Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Seskin Wind Farm, Co. Carlow

Chapter 1 – Introduction

Table of Contents

1. INTRODUCTION

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of the applicant, EDF Renewables Ireland Ltd. hereafter referred as EDF, who intends to apply to both Carlow County Council (CCC) and Kilkenny County Council (KCC) for planning permission to construct a renewable energy development which will comprise 7 No. wind turbines, and associated infrastructure in the townlands of Seskinrea and Ridge and adjacent townlands, in Co. Carlow, and a 38kV on-site substation, battery energy storage system and associated works, including underground 38kV cabling to connect to the national grid at Kilkenny 110kV substation, in the townland of Scart near Kilkenny, Co. Kilkenny.

The majority of the proposed project including the 7 no. turbines and associated infrastructure, on-site 38kV substation and approximately 2 kilometres (km) of the underground grid connection cabling route is located in Co. Carlow and will be the subject of an application for planning permission to CCC. The remaining 18.1 km of the underground grid connection cabling route is located in Co. Kilkenny, along with junction accommodation works areas for facilitation of turbine delivery, will be the subject of an application for planning permission to KCC.

Full details of the pre-application consultation undertaken with regards both planning applications can be found in Section 2.8.2 in Chapter 2 of this EIAR.

1.1.1 References to Proposed Project

The Proposed Project, which will be known as the 'Seskin Wind Farm' is being brought forward in response to local, national, regional and European policy regarding Ireland's transition to a low-carbon economy, associated climate change policy objectives and to reduce Ireland's dependence on imported fossil fuels for the production of electricity.

For the purposes of this EIAR:

- Where the 'Proposed Project' is referred to this encompasses the entirety of the project for the purposes of this EIA in accordance with the EIA Directive. The Proposed Project is described in detail in Chapter 4 of this EIAR.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hardstanding areas, including access roads, underground cabling, permanent meteorological mast, temporary construction compounds, carriageway strengthening works, junction accommodation works, peat and spoil management, tree felling, site drainage, operational stage signage, battery energy storage system, 38kV onsite substation, and all ancillary works and apparatus. The Proposed Wind Farm is described in detail in Chapter 4 of this EIAR.
- Where the 'Proposed Grid Connection Route' is referred to, this refers to underground 38kV cabling connecting to the existing Kilkenny 110kV substation, and all ancillary works and apparatus. The Proposed Grid Connection Route is described in detail in Chapter 4 of this EIAR.
- 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.

This EIAR, along with a Natura Impact Statement ('NIS'), will accompany the applications for planning permission for the Proposed Project which will be made to the local authorities. Both the EIAR and NIS contain the information necessary for the local authorities to complete the Appropriate Assessment and Environmental Impact Assessment (EIA) as required for the planning permission applications.

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 will be assessed cumulatively and in combination with other plans and projects to aid the local authorities in carrying out an EIA.

The EIAR Site Boundary identifies the primary EIAR site area for the Proposed Project and has been defined in consideration of the landownership boundaries, natural features onsite, such as watercourses, drains, field pattern, land-use, habitats, treelines and hedgerows, and man-made features, such as roads, rail-lines, other infrastructure and canals. However, each individual topic, i.e., chapter, determines its own study area for assessment purposes relevant to that topic which will be clearly identified in the relevant chapters. The actual site outline (red line planning application boundary) for the purposes of this planning permission application occupies a smaller area within the EIAR Site Boundary. The EIAR Site Boundary encompasses an area of approximately 370 hectares. The permanent footprint of the Proposed Project measures approximately 7.3 hectares, which represents approximately 2% of the site.

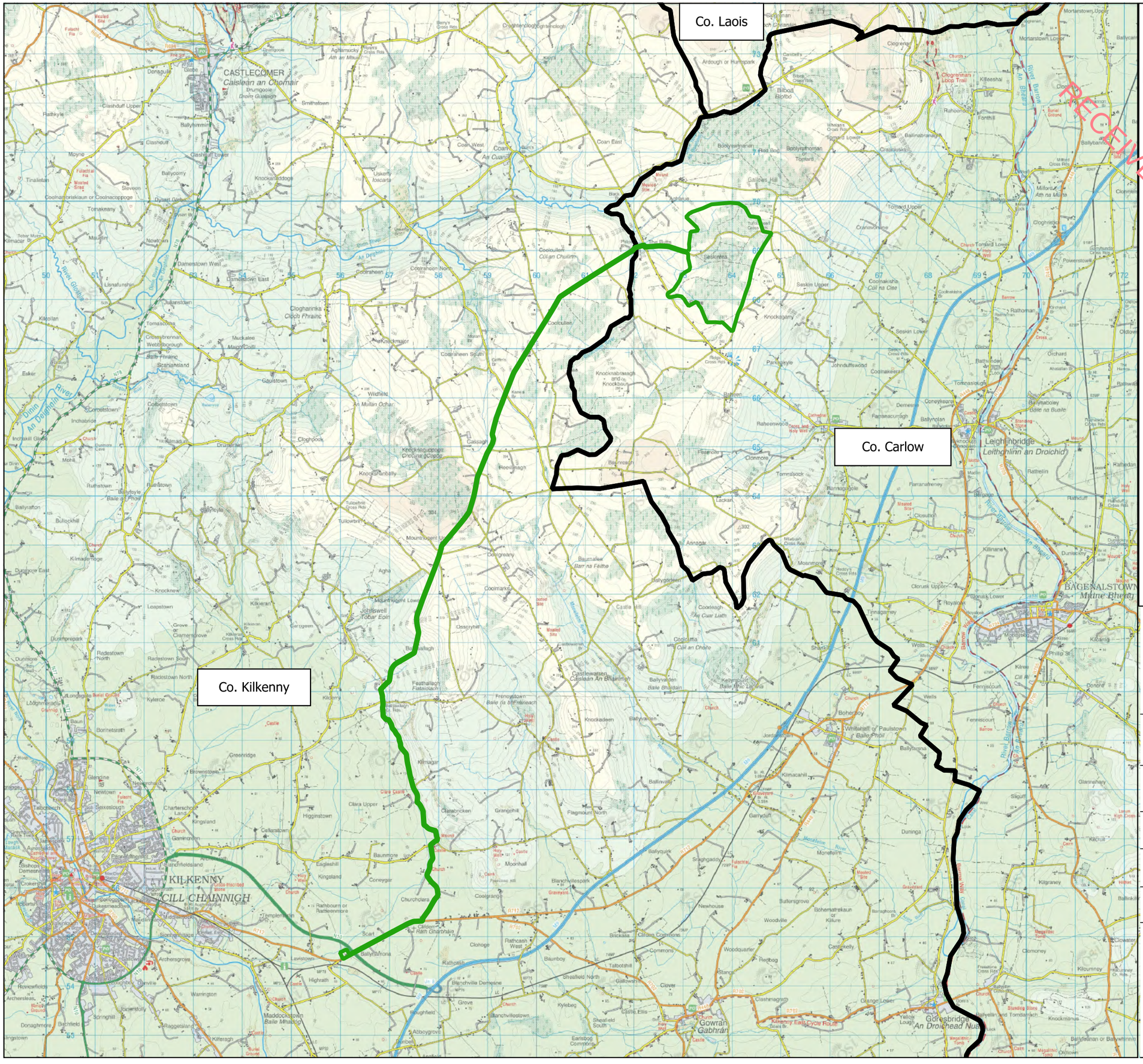
The Proposed Project is described in detail in Chapter 4 of this EIAR.

1.1.2 Proposed Project Site Location

The Proposed Wind Farm is located approximately 3.1 km northwest of the village of Oldleighlin, Co. Carlow, 5km northwest of Leighlinbridge, Co. Carlow, and 9.9 kilometres southeast of Castlecomer, Co. Kilkenny. It is proposed to access the Proposed Wind Farm via upgrades to an existing agricultural entrance off the L3037 Local Road along the western boundary of the Proposed Wind Farm. The Proposed Wind Farm is served by a number of existing public, forestry and agricultural roads and tracks. A site location context map and the EIAR Site Boundary is shown as Figure 1-1. The Proposed Wind Farm is shown overlain on aerial imagery in Figure 1-2. For clarity, the red line planning application boundary is shown on Figure 1-3.

The Proposed Grid Connection Route includes for underground 38kV cabling from the proposed onsite 38kV substation, in the townland of Seskinrea, Co. Carlow, to the existing Kilkenny 110kV substation in the townland of Scart, Co. Kilkenny. The Proposed Grid Connection Route to Kilkenny, measuring approximately 20.1 km in length, is primarily located within the public road corridor.

Current land-use on the Proposed Wind Farm comprises coniferous forestry and agriculture. Current land-use along the Proposed Grid Connection Route comprises of public road corridor, public open space, pastures, coniferous forestry and land principally used by agriculture with significant areas of natural vegetation. Land-use in the wider landscape of the site comprises a mix of agriculture, peat cutting, quarrying, low density residential and commercial forestry.



