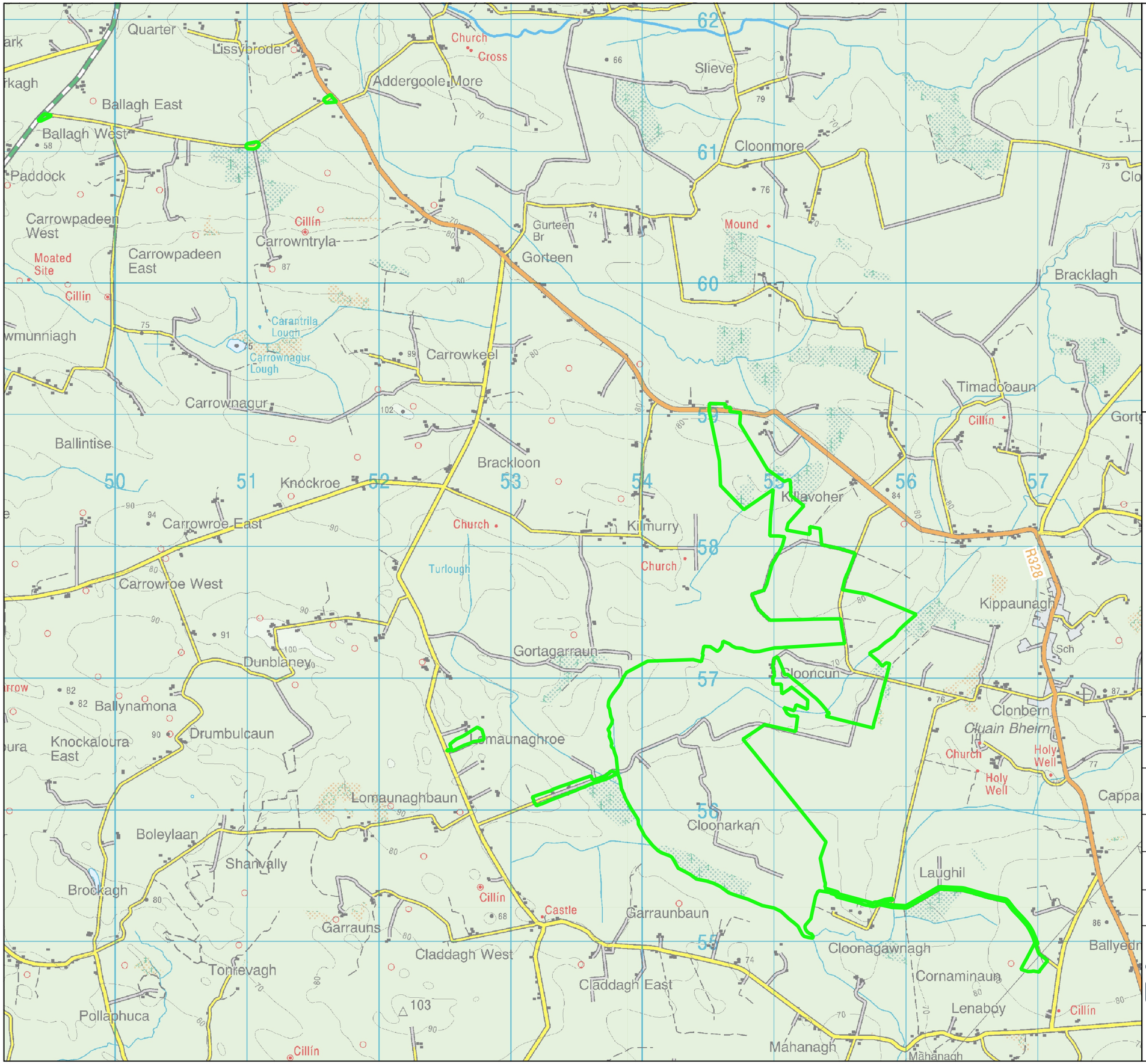
For clarity in this EIAR, all elements of the Proposed Project, Proposed Wind Farm and the Proposed Grid Connection will be assessed cumulatively and in combination with other plans and projects to aid the competent authority in carrying out an EIA. Unless stated otherwise, chapters will be assumed to assess the Proposed Project which combines the respective elements of the Proposed Wind Farm and the Proposed Grid Connection. If stated otherwise, a chapter will assess the Proposed Wind Farm and/or the Proposed Grid Connection.

The EIAR Site Boundary identifies the primary EIAR site area for the Proposed Project, however, each individual topic, i.e., chapter, has its own study area for assessment purposes relevant to that topic which will be clearly identified in the relevant chapters. The EIAR Site Boundary encompasses an area of approximately 353 hectares (ha). The permanent footprint of the Proposed Project measures approximately 33.7 hectares, which represents approximately 9.5% of the Site.

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

1.1.2 Proposed Project Site Location

The Proposed Wind Farm site is located c.14km to the north-east of Tuam, and c.6.5km to the south-east of Dunmore in Co. Galway. The approximate location of the centre of the site is X554464, Y756549 in Irish Transverse Mercator (ITM). It is proposed to access the Proposed Wind Farm site via a new access roadway off the R328 Regional Road to the north of the Proposed Wind Farm site. The Wind Farm site is served by a number of existing agricultural roads and tracks. A site location context map is included as Figure 1-4.



Map Legend

EIAR Site Boundary

Drawing Title	EIAR Site Boundary
Project Title	Clonberne WF
Drawn By: JF	Checked By: OC
Project No.: 180740	Drawing No.: Fig. 1-1
Scale: 1:28,000	Date: 2024-06-24

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Map Legend

— Proposed Wind Farm

Drawing Title	Proposed Wind Farm
Project Title	Clonberne WF
Drawn By: JF	Checked By: OC
Project No.: 180740	Drawing No.: Fig. 1-2
Scale: 1:30,000	Date: 2024-06-24

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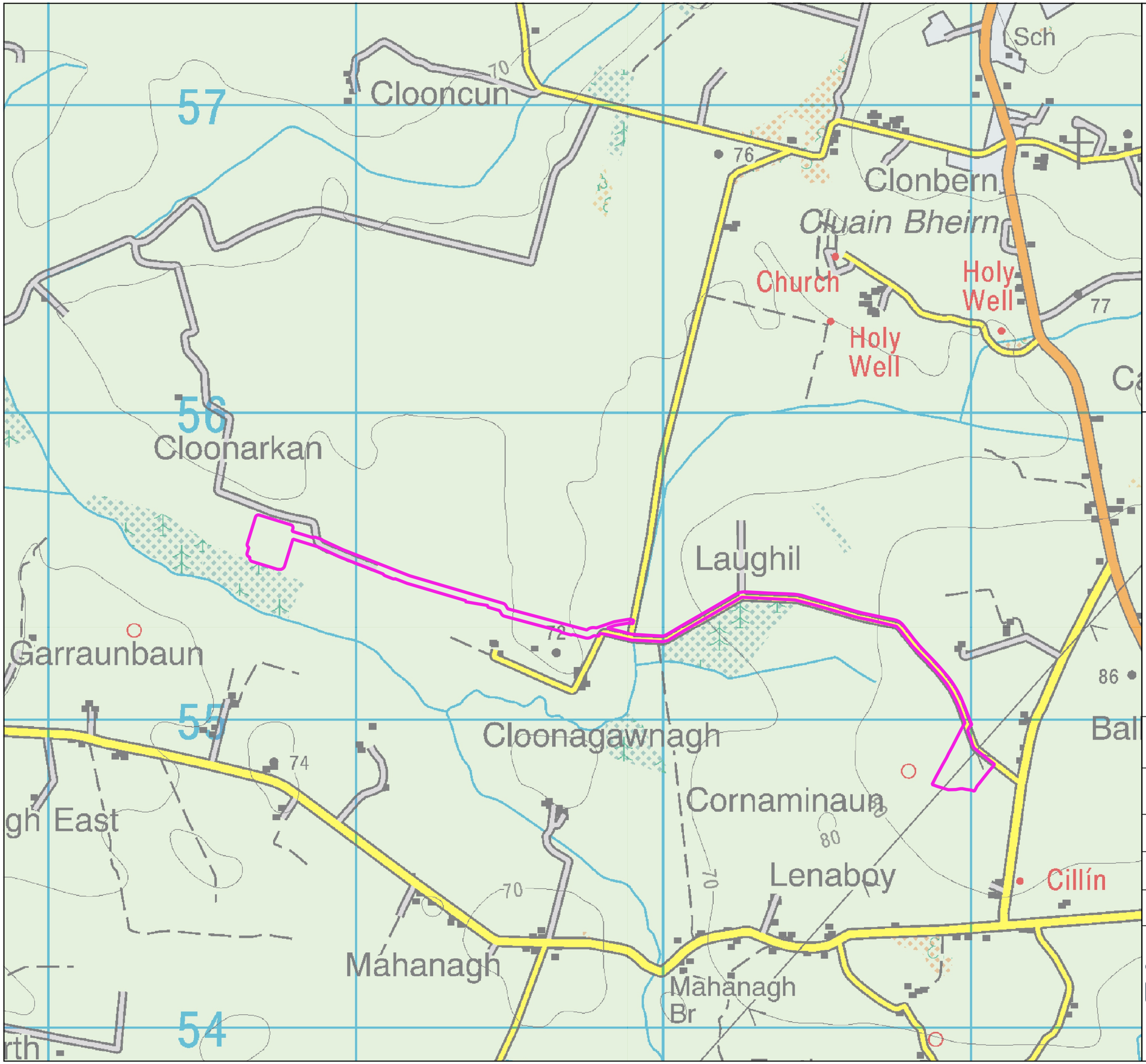

Map Legend

Proposed Grid Connection

Drawing Title	Proposed Grid Connection
Project Title	Clonberne WF
Drawn By: JF	Checked By: OC
Project No.: 180740	Drawing No.: Fig. 1-3
Scale: 1:12,000	Date: 2024-06-24