Map Legend

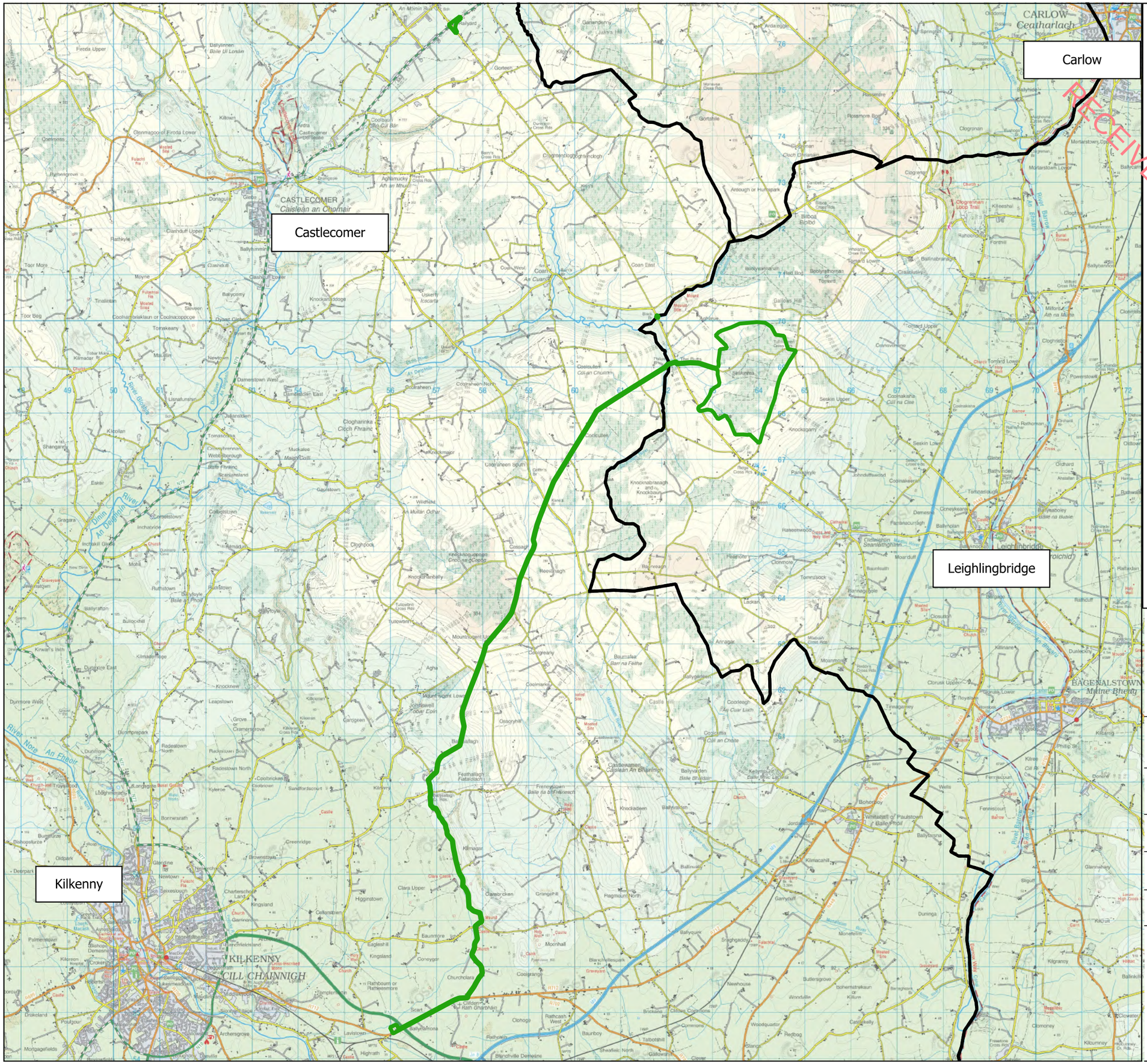
- EIAR Site Boundary
- County Boundaries

Drawing Title
Site Location Context

Project Title
Seskin Wind Farm, Co. Carlow

Drawn By	Checked By
CJ	EC
Project No. 220246	Drawing No. Figure 1-1
Scale 1:75,000	Date 2023-12-14

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie



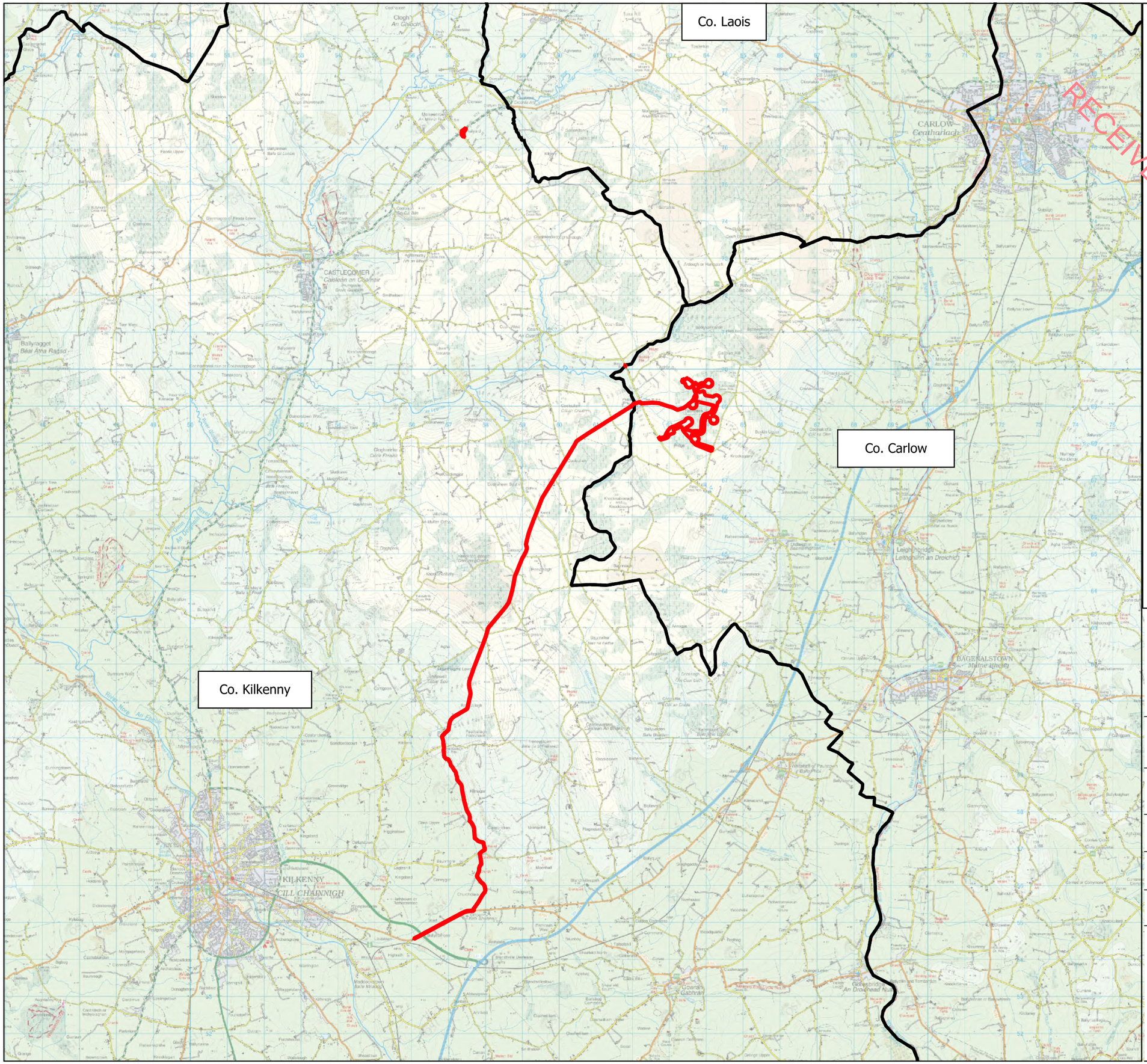
Map Legend

- EIAR Site Boundary
- County Boundaries

Ordnance Survey Ireland Licence No. AR 0021821© Ordnance Survey Ireland/Government of Ireland

Drawing Title: Site Location Map	
Project Title: Seskin Wind Farm, Co. Carlow	
Drawn By: CJ	Checked By: EC
Project No.: 220246	Drawing No.: Figure 1-2
Scale: 1:80,000	Date: 2024-01-17

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie



Map Legend

- County Boundaries
- Red Line Boundary

Drawing Title: Planning Application Boundary	
Project Title: Seskin Wind Farm, Co. Carlow	
Drawn By: BT	Checked By: EC
Project No.: 220246	Drawing No.: Figure 1-3
Scale: 1:100,000	Date: 2024-05-02

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

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	Townlands in Co. Carlow	Townlands in Co. Kilkenny
Proposed Wind Farm		
Wind Turbines and Associated Foundations and Hardstanding Areas, Access Roads, Underground Cabling, Permanent Meteorological Mast, Temporary Construction Compounds, Peat and Spoil Management, Tree Felling, Site Drainage, Operational Stage Site Signage and all ancillary works and apparatus	Ridge, Agharue, Seskinrea, Coolnakisha	
Proposed Grid Connection Route		
Onsite 38kV Substation, Battery Energy Storage System, Underground 38kV Cabling Route connecting to the existing Kilkenny 110kV substation	Seskinrea, Ridge	Kilmagar, Clara Upper, Mountnugent upper, Mountnugent lower, Ossoryhill, Feathallagh, Churchclara, Rathgarvan or Clifden, Clarabricken, Coolgreany, Coolcullen, Reevanagh, Scart, Highrath, Ballysallagh, Ballynamona
Turbine Delivery Route facilitation works		
Accommodation works to facilitate the delivery of large turbine components and other abnormally sized loads	Agharue	Coan East, Cloneen

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 through the amendment of the Planning and Development Act 2000 and the Planning and Development Regulations 2001. Directive 2011/92/EU was amended by Directive 2014/52/EU which has been transposed into Irish law under European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018), amending the Planning and Development Act, 2000 and the Planning and Development Regulations 2001.

This EIAR complies with the EIA Directive as amended by Directive 2014/52/EU, the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations (as amended).

An Environmental Impact Assessment (EIA) of the Proposed Project will be undertaken by both Carlow and Kilkenny County Councils as part of their consideration of the applications for planning permission for those parts of the Proposed Project located within their respective functional areas.

Article 5 of the EIA Directive 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, Annex IV of the EIA Directive provides further detail on the information to be included in an EIAR. These requirements are transposed under Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended), 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].

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 Wind Farm exceeds 5 Megawatts in scale and proposes more than 5 turbines, and therefore is subject to EIA.

The EIAR describes the receiving environment, assesses the likely significant effects of the Proposed Project on the receiving environment and proposes mitigation measures to avoid or reduce these effects as well as appropriate monitoring to ensure the efficacy of such mitigation measures. 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 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 of the EIA Directive, the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended).

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 (EIA Directive) including '*Guidance on Screening*', '*Guidance on Scoping*', '*Guidance on the preparation of the Environmental Impact*

Assessment Report' and '*Guidance on integrating climate change and biodiversity into environmental impact assessment*'. MKO has prepared the EIAR in accordance with these guidelines also.