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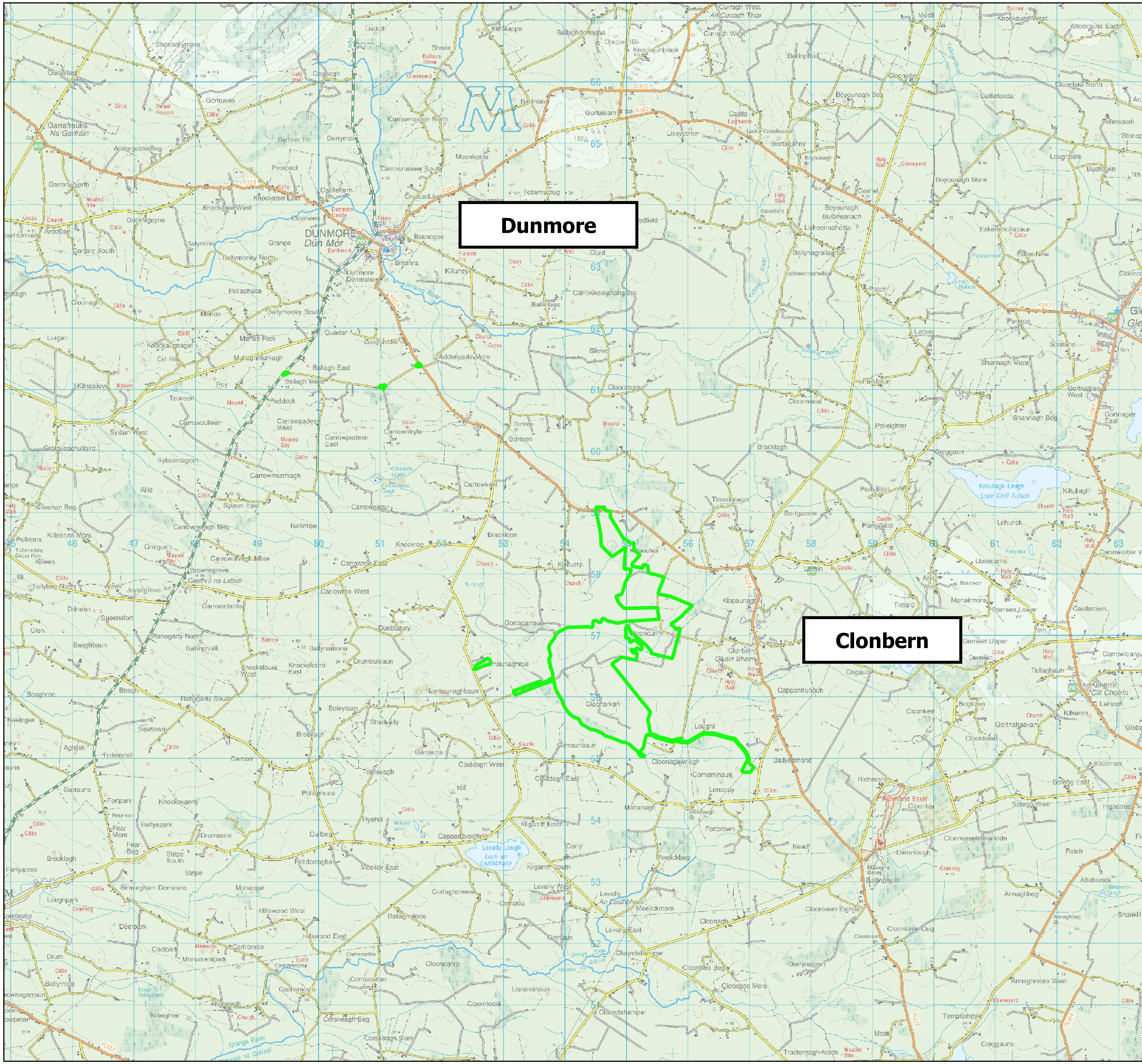

Map Legend

EIAR Site Boundary

Drawing Title	Site Location Context
Project Title	Clonberne WF
Drawn By: JF	Checked By: OC
Project No.: 180740	Drawing No.: Fig. 1-4
Scale: 1:60,000	Date: 2024-06-24

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The Proposed Grid Connection for the Proposed Project comprises connecting the Proposed Wind Farm site to the National Grid. Underground electrical cables will transmit the power from each wind turbine to the proposed on-site substation which will be configured for a 220kV connection. The Proposed Grid Connection will connect the Proposed Project into the National Grid via connecting into the existing 220kV Cashla – Flagford Overhead Line at Laughil, measuring approximately 2.8km in length. The underground cabling route will be located along the public road corridor and new access tracks. Once operational, the substation will be accessed via the new access track and public road to the east.

Current land-use on the Proposed Wind Farm site comprises a mix of small-scale agriculture with pockets of commercial forestry, low-density residential, public road corridors and cut peat. Current land-use along the Proposed Grid Connection comprises of public road corridor, cut peat, commercial forestry, and agriculture. Land-use in the wider landscape of the Site comprises a mix of agriculture, peat cutting, quarrying, low density residential and commercial forestry.

The Proposed Project has been brought forward in response to local, national, regional, and European policy pertaining to Ireland's transition to a low carbon economy and associated climate change policy objectives. The Proposed Wind Farm site is split between areas that have been designated in the Galway County Development Plan (2022-2028) as **'Open to Consideration'** (to the north and west of the Wind Farm site) and **'Acceptable in Principle'** (to the south and east of the site). The proposed turbine locations are all located in either **'Acceptable in Principle'** (6 no. turbines) and **'Open to Consideration'** (5 no. turbines).

The townlands in which the Proposed Project is located are listed in Table 1-1

Table 1-1 Townlands within which the Proposed Project is Located

Development Works	Townland
Proposed Wind Farm Site	
Proposed Wind Turbines, Hardstands, Site Access Roads, New Site Entrance off the R328, Borrow Pit, Temporary Construction Compounds, 38kV Line to Cable Interface End Masts, Underground 38kV cabling, Underground 33kV cabling, Peat, Spoil and Overburden Management, Turbine Delivery Accommodation works, Tree Felling, Site Drainage, Peatland Enhancement Area, Operational Site Signage, all associated infrastructure.	Killavoher, Gortagarraun, Cloonarkan, Lomaunaghroe, Clonbern, Ballagh West, Carrowntryla and Lissybroder.
Proposed Grid Connection	
On-site 220kV Substation, Underground 220kV Cabling Route, 2 no. new interface towers, Access Track, Operational Access Road, Telecommunications Mast, Site Drainage, Operational Site Signage, Joint Bays, all associated infrastructure.	Cloonarkan, Clonbern, Laughil.

1.2 Legislative Context of Environmental Impact Assessment

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

This EIAR complies with the EIA Directive as amended by Directive 2014/52/EU.

The Environmental Impact Assessment (EIA) of the Proposed Project will be undertaken by An Bord Pleanála, as the competent authority.

Article 5 of the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU provides where an EIA is required, the developer shall prepare and submit an environmental impact assessment report (EIAR). The information to be provided by the developer shall include at least:

a) *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, Article 94 of the Planning and Development Regulations 2001 (as amended) sets out the information to be contained in an EIAR, with which this EIAR complies.

MKO was appointed as environmental consultant on the Proposed Project and commissioned to prepare this EIAR in accordance with the requirements of the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU.

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

The EIAR provides information on the receiving environment and assesses the likely significant effects of the Proposed Project on it and proposes mitigation measures to avoid or reduce these effects. The function of the EIAR is to provide information to allow the competent authority to conduct the EIA of the Proposed Project.

All elements of the Proposed Project, i.e., the Wind Farm site and Grid Connection have been assessed as part of this EIAR.

1.2.1 EIAR Guidance

The Environmental Protection Agency (EPA) published its 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' in May 2022, 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) including 'Guidance on Screening', 'Guidance on Scoping' and 'Guidance on the preparation of the Environmental Impact Assessment Report'. MKO has prepared the EIAR in accordance with these guidelines.

1.2.2 Wind Energy Development Guidelines for Planning Authorities

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

The '*Wind Energy Development Guidelines for Planning Authorities'* (DoEHLG, 2006) were the subject of a targeted review. The proposed changes to the assessment of impacts associated with onshore wind energy developments were outlined in the document Draft Wind Energy Development Guidelines (December 2019) (referred to as the Draft Guidelines). A consultation process in relation to the Draft Guidelines closed on 19th February 2020. The proposed changes presented in the Draft Guidelines give certain focus on the setback distance from residential properties (four times the proposed maximum tip height), along with shadow flicker and noise requirements relative to sensitive receptors.

At time of writing, the Draft Guidelines have not yet been adopted, and the relevant guidelines for the purposes of Cection 28 of the Planning and Development Act 2000, as amended, remain those issued in 2006. Notwithstanding this, however, due to the timelines associated with the planning process for renewable energy projects and the commitment within the Climate Action Plan 2023 to publish new draft guidelines in 2023 and final guidelines in 2024 (refer to Section 1.5.1.1 below), it is possible that the Draft Guidelines are adopted during the consideration period for the current planning application. Should the Draft Guidelines be adopted in advance of a planning decision being made on the Proposed Project, it will be capable of achieving the noise and shadow flicker requirements of the new guidelines as currently proposed.

The distance from proposed turbines to third party sensitive receptors will achieve the proposed 4 times turbine tip height and any revised noise and shadow flicker requirements can be achieved by implementing mitigation through use of the turbine control systems where necessary.

1.3 The Applicant

The applicant for the Proposed Project is Clonberne Windfarm Limited. Clonberne Windfarm Limited is a subsidiary company of Cregmore Construction Ltd., which is an Irish-owned, Galway-based company with extensive experience in the design, construction, and operation of wind energy developments throughout Ireland, with projects currently operating in Galway. Cregmore Construction Ltd. have wide ranging experience in the area of electricity connections to the national grid and electricity substation development and various other utilities projects.

1.4 Brief Description of the Proposed Project

1.4.1 Description of the Proposed Wind Farm

The current planning application, relating to the Proposed Wind Farm, is being made to An Bord Pleanála under Section 37E of the Planning and Development Act, 2000, as amended.

The Proposed Wind Farm description for the current planning application as appears in the public notices is as follows:

i. *11 no. wind turbines with an overall turbine tip height of 180 metres; a rotor blade diameter of 162 metres; and hub height of 99 metres, and associated foundations, hard-standing and assembly areas;*
ii. *Underground electrical cabling (33kV) and communications cabling;*
iii. *Provision for the undergrounding of a section of 38kV overhead electrical cabling (as proposed under GCC Ref No. 24/60230), including the provision of 2 no. 38kV Line to Cable Interface End Masts up to a height of 16.2 metres and associated* ***cable ducting*** *to facilitate the undergrounding of the proposed 38kV cabling;*
iv. *Upgrade of existing tracks/ roads and provision of new site access roads, junctions and hardstand areas;*
v. *Construction of 1 no. new gated site entrance off the R328 Regional Road to facilitate the delivery of the construction materials and turbine components to site;*
vi. *Construction of 2 no. temporary construction compounds and associated ancillary infrastructure including temporary site offices, staff facilities and car-parking areas for staff and visitors, all to be removed at end of construction phase;*
vii. *Development of 1 no. borrow pit;*
viii. *Provision of 3 no. passing bays adjacent to the L22321 Local Road and an existing access track to facilitate the transport of stone material to the site;*
ix. *Peat and spoil management including the provision of 4 no. peat repository areas and 1 no. spoil repository area;*
x. *Junction accommodation works including temporary accommodation areas adjacent to the N83 National Secondary Road, R328 Regional Road and L6466 Local Road to facilitate the delivery of turbine components to site;*
xi. *Site Drainage;*
xii. *Peatland Enhancement Area;*
xiii. *Biodiversity Enhancement Measures (including the planting of woodland, linear habitat, grassland management and invasive species removal);*
xiv. *Tree felling and hedgerow removal to facilitate construction and operation of the proposed development;*
xv. *Operational stage site signage; and*
xvi. *All ancillary works and apparatus.*

A thirty five-year operational life from the date of full commissioning of the entire wind farm is being sought and the subsequent decommissioning.

The application is seeking a ten-year planning permission. A concurrent planning application in relation to a proposed substation which will comprise of a 220kV Gas Insulated Switchgear (GIS) building, an Independent Power Producer (IPP) compound, a Battery Energy Storage System (BESS) compound, underground grid connection and associated cabling to connect to the existing Flagford to Cashla 220kV overhead line in the townland of Laughil is also being lodged to An Bord Pleanála.

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the Proposed Project, will have an operational lifespan greater than the 35-year operational life that is being sought as part of the planning application.

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. For the purposes of this EIAR it is assumed that the wind turbine model installed as part of the Proposed Project will have an output of 7.2 MW. Therefore, on this basis, the proposed wind turbines would have a combined generating capacity of 79.2MW. The actual turbine procured as part of a competitive tender process may have a power output that is marginally lower or greater than the 7.2MW turbine described in the EIAR. Irrespective of the power output of the actual turbine procured, the conclusions of the EIAR will not be materially affected.

The layout of the Proposed Project has been led by consideration of constraints and facilitators, thereby avoiding the environmentally sensitive parts of the Site. The roads layout for the Wind Farm Site makes the use of the existing onsite access roads and tracks where possible, with c.2.15km of existing roadways and tracks that require upgrading, and c.8.4km of new access tracks that will need to be constructed.

There are 27 sensitive receptors located within 1km of the proposed wind turbine locations, with 6 of those properties belonging to landowners who form part of the Proposed Project. There are 2 No. unoccupied dwelling located within 720 metres from any proposed turbine location all belonging to landowners who form part of the Proposed Project.

1.4.2 Description of the Proposed Grid Connection

The current planning application, relating to the Proposed Grid Connection, is being made to An Bord Pleanála under Section 182A of the Planning and Development Act, 2000, as amended.

The Proposed Grid Connection description for the current planning application as appears in the public notices is as follows:

i. *Construction of a proposed substation which will comprise of a 220kV Gas Insulated Switchgear (GIS) building, an Independent Power Producer (IPP) compound, a Battery Energy Storage System (BESS) compound, including 4 no. 18-metre high Lightning Monopoles, welfare facilities, car parking, wastewater holding tank, 36-metre-high Telecommunications Mast, 2.6-metre high palisade fencing, external lighting, underground cabling, and all associated infrastructure and apparatus;*
ii. *All works associated with the connection of the proposed Clonberne Wind Farm to the national electricity grid, including the provision of underground electrical cabling (220kV) to the existing Flagford to Cashla 220kV overhead line, in the townland of Laughil;*

iii. *The provision of 2 no. loop-in towers, 2 no. gantries within 2 no. cable compounds to facilitate the connection of the proposed substation to the existing Flagford to Cashla 220kV overhead line;*
iv. *Construction of 2 no. gated permanent site entrances off the L6501 Local Road to facilitate access to the proposed development and the proposed Clonberne Wind Farm;*
v. *Provision of 4 no. joint bays, communication chambers and earth sheath links along the underground electrical cabling route and temporary accommodation areas to facilitate underground cabling works;*
vi. *Provision of a cable access track to facilitate the installation of cabling and provide access to the proposed substation;*
vii. *Reinstatement of the road or track surface above the proposed cabling trench along existing roads and tracks;*
viii. *Operational access road to the proposed development and the proposed Clonberne Wind Farm;*
ix. *Site Drainage;*
x. *Tree Felling and hedgerow removal to facilitate construction and operation of the proposed development;*
xi. *Operational stage site signage; and*
xii. *All ancillary works and apparatus.*

The application is seeking a ten-year planning permission. The development subject of this application will facilitate the connection of the proposed 11 no. wind turbine Clonberne Wind Farm to the national electricity grid. A concurrent application in relation to proposed Clonberne Wind Farm is also being lodged to An Bord Pleanála.

1.4.3 Description of the Proposed Project

The Proposed Project comprises all that is listed above in the Proposed Wind Farm and the Proposed Grid Connection in Section 1.4.1 and Section 1.4.2, respectively.

All elements of the Proposed Project i.e., the Proposed Wind Farm and the Proposed Grid Connection have been assessed as part of this EIAR. The Planning Application Boundary for the Proposed Wind Farm site is shown in Figure 1-2 and the Planning Application Boundary for the Proposed Grid Connection is shown in Figure 1-3.

1.5 Need for the Proposed Project

1.5.1 Overview

In July 2021, the Climate Action and Low Carbon Development (Amendment) Act 2021 was signed into law, committing Ireland to reach a legally binding target of net-zero emissions no later than 2050, and a cut of 51% by 2030 (compared to 2018 levels). On this pathway to decarbonisation, the Government published the Climate Action Plan 2024[1] announcing a renewable electricity target of 80% by 2030, without compromising security of energy supply. The Proposed Project is expected to be operational before 2030 and would therefore contribute to this 2030 target.

In July 2023, the EPA published '*Irelands Provisional Greenhouse Gas Emissions 1990-2022* [2]which stated a provisional total of national greenhouse gas emissions in for 2022 to be 60.76 million tonnes carbon dioxide equivalent ($MtCO_2eq$) which is 1.9% lower (or 1.19 Mt CO2eq) than emissions in 2021 (61.95 $MtCO_2eq$) and follows a 5.1% increase in emissions reported for 2021. In 2022, the energy industries, transport and agriculture sectors accounted for 74.1% of total greenhouse gas (GHG) emissions. Agriculture is the single largest contributor to the overall emissions, at 38.4%. Transport, energy industries and the residential sector are the next largest contributors, at 19.1%, 16.6% and 10.0%, respectively. The report also further states that there was a substantial reduction in coal, oil and peat used in electricity generation (-16%, -29% and -25% respectively), and renewable energy usages increased from 35% in 2021 to 39% in 2022. The report highlights that whilst emissions are beginning to reduce, transformative measures will be needed to meet National Climate ambitions.

As such, the Proposed Project is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels. The need for the Proposed Project is driven by the following factors:

i. *A legal commitment from Ireland to limit greenhouse gas emissions under the Kyoto protocol to reduce global warming;*
ii. *A requirement to increase Ireland's national energy security as set out in the Energy White Paper;*
iii. *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);*
iv. *Provision of cost-effective power production for Ireland which would deliver local benefits; and*
v. *Increasing energy price stability in Ireland through reducing an over reliance on imported gas.*

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

1.5.1.1 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 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.

[1] *Government of Ireland (2021) Climate Action Plan 2021*
[2] *EPA (2023) Irelands Provisional Greenhouse Gas Emissions 1990-2022'*

Under the agreement, 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 most recent climate conference (COP28) in December 2023 in Dubai resulted in the first agreement explicitly calling for the transition away from fossil fuels, the United Arab Emirates (UAE) Consensus. This text raised concerns over the achievement of limiting warming below 1.5°C, as the text to 'phase out as soon as possible inefficient fossil fuel subsidies' does not address energy poverty or the just transition. The UAE Consensus further calls for more explicit near-term goals in the lead up to 2050, calling for the world to cut greenhouse gas emissions by 43% as compared to 2019 levels.

The Intergovernmental Panel on Climate Change (IPCC) put forward its clear assessment in their Fifth Assessment Report[3], 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 degrees and in accordance with the COP 21 agreement to limit global warming to well below 2ºC above pre-industrial levels. Former Minister Kelly remarked in 2015 that "*As a nation we must do everything in our power to curb our emissions".*

In April 2022, the IPCC released the report 'Working Group-III – Climate Change 2022: Mitigation Of Climate Change', which assesses literature on the scientific, technological, environmental, economic and social aspects of mitigation of climate change. The report reflects new findings in the relevant literature and builds on previous IPCC reports, including the WGIII contribution to the IPCC's Fifth Assessment Report (AR5), the WGI and WGII contributions to Sixth Assessment Report (AR6) and the three Special Reports[4] in the Sixth Assessment cycle. This report outlines developments in emission reduction and mitigation efforts, assessing the impact of national climate pledges in relation to long-term emissions goals in a global context.; and states that 'Unless there are immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C will be beyond reach.'

In November 2023, the IPCC published the 'AR6 Synthesis Report: Climate Change 2023[5], and is the final product of the AR6 of the IPCC. It summarizes the state of knowledge of climate change, its widespread impacts and risks, and climate change mitigation and adaptation. It confirms that the unsustainable and unequal energy and land use as well as historical use of fossil fuels have unequivocally caused global warming, with global temperatures approximately 1.1°C above 1850-1900 levels. A substantial 'emissions gap' exists between global greenhouse gas emissions in 2030 associated with the implementation of NDCs announced prior to COP26, Parties to the Paris Agreement have two years to submit updated NDCs for the period up to 2035, ambition will need to be ratchetted up in order to limit warming to 1.5°C.

In June 2023, the EPA6 reported, for the 2021 year, that the energy sector contributed to 17% of Ireland's total emissions. Under a With Existing Measures (WEM) scenario, emissions from the energy industries sector are projected to decrease by 50% from 10.3 to 5.2 MtCO2eq; under a With Additional Measures (WAM) scenario, emissions from the energy sector are projected to decrease by 60% from 10.3 to 4.2 MtCO2eq over the period 2021-2030.

The EPA 'Ireland's Provisional Greenhouse Gas Emissions 1990-2022"7 report stated that in 2022, overall electricity generation in Ireland increased by a 2.1% and renewable electricity generation increased from 35.0% in 2021 to 38.6%, mainly due to an increase in wind energy production of 14.6%. The increase in renewables, combined with decreases in coal, oil, and peat use, resulted in the emissions intensity of power generation in 2022 decreasing by 4.8%, 331 g CO2/kWh compared with 348 g CO2/kWh in 2021.

[3] IPCC Fifth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR5 Report
[4] *IPCC's Fifth Assessment Report (AR5), the WGI and WGII contributions to Sixth Assessment Report (AR6)*
[55] *IPCC (2023) AR6 Synthesis Report: Climate Change 2023.*

The 'National Energy Projections 2023'8, published annually by the Sustainable Energy Authority of Ireland (SEAI), state that in 2022, 86% of all energy used in Ireland was from fossil fuels, 13% from renewable sources and the remainder from others such as waste and electricity imports. By 2030, fossil fuels could still provide most of Ireland's energy, ranging from 68% in the WEM scenario to 57% in the most ambitious WAM scenario. The deployment of renewables needs to outpace the growth of energy demand for the absolute reductions in greenhouse gas emissions that are required to be met. However, the SEAI National Energy Projections show that by the end of the second budget period, the total exceedance in the electricity sector is projected to be 20.1 MtCO2eq, or 33%, and 13.8MtCO2eq, or 23%, in the WEM and WAM scenarios, respectively.