1.2.2 Wind Energy Development Guidelines for Planning Authorities

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

The '*Wind Energy Development Guidelines for Planning Authorities'* (DoEHLG, 2006) (hereafter referred to as the 'DoEHLG 2006 Guidelines') 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) (hereafter referred to as the 'Draft 2019 Guidelines'). A consultation process in relation to the Draft 2019 Guidelines closed on 19th February 2020. The proposed changes presented in the Draft 2019 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 2019 Guidelines have not yet been adopted, and the relevant guidelines for the purposes of section 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 2024 to publish the final version of the guidelines (refer to Section 1.5.1.1 below), it is possible that the Draft 2019 Guidelines are adopted during the consideration period for the current planning application. Should the Draft 2019 Guidelines, in their current form, be adopted in advance of a planning decision being made on the Proposed Project, the Proposed Project will be capable of meeting the requirements of the DoEHLG 2006 Guidelines as well as the requirements of the Draft 2019 Guidelines as currently proposed. The distance from proposed turbines to third party sensitive receptors will achieve the proposed 4 times turbine tip height and to the extent any adopted new guidelines include more onerous noise or shadow flicker requirements, these can be readily achieved by implementing appropriate mitigation through use of the turbine control systems.

1.3 The Applicant

The applicant for the Proposed Project, EDF Renewables Ireland is part of one of the world's largest electricity companies and their investment and innovation in renewable energy projects is reducing costs for consumers and bringing significant benefits to communities.

EDF Renewables Ireland's team has a wealth of experience in bringing complex development projects to fruition, across onshore and offshore wind, solar PV and battery storage technology, and is supported by more than 400 colleagues in the UK.

In 2020 EDF acquired 50% of Codling Wind Park, a major offshore wind farm which will be located off the coast of Wicklow and have also entered into a 50:50 partnership to develop the Emerald and Western Star floating offshore wind farms, to be located off the coasts of Cork and Clare, respectively. Together, these three projects could power over two million homes across Ireland.

Earlier this year EDF energised three of Ireland's first grid-scale solar farms and have announced plans for five onshore wind farms across Ireland. In total EDF will have an Irish onshore development pipeline of almost 1GW.

In the UK, EDF Renewables has an operating portfolio of 36 wind farms and two battery storage units (together totalling more than 1.5GW) and a development pipeline of 14GW across wind, solar and battery storage. EDF Renewables operates in more than 20 countries around the world.

1.4 Brief Description of the Proposed Project

The Proposed Project will comprise the construction of 7 No. wind turbines with a blade tip height range of between 179.5 and 180 metres and all associated works, and a 38kV substation and associated works, including underground 38kV cabling to connect to the national grid at the Kilkenny 110kV substation. The full description of the Proposed Project is detailed in Chapter 4 of this EIAR.

The Proposed Project will consist of the provision of the following:

i. *The construction of 7 no. wind turbines with the following parameters (all within Co. Carlow):*
    a. *Total tip height range of 179.5m – 180m,*
    b. *Rotor diameter range of 149m – 155m,*
    c. *Hub height range of 102.5m to 105m,*
ii. *Construction of associated foundations, hardstand and assembly areas (all within Co. Carlow);*
iii. *All associated wind farm underground electrical and communications cabling connecting the turbines and meteorological mast to the proposed onsite electrical substation including road crossing at L30372, Co. Carlow (all within Co. Carlow);*
iv. *Construction of 1 no. permanent 38kV electrical substation compound including a single-story control building with welfare facilities, all associated electrical plant and equipment, security fencing, entrance on to the access track, all associated underground cabling, wastewater holding tank and all ancillary works in the townland of Seskinrea, Co. Carlow (all within Co. Carlow);*
v. *A permanent Battery Energy Storage System within the electrical substation compound in the townland of Seskinrea, Co. Carlow (all within Co. Carlow);*
vi. *All works (within County Carlow) associated with the connection of the proposed wind farm to the national electricity grid, via underground 38kV electrical cabling predominantly within the public road corridor from the proposed onsite electrical substation in the townland of Seskinrea, Co. Carlow to the existing 110kV Kilkenny substation (all within Co. Carlow);*
vii. *Provision of 2 no. joint bays, communication chambers and earth sheath links along the underground electrical cabling route (all within Co. Carlow);*
viii. *Reinstatement of the road and track surfaces above the cabling trench along existing roads and tracks (all within Co. Carlow);*
ix. *1 no. meteorological mast of c. 36.5m in height, and associated foundation and hard-standing area in the townland of Ridge, Co. Carlow (all within Co. Carlow);*
x. *The permanent upgrade of 1 no. existing site entrance off L3037 for the provision of construction and operational access (all within Co. Carlow);*
xi. *The provision of 1 no. new permanent site entrance and the upgrade of 1 no. existing site entrance off the L30372 (all within Co. Carlow);*
xii. *Upgrade of existing tracks/roads and provision of new site access roads, 2 no. clear span bridge crossings, junctions and hardstand areas (all within Co. Carlow);*
xiii. *2 no. temporary construction compounds with temporary offices and staff facilities in the townland of Ridge and Seskinrea, Co Carlow (all within Co. Carlow);*
xiv. *Carriageway strengthening works at 'Black Bridge' on the L1835 / L3037 (Protected Structure: Kilkenny RPS Ref. D84) (within Co. Carlow and Co. Kilkenny);*
xv. *Peat and Spoil Management (all within Co. Carlow);*
xvi. *Tree Felling to accommodate the construction and operation of the proposed development (all within Co. Carlow);*
xvii. *Operational stage site signage; and*

xviii. *All ancillary apparatus and site development works above and below ground, including soft and hard landscaping and drainage infrastructure (all within Co. Carlow).*

xix. *All works (within county Kilkenny) associated with the connection of the proposed Seskin Wind Farm to the national electricity grid, via underground 38kV electrical cabling within the public road corridor to the existing Kilkenny 110kV substation (all within Co. Kilkenny);*

xx. *Provision of 16 no. joint bays, communication chambers and earth sheath links along the underground electrical cabling route (all within Co. Kilkenny);;*

xxi. *Reinstatement of the road and track surfaces above cabling trench along existing roads and tracks (all within Co. Kilkenny);;*

xxii. *Carriageway strengthening works at 'Black Bridge' on the L1835 / L3037 (Protected Structure RPS Ref. D84) (within Co. Carlow and Co. Kilkenny);*

xxiii. *A new temporary access road off the N78 to the L30372 in the townlands of Cloneen, Co. Kilkenny to facilitate the delivery of turbine components and other abnormal loads (all within Co. Kilkenny);;*

xxiv. *All ancillary apparatus and site development works above and below ground (all within Co. Kilkenny).*

The applicant is seeking a ten-year planning permission for development.

The majority of the Proposed Project including the 7 no. turbines and associated infrastructure, on-site 38kV substation and approximately 2 kilometres (km) of the underground grid connection cabling route is located in Co. Carlow and will be the subject of an application for planning permission to CCC. The remaining 18.1 km of the underground grid connection cabling route is located in Co. Kilkenny, along with junction accommodation works areas for facilitation of turbine delivery, will be the subject of an application for planning permission to KCC.

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 onshore 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 6.6MW. Therefore, on this basis, the proposed 7 no. wind turbines would have a combined generating capacity of 46.2MW. The actual turbine procured as part of a competitive tender process may have a power output that is marginally lower or greater than the 6.6MW turbine described in the EIAR.

As detailed in Section 3.2.6 in Chapter 3: Consideration of Reasonable Alternatives, the layout of the Proposed Project has been led by consideration of constraints and facilitators, thereby avoiding the environmentally sensitive parts of the Proposed Project site. The roads layout for the Proposed Project makes the use of the existing onsite access roads and tracks where possible, with approximately 2.8 kilometres of existing roadway/ tracks requiring upgrading and approximately 2.7 kilometres of new access road to be constructed.

There are 42 inhabitable dwellings located within 1 kilometre of the proposed turbine locations with 10 of those properties belonging to the landowners who form part of the Proposed Project. There are no inhabitable dwellings located closer than four times the maximum turbine tip height (i.e. within 720 metres) of any proposed turbine location.

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] reaffirming the 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 for 2022 to be 60.76 million tonnes carbon dioxide equivalent ($MtCO_2eq$) which is 1.9% lower (or 1.19 MtCO2eq) than emissions in 2021 (61.95 $MtCO_2eq$). 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 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 usage 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:

1. *A legal commitment from Ireland to limit greenhouse gas emissions under the Kyoto protocol to reduce global warming;*
2. *A requirement to increase Ireland's national energy security as set out in Ireland's Transition to a Low Carbon Energy Future 2015-2030;*
3. *A requirement to diversify Ireland's energy sources, with a view to achievement of national renewable energy targets and an avoidance of significant fines from the EU (the EU Renewables Directive);*
4. *Climate Action Plan 2024 which aims to ensure that Ireland achieves its legally binding target (the Climate Action and Low Carbon Development (Amendment) Act 2021) of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030;*
5. *Increasing energy price stability in Ireland through reducing an over reliance on imported fossil fuels;*
6. *Provision of cost-effective power production for Ireland which would deliver local benefits; and*
7. *To facilitate the Government in meeting its ambitious 80% renewable energy target by 2030.*

These factors are addressed in further detail below. Section 2.2 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 project. Section 2.2 addresses climate change, including Ireland's current status with regard to meeting greenhouse gas emission reduction targets.

[1] *Department of Environment, Climate and Communications (2023) Climate Action Plan 2024*
[2] *Ireland's Provisional Greenhouse Gas Emissions (1990-2022)* <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/2023-EPA-Provisional-GHG-Report_Final_v3.pdf>

In March 2024, the World Meteorological Organisation (WMO) published the State of the Global Climate 2023 Report.[3] The report provides a summary on the state of the climate indicators in 2023 with sections on key climate indicators, extreme events and impacts. The key messages in the report include:

- 2023 was the warmest year on record at 1.45 ± 0.12 °C above the pre-industrial average.
- Concentrations of the three main greenhouse gases – carbon dioxide, methane, and nitrous oxide – reached record high observed levels.
- Antarctic sea-ice extent reached an absolute record low in February. The annual maximum extent was around 1 million km2 below the previous record low maximum.
- Extreme weather continued to lead to severe socio-economic impacts. Extreme heat affected many parts of the world. Wildfires in Hawaii, Canada and Europe led to loss of life, the destruction of homes and large-scale air pollution.
- Food security, population displacement and impacts on vulnerable populations continue to be of mounting concern in 2023, with weather and climate hazards exacerbating the situation in many parts of the world.

The State of the Global Climate 2023 report goes on to state that renewable energy generation, primarily driven by the dynamic forces of solar radiation, wind and the water cycle, has surged to the forefront of climate action for its potential to achieve decarbonization targets. There has been a substantial worldwide energy transition, with renewable capacity additions increasing by nearly 50% from 2022, totalling 510 gigawatts (GW).[4] This growth represents the highest rate observed in the past two decades, signalling a significant momentum toward achieving the clean energy goal set at the United Nations Framework Convention on Climate Change (UNFCCC) 28th Conference of the Parties (COP28) meeting in 2023 to triple renewable energy capacity globally to 11,000 GW by 2030.

The recent joint publication of WMO and International Renewable Energy Agency on Climate-driven Global Renewable Energy Potential Resources and Energy Demand in 2022[5] underscores the inherent links between renewable energy resources and weather and climate conditions. It calls for better integration of climate variability considerations into energy resource operation, management, and planning to enhance effectiveness and sustainability in these regions.

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. 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.

[3] *World Meteorological Organisation (2024) State of the Global Climate 2023* <https://library.wmo.int/records/item/68835-state-of-the-global-climate-2023>
[4] *IEA (2024), Renewables 2023, IEA, Paris* <https://www.iea.org/reports/renewables-2023>
[5] *International Renewable Energy Agency + WMO (2023) 2022 Year in Review: Climate-driven Global Renewable Energy Potential Resources and Energy Demand* <https://www.irena.org/Publications/2023/Dec/2022-Year-in-Review-Climate-driven-Global-Renewable-Energy-Potential-Resources-and-Energy-Demand>

The Intergovernmental Panel on Climate Change (IPCC) put forward its clear assessment in their Fifth Assessment Report[6], 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 2°C 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 February 2022, the International Panel on Climate Change (IPCC) released the report 'Working Group II-Climate Change 2022: Impacts, Adaptation and Vulnerability' regarding the impacts of climate change on nature and human activity. The report states that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades. the report identifies four key risks for Europe with most becoming more severe at 2°C global warming levels (GWL) compared with 1.5°C GWL. From 3°C GWL, severe risks remain for many sectors in Europe. The four key risks identified are:

- Key Risk 1: Mortality and morbidity of people and changes in ecosystems due to heat;
- Key Risk 2: Heat and drought stress on crops;
- Key Risk 3: Water scarcity;
- Key Risk 4: Flooding and sea level rise

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[7] 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*'[8], and is the final product of the AR6 of the IPCC. It summarises 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 EPA[9] 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 $MtCO_2eq$; under a With Additional Measures (WAM) scenario, emissions from the energy sector are projected to decrease by 60% from 10.3 to 4.2 $MtCO_2eq$ over the period 2021-2030.

---

[6] *IPCC Fifth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR5 Report*
[7] *The three Special Reports are: Global Warming of 1.5°C: an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (2018); Climate Change and Land: an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (2019); IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (2019)*
[8] *IPCC Sixth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR6 Report: Climate Change 2023*
[9] *Ireland's Greenhouse Gas Emission Projections 2022-2040* <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-GHG-Projections-2022-2040_Finalv2.pdf>

The EPA '*Ireland's Provisional Greenhouse Gas Emissions 1990-2022*'[10] report stated that in 2022, overall electricity generation in Ireland increased by 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.

The '*National Energy Projections 2023*'[11], 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 $MtCO_2eq$, or 33%, and 13.8$MtCO_2eq$, or 23%, in the WEM and WAM scenarios, respectively.

It is estimated that the Proposed Project will have a potential output of 46.2MW. On this basis, the Proposed Project will result in the net displacement of approximately 38,334 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*'[12] 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.[13] The '*Energy Security in Ireland to 2030*' 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*'[14], 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,

[10] *Ireland's Provisional Greenhouse Gas Emissions 1990-2022 (July 2023)* <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/2023-EPA-Provisional-GHG-Report_Final_v3.pdf>
[11] *SEAI National Energy Projections 2023 Report.* <https://www.seai.ie/publications/National-Energy-Projections-2023.pdf>
[12] *Department of the Environment, Climate and Communications (2023) Energy Security in Ireland to 2030.* <https://assets.gov.ie/276471/2d15ce6d-e555-4ada-a3cf-b325a5d7ba20.pdf>
[13] *Sustainable Energy Authority of Ireland (2023) Key insights from SEAIs 2022 National Energy Balance.* <https://www.seai.ie/data-and-insights/seai-statistics/key-publications/national-energy-balance/Key-Insights-from-2022-National-Energy-Balance.pdf>
[14] *Sustainable Energy Authority Ireland (2024) Energy in Ireland – 2023 Report*

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 Irelands 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"*[15].

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 Ireland's 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[16] ('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[17], 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[18] 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.

---

[15] *Dr Eimear Cotter, Head of Low Carbon Technologies, SEAI - "Energy Security in Ireland 2015"*
[16] *Ireland's Transition to a Low Carbon Energy Future 2015-2030 (Department of Communications, Energy & Natural Resources, 2015)*
[17] *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
[18] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131

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.

1.5.2.2 Council Regulation (EU) 2022/2577 and 2024/223

Arising from REPowerEU, Council Regulation (EU) 2022/2577 laying down a framework to accelerate the deployment of renewable energy was adopted on the 22 December 2022. Regulation 2022/2577 came into effect on the 23 December 2022 and has effect until the 30 June 2024. The Regulation made provision for a review by the commission within 12 months. Following this review the Council introduced Regulation 2024/223 on the 22 December 2023 amending Regulation 2022/2577. Regulation 2022/2577 and 2024/223 recognises the relative importance of renewable energy deployment in the current difficult energy context and provides significant policy and legislative support to enabling renewable energy projects.

Article 2(2) of Regulation EU) 2022/2577 requires priority to be given to projects that are recognised as being of overriding public interest whenever the balancing of legal interests is required in individual cases and where those projects introduce additional compensation requirements for species protection. An analogous provision is not present in Directive (EU) 2018/2001. The first sentence of Article 3(2) of Regulation (EU) 2022/2577 has the potential, in the current urgent and still unstable energy situation on the energy market which the Union is facing, to further accelerate renewable energy projects since it requires Member States to promote those renewable energy projects by giving them priority when dealing with different conflicting interests beyond environmental matters in the context of Member States' planning and the permit-granting process. The Commission's report demonstrated the value of the first sentence of Article 3(2) of Regulation (EU) 2022/2577 which beyond the specific objectives of the derogations foreseen in the Directives referred to in Article 3(1) of Regulation (EU) 2022/2577. (emphasis added).

Further detail is provided in Section 2.3.1 in Chapter 2 of this EIAR. As such, the Proposed Project, a renewable energy project, is critical to helping Ireland, and the EU in addressing energy security challenges as well as addressing the country's over-dependence on imported fossil fuels.

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*".

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)[19] 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),[20] 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)[21] entered into force on 20 November 2023. REDIII amended the EY-wide overall 2030 RES target from 32% to at least 42.5%, and it is assumed that Irelands 2030 RES target will increase accordingly.

---

[19] *Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Available from: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF*

[20] *Directive (EU) 2018/2001 on the promotion of the use of energy from renewable resources (recast). Available from: https://eurlex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L2001*

[21] *Directive (EU) 2023/2413 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413*

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 targets 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 wind will need to reach 9GW and at least 5GW of offshore wind. Irelands installed capacity for wind generation at the end of 2022 was 4.54GW[22]. The SEAI provides a provisional estimate of installed wind energy capacity in 2023 based on EirGrid data to the end of August and ESBN data to the end of September; the provisional value of installed wind capacity in Ireland is 4.5GW.[23] 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 9GW 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'concluded that *'potential costs of purchasing non-Emission Trading Scheme (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[24] 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. The SEAI has provided a provisional estimate of wind capacity in Ireland in 2023 to be 4.59GW.[25]

It is noted that the key driver for electricity demand in Ireland for the next number of years is the connection of large new 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 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[26] at the end of

[22] *Sustainable Energy Authority of Ireland (2024) Energy in Ireland – 2023 Report*
[23] *Ibid.*
[24] https://www.seai.ie/publications/Ireland___s-Energy-Targets-Progress-Ambition-and-Impacts.pdf
[25] *Sustainable Energy Authority of Ireland (2024) Energy in Ireland – 2023 Report*
[26] https://bitpower.ie/images/Reports/2021_H1_Report.pdf

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 he 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.

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 Wind Farm, 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[27] 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[28]. 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 2023, the DECC published Climate Action Plan 2024 which is the third annual update to Irelands Climate Action Plan 2019 and the second to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021. Climate Action Plan 2024 notes the need for renewable alternatives to coal and peat. Further information on the Climate Action Plan can be seen in Chapter 2, Section 2.2.

Climate Action Plan 2024 states that as electrification and decarbonisation of other sectors continues, there will be an increase in electricity demand, and a transferring of emissions from those sectors to the electricity sector. The deployment of renewables needs to outpace the growth in energy demand for it to deliver the absolute reductions in greenhouse gas emissions required. Therefore, the timing of the delivery of the renewable energy generation relative to the scale and pace of growth in electricity demand is a critical factor. 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.

Underlying drivers of changes in electricity demand include:

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

- 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. As detailed in Section 1.5.2.2 above, EU Regulation 2022/2577 as amended by Regulation 2024/223 identifies the priority that should be afforded renewable energy development whenever the balancing of legal interests is required in individual cases and where those projects introduce additional compensation requirements for species protection.