It is estimated that the Proposed Project will have a potential output of 79.2 MW. On this basis, the Proposed Project will result in the net displacement of approximately 72,217 tonnes of carbon dioxide (CO_2) per annum, including accounting for back-up generation. The carbon offsets resulting from the Proposed Project are described in detail in Section 11.5.3 of Chapter 11 of this EIAR: Climate.

1.5.2 Energy Security

At a national level, Ireland currently has one of the highest external dependencies on imported sources. In November 2023 the Department of the Environment, Climate and Communications (DECC) released '*Energy Security in Ireland to 2030*'[9] which states that 'Irelands future energy will be secure by moving from an oil-, peat-, coal, and gas-based energy system to an electricity-led system, maximising our renewable energy potential flexibility and being integrated in Europe's energy systems. This report proposes a package of a wide range of measures to implement to 2030 to improve Irelands energy security. Ireland is currently one of the most energy import dependent countries in the EU, having imported 77% of its energy supply in 2021 and 82% in 2022.[10] The '*Energy Security in Ireland to 2030'* report provides a roadmap to energy security in Ireland, on the basis of current energy policies and project and to implement the measures proposed as part of the energy security package. EirGrid in their '*All Island Generation Capacity Statement 2022 - 2031'* (October 2022), states that new wind farms commissioned in Ireland in 2021 brought total wind installed capacity to over 4,300MW, contributing to the overall RES-E percentage of 36.4% with wind energy accounting for 32.5%. Prior to 2015, Irelands import dependency of energy was over 90% but dropped to 71% in 2016 with the Corrib gas field starting production. Since 2018, Ireland's import dependency has been increasing as the output from the Corrib gas field reduces faster than we are adding new renewable sources.

In January 2024 the SEAI published their 'Energy in Ireland – 2023 Report',12, stating that in 2022, 49.2% of the electricity generated indigenously in Ireland came from gas, with renewables accounting for a further 38.9%. Coal, oil, non-renewable wastes (NRW), and peat accounted for the remainder of electricity generation in Ireland. The overall renewable energy share for gross final energy consumption for 2022 was 13.1%. 2022 had the lowest energy-related emissions of any year in the last quarter century, except for 2020 which was heavily influence by the COVID-19 lockdowns. The SEAI 'Energy in Ireland – 2023 Report', using early provisional data from January to September 2023, states that electricity emissions may be significantly reduced from 2022 levels in 2023 and the carbon intensity of the national grid may be down to 259 gCO2/kWh, which, if achieved, will be the lowest carbon intensity value ever reached in Ireland.

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 Ireland's 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"*[6].

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 and peat generate almost 5% of Ireland's electricity, while gas generates 51%. Climate Action Plan 2024 calls for a reduction of 75% in electricity related emissions to not exceed the carbon budget allocations. At a time when the energy system is under severe pressure to ensure security of supply, amid projections of rapid electricity demand growth over the coming 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[7] ('the White Paper') notes "There will be a substantial increase in the cost of carbon in the short and medium term, through the EU Emissions Trading Scheme". Any steps to reduce dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. As the White Paper notes:

> *"In the longer term, fossil fuels will be largely replaced by renewable sources".*

1.5.2.1 REPowerEU

In a Communication from the European Parliament on Joint European Action for more affordable, secure and sustainable energy[8], the European Commission proposed an outline of a plan to make Europe independent from Russian fossil fuels well before 2030 in light of Russia's invasion of Ukraine. Commission President Ursula von der Leyen stated:

> "*We must become independent from Russian oil, coal and gas. We simply cannot rely on a supplier who explicitly threatens us. We need to act now to mitigate the impact of rising energy prices, diversify our gas supply for next winter and accelerate the clean energy transition. The quicker we switch to renewables and hydrogen, combined with more energy efficiency, the quicker we will be truly independent and master our energy system.".*

In May 2022, the EU published the REPowerEU Plan[9] in light of Russia's invasion of Ukraine in February 2022. The core purpose of the plan, in addition to accelerating the EU's transition from the use of fossil fuel to renewable energy sources, is to end the dependence on Russian fossil fuels.

In April 2022, the Government published the National Energy Security Framework (NESF) providing a single overarching and initial response to address Ireland's energy security needs in the context of the war in Ukraine. This framework mirrors that of the EU, in which accelerating Ireland's transition from the use of fossil fuel to renewable energy sources is a key objective.

1.5.3 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*".

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[6] *Dr Eimear Cotter, Head of Low Carbon Technologies, SEAI - "Energy Security in Ireland 2015"*
[7] *Ireland's Transition to a Low Carbon Energy Future 2015-2030 (Department of Communications, Energy & Natural Resources, 2015)*
[8] *European Commission (March 2022) REPowerEU: Joint European Action for more affordable, secure and sustainable energy. Strasbourg.* https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511
[9] *https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131*

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 approx. 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. A Pöyry study from 2015 showed that reaching our targets in 2020 would reduce wholesale prices by more than costs of new grid infrastructure, backup and the subsidies paid to wind, resulting in a net saving of €43m per year in 2020. The EU has noted that Ireland has one of the lowest costs of supporting renewables mainly because onshore wind is on a par with the cost of power from conventional generation when a full cost-benefit analysis is undertaken.

1.5.3.1 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 the Renewable Energy Directive (2018/2001 EU) on the Promotion of the Use of Energy from Renewable Sources in December 2018 which sets EU 2030 Renewable Energy Targets.

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).

The first Renewable Energy Directive (RED)[17] is legislation that influenced the growth of renewable energy in the EU and Ireland for the decade ending in 2020. From 2021, RED was replaced by the second Renewable Energy Directive (REDII),[18] which continues to promote the growth of renewable energy out to 2030. Ireland's mandatory national target for 2020 was to supply 16% of its overall energy needs from renewable sources. This target covered energy in the form of electricity (RES-E), heat (RES-H) and transport fuels (RES-T). Ireland fell just short of this target with the total renewable share of gross final consumption (GFC) reaching 13.5%. REDII introduced a binding EU-wide target for overall RES of 32% in 2030 and requires Member States to set their national contributions to the EU-wide target. As per the National Energy and Climate Plan (NECP) 2021-2030, Ireland's overall RES target is 34.1% in 2030.

Under RED, the RES-E target was for 40% of gross electricity consumption to come from renewable sources in 2020 The actual RES-E achieved in 2020 by Ireland was 39.1%, falling just short of the national target. Under REDII, Ireland's National Energy and Climate Plan 2021-2030 included a planned RES-E of 70% in 2030, which has been replaced by the 80% by 2030 RES-E target as detailed in the more recent Climate Action Plan (2024), which will ensure that renewable electricity continues to form the backbone of Irish renewable energy use for the coming decade and beyond.

1.5.3.2 EU 2030 Renewable Energy Targets

The Climate Action and Low Carbon Development (Amendment) Act 2021 commits Ireland to reach a legally binding target of net-zero emissions no later than 2050, and a cut of 51% by 2030 (compared to 2018 levels). Under the 2021 Act, Ireland's national climate objective requires the state to pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy.

Ireland's statutory national climate objective and 2030 targets are aligned with Ireland's obligations under the Paris Agreement and with the European Union's objective to reduce GHG emissions by at

least 55% by 2030, compared to 1990 levels and to achieve climate neutrality in the European Union by 2050.

Given the need to ratchet up the EUs clean energy transition, RED was revised in 2023, and the amending Directive EU/2023/2413 (REDIII)[19] entered into force on 20 November 2023. REDIII amended the EU-wide overall 2030 RES target from 32% to at least 42.5%, and it is assumed that Irelands 2030 RES target will increase accordingly.

In December 2023, the Government published the most recent Climate Action Plan 2024, announcing a renewable electricity target of 80% by 2030 for Ireland. This is in line with target previously announced in the Climate Action Plan 2021 and 2023.

The Climate Action Plan 2024 states that in order to meet the required level of emissions reduction by 2030 and the 80% renewable electricity generation target by 2030, the installed generation capacity of onshore will need to reach 9GW and at least 5GW of offshore wind. By May 2022, the installed wind capacity in the Republic of Ireland is over 4.3GW according to Wind Energy Ireland[10]. As noted previously, Ireland missed it's 2020 renewable energy target of 40% with a renewable share in electricity of 39.1%, and by the end of 2021, Irelands renewable energy share for electricity generation was 32.5%. With a renewable share of electricity generation at 80% in mind and a target of 8GW installed onshore wind by 2030, it is now more critical than ever that we continue to progress renewable energy development in Ireland so that we are successful in meeting our 2030 targets. Further detail on the EU 2030 targets is noted in Chapter 2.

1.5.4 Increasing Energy Consumption

As detailed above, the Climate Action Plan 2024 identifies a need for 9GW of onshore wind generation in order for Ireland to meet its 2030 targets. In their '*All Island Generation Capacity Statement 2022 - 2031'* (October 2022), EirGrid estimate that installed capacity of wind generation is set to increase to at least 12 GW between onshore and offshore capacity as Ireland endeavours to meet its renewable targets in 2030 and beyond.

Failure to meet Ireland's targets for renewable energy will result in substantial EU sanctions. The Department of Public Expenditure and Reform (DPER) in their report 'Future Expenditure Risks associated with Climate Change/Climate Finance'[11] concluded that *'potential costs of purchasing non-ETS GHG compliance for the Irish Exchequer for the 2020 to 2030 period could have a cumulative total in the billions in the absence of any further policy changes'*. If Ireland decided to backfill shortfalls in the RES-H target with additional renewable electricity this could significantly reduce these costs.

In April 2016[12] the SEAI estimated the historic build rate for wind energy deployment as 180 MW per year since 2005. If this average build rate over the remaining period between 2018 and 2020 is assumed, then approximately 3.85 GW of wind would be built up to 2020. As of February 2023, the installed wind capacity in the Republic of Ireland is over 4.3GW according to Wind Energy Ireland[13].

It is noted that the key driver for electricity demand in Ireland for the next number of years is the connection of new large energy users, such as data centres. This statement notes that '*Large industrial connections normally do not dominate a country's energy demand forecast but this is the case for Ireland at the moment*'. EirGrid analysis shows that demand from data centres could account for 28% of all demand by 2031 in a median demand scenario (accounts for the connection of all 1400MVA of

[10] *https://windenergyireland.com/about-wind/facts-stats*
[11] https://igees.gov.ie/wp-content/uploads/2013/10/Future-Expenditure-Risks-associated-with-Climate-Change-Climate-Finance1.pdf
[12] *https://www.seai.ie/publications/Ireland___s-Energy-Targets-Progress-Ambition-and-Impacts.pdf*
[13] *https://windenergyireland.com/about-wind/facts-stats*

potential demand in the connection process). The median demand scenario is now higher than for last year's forecast for high demand, indicating the progression of many of the data centre projects.