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 Wind Farm will displace approximately 38,334 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: Climate.

The World Health Organisation (WHO) in 2019 estimated that ambient (outdoor) air pollution caused 4.2 million deaths worldwide in 2019.[29] The Environmental Protection Agency (EPA) report '*Air Quality in Ireland 2022*'[30] noted that in Ireland, the premature deaths attributable to poor air quality are estimated at 1,300 people per annum. The European Environmental Agency (EEA) Report, '*Air Quality in Europe – 2022 Report*'[31] highlights the negative effects of air pollution on human health. The report assessed that poor air quality in Europe accounted for premature deaths of approximately

[29] https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health
[30] *Air Quality in Ireland Report 2022* <https://www.epa.ie/publications/monitoring-assessment/air/Air_Quality_Report_22_v8v2.pdf>
[31] *Air Quality in Europe 2022* <https://www.eea.europa.eu/publications/air-quality-in-europe-2022>

238,000 people in the 27 EU Member States in 2021. The estimated impacts on the population in Europe of exposure to NO_2 and O_3 concentrations in 2021 were around 49,000 and 24,000 premature deaths per year, respectively. Of these numbers, 610 deaths due to poor air quality were estimated in Ireland in 2020 with 490 Irish deaths attributed to $PM_{2.5}$, 50 Irish deaths attributed to nitrogen oxides (NO_2) and 70 Irish deaths attributed to Ozone (O_3). These emissions, along with others, including sulphur oxides (SO_x), are produced during fossil fuel-based electricity generation in various amounts, depending on the fuel and technology used, emissions from industry and power plants, vehicles emissions and transport fuels.

The EPA 2016 report '*Ireland's Environment – An Assessment*'[32] 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 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 climate 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 – 2023 Report*', Ireland has a high import dependence on oil and gas and is essentially a price-taker on these commodities. The '*Energy in Ireland 2022 Report*'[33] stated that 2021 was the first year since 2016, in which Irelands indigenous production of energy from renewables (17,500 GWh) exceeded that of indigenous gas (14,600 GWh); however, in 2022 indigenous gas production once again exceeded renewables production. The SEAI estimates electricity emissions to be 7.3 $MtCO_2e$ in 2023, the addition of this best estimate for 2023 to the definitive 2021 and 2022 electricity emissions reported by the EPA identifies a 3-year 2021 - 2023 total of 27.0 $MtCO_2e$. The 5-year 2021-2025 sectoral emission ceiling for electricity is 40 $MtCO_2e$. This means that 13.0 $MtCO_2e$ of budgeted electricity emissions will remain for the last 2 years of the 2021-2025 carbon budget. To remain within its sectoral emission ceiling, electricity emissions would therefore need to remain below an average of 6.5 $MtCO_2e$ in both 2024 and 2025.The SEAI report '*Energy in Ireland – 2023 Report'* indicated that wind energy:

- Accounted for 85.7% of renewable energy generated in 2022
- Capacity at the end of 2022 was 4.54GW, this is a 4.6% increase from wind energy capacity in 2021

[32] *Ireland's Environment – An Assessment (2016)* <https://epawebapp.epa.ie/ebooks/soe2016/files/assets/basic-html/page-1.html#>
[33] *Sustainable Energy Authority Ireland (2022) Energy in Ireland – 2022 Report*

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 33,726 households every year, as presented in the calculations in Section 4.4.1.1.5 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'* (October 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 Fund.

Commercial rate payments from the Proposed Project will be provided to the respective local authority each year which will be redirected to the provision of public services. 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 up to 80-100 jobs during the construction phase and up to 2-3 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 5.10.2.2 of this EIAR.

EDF is committed to delivering local benefits and working in partnership with local communities. If the project receives planning permission and is constructed, EDF will establish a Community Benefit Fund as part of their long-term commitment to the local area. The Community Benefit Fund will see funds from the project go towards supporting positive local initiatives and activities.

The fund will be set up once the project is energised, and EDF will appoint an administrator to implement the funding strategy and decisions and ensure good governance in the funding administration. A volunteer committee, drawn from the local community, will be set up to decide on applications made to the Community Benefit Fund by local groups or individuals for funding.

Further details on the proposed Community Gain proposals are presented in Appendix 2-2 and Section 4.5 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 on and in the vicinity of the Proposed Project site and to quantify the likely significant effects of the Proposed Project on the environment. 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 the Planning Authority and the EIAR. 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 significant 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 authority. The information to be contained in the EIAR is prescribed in Article 5 and Annex IV of the revised EIA Directive and Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended) described in Section 1.2 above.

1.7 Structure and Content of the EIAR

1.7.1 General Structure

This EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the Proposed 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 quality, 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 risk of major accidents and vulnerability to disasters.

The chapters of this EIAR are as follows:

1. *Introduction*
2. *Background to the Proposed Project*
3. *Considerations of Reasonable Alternatives*
4. *Description of the Proposed Project*
5. *Population and Human Health*
6. *Biodiversity (excluding Birds)*
7. *Birds*
8. *Land, Soils and Geology*
9. *Water*
10. *Air Quality*
11. *Climate*
12. *Noise and Vibration*
13. *Cultural Heritage*
14. *Landscape and Visual*
15. *Material Assets (including Traffic and Transport, Telecommunications and Aviation)*
16. *Major Accidents and Natural Disasters*
17. *Interactions of the Foregoing*

18. *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.

1.7.2 Description of Likely Significant Effects and Impacts

As stated in the *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, May 2022), an assessment of the likely impacts of a development is a statutory requirement of the EIA process. The statutory criteria for the presentation of the characteristics of potential impacts requires that potential significant impacts are described with reference to the extent, magnitude, complexity, probability, duration, frequency, reversibility and trans–boundary 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):

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, May 2022)
- 'Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report' (EC, 2017).
- 'Revised Guidelines on the Information to be contained in Environmental Impact Statements – Draft September 2015' (EPA, 2015).
- 'Advice Notes for Preparing Environmental Impact Statements – Draft September 2015' (EPA, 2015).
- 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (EPA, 2003).

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

Table 1-2 Impact Classification Terminology (EPA, 2022)

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An effect capable of measurement but without significant consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
	Profound	An effect which obliterates sensitive characteristics
Extent & Context	Extent	Describe the size of the area, number of sites and the

Impact Characteristic	Term	Description
		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, duration 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.

1.7.3 Assessment of Turbine Parameter Range within the EIAR

As detailed in Section 1.4 above, and further detailed in Chapter 4 of this EIAR, the Proposed Project will comprise the construction of 7 No. wind turbines and associated hardstand areas with the following parameters (all within Co. Carlow):

a) Total tip height range of 179.5m – 180m,
b) Rotor diameter range of 149m – 155m,
c) Hub height range of 102.5m to 105m

For the purposes of this EIAR, various types and sizes of wind turbines, within the proposed ranges outlined above, have been selected and considered in the relevant sections of the EIAR. This allows for a robust assessment of the proposed range of turbines. Turbine design parameters have a bearing on the assessment of shadow flicker, noise, visual impact, traffic and transport and ecology (specifically birds), and Table 1-4 below outlines the specific sections within the EIAR where turbine scenarios within the turbine parameter range are assessed.

It should also be noted that the assessment of the development footprint of the Proposed Project site, within this EIAR, is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, the potential for significant effects will also be reduced.

Table 1-3 Assessment of Turbine Parameter Range within the EIAR

EIAR Chapter	EIAR Section	Assessment of Range of Turbine Parameters	Assessment Parameters Detail		
Chapter 5: Population & Human Health	Section 5.8.4 Shadow Flicker Assessment	Three scenarios have been assessed for the Shadow Flicker Assessment, as part of the EIAR. Scenario 1: Maximum is the scenario that gives rise to the greatest modelled levels of shadow flicker. A Comparative Shadow Flicker Assessment is included as an Appendix to Chapter 5 which presents the modelling results of Scenario 2: Minimum and Scenario 3: Median, all of which are assessed within the EIAR.	**Scenario 1: Maximum**	**Scenario 2: Minimum**	**Scenario 3: Median**
			Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m	Tip Height: 179.5m Rotor Diameter: 149m Hub Height: 105m	Tip Height: 180m Rotor Diameter: 150m Hub Height: 105m
Chapter 6: Biodiversity: Flora & Fauna	Section 6.6.2.2.5 Bat Mitigation: Turbine Felling Buffer (Section 6.1.3 of Appendix 6-2: Bat Report)	It should also be noted that the assessment of the development footprint of the Proposed Project site, within this EIAR, is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, the potential for significant effects will also be reduced. Scenario 1: Maximum is the scenario which gives rise to the largest felling radius for bat mitigation and is assessed within the EIAR. The bat buffer calculation takes into account theoretical precautionary conditions by using the longest blade on the lowest hub. the largest rotor diameter (155m) and the minimum hub height (102.5m), therefore providing the maximum tip height of 180m, and also detailing the maximum forestry buffer that would be required (97.2m). Any other combination could only be based on a shorter rotor diameter or higher hub height which would	**Scenario 1: Maximum**		
			Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m		

		therefore result in a reduction in the buffer requirement. The precautionary scenario has therefore been considered in the bat impact assessment.			
Chapter 7: Biodiversity: Birds	Section 7.2.5.4 Collision Risk Modelling (CRM)	Three scenarios have been analysed via the collision risk model, representing the minimum, maximum and median of the turbine range, the outputs of which are detailed in Table 7-5-1 in Appendix 7-5 of Chapter 7: Collision Risk Assessment and assessed within the EIAR.	**Scenario 1: Maximum** Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m	**Scenario 2: Minimum** Tip Height: 179.5m Rotor Diameter: 149m Hub Height: 105m	**Scenario 3: Median** Tip Height: 180m Rotor Diameter: 150m Hub Height: 105m
Chapter 8: Land, Soils & Geology Chapter 9: Water Chapter 10: Air Chapter 11: Climate		It should also be noted that the assessment of the development footprint of the Proposed Project site, within this EIAR, is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, the potential for significant effects will also be reduced.			
Chapter 12: Noise & Vibration	Section 12.4.1.3 Operational Noise Modelling	The noise assessment three turbine models which are that fall within the range of turbine dimensions proposed as part of the application The Median Scenario and Minimum Scenario have been assumed with a proposed hub height of 105m and the Maximum Scenario with a proposed hub height of 102.5m. These candidate turbine models are considered representative of the type of turbine that could be installed. The modelling results presented within this Chapter are based on the Median Scenario (which utilises the sound power data of the Vestas	**Scenario 1: Maximum** Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m	**Scenario 2: Minimum** Tip Height: 179.5m Rotor Diameter: 149m Hub Height: 105m	**Scenario 3: Median** Tip Height: 180m Rotor Diameter: 150m Hub Height: 105m