In 2015, IWEA commissioned a study '*Data Centre Implications for Energy Use in Ireland'* which concluded that an extra approx. 1 Gigawatt (GW) of electricity demand could materialise between 2015 and 2020 due to growth in data centres. More recently, data available from Bitpower[14] at the end of 2021 noted a 25% increase in completed data centre capacity over the past 12 months with a total of 70 operational data centres with a combined total of 900 MW of connected power capacity. Ten new data centres came online between the period of November 2020 and November 2021. The increase in growth of data centres means an increase in electricity demand, with many of the proposed data centres committing to using 100% renewable energy which will result in an increased demand for renewable electricity as detailed above.

In the context of increasing energy demand and prices, uncertainty in energy supply and the effects of climate change, our ability to harness renewable energy such as wind power plays a critical role in creating a sustainable future. The DECC have set a target for Ireland of 80% of total electricity consumption to come from renewable resources by 2030, this target forms part of the Government's strategy to make the green economy a core component of its economic recovery plan for Ireland. It is envisaged that wind energy will provide the largest source of renewable energy in achieving this target, with a target of 9GW onshore wind installed generation capacity and a target of 5GW offshore wind installed generation capacity.

The Department of Communications, Energy & Natural Resources (DCENR) noted in their Draft Bioenergy Plan 2014, that achieving the anticipated renewable energy usage in the three energy sectors will be challenging, with the 12% for renewable heat being particularly so. SEAI estimate that the shortfall could be in the region of 2% to 4% of the 12% RES-H target. Given that individual member states 2030 targets are set at a more challenging level than 2020, fines could persist for an extended number of years, and so the total cost to Ireland could run to billions. For comparison, the entire wholesale electricity market has an annual value of around €3bn.

In the medium-term, with the introduction of electric vehicles and uptake of smart demand such as storage heating and heat pumps, emissions in the heat and transport sector will be substantially reduced. A high renewables electricity system is the foundation of such a transformation.

The White Paper published by DCENR in December 2015 expanded on the vision set out above. It outlines a radical transition to a low carbon future which will involve amongst other things, *'generating our electricity from renewable sources of which we have a plentiful indigenous supply'* and *'Increasing our use of electricity and biogas to heat our homes and fuel our transport'*.

The DCENR confirmed in the publication of the White Paper '*Ireland's Transition to a Low Carbon Future' 2015 – 2030*, that wind is the cheapest form of renewable energy:

> *"(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."*

EU countries have agreed on a new 2030 Framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target. It is noted that a binding EU target of 32% for renewable energy by 2030 has been set by the EU 2030 Framework for Climate and Energy, with Ireland confirming its own targets for 2030 as detailed below.

[14] *http://www.bitpower.ie/images/Reports/2020_H2_Report.pdf*

Ireland will therefore have to meet even more demanding climate change and renewable energy supply obligations in order to play its part in achieving the European climate and energy ambitions. As announced in December 2022, the Irish Government have pledged to generate 80% of the country's electricity supply from renewable sources by 2030. The development of additional indigenous wind energy generating capacity, such as that proposed at the Proposed Project, will not only help to reduce carbon emissions but will also improve Ireland's security of energy supply. Such penetration levels of wind are technically and economically feasible once paired with other energy system changes such as increasing electric vehicle penetration and electrification of heat. Further information on the 2030 commitments for Ireland are noted in Chapter 2, Section 2.2.

These sources of 'flexible demand' allow the system to match intermittent renewable energy resources with minimal extra cost. Additional interconnection is also planned with the UK and France, further assisting in the integration of wind (and in the future solar) on the power system.

A number of alternative energy types have been examined when considering how best to meet this renewable energy target.

In 2014, a report prepared by UK consultant BW Energy for the Rethink Pylons campaign group has suggested that converting Moneypoint generation station (which runs solely on coal) from coal to biomass would have enabled Ireland to meet 2020 renewable energy targets. Dr Brian Motherway, Chief Executive SEAI[15] refutes this claim. While Dr Motherway agrees that biomass offers benefits and is helping Ireland to move away from fossil fuels, he states that "*the conversion of Moneypoint to biomass has been considered a number of times over the years, including actual trials of small amounts of biomass in the station. However, the technical and economic challenges have proven far greater than some would have us believe*".

The reason being that the move of Moneypoint from coal to biomass would not entail a clean swap. In fact, '*to allow for combustion of biomass, a full redesign and rebuild of much of the station would be required*'. In the UK where this has been done, energy generation stations have required significant financial support to make the process viable and with each unit of energy in the UK being worth approx. 13 cents, almost double that of Ireland which is approx. 7 cents, wind energy works out cheaper in Ireland. Also, the amount of biomass required to feed Moneypoint would require 300,000ha of land; an equivalent area of Counties Wexford and Carlow being planted with willow which is far more than Ireland currently produces which means we would need to import.

Importation raises the question; would this be cost effective? As prices are volatile and availability of biomass is difficult to predict Ireland would become dependent on the uncertainty of imported biomass. It is also noted that there will be emissions from transport and distribution. The further the biomass is transported, the greater the greenhouse gas emissions[16]. So, while biomass is currently contributing to a move to renewable energy production, on its own it is not the sole answer to meeting Ireland's renewable energy targets. Ireland has a legal obligation to diversify its energy sources requiring the development of renewable energy to avoid substantial fines.

The Joint Committee on Climate Action published its cross-party report entitled, '*Climate Change: A Cross- Party Consensus for Action'* (March 2019). This report highlights the requirements for alternate energy production. More specifically, the report notes that it is currently planned to stop burning coal at Moneypoint by 2025 as well as peat at Bord na Mona and ESB stations by 2030. In December 2022, the Department of Environment, Climate and Communications published its Climate Action Plan (CAP), which notes the need for renewable alternatives to coal and peat. Further information on the CAP can be seen in Chapter 2, Section 2.2.

[15] http://www.seai.ie/News_Events/Press_Releases/2014/Biomass-is-a-big-part-of-the-solution-but-not-the-whole-solution.html
[16] *Sustainability Criteria Options and Impacts for Irish Bioenergy Resources (SEAI 2019)*

The Climate Action Plan 2021 states that in Ireland, total electricity demand over the next ten years is forecast to grow by between 19% and 50%, largely driven by new large energy users, many of which are data centres, based on existing policies and strategies. In the high demand scenario outlined in the Programme for Government, electricity demand will almost double by 2030, while electricity emissions are to be reduced by 60-80% at the same time. While building upon the demands identified in the Climate Action Plan 2021, the Climate Action Plan 2023 identified specifically the increase of 3.5 TWh of electricity demand from the electrification of heat in industry.

Underlying drivers of changes in electricity demand include:

- Data centres are forecast to continue to grow by up to ~9 TWh in 2030 (~2316% of total demand).
- Transport electricity demand is forecast to grow (~23% p.a.) as a result of fast uptake of EV charging.
- Electrical heating in industry will increase by more than 2.5 times in 2030 from 2017 levels.
- Building energy efficiency improvements from an extensive retrofit programme will moderate the growth in electricity demand from new heat pumps in buildings.

Against this backdrop, the importance of wind energy as the main component of Ireland's renewable energy development is acknowledged, and wind energy is accepted as the main contributor to meeting the Country's national climate change and energy supply obligations. Notwithstanding this, it must also be acknowledged that not every part of Ireland is well endowed with wind resources and therefore, not all counties will be able to deliver wind-based renewable energy. Furthermore, whilst it is accepted that there are other renewable energy technologies in operation, for the foreseeable future many areas will be unable to deliver significant renewable energy output. This primarily applies to the more populous areas.

National and international renewable energy and climate change targets must be achieved, and it is crucial that these are appropriately translated and implemented at regional and local levels. Wind farm development and design involves balancing the sometimes-conflicting interests of constraints (e.g., natural and built heritage, human beings, ecological, ground conditions, hydrological, etc.) with visual amenity and the technological/economic requirements/realities of the specific project and turbines.

1.5.5 Reduction of Carbon Emissions and Other Greenhouse Gases

The production of renewable energy from the Proposed Project 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 Proposed Project will displace approximately 72,217 tonnes of carbon emissions per annum from the largely carbon-based traditional energy mix, the detail of which is presented in Section 11.5.3.2 in Chapter 11 of this EIAR.

The Environmental Protection Agency (EPA) report '*Air Quality in Ireland 2021'* noted that in Ireland, the premature deaths attributable to poor air quality are estimated at 1,300 people per annum. A more recent European Environmental Agency (EEA) Report, '*Air Quality in Europe – 2021 Report'* highlights the negative effects of air pollution on human health. The report assessed that poor air quality

accounted for premature deaths of approximately 307,000 people in the 27 EU Member States in 2019, with regards to deaths relating to $PM_{2.5}$. The estimated impacts on the population in Europe of exposure to NO_2 and O_3 concentrations in 2019 were around 40,400 and 16,800 premature deaths per year, respectively. From this, 1,300 Irish deaths were attributable to fine particulate matter ($PM_{2.5}$), 30 Irish deaths were attributable to nitrogen oxides (NO_2) and 50 Irish deaths were attributable to Ozone (O_3) (Source: *Air Quality in Europe – 2021 Report'*, EEA, 2021).

The EPA 2016 report '*Ireland's Environment – An Assessment'* states that the pollutants of most concern are NOx, (the collective term for the gases nitric oxide and nitrogen dioxide, PM (particulate matter) and O_3 (ozone). The EPA 2016 report goes on to state that:

> *"Ireland has considerable renewable energy resources, only a fraction of which are utilised to address our energy requirements.*
>
> *Wind, ocean, solar, hydro and geothermal energy do not produce GHG (greenhouse gas) emissions or emissions of air pollutants such as particulates, sulphur dioxide and nitrogen dioxide. Use of these renewable resources can have* ***considerable co-benefits for human health and ecosystems****. Meeting energy requirements from renewable resources can provide significant economic and employment benefits at local to national scales."*

The Proposed Project 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 (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide SO_2, thereby resulting in cleaner air and associated positive health effects.

1.5.6 Economic Benefits

In addition to helping Ireland avoid significant fines and reducing environmentally damaging emissions, the Proposed Project will have significant economic benefits. At a national level, Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas. As detailed in the SEAI Report '*Energy in Ireland 2021'*, Ireland has a high import dependence on oil and gas and is essentially a price-taker on these commodities. In 2019 the cost of all energy imports to Ireland was approximately €4.5 billion with imported fossil fuels accounting for 69% of all energy consumed ('*Energy in Ireland 2020'*, Sustainable Energy Authority of Ireland, 2020).

The SEAI report '*Energy in Ireland 2020'* indicated that renewable electricity (mostly wind energy) in 2019:

- Displaced €501 million in fossil fuel imports; and
- Reduced CO_2 emissions by 4.8 million tonnes.

The 2014 report '*The Value of Wind Energy to Ireland'*, published by Pőyry, 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.

In April 2021, Wind Energy Ireland published a report produced by KPMG on the '*Economic Impact of Onshore Wind in Ireland*' stating that Irish wind farms are worth €400 million to the economy every year and it is expected to rise to €550 million by the end of the decade. If Ireland are to achieve the 8,200 MW target set in the Climate Action Plan 2021, the total industrial output across operating and capital activities would rise from 1.1bn in 2020 (from the 4,200 MW installed capacity) to 1.5bn in 2030.

The Proposed Project will be capable of providing power to over 57,816 households every year, as presented in the calculations in Section 4.3.1.1.6 of this EIAR.

The Proposed Project will help to supply the rising demand for electricity, resulting from renewed economic growth. The EirGrid report '*All-Island Generation Capacity Statement 2022 – 2031'* (December 2022) notes that the median electricity demand forecast on the island of Ireland is expected to grow by 21% in 2030. Much of this growth is expected to come from new data centres in Ireland.

The Proposed Project will have both long-term and short-term benefits for the local economy including income to local landowners, job creation, work opportunities for local businesses and service providers, local authority commercial rate payments and a Community Benefit Scheme.

Commercial rate payments from the Proposed Project will be provided to Galway County Council each year during the construction phase, which will be redirected to the provision of public services within Co. Galway. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the Proposed Project has the potential to create 80-100 jobs during the construction phase and 3-4 jobs during operational and maintenance phases of the Proposed Project. During construction, additional indirect employment will be created in the region through the supply of services and materials to the renewable energy development. There will also be income generated by local employment from the purchase of local services i.e., travel, goods and lodgings. Further details on employment associated with the Proposed Project are presented in Section 5.9 of this EIAR.

Should the Proposed Project receive planning permission, there are substantial opportunities available for the local area in the form of Community Benefit Funds. Based on the current proposal, a Community Benefit Fund would attract a community contribution in excess of €400,000/year for the local community over the lifetime of the Proposed Project. The value of this fund will be directly proportional to the installed capacity and/or energy produced at the site and will support and facilitate projects and initiatives including youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects.

Further details on the proposed Community Gain proposals are presented in Appendix 2-1 and Section 4.7 in Chapter 4 of this EIAR.

1.6 Purpose and Scope of the EIAR

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

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

a) *population and human health*
b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC*

c) *land, soil, water, air and climate*
d) *material assets, cultural heritage and the landscape*
e) *the interaction between the factors referred to in points (a) to (d)*

The EIAR submitted by the applicant provides the relevant environmental information to enable the EIA to be carried out by the competent authorities. The information to be contained in the EIAR is prescribed Article 5 of the revised EIA Directive described in Section 1.4 above.

1.7 Structure and Content of the EIAR

This EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the Proposed Project thereon and the proposed mitigation measures. Background information relating to the Proposed Project, scoping and consultation undertaken and a description of the Proposed Project are presented in separate sections. The grouped format sections describe the impacts of the Proposed Project in terms of population and human health, biodiversity, with specific attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EEC; land, soils and geology, water, 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, schedule of mitigation and monitoring, and vulnerability to natural disasters.

The chapters of this EIAR are as follows:

- Introduction
- Background to the Proposed Project
- Considerations of Reasonable Alternatives
- Description of the Proposed Project
- Population and Human Health
- Biodiversity (excluding Birds)
- Birds
- Land, Soils and Geology
- Water
- Air Quality
- Climate
- Noise and Vibration
- Landscape and Visual
- Cultural Heritage
- Material Assets (including Traffic and Transport, Telecommunications and Aviation)
- Vulnerability of the Project to Major Accidents and Natural Disasters
- Interactions of the Foregoing
- Schedule of Mitigation 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 Proposed Project followed by the existing environment, impacts and mitigation measures presented in the grouped format.

1.7.1 Description of Likely Significant Effects and Impacts

As stated in the *Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EPA, 2022), an assessment of the likely impacts of a Proposed Project is a statutory requirement of the EIA process. The statutory criteria for the presentation of the characteristics of potential impacts requires that potential significant impacts are described with reference to the extent, magnitude, complexity, probability, duration, frequency, reversibility and trans-frontier nature (if applicable) of the impact.

The classification of impacts in this EIAR follows the definitions provided in the Glossary of Impacts contained in the following guidance documents produced by the 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'* (EPA, May 2022)
- *'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)

The European Commission published a number of guidance documents in December 2017 in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU as amended by 2014/52/EU) including 'Guidance on Screening', 'Guidance on Scoping' and 'Guidance on the preparation of the Environmental Impact Assessment Report', which have also been consulted.

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 Proposed Project on the receiving environment. The use of pre-existing standardised terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across all disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the Proposed Project 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

Impact Characteristic	Term	Description
	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
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)

Impact Characteristic	Term	Description
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 17: Interaction of the Foregoing.

1.8 Project Team

1.8.1 Project Team Responsibilities

The companies and staff listed in Table 1-3 are responsible for completion of the EIAR of the Proposed Project. Further details regarding project team members are provided below.

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

Table 1-3 EIAR Project Team

Consultants	Principal Staff Involved in Project	EIAR Input
MKO Tuam Road Galway	Brian Keville Michael Watson Sean Creedon Owen Cahill Jonny Fearon Eileen Corley Edward Ryan Ellen Costello Catherine Johnson Brodie Ní Thuathail Alan Clancy Jade Power Sasha Hornby John Hynes Pat Roberts Sarah Mullen Kate O'Donnell Katy Beckett Aoife Joyce Ryan Connors Dervla O'Dowd Padraig Cregg Patrick Manley Jack Workman Jack Smith Alan Roache Darragh Buckley Joseph O'Brien Gabriela Oliveira	Project Managers, Scoping and Consultation, Preparation of Natura Impact Statement and the following Chapters: › 1. Introduction › 2. Background to the Proposed Project › 3. Consideration of Reasonable Alternatives › 4. Description of the Proposed Project › 5. Population and Human Health › 6. Biodiversity › 7. Ornithology › 10. Air Quality › 11. Climate › 12. Landscape and Visual › 14. Material Assets (Non-Traffic) › 16. Vulnerability of the Project to Major Accidents and Natural Disasters › 17. Interactions of the Foregoing › 18. Schedule of Mitigation Measures
Hydro Environmental Services 22 Lower Main Street Dungarvan	Michael Gill David Broderick Gabi Andersen	Flood Risk Assessment, Drainage Design and Preparation of the following Chapters: › 8. Land, Soils and Geology › 9. Hydrology and Hydrogeology

Consultants	Principal Staff Involved in Project	EIAR Input
Co. Waterford		
Gavin & Doherty Geosolutions Unit A2. Nutgrove Office Park, Rathfarnham, Dublin 14	Pat Quigley Andria Loppas John O'Donovan Stephen Curtis Chris Engelman Brian McCarthy Efstathia Chioti Daniel Murphy	Preparation of Peat Stability Assessment and Peat and Spoil Management Plan
TNEI Ireland Unit S12, Synergy Centre TU Dublin Tallaght Campus, Tallaght, Dublin, D24	James McKay Jason Baldwin Mark Tideswell Gemma Clark	Baseline Noise Survey and Preparation of Chapter 12: Noise and Vibration
Tobar Archaeological Services Saleen Midleton Co. Cork	Miriam Carroll	Preparation of Chapter 13: Archaeological, Architectural and Cultural Heritage
Alan Lipscombe Traffic and Transport Consultants Claran, Headford, Co. Galway	Alan Lipscombe	Preparation of Chapter 15: Material Assets - Traffic and Transport

1.8.2 Project Team Members

1.8.2.1 MKO

Brian Keville B.Sc. (Env.)

Brian Keville has over 18 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. 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 19 years' experience in the environmental sector. Following the completion of his Master's Degree in Environmental Resource Management, Geography, from National University of Ireland, Maynooth he worked for the Geological Survey of Ireland and then a prominent private environmental & hydrogeological consultancy prior to joining MKO in 2014. Michael's professional experience includes managing Environmental Impact Assessments, EPA License applications, hydrogeological assessments, environmental due diligence, and general environmental assessment on behalf of clients in the wind farm, waste management, public sector, commercial and industrial sectors nationally. Michaels 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).

Sean Creedon M.Sc., B.Sc.

Sean Creedon is an Associate Director in the Environment Team at MKO. He leads a team of highly skilled environmental professionals working on EIAR for large-and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He has worked on the planning and environmental impact elements within all stages of wind farm project delivery. Sean's professional experience includes the development and management of a portfolio of wind farm developments to the consenting decision. He is a member of the MKO senior management team. Sean has over 22 years' experience in program and project development, holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

Owen Cahill B.Sc., M.Sc. (Eng.) MIEMA CEnv

Owen is an Environmental Engineer with over 12 years of experience in the environmental management and construction industries. Owen is also the MKO Health & Safety Officer with the responsibility for managing Occupational Safety and Health matters in the Galway Office. Owen holds BSc. (Hons) and MSc. in Construction Management and a Master's in environmental engineering. Owen has also successfully completed a Managing Safely Course approved and validated by the Institution of Occupational Safety and Health. Prior to taking up his position with McCarthy Keville O'Sullivan in October 2013, Owen worked as an Environmental Officer with Kepak and prior to which he held a post with Pentland Macdonald Contaminated Land & Water Specialist in Northern Ireland. Prior to working in planning and environmental consultancy, Owen was employed within the construction industry where he gained significant experience on a variety of civil, residential and commercial projects. Owen's wide ranging multi sector experience has provided him with specialist knowledge and understanding of the challenges in the planning and delivery of developments with the minimum environmental impact and with practicality and constructability in mind.

Owen's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy & solar energy construction & environmental management planning and waste permit management. Since joining MKO Owen has been involved as a Project Manager on a range of

energy infrastructure, commercial, residential, waste facility and quarry projects as well as managing the licensing requirements of a number of EPA licensed facilities. Within MKO Owen plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIS Reports. Owen is Full Member and Chartered Environmentalist with the Institute of Environmental Management & Assessment.

Jonny Fearon B.Sc. (Env), M.Sc.

Jonny Fearon is an Environmental Scientist with MKO having joined the company in March 2022. Jonny holds a BSc (Hons) Environmental Science, a MSc (Hons) in Environmental Leadership and a Specialist Diploma in Corporate Environmental Planning. Jonny's key strengths are GIS, data analysis, fieldwork and report writing. Since joining MKO, Jonny has been involved in a range of wind farm projects. In his role as an Environmental Scientist, Jonny 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.

Eileen Corley B.Sc. (Env)

Eileen Corley is a Graduate Environmental Scientist who has been working with MKO since September 2023. Eileen graduated from University of Galway in BSc Environmental science where she focused her studies on environmental nature conservation and environmental legislation. Since taking up her position with MKO, Eileen has worked on Environmental Impact Assessment Screening Reports, Construction and Environmental Management Plan Reports and QGIS mapping for a range of projects such as wind energy and wastewater treatment plants.

Edward Ryan B.Sc. (Env), M.Sc.

Edward is an Environmental Scientist with a B.Sc. (Hons) in Environmental Science from the University of Limerick and a M.Sc. (hons) in Environmental Systems from Atlantic Technological University: ATU (formally GMIT). Edward has been involved in a myriad of environmental service offerings at MKO including EIA Screenings and Reports, and renewable energy infrastructure projects.

Ellen Costello B.Sc., M.Sc.