		V150 6.0 MW turbine) as that is one of the loudest turbines at the key wind speed range. Prediction modelling results for the other two candidate turbines are included within Appendix 12-2.			
Chapter 13: Cultural Heritage	Section 13.2.5 Viewshed Analysis relative to Cultural Heritage Sites	The Zone of Theoretical Visibility as presented in Chapter 14: Landscape & Visual is produced using Scenario 3: Median, as well as photomontage / photowires from specific cultural heritage assets or other general locations which are produces using all three scenarios. This is utilised in the Cultural Heritage assessment to identify impacts on visual setting relative to monuments and cultural heritage aspects, all of which is assessed in the EIAR.	**Scenario 1: Maximum** Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m	**Scenario 2: Minimum** Tip Height: 179.5m Rotor Diameter: 149m Hub Height: 105m	**Scenario 3: Median** Tip Height: 180m Rotor Diameter: 150m Hub Height: 105m
Chapter 14: Landscape & Visual	Section 14.1.3.2 Landscape and Visual Assessment	Three scenarios are assessed for the Landscape and Visual Assessment, as part of the EIAR. Scenario 3: Median is the turbine presented in all photomontages in the Photomontage Booklet. Scenario 1: Maximum, and Scenario 2: Minimum are also presented for three selected viewpoints at short-range, mid-range and long-range views, all of which is assessed within the EIAR.	**Scenario 1: Maximum** Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m	**Scenario 2: Minimum** Tip Height: 179.5m Rotor Diameter: 149m Hub Height: 105m	**Scenario 3: Median** Tip Height: 180m Rotor Diameter: 150m Hub Height: 105m
Chapter 15: Material Assets	Section 15.1.5 Traffic Assessment	Scenario 1: Maximum is the scenario which gives rise to the longest turbine blade for delivery and is assessed within the EIAR. This precautionary approach is taken as the assessment of the maximum blade length will give rise to the greatest potential for significant effects. Should the blade length be less than the maximum, the potential for significant effects will also be reduced.	**Scenario 1: Maximum** Tip Height: 180m Rotor Diameter: 155m Hub Height: 102.5m		

1.8 Project Team

1.8.1 Project Team Responsibilities

The companies and staff listed in Table 1-3 were responsible for completion of this 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.

Table 1-4 Companies and Staff Responsible for EIAR Completion

Consultants	Principal Staff Involved in Project	EIAR Input*
MKO Tuam Road, Galway, H91 VW84	Michael Watson Sean Creedon Ellen Costello Colm Ryan Dervla O'Dowd John Hynes Catherine Johnson Brandon Taylor Brodie Ní Thuathail John Willoughby Ronan Dunne Jack Workman James Crean Corey Cannon Pat Roberts Steohanie Corkery Bronagh Boylan Valerie Kendall Cora Twomey Padraig Cregg Donnacha Woods James Newell Joseph O'Brien Killian Devereux Gabriela Oliveria Aoife Joyce Sara Fissolo	Project Managers, Scoping and Consultation, Preparation of Natura Impact Statement, EIAR Report Sections: 1. Introduction 2. Background to the Proposed Project 3. Considerations of Reasonable Alternatives 4. Description of the Proposed Project 5. Population & Human Health 6. Biodiversity 7. Birds 10. Air Quality 11. Climate 13. Landscape & Visual 15. Material Assets (non-Traffic) 16. Major Accidents and Natural Disasters 17. Interaction of the Foregoing 18. Schedule of Mitigation
Afry The Hyde Building, The Park, D18VC44, Dublin 18, D18 VC44	Liam Power Mark Browne Manasvi Srivastava	Geometric Design, Geotechnical & Peat Stability Assessment, Peat & Spoil Management Plan, and Management of SI Works
Hydro Environmental Services 22 Lower Main Street Dungarvan	Michael Gill Conor McGettigan	Flood Risk Assessment, Drainage Design, Preparation of EIAR Sections: 8. Land, Soils & Geology

Consultants	Principal Staff Involved in Project	EIAR Input
Co. Waterford		9. Water
TNEI Ireland Ltd. Unit S12, Synergy Centre TU Dublin Tallaght Campus, Tallaght, Dublin.	James Mackay Gemma Clark Jason Baldwin Moise Coulon	Preparation of EIAR Section 11. Noise and Vibration
Tobar Archaeological Services Saleen Midleton Co. Cork	Miriam Carroll	Preparation of EIAR Section 12. Cultural Heritage
Alan Lipscombe Traffic and Transport Consultants Claran, Headford, Co. Galway	Alan Lipscombe	Swept Path Analysis, Preparation of EIAR Section 14. Material Assets - Traffic and Transport

* A Statement of Authority is included in each chapter of this EIAR detailing the experts who contributed to the preparation of this report, identifying for each such expert the part or parts of the report which he or she is responsible for or to which he or she contributed, his or her competence and experience, including relevant qualifications in relation to such parts, and such additional information in relation to his or her expertise that demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality.

1.8.2 Project Team Members

1.8.2.1 MKO

Michael Watson, MA; MIEMA, CEng, 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 BSc. MSc

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.

Ellen Costello M.Sc., B.Sc., PIEMA

Ellen Costello is a Project Environmental Scientist with MKO with over four 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.

Colm Ryan

Colm Ryan is the Planning Project Director with MKO with over 10 years of experience in both private practice and local authorities. Colm holds BA (Hons) in Geography & Irish and Masters in Civic Design Town & Regional Planning. Prior to taking up his position with McCarthy Keville O'Sullivan in May 2017, Colm worked as a Senior Planner with Lightsource Renewable Energy Ltd. and held previous posts with Partnerships for Renewables, South Kesteven District Council, Planning Aid, Frank O Gallachoir & Associates in Bray and Laois County Council. Colm is a chartered town planner with specialist knowledge in renewable energy, mixed use development and residential. Colm's key strengths and areas of expertise are in large scale renewable energy development particularly in the ground mounted solar, delivery of local community engagement processes on contentious planning applications, management of community and developers' interest through the planning process and post or pre-planning due diligence. Since joining MKO as a Senior Planner Colm has been overseeing and managing a wide range of development projects such as large-scale solar applications, site feasibility work for potential wind energy projects, large scale housing and mixed use schemes. Within MKO Colm plays a large role in the management of staff members including several aspects of business development. Colm has proven negotiation skills and stakeholder relationship building across numerous development projects in Ireland and the UK and is a corporate member of the Irish Planning Institute.

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

Dervla O'Dowd is a Senior Ecologist and Project Manager with MKO with fifteen years of experience in environmental consultancy. Dervla graduated with a first class honours B.Sc. in Environmental Science from NUI, Galway in 2005 and joined Keville O'Sullivan Associates in the same year. Dervla

has gained extensive experience in the project management and ecological assessment of the impacts of various infrastructural projects including wind energy projects, water supply schemes, road schemes and housing developments nationwide and has also been involved in the compilation of Environmental Impact Statements, with emphasis on sections such as Flora & Fauna, and acted as EIS 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 and current Safe Pass card.

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

John Hynes is a Senior Ecologist and director of the Ecology team with McCarthy O'Sullivan Ltd. with over 10 years of experience in both private practice and local authorities. John holds a B.SC in Environmental Science and a M.Sc. in Applied Ecology. Prior to taking up his position with MKO in March 2014, John worked as an Ecologist with Ryan Hanley Consulting Ltd. and Galway County Council. John has specialist knowledge in Flora and Fauna field surveys. Geographic Information Systems, data analysis, Appropriate Assessment, Ecological Impact Assessment and Environmental Impact Assessment. John's key strengths and areas of expertise are in project management. GIS and impact assessment. Since joining MKO John has been involved as a Senior Ecologist on a significant range of energy infrastructure, commercial, national roads and private/public development projects. Within MKO John plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIS/EIAR Reports. John has project managed a range of strategy and development projects across the Ireland and holds CIEEM membership.

Owen Cahill B.Sc., M.Sc.

Owen is an Environmental Engineer with McCarthy O'Sullivan Ltd. with over 15 years of experience in the environmental management and construction industries. Owen holds BSc. (Hons) and MSc. in Construction Management and a Masters in Environmental Engineering. Prior to taking up his position with 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 has project managed the Environmental Impact Assessment of a range of development projects across the Ireland and is a Full Member with the Institute of Environmental Management & Assessment and is a Chartered Environmentalist.

Catherine Johnson LLM. B.Sc., GradCIWEM

Catherine is an Environmental Scientist and Climate Practitioner 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.

Brandon Taylor

Brandon Taylor is a Graduate Environmental Scientist with MKO with over one year of private consultancy experience. Brandon holds a BSc (Hons) in Geography from McGill University, and a MSc (Hons) in Coastal & Marine Environments from the University of Galway. Since joining the company, Brandon has been involved in the feasibility studies and EIAR production of multiple large-scale onshore wind energy developments, as well as additional reports including EIA screenings and construction and environmental management plans.

Brodie Ní Thuathail

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.

John Willoughby

John is a Project Planner in MKO with over 6 years experience across planning consultancy and environmental management. John holds a BA (Hons) in Geography, Planning and Environmental Policy, and an MSc (Hons) in Environmental Policy, both from UCD, and recently completed an Advanced Diploma in Planning and Environmental Law at Kings Inns. Prior to taking up his position with MKO in 2022, John worked in planning consultancy since 2017, managing and assisting with the coordination of development projects throughout the statutory planning process, from feasibility stage to final grant and planning compliance, carrying out due diligence, feasibility assessments, development potential reports, appeals, submissions and bespoke planning advice on a wide range of development projects. John also has previous experience in environmental management in both the Pharmaceutical and Infrastructure sectors.

Through both his professional and academic experience, John has gained skills in urban planning, Environmental Impact Assessment, regeneration, development management, project management, strategic planning and policy research. John is a corporate member of the IPI with specialist knowledge in national, regional and local planning policy and guidance, development management and strategic planning analysis for a wide range of projects across the residential, commercial, mixed-use, retail and renewable energy sectors. Within MKO, John works as part of a larger multidisciplinary team to coordinate the development of planning applications for renewable energy infrastructure for submission to both Local Authorities and An Bord Pleanála.

Ronan Dunne

Ronan Dunne is a Planner with MKO having joined the company in June 2022. Ronan holds a BSc (Hons) in City Planning and Environmental Policy, and a MSc (Hons) in Urban and Regional Planning from University College Dublin where he focused his studies on wind energy development. Since joining MKO, Ronan has been involved in a range of infrastructure projects, including onshore wind, solar, battery storage and grid infrastructure developments. In his role as a planner, Ronan works with multidisciplinary teams including members from MKO's Environmental, Ecological and Ornithological departments as well as sub-contractors from various fields in the develop/deliver reports to facilitate the planning process.

Jack Workman MSc

Jack is the Landscape & Visual Project Director 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.

James Crean

James Crean is an Environmental Scientist and LVIA Graduate with MKO. His primary role at MKO is producing the LVIA chapter of EIAR reports. James holds an MSc. In Applied Coastal and Marine Management from University College. Since joining MKO, James has worked widely on renewable energy infrastructure, commercial, recreational, and residential projects. James is a qualified Unmanned Aerial Vehicle Operator and holds an A1/A3 and A2 drone licence.

Corey Cannon

Corey is a Senior Ecologist at MKO and holds a BSc in Zoology and an MSc in Biodiversity Survey. Corey is also a Chartered Ecologist and Full Member of CIEEM. Corey has over ten years' consultancy experience. She is an experienced ecologist with skills covering habitat and botanic assessments and specialist mammal (including all bat species) surveys. Corey has undertaken numerous Ecological Impact Assessment and AA assessments for public and private sector clients.

Pat Roberts

Pat Roberts is Principal Ecologist with MKO with over 18 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 is currently responsible for staff development, training and ensuring that the outputs from the ecology 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)

Stephanie Corkery

Stephanie is an Ecologist with MKO with over 1.5 years of experience in professional ecological consultancy. Stephanie holds a BSc. in Ecology and Environmental Biology, an MSc. in Marine Biology, and a HDip in Sustainability in Enterprise, all from University College Cork. Since joining MKO as a graduate in March 2022, Stephanie has worked on a wide variety of projects including wind farms, large scale residential developments, and County Council projects. Stephanie's key strengths include organising and carrying out both terrestrial and marine mammal surveys, as well as general ecological walkover surveys and bat surveys. She is also experienced in GIS, acoustic data analysis for bat species, and in preparing Appropriate Assessment Screening Reports (AASR), Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), Biodiversity Chapters, and Bat Reports. Stephanie is also a JNCC Certified Marine Mammal Observer and has completed the ACCOBAMS Course for Highly Qualified Marine Mammal Observers (MMO) and Passive Acoustic Monitoring operators (PAM).

Bronagh Boylan

Brónagh is an Ecologist with MKO, since July 2022 with one year of experience in professional ecological consultancy. Brónagh holds a BSc (Hons) in Environmental Science from National University of Ireland, Galway. Brónagh's key strengths and areas of expertise are in terrestrial flora and fauna ecology, including vegetation surveys, habitat mapping, mammal surveys, bat surveys and roost site potential assessment, Appropriate Assessment Screening reporting and Ecological Impact Assessment. Since joining MKO Brónagh has worked widely on energy infrastructure, commercial, recreational and residential projects and plays a role preparing Ecological Impact Assessment reports and Appropriate Assessment reports, along with a role as an Ecological Clerk of Works for some site supervision. Brónagh is trained in carrying out bat surveys, terrestrial invertebrate surveys and in taking vegetation relevés of vascular plants. She also has experience in habitat identification and habitat mapping. Within MKO Brónagh is responsible for independently carrying out and planning ecological field surveys in accordance with NRA Guidelines, and for carrying out bat surveys in accordance with Scottish Natural Heritage 2019 Guideline standards, habitat surveys, and Appropriate Assessment screenings as part of the ecology team. Brónagh is a member of CIEEM (QCIEEM membership), Irish Whale and Dolphin Group (IWDG) and holds a current Bat Roost Disturbance licence.

Valerie Kendall

Valerie Kendall is an Ecologist with MKO Planning and Environmental Consultants with 12 years of experience in the environmental sector in Atlantic Canada and Ireland. Valerie holds a MEnvSc and a BSc (Hons) with a Biology Major, from Memorial University of Newfoundland, of St. John's, Newfoundland, Canada. Valerie's broad experience includes providing biological expertise and project management for Canadian and provincial environmental assessments, national environmental effects monitoring and impact assessments, regulatory biomonitoring programmes, habitat offsetting plans, and a range of biological studies. Since relocating to Ireland in 2020, Valerie has gained experience conducting Appropriate Assessments and Ecological Impact/Biodiversity Assessments, as well as in the scientific development of freshwater biomonitoring programmes according to the Water Framework Directive. She has experience with numerous sectors such as renewables, quarry and aggregates, public infrastructure, and wastewater management, regularly liaising with government, industry, and academic

clients to successfully deliver on a wide range of projects. Valerie has specialist knowledge in freshwater ecology, with previous experience conducting scientific research for the development of national coastal management strategies, national freshwater biomonitoring programmes, in environmental management relating to use of aircraft de-icing fluids and wastewater treatment in Canada and internationally, as well as environmental microbiology and chemistry, particularly relating to water quality with a leading laboratory in Nova Scotia, Canada.

Cora Twomey

Cora is a Practitioner Ecologist with MKO, since July 2022 with over 1.5 years of experience in professional ecological consultancy. Cora holds a First-Class Honours BSc degree in Ecology and Environmental Biology from University College Cork. Cora's key strengths and areas of expertise are in fauna ecology, including breeding raptor and waterbirds, mammal surveys including bat emergences, transect surveys, appraisals and roost assessments for Appropriate Assessment Screening reporting, Ecological Impact Assessments and Condition Compliance monitoring. Cora has expertise in Ecological Clerks of Works for site supervision in both construction phase and operational monitoring of small to large scale projects and in completing Final Audit Reports and Annual Monitoring Reports. Since joining MKO Cora has worked widely on energy infrastructure, commercial, recreational and residential projects and plays a role preparing Ecological Impact Assessment reports and Appropriate Assessment reports. She also has experience in taking vegetation relevés of vascular plants, habitat identification and habitat mapping in addition to establishing Invasive Species Management Plans. Cora has continued to hone in on her skillset and upskill since joining MKO by taking part in internal trainings on drone surveying, winter tree identification and bryophyte identification training. Cora has also taken part in external trainings such as Stage 1 and Stage 2 Freshwater Peral Mussel training, I-WeBS counts for the Inner Galway Bay region, BSBI training days, and Birdwatch Ireland trainings, in addition to attending conferences such as Salmon Watch Ireland. Cora is a member of Botanical Society of Britain and Ireland. Cora holds a current NPWS Bat Roost Disturbance License, Certificate for Certificate for Freshwater Pearl Mussel Surveying Surveying (Stage 1 and 2), Irish Aviation Authority Drone A1 & A3 A1 & A3 licenses, a NPWS license to film and photograph wild animals and a full clean drivers license.

Padraig Cregg M.Sc., B.Sc.

Padraig Cregg is a Senior Ornithologist with MKO with over 9 years of experience in both private practice and NGOs. Padraig holds a BSc (Hons) in Zoology and Masters in Evolutionary and Behavioural Ecology. Prior to taking up his position with McCarthy Keville O'Sullivan in December 2018, Padraig worked as a Senior Ornithologist and held previous posts with TOBIN Consulting Engineers, Energised Environments Ltd in Scotland, WSP Environment and Energy Ltd in Scotland and BirdWatch Ireland. Padraig has specialist knowledge in designing, executing and project managing ornithological assessments, primarily in the renewable industry. Padraig's key strengths and areas of expertise are in ornithology and ecology surveying and in writing Natura Impact Statements (NIS) and the Biodiversity chapter of Environmental Impact Assessment Reports (EIAR) to accompany planning applications. Since joining MKO Padraig has been involved in designing, executing and project managing the ornithological assessment on over 20 proposed wind farm developments. He has played a key role in project managing these planning applications through the statutory planning system, with more projects in the pipeline. Within MKO Padraig plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIAR and NIS Reports.

Donnacha Woods

Donnacha is a Project Ornithologist with MKO. Donnacha worked as a field ornithologist on a range of projects across multiple countries, including roles in Ireland with BirdWatch Ireland, and in Canada and France with respective NGOs. Donnacha then worked as an ecologist with both Enviroguide

Consulting and Mott MacDonald, before joining MKO in August 2020. Donnacha has a B.Sc. in Zoology from UCD, and a M.Sc. in Biodiversity and Conservation from Trinity College Dublin.

James Newell

James holds the position of CAD and Information Technology Technician with MKO since joining the Company in May 2006. Prior to joining MKO, he worked as a graphic designer and illustrator for over eight years. In recent years James' role has extended to include all wind farm visual modelling completed by the company. He is proficient in the use of MapInfo GIS software in addition to AutoCAD and other design and graphics packages.

Joseph O'Brien

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

Killian Devereux

Killian is currently the Project CAD Technician at MKO he has over 8 years of drafting experience in various sectors of the building industry. He holds BSc (Hons) in Architectural Technology from Galway Mayo Institute of Technology. Prior to taking up his position with MKO in October 2022, Killian worked as a Structural CAD/BIM Technician for Tobin Consulting Engineers and as an Architectural Technician for some smaller-scale Engineering Consultants. He was primarily involved in a variety of Commercial / Residential projects where he was responsible for the structural drawing packages but also has experience working in RC concrete Drawings, Architectural and Civil drawings, FSC's /DAC's and one-off housing planning applications. His key strengths and areas of expertise are in Auto CAD, Revit, Cads RC and Google Sketch up. Since Joining MKO Killian has been the lead CAD technician on multiple Renewable Energy Planning Applications.

Gabriela Oliveria

Gabriela Oliveira is a CAD Technician with MKO with over 7 years of experience specializing in the design of residential and commercial spaces, as well as expertise in sustainable and energy-efficient drafting. Gabriela holds a Bachelor of Architecture (B.Arch. Hons) degree in Architecture and Urbanism. Before joining McCarthy Keville O'Sullivan in July 2023, Gabriela held significant roles in the industry, including Architect and CAD Technician positions. She contributed her skills and knowledge at Fergal Bradley & Co. Building Surveyors in Ireland for 4 years and at DAMOUS Ltd. Consulting Engineers in Brazil for 3 years. Gabriela possesses specialized proficiency in architectural design, technical drafting utilizing software such as AutoCAD, SketchUp, and Revit, as well as expertise in measurement surveys and the preparation of Planning Application drawings and documents. Gabriela excels in various areas, with a particular focus on design, drafting, and leading measurement surveys for planning application packages. Since joining MKO, Gabriela has been actively involved in producing drawings for planning applications across a diverse range of projects, including Wind Farms, Solar Farms, residential developments, and commercial buildings.

Within MKO, Gabriela plays a role in the CAD team, dedicated to delivering high-quality technical drawings tailored for planning applications.

Aoife Joyce M.Sc. (Agribioscience), B.Sc

Aoife Joyce is an Ecologist with MKO Planning and Environmental Consultants with experience in research, consultancy and drilling contractors. Aoife is a graduate of Environmental Science (Hons.) at NUIGalway, 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.

Sara Fissolo

Sara Fissolo is a Project Ecologist with MKO Planning and Environmental Consultants. She holds a BSc. (Hons) in Ecology and Environmental Biology from University College Cork. Sara is a member of MKO's dedicated bat unit, where she scopes and manages bat survey requirements for a variety of projects, including windfarms planning applications. She has four years' experience carrying out bat survey requirements including roost assessments, manual/static activity surveys, data analysis, impact assessment and report writing. She is experienced in the use of endoscopes and thermal equipment to carry out bat surveys, as well as site-supervision. She attended Wildlife Acoustics, Bat Conservation Ireland (BCI), Bat Conservation Trust (BCT) and CIEEM courses on surveying heritage buildings for bats, on bats and lighting, on performing bat care, on assessing the impact of developments on bats and on the use of Kaleidoscope Pro Software. Sara is a member of BCI, for which she carries out volunteer surveys, and holds a current Bat Disturbance Licence from NPWS.

1.8.2.2 Afry

Liam Power

Liam Power is a Senior Project Manager at AFRY Ireland Limited and leads the civil team. With over 25 years of construction experience, he has been involved in all aspects of large civil engineering projects, with a recent emphasis on project management for large-scale renewable projects.

Liam's career began as a Site Engineer and progressed through various roles, including Roads Engineer, Quality and Environmental Manager, Assistant Project Manager, and Project Manager at Roadbridge Civil Engineering & Construction Ltd, where he spent 24 years. He has extensive experience in managing a variety of projects in Ireland, the UK, and Sweden, including Large Road and Bridge Construction Schemes, Landfill Construction Sites, Sewerage Schemes, Gasline Construction, Site Development, and Windfarm Construction projects. Liam possesses vast experience in multi-disciplinary procedures for multinational clients, demonstrating excellent team-building skills and adeptly managing interfaces with different stakeholders including Clients, Employers, Statutory Bodies, Community Groups, and Landowners. Liam holds a Diploma in Construction Management and a National Certificate in Civil Engineering.

Mark Browne

Mark is the Infrastructure Design Lead with AFRY. He holds a BSc in Computer aided Design and Construction. He has worked for AFRY for 12 years and has expertise in designing Wind and Solar Farms using Civil 3d and Vehicle Tracking software to detail hardstandings, roads, bridges, culverts and cable trenches to comply with industry standards . Prior to joining AFRY, Mark had a background in structural drafting and RC detailing, which has carried through to assist in turbine foundation and substation designs.

Manasvi Srivastava

Manasvi Srivastava is a Civil Engineer at AFRY Ireland Limited with five years of experience in civil, structural, and geotechnical engineering. Manasvi holds a Master's degree in Environmental Engineering from Trinity College Dublin, a Master's degree in Structural Engineering, and a Bachelor's degree in Civil Engineering from India. Before joining AFRY in 2020, Manasvi worked as a Bridge Engineer in India for one and a half years, where she was responsible for the preliminary and detailed design of road and railway bridges, culverts, and various structural components. At AFRY, Manasvi has contributed to a variety of onshore wind, solar, and battery storage projects undertaking technical due diligence, feasibility studies, infrastructure design, design reviews, and technical report preparation.

1.8.2.3 Hydro Environmental Services Ltd

Michael Gill

Michael Gill is an Environmental Engineer with over 22 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms in Ireland. In addition, he has substantial experience in geological characterisation, peatland morphology, and surface water drainage design and SUDs design and surface water/groundwater interactions. Michael has worked on the EIS/EIAR for Oweninny WF, Cloncreen WF, Derrinlough WF and over 100 other wind farm related projects across the country.

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.

Conor McGettigan

Conor McGettigan (BSc, MSc) is an Environmental Scientist with 3 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor routinely prepares the land, soils and geology chapters of environmental impact assessment reports for wind farm development on peatlands.

1.8.2.4 TNEI Ireland Ltd.

James Mackay

James is Director of Environment and Engineering and has significant experience of all aspects of noise assessment work associated with energy developments having been involved with all stages of development for initial site finding and feasibility assessments, baseline surveys, impact assessments through to appeals and compliance monitoring. Since joining TNEI in 2006 James has worked on over 5 GW of onshore wind projects during which time his work has primarily focused on the technical aspects of energy developments particularly, site assessment, layout design, GIS mapping and analysis, noise and shadow flicker assessments.

James holds the Diploma in Acoustics and Noise Control, is a Member of the Institute of Acoustics and has presented papers at International Wind Farm Noise conferences. James has delivered training on a range of topics from noise to GIS both in the UK and Asia. Training clients range from developers, Local Authorities, other consultancies, Government and Utilities. In 2013/2014, James formed part of the peer review group for the UK Institute of Acoustics Good Practice Guide for wind farm noise assessments (IOA GPG). In addition to baseline noise assessments James also has experience of wind turbine compliance testing, complaints investigations and Planning Appeals.

Jason Baldwin

Jason is a Principal Technical Consultant with over 8 years experience working on noise related assessments for renewable energy developments. He holds the Diploma in Acoustics and Noise Control, and is an Associate of the Institute of Acoustics.

For a given project, Jason will become involved during feasibility assessments, baseline surveys, impact assessments, in addition to compliance and complaints investigations. Since joining TNEI in 2013, he has primarily worked on wind farm noise projects (specifically site assessment, layout design, and noise and shadow flicker assessments); his role also involves the development of noise models, and the analysis of operational turbine data during compliance exercises (to understand better the conditions in which noise is an issue). Jason moved to the Republic of Ireland in 2020 to set up a team and further extend the services that TNEI offer.

Gemma Clark

Gemma is a Principal Consultant with over 18 years experience working in the Environmental Consultancy Sector. Gemma holds a BSc in Environmental Science and an MSc in Clean Technology. Since joining TNEI in 2007, Gemma has primarily worked on wind farm noise projects. She has been involved with all stages of development for initial feasibility assessments, baseline surveys, impact assessments through to assisting with collating information for Appeals and compliance monitoring.

Gemma is an experienced Project Manager and has managed a range of projects from single turbine developments through to 300 MW+ applications in the UK and Ireland. Gemma is also proficient in the use of ArcGIS and provides GIS support across the business including site finding analysis, feasibility assessments and constraints mapping.

Moise Coulon

Moise is an experienced Project Manager and Acoustician, who provides technical support and assessment of proposed and operational developments. Moise specialises in undertaking noise assessments and has worked on projects associated with a variety of sectors including renewable energy, property development and industry.

Moise has extensive experience in complex noise monitoring campaigns and noise modelling in specialist software such as CadnA and SoundPlan. Moise leads projects from the early phases to completion and has worked on a number of complex cumulative impact assessments. Moise has extensive experience in Wind Farm noise, as well in BS5228 construction noise assessments, BS4142 noise assessments, shadow flicker assessments, due diligence, wind resource assessments and preparing reports to support planning applications. Moise is a full member of the Institute of Acoustics and has experience of presenting papers at wind farm noise conferences.

1.8.2.5 Tobar Archaeological Services

Tobar Archaeological Services is a Cork-based company in its 17th 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 EIS/EIAR stage through to construction stage when archaeological monitoring is frequently required.

Miriam Carroll

Miriam holds a Degree in Archaeology (1993-1996) and a 2-year Masters in Methods and Techniques in Irish Archaeology (1996-1998) from UCC and has over 20 years' experience in private sector archaeology. Miriam has managed and co-ordinated numerous projects from commencement stage to completion on behalf of numerous small and large companies.

1.8.2.6 Alan Lipscombe Traffic and Transport Consultants

Alan Lipscombe

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 of the EIAR

Copies of this EIAR will be available online for the planning application, including the Non-Technical Summary (NTS), on the Planning Sections of the Carlow County Council and Kilkenny County Council websites, under the relevant Planning Reference Number (to be assigned on lodgement of the application).

Carlow County Council: https://www.carlow.ie
Kilkenny County Council: https://kilkennycoco.ie

This EIAR and all associated documentation will also be available for viewing at the offices of Carlow County Council and Kilkenny 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:

Carlow County Council,
County Buildings,
Athy Road,
Co. Carlow

Kilkenny County Council,
County Hall,
John Street,
Co. Kilkenny

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)