Ellen Costello is a Project Environmental Scientist with MKO with over three years of experience in private consultancy. Ellen holds a BSc (Hons) in Earth Science, and a MSc (Hons) in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on renewable energy development in Europe and its implications on environment and society. Ellen's key strengths and expertise are Environmental Protection and Management, Environmental Impact Statements, Project Management, and GIS Mapping and Modelling. Since joining MKO, Ellen has been involved in a range of renewable energy infrastructure projects. In her role as a project manager, Ellen 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. Ellen is a Practitioner Member of the Institute of Environmental Management & Assessment.

Catherine Johnson B.Sc. (Hons), LLM

Catherine is a Climate Practitioner and Environmental Scientist with MKO with over one year of private consultancy experience and expertise in climate and sustainability matters. Catherine holds a BSc in Earth and Ocean Science and a LLM in Global Environment and Climate Change Law. Prior to joining MKO in 2022, Catherine worked as an Environmental Social Governance (ESG) analyst for

Acasta in Edinburgh. Catherine has expertise regarding international climate law and policy, earth processes, ocean science, and sustainability/ESG. Catherine has been involved in a myriad of environmental service offerings at MKO including EIA Screenings and Reports, climate and sustainability related work and renewable energy infrastructure projects.

Brodie Ní Thuathail M.Sc., BCL.

Brodie Ní Thuathail is a Graduate Environmental Scientist with MKO. Brodie holds a BCL in Corporate Law and an MSc in Environmental Leadership. Prior to taking up her position with MKO in September 2023, Brodie worked as a legal researcher for the School of Law in the University of Galway, where she assisted on various legal projects, including publication of a legal textbook on disability law in Ireland. Brodie's key strengths and areas of expertise are in environmental law and policy, drafting EIAR report chapters and QGIS mapping. Since joining MKO, Brodie has been involved as a Graduate Environmental Scientist in a range of wind farm projects, assisting with field work, client briefing notes, compiling planning policy rationale reports, constraints mapping and drafting EIAR chapters, with more projects in the pipeline.

Alan Clancy BA (Hons), MPlan

Alan Clancy is a Planner with MKO with over 5 years of experience in private practice. Alan holds a BA in Geography & History and Masters in Planning and Sustainable Development. Prior to taking up his position with MKO in February 2021, Alan worked as a Planner for Indigo Telecom Group in Limerick Ireland where he assisted with management of all planning aspects of new telecommunications network roll out programmes, retentions of existing sites and all aspects of dealing with planning applications and appeals for leading telecommunications operators. Prior to this, Alan worked in the UK with the JTS Partnership LLP, where he gained experience as a graduate planner through to planner level. Alan has experience across a range of sectors including commercial, residential and industrial, as well as having experience with providing development advice and undertaking background research for clients, preparing planning applications of varying sizes as well as planning appeals and conditions compliance and managing all aspects of the planning process for commercial, educational and Infrastructural projects. Alan's key strengths and areas of expertise are in development management, provision of planning advice and project management of small and medium sized projects. Since joining MKO, Alan has been working closely with Pamela Harty, Meabhann Crowe and the wider planning team, assisting with various projects including Strategic Infrastructure Developments, lodgement and management of Planning Applications, Development Plan Submissions and preparing Development Potential Reports. Alan is working towards chartered membership of the Irish Planning Institute.

Jade Power MRUP, B.Sc.,

Jade Power is a Planner with MKO with over 2 years of experience in private practice. Jade holds a bachelor's in Social Sciences (Environmental Policy) and Masters in Rural and Urban Planning (MRUP) from University College Dublin (UCD). Prior to taking up her position with MKO in November 2022, Jade worked as a Planner for Thornton O'Connor Town Planning in Dublin City, where she gained experience as a graduate planner through to planner level. Jade has experience across a range of sectors including commercial, residential, and industrial, as well as having experience with providing development advice and undertaking background research for clients, preparing planning applications of varying sizes as well as planning appeals and managing all aspects of the planning process of various development projects. Since joining MKO, Jade has been working closely on renewable energy infrastructure projects with Colm Ryan, Alan Clancy, and the wider planning team, assisting with various projects including Strategic Infrastructure Developments (SIDs) and the lodgement and management of planning applications for renewable energy projects. Jade is a member of the Irish Planning Institute (IPI) and the Royal Town Planning Institute (RTPI).

Sasha Hornby

Sasha Hornby is a Student Planner who has worked with MKO for 10 months. She is a member of the Royal Town Planning Institute (RTPI) where she holds a student membership. Sasha is currently in her final year at University of Ulster where she is working towards her Integrated Masters of Science in Planning, Regeneration and Development. Sasha has gained experience across a variety of projects during her time at MKO including within residential and renewable energy sectors. She has assisted in undertaking research for clients, engaging with Planning Authorities, preparing of planning applications for Strategic Infrastructure Developments (SIDs) and Large-scale Residential Developments (LRD), and contributed to a number of Environmental Impact Assessment Reports (EIARs).

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

John Hynes is a Senior Ecologist with McCarthy O'Sullivan Ltd. with over 9 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.

Pat Roberts B.Sc. (Env.)

Pat Roberts is a Senior Ecologist and director of the Ecology team with McCarthy O'Sullivan Ltd. with over 12 years post graduate experience of providing ecological services in relation to a wide range of developments at the planning, construction and monitoring stages. Pat holds B.Sc. (Hons) in Environmental Science. Pat has extensive experience of providing ecological consultancy on large scale industrial and civil engineering projects. He is highly experienced in the completion of ecological baseline surveys and impact assessment at the planning stage. He has worked closely with construction personnel at the set-up stage of numerous construction sites to implement and monitor any prescribed best practice measures. He has designed numerous Environmental Operating Plans and prepared many environmental method statements in close conjunction with project teams and contractors. He has worked extensively on the identification, control and management of invasive species on numerous construction sites. Prior to taking up his position with MKO in June 2005, Pat worked in Ireland, USA and UK as a Tree Surgeon and as a nature conservation warden with the National Trust (UK) and the US National Park Service. Pats key strengths include his depth of knowledge and experience of a wide range of ecological and biodiversity topics and also in his ability to understand the requirements of the client in a wide range of situations. He currently manages the ecological team within MKO and ensures that the outputs from that team are of a very high standard and meet the requirements of the clients and relevant legislation and guidelines. He is a full member of the Chartered Institute of Ecologists and Environmental Managers (CIEEM).

Sarah Mullen B.Sc. (Hons) M.Sc.

Sarah Mullen is an Ecologist with MKO with over 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. Sarah has experience in conducting multidisciplinary ecological surveys and 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.

Kate O'Donnell B.Sc. (Hons)

Kate is a Project Ecologist with MKO with over 3 years of experience in ecological consultancy. Kate holds a BSc (Hons) in Ecology and Environmental Biology. Kate's key strengths and areas of expertise are in terrestrial ecology, including vegetation surveys, habitat identification, invasive species surveys, mammal surveys, Appropriate Assessment and Ecological Impact Assessment. Kate is also skilled in GIS. Prior to taking up her position with MKO in February 2022, Kate worked as an Ecologist with RPS where she gained experience in Ecological Impact Assessment, Appropriate Assessment and multidisciplinary ecological surveys for a range of projects including IDA developments, flood relief schemes, road network improvements and greenway developments. Since joining MKO Kate has been responsible for organising and undertaking flora, fauna and habitat surveys in accordance with NRA Guidelines for projects including wind farm developments and housing developments and for the preparation of Ecological Impact Assessments and Stage 1 and Stage 2 Appropriate Assessment reports. She holds membership with the Chartered Institute of Ecology and Environmental Management.

Katy Beckett B.Sc. (Hons), M.Sc.

Katy is a Graduate Ecologist with MKO having joined the company in June 2023. Katy holds a B.A. (Hons) in Environmental Science from Trinity College Dublin during which she researched the potential hybridisation of invasive plants with Irish native flora. She also holds an M.Sc. in Biodiversity and Conservation from Trinity College Dublin. During these academic studies she focused on conservation, gaining field and desk skills, and completing a thesis on the impact of wind farms on Irish pollinators with the Nature+ energy research group. Katy's key strengths and expertise are in terrestrial ecology and conservation, including vegetation and invasive species surveys, mammal surveys and habitat mapping. Katy is also skilled in QGIS mapping, data analysis and scientific communication. Since joining MKO, Katy has primarily been involved in renewable energy and wind farm projects, completing multidisciplinary walkover surveys, specialist surveys, as well as the subsequent Appropriate Assessments, Ecological Impact Assessments and Biodiversity Chapters. She is a Qualifying member of the Chartered Institute of Ecology and Environmental Management and continues to upskill through internal training as well as external courses and volunteering through Birdwatch Ireland and the British Trust for Ornithology.

Aoife Joyce B.Sc., M.Sc.

Aoife Joyce is an Ecologist with MKO with experience in research, consultancy, and drilling contractors. Aoife is a graduate of Environmental Science (Hons.) at NUI Galway, complemented by a first-class honours MSc in Agribioscience. Prior to taking up her position with MKO in May 2019, Aoife worked as an Environmental Scientist with Irish Drilling Ltd. and held previous posts with Inland Fisheries Ireland and Treemetrics Ltd. She has a wide range of experience from bat roost identification, acoustic sampling, sound analysis, soil and water sampling, Waste Acceptability Criteria testing, electrofishing, mammal and habitat surveying to GIS, Environmental Impact Assessments (EIAs) and mapping techniques. Since joining MKO, Aoife has been involved in managing bat survey requirements for a variety of wind farm planning applications, as well as commercial, residential and infrastructure projects. This includes scope, roost assessments, deploying static bat detectors and weather stations nationwide, dawn and dusk bat detection surveys, acoustic analysis, mapping, impact assessment, mitigation and report writing. Within MKO, she works as part of a multidisciplinary team to help in the production of ecological reports and assessments. Aoife is a member of Bat Conservation Ireland and CIEEM and holds a current Bat Roost Disturbance licence.

Ryan Connors M.Sc., B.Sc.

Ryan is a Seasonal Bat Ecologist with MKO having joined the company in March 2023. Ryan holds a BSc (Hons) in Zoology at National University of Ireland, Galway and a MSc (Hons) in Conservation Behaviour at Atlantic Technological University. He has a range of experience from bat roost

identification, acoustic sampling, sound analysis, mammal and habitat surveying to GIS, Ecological Impact Assessments (EcIAs) and mapping techniques. Since joining MKO, Ryan has been involved in roost assessments, deploying static bat detectors and weather stations nationwide, dawn and dusk bat detection surveys, sonogram analysis, mapping, impact assessment, mitigation and report writing. He attended BATS Research & Training courses on surveying trees for bats. Within MKO, he works as part of a multidisciplinary team to help in the production of ecological reports and assessments. Ryan currently holds a Bat Roost Disturbance licence and is a member of Bat Conservation Ireland as well as a qualifying member with CIEEM.

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

Dervla O'Dowd is a Senior Ecologist and Project Manager with McCarthy O'Sullivan Ltd. with twelve years of experience in environmental consultancy. Dervla graduated with a first-class honours B.Sc. in Environmental Science from NUI, Galway in 2005 and joined Keville O'Sullivan Associates in the same year. Dervla has gained extensive experience in the project management and ecological assessment of the impacts of various infrastructural projects including wind energy projects, water supply schemes, road schemes and housing developments nationwide and has also been involved in the compilation of Environmental Impact Statements, with emphasis on sections such as Flora and Fauna, and acted as EIS co-ordinator on many of these projects. Dervla has also provided site supervision for infrastructural works within designated conservations 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., M.Sc.

Padraig Cregg is a Senior Ornithologist with McCarthy O'Sullivan Ltd. with over 10 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 MKO 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 EIA Reports 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.

Patrick Manley B.Sc.

Patrick Manley is an Ornithologist at MKO. He attended University College Dublin where he completed a BSc (Hons) in Geology. Prior to joining the company Patrick worked as part of the conservation team in BirdWatch Ireland, on projects such as the Dublin Bay birds project, Kilcoole Little Tern conservation project and the results based agri-environmental scheme for breeding waders. He has extensive experience surveying birds through other projects such as the Irish wetlands bird survey, the Inishmurray all-island breeding birds survey, the national Hen Harrier survey and the countryside bird survey

Jack Workman B.Sc., M.Sc.

Jack is the Landscape & Visual Team manager at MKO and is a Technician Member with the British Landscape Institute. He is a Landscape and Visual Impact Assessment Specialist with an academic background in the field of Environmental Science and Geography. Jack's primary role at MKO is conducting Landscape and Visual Impact Assessment (LVIA) for Environmental Impact Assessment reports. Jack holds a BSc. in Psychology, and an MSc. in Coastal and Marine Environments (Physical Processes, Policy & Practice) where he was awarded the Prof. Máirín De Valéra distinction in science research award. Prior to taking up his position with MKO, Jack worked as a Geospatial Analyst and Research Assistant with NUIG and also held previous posts in the coastal engineering sector with Royal Haskoning DHV and Saltwater Technologies. Since joining MKO in February 2020, Jack has conducted and project managed all aspects of LVIA for a broad range of commercial infrastructure developments including wind and solar energy projects, grid infrastructure, extraction industry and Strategic Housing Developments. Jack holds a membership with the Chartered Institute of Water and Environmental Management and is also a member of the Landscape Research Group.

Jack Smith M.Sc., B.Sc.

Jack is an Environmental Scientist and Landscape and Visual Impact Assessment (LVIA) specialist with MKO. Jack is an Affiliate member of the British Landscape Institute and holds membership with the Landscape Research Group. Jack's primary role at MKO is producing the LVIA chapter of EIA reports. Jack specialises in preparing Landscape and Visual Impact Assessment Reports for large-scale renewable energy projects including wind farms, solar farms, quarry extraction and strategic housing schemes. Jack has additional experience in preparing landscape feasibility reports for large wind farm projects.

Alan Roache M.Sc., B. Eng

Darragh Buckley currently holds the role of Graphics Technician within MKO. Darragh has achieved a B. Eng. in Video and Sound Technology awarded from the Limerick Institute of Technology. Prior to taking up his position with MKO in November 2019, Darragh worked as a graphic designer within the design and print industry. Darragh has worked for print / design companies such as Cube Printing (Limerick) and Dyna Signs (Galway), as well as operating his own freelance design business. His key skills involve the proficient use of the Adobe Suite, e.g., Photoshop, InDesign, and Illustrator. These acquired skills have greatly benefited him when applying them to the production of EIAR Photomontages, Website design and other MKO graphic requirements.

Darragh Buckley B.Eng

Darragh Buckley currently holds the role of Graphics Technician within MKO. Darragh has achieved a B. Eng. in Video and Sound Technology awarded from the Limerick Institute of Technology. Prior to taking up his position with MKO in November 2019, Darragh worked as a graphic designer within the design and print industry. Darragh has worked for print / design companies such as Cube Printing (Limerick) and Dyna Signs (Galway), as well as operating his own freelance design business. His key skills involve the proficient use of the Adobe Suite, e.g. Photoshop, InDesign, and Illustrator. These acquired skills have greatly benefited him when applying them to the production of EIAR Photomontages, Website design and other MKO graphic requirements.

Joseph O'Brien BA (Hons)

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.

1.8.2.2 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.

1.8.2.3 Gavin & Doherty Geosolutions

Paul Quigley

Paul is a Chartered Engineer with over 26 years of experience in geotechnical engineering and a UK Registered Engineering (RoGEP) Advisor. He has worked on a wide variety of projects for employers, contractors and third parties, gaining a range of experience, including earthworks for major infrastructure schemes in Ireland and overseas, roads, tunnelling projects, flood protection schemes, retaining wall and basement projects, ground investigations and forensic reviews of failures. Paul is adept at designing creative solutions for complex problems and has published numerous peer-reviewed technical papers. He has also acted as an independent expert for several legal disputes centred on ground-related issues. He is a reviewer for the ICE Geotechnical Engineering Journal, a member of the Eurocode 7 review panel at NSAI and a former Chairman of the Geotechnical Society of Ireland.

Andria Loppas

Andria is a Chartered Geotechnical Engineer with over 9 years of experience working on a variety of infrastructure (highway and railway), utility and onshore renewables projects with a proven ability of leading geotechnical and engineering geology packages as well as performing geotechnical design. At

GDG Andria leads the geotechnical design of a number of onshore renewable projects from planning to construction stage.

Andria's varied experience includes undertaking desk studies, interpretative report writing, site investigation planning and supervision, slope stability design, earth retaining structure design, preparation of contract documents and supervision as well as management of construction works. Andria has experience in assessing and managing ground related risks, together with responsibility for managing technical quality, programme, cost and health and safety of projects. Andria is a Chartered Geologist with the Geological Society of London, member of the UK Register of Ground Engineering Professionals and Cyprus Scientific and Technical Chamber.

John O'Donovan

John is a chartered engineer with 10 years' experience. He is the head of the Onshore Renewables sector and leads the soil-structure interaction team. John specialises in the design of complex foundation systems, temporary works and retaining systems.

In recent years, John has been responsible for the design of over a hundred foundation projects. John has completed forensic engineering projects investigating failures and issues related to retaining wall systems. This work has included an ultimate limit state failure of a Diaphragm wall and a serviceability failure of a Diaphragm wall in Abu Dhabi. John also acted as lead author on CIRIA C794 "Grouted anchors and soil nails: inspection, condition assessment and remediation".

John is familiar with a wide range of retaining wall designs from contiguous, secant piled walls, king-posts, reinforced earth, soil nailed solutions, and diaphragm walls. From a design perspective, John is intimately familiar with analytical, empirical, and numerical design approaches. John is currently acting as Temporary Works Engineer on a number of large-scale civil engineering projects utilising his expertise in piling platform design, trench box design and cofferdam design.

Stephen Curtis

Stephen is a Senior Engineering Geologist on the onshore renewables team. He has over seven years of experience in both site investigation contracting and geotechnical consultancy environments. He is Chartered with the Institute of Geologists of Ireland (IGI) and the European Association of Geographers. Stephen has worked on multiple renewable energy projects, primarily solar and wind farm projects in Ireland and the UK, for over four years. He has been involved in the feasibility study, planning, design and construction stages of wind and solar farm developments, focusing on geotechnical risk management and mitigation for construction in upland peat areas and Irish glacial ground conditions.

Chris Engelman

Chris is a Geologist with a Master's degree in Geological Sciences from the University of Leeds. He has four years of industry experience within the onshore renewables sector and the field of geological mapping with a particular focus on Quaternary geology, predominantly working on projects for peat stability and management, ground investigation, rock and soil logging, GIS mapping and geotechnical design. Chris has worked on several renewable energy projects, particularly wind and solar, for over two years. Chris supervised site investigation works at the Proposed Project in 2023.

Brian McCarthy

Brian is a Civil Engineer within the infrastructure team in GDG with two years of post-graduate experience. Brian holds a Master's degree in Civil, Structural and Environmental Engineering from University College Cork and is a member of the Institution of Engineers of Ireland. Brian has worked

on various renewable energy and infrastructural projects in Ireland and the UK and has carried out peat probing on several projects throughout Ireland. Brian lead peat probing site investigation works at the Proposed Project in 2023.

Efstathia Chioti

Efstathia is a Geotechnical Engineer within the structures team in GDG with 2 years of industry experience. Since joining GDG, Efstathia has completed geotechnical design work on various projects, including retaining wall design, shallow foundation design and earthworks, and ground movement assessment in Ireland and the UK. She has strong technical skills within geotechnical design. Efstathia lead peat probing site investigation works at the Proposed Project in 2023.

Daniel Murphy

Daniel is a Graduate Engineer working in both the GDG Infrastructure team and the Structures team. He has a Masters' degree in Civil Structural and Environmental Engineering from University College Cork and has been working with GDG since graduating in 2022. Daniel has worked on a variety of Temporary Works and Permanent Works design projects in Ireland and the UK. Daniel has carried out site inspections, visual assessments of slopes, peat probing and water sampling on a number of projects throughout Ireland. Daniel carried out peat probing at the Proposed Project in 2023.

1.8.2.4 TNEI Ireland Ltd.

The noise assessments were carried out by TNEI Services Ltd (TNEI). TNEI is a specialist energy consultancy with an Acoustics team that has undertaken noise assessments for over 5 GW of onshore wind farm developments. The decommissioning and construction noise assessment was undertaken by Will Conway (BSc), who is a Technician Member of the Institute of Acoustics. The operational noise assessment was undertaken by Mark Tideswell (BSc, Dip) who is an Associate Members of the Institute of Acoustics. The decommissioning and construction noise assessment was reviewed and approved by Jim Singleton (BSc, Dip). The operational noise assessment and this EIAR Chapter were reviewed by James Mackay (BSc, Dip). Jim and James are full members of the Institute of Acoustics and hold the Diploma in Acoustics and Noise Control.

1.8.2.5 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 Director Miriam Carroll, is 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.

1.8.2.6 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.

1.9 Difficulties Encountered

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

1.10 Viewing and Purchasing the EIAR

Copies of this EIAR will be available online, including the Non-Technical Summary (NTS), on the website of An Bord Pleanála, under the relevant Planning Reference Number (to be assigned on lodgement of the application).

- An Bord Pleanála: http://www.pleanala.ie/

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

- An Bord Pleanála,
  64 Marlborough Street,
  St. Rotunda,
  Dublin 1

- Galway County Council,
  Áras an Chontae,
  Prospect Hill,
  Galway

The EIAR will also be available to view online via the Department of Planning, Housing and Local Government's EIA Portal, which will provide a link to the planning authority's website on which the application details are contained. This EIA Portal was recently set up by the Department as an electronic notification to the public of requests for development consent which are accompanied by an EIAR.

(https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal)