FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED BALLINAGREE WIND FARM

VOLUME 2 - MAIN EIAR

CHAPTER 1 - INTRODUCTION

Prepared for: Ballinagree Wind DAC

Ballinagree Wind farm

Date: January 2022

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1. INTRODUCTION

Fehily Timoney & Company (FT) has prepared this environmental impact assessment report (EIAR) on behalf of Ballinagree Wind DAC, (generally referred to in this document as the 'Developer') a joint venture between FuturEnergy Ireland and Ørsted. Ballinagree Wind DAC intends to apply to An Bord Pleanála for consent to construct the proposed Ballinagree Wind Farm in County Cork. The location of the development is shown on Figure 1.1.

The proposed project assessed in this EIAR is comprised of the following key elements:

The wind farm site, consisting of 20 turbines within the townlands of Annagannihy, Ballynagree East, Ballynagree West, Carrigagulla, Carrigduff, Finnanfield, Inchamay South and Knocknagappul, Co. Cork.

The grid connection is a 110kV underground electrical cable from the wind farm site to the existing 110 / 220kV substation at Clashavoon, within the townland of Aughinida, Co. Cork. The grid connection will traverse the townlands of Clonavrick, Knocknagappul, Ballynagree East, Bawnmore, Ballynagree West, Derryroe, Rahalisk, Kilberrihert, Caherbaroul, Aughinida, Co. Cork

The turbine delivery route and associated accommodation works required to deliver the turbines to the wind farm site. Accommodation works included in the planning application include works within the townlands of Dromagh, Dromskehy, Drishane More, Tullig, Drominahilla and Ballinagree East, Co. Cork.

Biodiversity enhancement measures on lands proximate to the wind farm site, (please see Biodiversity Enhancement Management Plan in Appendix 3.4). Four private landowners with a combined total of c. 304 ha of lands in the vicinity of the wind farm, but beyond 250m of any proposed turbine, have agreed to a long-term commitment to detailed land management measures designed to maintain and enhance local biodiversity. In addition, the Developer has undertaken to create wildlife corridors through strategic tree-felling between areas of open upland habitat in the vicinity of the proposed wind farm area. These lands are located primarily outside of the redline boundary of the main wind farm site. The lands are in the townlands of Carrigduff, Annagannihy, Knocknagappul, Rahalisk, Oughtihery, Dooneens, Carriganish, Kilberrihert and Caherbaroul, Co. Cork.

Therefore, the key components for this assessment will be described throughout the EIAR as the following;

- The wind farm site (also referred to in this EIAR as 'the Site');
- The grid connection (also referred to in this EIAR as 'the UGC')
- The turbine delivery route (also referred to in this EIAR as 'the TDR');
- Biodiversity enhancement and management plan lands (also referred to in this EIAR as 'the BEMP lands').

1.1 Applicant

The Applicant for the permission is Ballinagree Wind DAC, a joint venture between FuturEnergy Ireland and Ørsted.

FuturEnergy Ireland is a 50:50 joint venture company between Coillte and ESB.

The aim of FuturEnergy Ireland is to materially help the country deliver on its green energy targets, achieving net zero emissions by 2050, as set out in the Government's Climate Action Plan and legislated for under the Climate Action Act. The Coillte-ESB joint venture is looking to actively drive Ireland's transition to a low carbon economy by developing 1GW of wind energy projects by 2030, enough to power more than 500,000 homes.

FuturEnergy Ireland is dedicated to developing best-in-class, commercially successful wind farms while maximising the support from local communities. FuturEnergy Ireland's wind farm projects have the potential to play a fundamental role in a green economic recovery by creating jobs in rural areas and growing a green industrial sector, while also funding local development and enhancing amenities for host communities.

Ørsted is a Danish renewable energy company. Ørsted has an operating and in-construction portfolio of 4GW of wind and solar and has plans to increase this further with a strong future pipeline of projects. Ørsted are the world leader in offshore wind energy and recently acquired Brookfield Renewable Ireland to enter into the European onshore wind market. In acquiring the Irish Company Ørsted added more than 400 megawatts of operating wind capacity across 23 wind farms in 10 counties to their portfolio.

1.2 Outline of the Proposed Project

The proposed project consists of four main elements:

- The wind farm site (also referred to in this EIAR as 'the Site');
- The grid connection;
- The turbine delivery route (also referred to in this EIAR as 'the TDR');
- Biodiversity enhancement and management plan lands (also referred to in this EIAR as 'the BEMP lands').

The proposed project will consist of a wind farm of 20 no. wind turbine generators (WTG's), 2no. permanent meteorological masts (PMM's), and 1 no. substation compound along with ancillary civil and electrical infrastructure. The project shall also include infrastructure for community use in the form of walking trails.

The total Maximum Export Capacity (MEC) of the wind farm is between 118MW and 132MW. The exact MEC will be dependent on the output power of the models available at procurement stage but will fall within this range.

The proposed turbines will have a blade tip height range from 179m to 185m, a hub height range from 102.5 to 110.5m and a rotor diameter range from 149m to 155m as illustrated in the plans and particulars submitted with this application for consent.

The plans and particulars submitted with this application for consent are precise and provide specific dimensions for the turbine structures which incorporates a small range in dimensions. The turbine specifications will have a hub height range of between 102.5 and 110.5m and a rotor diameter range of between 149m and 155m with a tip height of between 179m and 185m. Each chapter of this EIAR has fully assessed all combinations within this range in turbine specification and the ultimate final turbine selection will fall within the parameters of this range.

The exact make and model of the turbine will be dictated by a competitive tender process, but it will be within the range shown on the plans and particulars and as described and assessed in this EIAR.

The associated grid connection route (GCR) will consist entirely of underground 110kV cable and will connect the on-site substation to the existing 110/220kV substation at Clashavoon, within the townland of Aughinida, Co. Cork. The GCR will be ca. 11.37 km in length, with ca. 9.35 km to be constructed primarily within the existing road corridor.

The Turbine Delivery Route (TDR) begins at the port of Foynes, County Limerick and approaches the wind farm site via the following roads: N69, M7, M20, N20, N72, R583 and L2758. Temporary accommodation works to facilitate turbine deliveries are proposed at lands contained within the following townlands: Dromagh, Dromskehy, Drishane More, Lackbane, Tullig, Drominahilla and Ballinagree East, Co. Cork.

Biodiversity enhancement measures will be undertaken on lands proximate to the wind farm site. Four private landowners with a combined total of c. 304 ha of lands in the vicinity of the wind farm, but beyond 250m of any proposed turbine, have agreed to a long-term commitment to detailed land management measures designed to maintain and enhance local biodiversity. In addition, the Developer has undertaken to create wildlife corridors through strategic tree-felling between areas of open upland habitat in the vicinity of the proposed wind farm area.

The construction of the project in its entirety is expected to take between 18-24 months.

1.3 Statutory Development Description for Consent.

The development description as per the statutory newspaper notice and the application form for which consent from An Bórd Pleanála (ABP) is being sought is as follows:

Permission for a period of 10 years, for development comprising the construction of a wind farm and related works within the townlands of Annagannihy, Aughinida, Ballynagree East, Ballynagree West, Bawnmore, Caherbaroul, Carrigagulla, Carrigduff, Clonavrick, Derryroe, Drishane More, Dromagh, Drominahilla, Dromskehy, Finnanfield, Inchamay South, Kilberrihert, Knocknagappul, Rahalisk and Tullig, Co. Cork.

The proposed development will constitute the provision of the following:

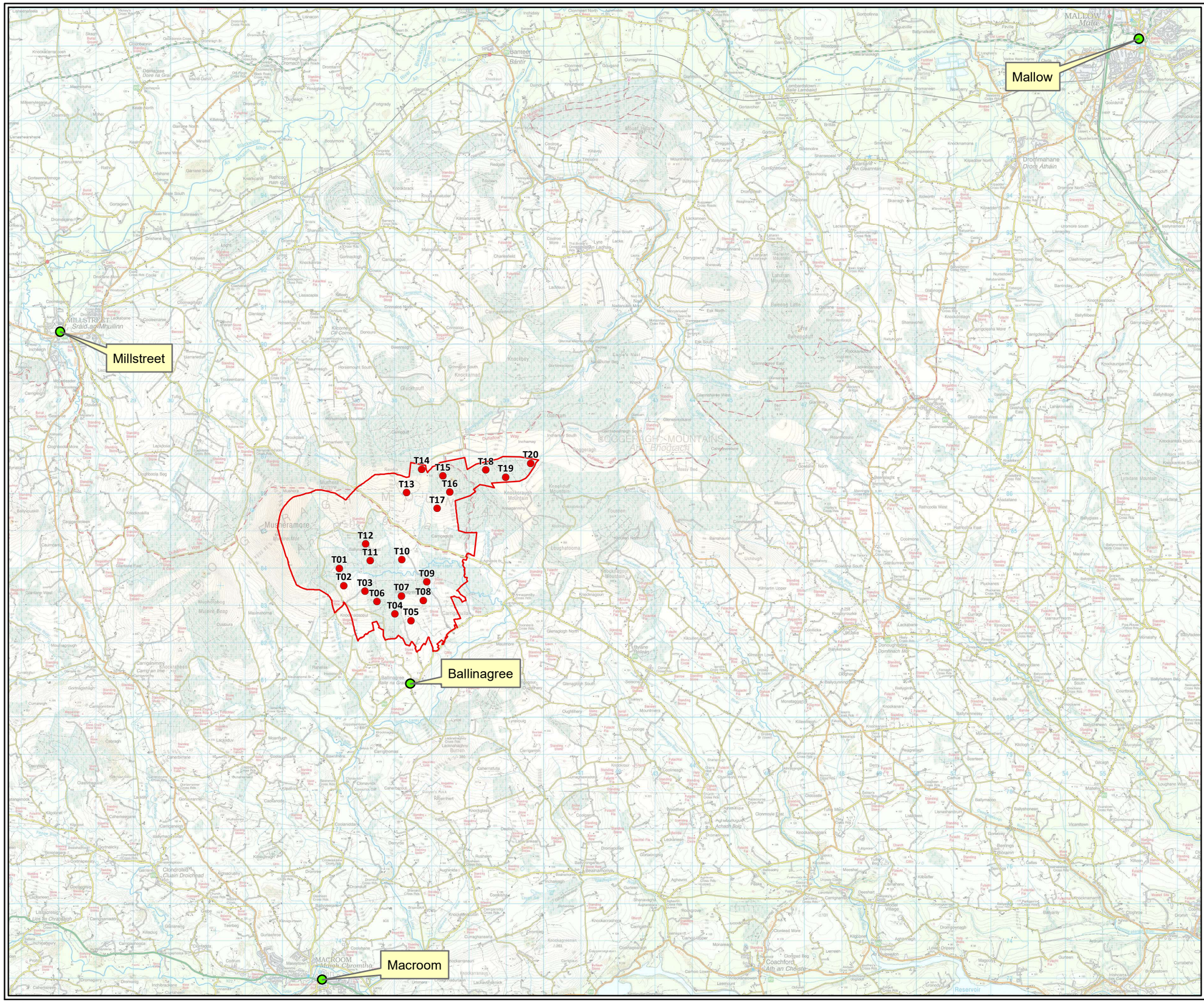
- Construction of 20 no. wind turbines with a blade tip height range from 179m to 185m, a hub height range from 102.5 to 110.5m and a rotor diameter range from 149m to 155m;
- Construction of turbine foundations and crane pad hardstanding areas including associated drainage infrastructure;
- Construction of new permanent site tracks and associated drainage infrastructure;
- Upgrading of existing tracks and associated drainage infrastructure;
- Upgrade of 2 no. existing forestry and agricultural access junctions for construction and operational access from 1) the Local Roads L2750-0/L1123-62 in the townlands of Finnanfield and Ballynagree East and 2) from the Local Road L7461-0 in the townland of Ballynagree West, Co. Cork;
- Upgrade of 2no. existing forestry access junctions for temporary construction access from the Local Road L7461-17 in the townland of Knocknagappul, Co. Cork;

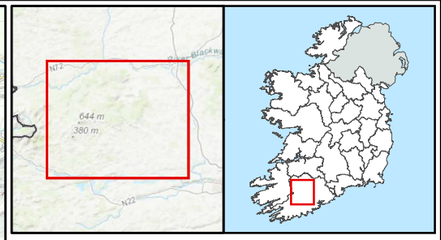
- Use of 1 no. existing forestry and agricultural access junction for operational access only from the Local Road L-7461-44 in the townland of Knocknagappul, Co. Cork;
- Installation of new permanent watercourse and drain crossings and the reuse and upgrade of existing internal watercourse and drain crossings to include 1) the replacement of an existing stone bridge structure with a new clear span concrete bridge structure along the Local Road L-7461-0 in the townland of Ballynagree West and 2) a new clear span concrete bridge structure along a proposed new track in the townland of Carrigagulla, Co.Cork;
- 3 no. on site borrow pits and associated ancillary drainage within the townlands of Carrigagulla and Knocknagappul, Co. Cork;
- 2 no. Temporary construction site compounds and associated ancillary infrastructure including parking within the townlands of Ballynagree West and Carrigagulla, Co. Cork;
- Use of proposed wind farm access tracks and existing forestry and agricultural tracks as permanent recreational amenity trails for community use including the installation of associated signage and information boards and; the partial reinstatement and re-purposing of the proposed temporary construction compound as a permanent trail head car park and picnic area including associated landscaping within the townland of Ballynagree West;
- Construction of 1 no. permanent on-site 110kV electrical substation including control buildings, electrical plant and equipment, welfare facilities, carparking, water and wastewater holding tanks, security fencing, lightening protection and telecommunications masts, security cameras, external lighting and, all associated infrastructure within the townland of Ballynagree East, Co. Cork;
- Installation of medium voltage underground electrical and communication cabling connecting the wind turbines to the proposed on-site substation and associated ancillary works;
- Installation of permanent high voltage 110kV underground electrical and communication cabling between the proposed on-site substation within the townland of Ballynagree East to the boundary of the existing Clashavoon substation within the townland of Aughinida, Co. Cork. The cabling will be laid primarily within the public road in the townlands of Knocknagappul, Ballynagree East, Ballynagree West, Bawnmore, Clonavrick, Derryroe, Rahalisk, Kilberrihert, Caherbaroul and Aughinida, Co. Cork. Associated works including the installation of 15 no. pre-cast joint bays and communication chambers; and horizontal directional drilling under 4 no. watercourse crossings in the townlands of 1) Knocknagappul, 2) Knocknagappul and Rahalisk, 3) Rahalisk and Bawnmore and 4) Bawnmore and Clonavrick;
- Tree felling to accommodate the construction and operation of the proposed development;
- Erection of 2no. meteorological masts with a height of 100m above existing ground levels for the measuring of metrological conditions within the townlands of Ballynagree East and Carrigagulla, Co. Cork. A lightning rod will extend above the masts by 4 meters;
- Temporary accommodation works at 6 no. locations adjacent to the public roads to facilitate delivery of turbine components to site within the townlands of Dromagh, Dromskehy, Liscahane, Tullig, Drominahilla, Finnanfield and Ballynagree East, Co. Cork. These works will primarily relate to trimming of trees and hedgerows, temporary lowering of boundary walls, temporary removal of boundary walls, temporary ground reprofiling and installation of temporary stone hard standing;
- Installation of a temporary off-site staging area for turbine components within the curtilage of Drishane Castle which is a Recorded Protected Structure (00319) and National Monument (296), within the townland of Drishane More. The works will include removal of a masonry wall and installation of temporary stone hard standing area and associated access track and entrances to and from the public road R583;

- All related site works and ancillary development including landscaping and drainage;
- A 35 year operational life from the date of commissioning of the entire wind farm is being sought.

In addition to the above infrastructure for which consent from An Bord Pleanála (ABP) is being sought, the following elements have also been fully assessed in this EIAR: Biodiversity Enhancement of lands shown in Chapter 3, Figure 3-5 and described in Appendix 3.4 and additional Turbine Delivery nodes described in Chapter 13 of this EIAR.

Path: R:\Map Production\2019\P2114\Workspace\EIAR\P2114_GIS_Fig1-1_SiteLocation_A3.mxd





Legend

- Wind Farm Site
- Proposed Turbine Layout

TITLE:	Site Location		
PROJECT:	Ballinagree Wind Farm		
FIGURE NO:	1.1		
CLIENT:	Coillte and Ørsted		
SCALE:	1:100000	**REVISION:**	0
DATE:	16/12/2021	**PAGE SIZE:**	A3

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1.4 Application and EIAR Requirements

1.4.1 Strategic Infrastructure Development Planning Process

The Planning and Development Act 2000 was amended in 2006 to require certain applications for permission for major infrastructure projects to be made directly to An Bord Pleanála, rather than to the local planning authority, as would have previously been the case. In this instance An Bord Pleanála is considered to be the 'competent authority'.

In March 2020, the Developer wrote to An Bord Pleanála to formally request a pre-application consultation meeting under Section 37B of the Planning and Development Act 2000, as amended ("the 2000 Act"), in respect of the proposed Ballinagree Wind Farm.

In order to commence the pre-application consultation required under section 37B, a proposed development must fall within a class specified in the Seventh Schedule to the 2000 Act. Part 1 of the Seventh Schedule, as amended, specifies, inter alia, the following classes of development:

> *"An installation for the harnessing of wind power for energy production (a wind farm) with more than 25 turbines or having a total output greater than 50 megawatts."*

Thereafter, the Board must satisfy itself that the proposed development meets one or more of the conditions set out in subsection 37A(2) of the 2000 Act, namely—

> *"(a) the development would be of strategic economic or social importance to the State or the region in which it would be situate,*
>
> *(b) the development would contribute substantially to the fulfilment of any of the objectives in the National Spatial Strategy or in any regional spatial and economic strategy in force in respect of the area or areas in which it would be situate,*
>
> *(c) the development would have a significant effect on the area of more than one planning authority."*

Following pre-application consultations held on 8th July 2020, and 3rd December 2020, An Bord Pleanála issued a notice to the Developer on 19th August 2021 (under Ref. No. PC04.306948) indicating its determination that the proposed development is Strategic Infrastructure Development (SID) in accordance with the provisions of section 37A of the 2000 Act and, accordingly, an application for permission should be made directly to An Bord Pleanála (the Competent Authority). Consequently, this EIAR is submitted with an application for consent made directly to An Bord Pleanála, in accordance with the requirements of Section 37E of the Planning and Development Act 2000, as amended.

Correspondence and detail relating to the pre-application consultation process undertaken are included in Appendix 5.3 of Volume 3 of this EIAR.

1.4.2 Requirement for Competent Authority to Conduct an EIA

The European Union Directive 2011/92/EU (the EIA Directive) as amended by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment, requires Member States to ensure that a competent authority (in this instance An Bord Pleanála) carries out an appraisal of the environmental impacts of certain types of project, as listed in the Directive, prior to development consent being given for the project.

The requirement for EIA of certain categories of development is transposed into Irish legislation under the Planning and Development Act 2000 as amended and the Planning and Development Regulations 2001 as amended (the "2001 Regulations"). Given the scale of development proposed the proposed development meets the mandatory threshold for EIA. Therefore, an EIAR has been prepared in accordance with the Planning and Development Regulations 2001 (as amended) and Directive 2014/52/EU.

1.4.3 Appropriate Assessment

In compliance with the provisions of Article 6 of the Habitats Directive (92/43/EEC), as implemented by Part XAB of the 2000 Act, in circumstances where a proposed plan or project not directly connected with or necessary to the management of the European site is likely to have a significant effect on a European (or Natura 2000) site, either individually or in combination with other plans or projects, an Appropriate Assessment (AA) must be undertaken by the competent authority of the implications for the site in view of the site's conservation objectives.

European Sites include Special Areas of Conservation (SAC) designated under the Habitats Directive, Special Protection Areas (SPA) designated under the Birds Directive (2009/147/EEC) and candidate SACs (cSACs) or proposed SPAs (pSPAs), all of which are afforded the same level of protection as fully adopted sites.

The assessment procedure is based on a four-stage approach, where the outcome at each successive stage determines whether a further stage in the process is required.

The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives. There is no necessity to establish such an effect; it is merely necessary for An Bord Pleanála, the 'Competent Authority' to determine that there may be such an effect. The threshold at this first stage is a very low one and operates as a trigger in order to determine whether a Stage Two AA must be undertaken by the competent authority on the implications of the proposed development for the conservation objectives of a European site. Where significant effects are likely, uncertain or unknown at screening stage, a second stage AA will be required.

A Stage Two AA is a focused and detailed examination, analysis and evaluation carried out by the competent authority (in this case, An Bord Pleanála) of the implications of the plan or project, alone and in-combination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives.

In the context of the proposed Ballinagree Wind Farm, an Appropriate Assessment Screening Report and Natura Impact Statement have been prepared and submitted to An Bord Pleanála with this application for permission so to enable An Bord Pleanála to carry out the Appropriate Assessment.

1.5 EIAR Methodology and Structure

The Environmental Impact Assessment Report (EIAR) is a report of the effects, if any, which a proposed development, if carried out, would have on the environment. The EIAR provides the competent authority and the public with a comprehensive understanding of the project, the existing environment, the likely significant effects of the project and the mitigation measures proposed.

Article 3 of the 2014 EIA Directive states that an "environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

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 effects referred to above shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and /or disasters that are relevant to the project concerned.

1.5.1 EIAR Methodology

The EIAR has been prepared in accordance with Directive 2011/92/EU as amended by Directive 2014/52/EU (the EIA Directive). Schedule 6 of the Planning and Development Regulations 2001 (as amended) and Article 5 of the EIA Directive set out the information to be contained in an EIAR.

In addition, in the preparation of this EIAR a scoping of possible impacts of the proposed development was carried out to identify impacts thought to be potentially significant, not significant or uncertain. Consultation with the relevant private and public agencies ensured that the most significant impacts and the areas of key concern were addressed. Details of the consultation carried out to date for the proposed development are outlined in Chapter 5 EIA Scoping, Consultation and Key Issues of this EIAR.

Schedule 6 of the Planning and Development Regulations 2001 (as amended) describes the information to be contained in EIAR:

1.
a) A description of the proposed development comprising information on the site, design, size and other relevant features of the proposed development;
b) A description of the likely significant effects on the environment of the proposed development;
c) A description of the features, if any, of the proposed development and the measures, if any, envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment of the development;
d) A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.

2. Additional information, relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, on the following matters, by way of explanation or amplification of the information referred to in paragraph 1:

a) A description of the proposed development, including in particular –

i. A description of the location of the proposed development;

ii. A description of the physical characteristics of the whole proposed development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;

iii. A description of the main characteristics of the operational phase of the proposed development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; and;

iv. An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during construction and operation phases.

b) A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;

c) A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge;

d) A description of the factors specified in paragraph (b)(i) (I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act likely to be significantly affected by the proposed development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape;

e) (i) a description of the likely significant effects on the environment of the proposed development resulting from, among other things-

(I) the construction and existence of the proposed development, including, where relevant, demolition works,

(II) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources,

(III) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste,

(IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters),

(V) the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources,

(VI) the impact of the proposed development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change, and

(VII) the technologies and the substances used, and;

(ii) the description of the likely significant effects of the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the proposed development, taking into account the environmental protection objectives established at European Union level or by a Member State of the European Union which are relevant to the proposed development;

f) A description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved;

g) A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of an analysis after completion of the development), explaining the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset during both the construction and operational phases of the development;

h) A description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events.

The assessment of environmental impacts has been conducted having regard to the guidance set out in the following:

- *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017)*
- *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, Draft, 2017)*
- *Advice Notes for Preparing Environmental Impact Statements (EPA, Draft 2015)*
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, 2018)*
- *Wind Energy Development Guidelines for Planning Authorities (DoEHLG, 2006)*
- *Draft Revised Wind Energy Development Guidelines (DoHPLG, 2019)*
- *European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, EU 2013.*

The EIAR firstly sets out the planning context, the background to the project, the need for the development, a description of the evolution of the project through the alternatives considered and a description of the proposed development. This sets the reader in context as to the practical and dynamic process undertaken, in order to arrive at the layout and design of the proposed development that will cause least impact on the environment.

Subsequent chapters deal with specific environmental topics for example, traffic & transportation, air quality & climate change, hydrology & water quality, noise, etc. These assessments involve specialist studies and evaluations. The methodology applied during these specific environmental assessments is a systematic analysis of the proposed development in relation to the existing environment. The broad methodology framework for these assessments is outlined below and is designed to be clear, concise and allow the reader to logically follow the assessment process through each environmental topic. In some instances, more specific topic related methodologies are outlined in the relevant chapters of the EIAR.

The broad methodology framework used in all chapters includes:

- Introduction
- Methodology
- Existing Environment
- Potential Impacts
- Mitigation Measures
- Residual Impacts

Introduction

This section generally introduces the environmental topic to be assessed and the areas to be examined in the assessment.

Methodology

Specific topic related methodologies are outlined in this section. This will include the methodology used in describing the existing environment and undertaking the impact assessment. It is important that the methodology is documented so that the reader understands how the assessment was undertaken. This can also be used as a reference if future studies are required.

Existing Environment

An accurate description of the existing environment is necessary to predict the likely significant impacts of a proposed development. Existing baseline environmental monitoring data can also be used as a valuable reference for the assessment of actual impacts from a development once it is in operation.

To describe the existing environment, desktop reviews of existing data sources were undertaken for each specialist area. This literature review relied on published reference reports and datasets to ensure the objectivity of the assessment.

Desktop studies may also be supplemented by specialised field walkovers or studies in order to confirm the accuracy of the desktop study or to gather more baseline environmental information for incorporation into the EIAR.

The existing environment is evaluated to highlight the character of the existing environment that is distinctive and what the significance of this is. The significance of a specific environment can be derived from legislation, national policies, local plans and policies, guidelines or professional judgements. The sensitivity of the environment is also described.

Potential Impacts

In this section, individual specialists predict how the receiving environment will interact with the proposed development. The full extent of the proposed development's potential effects and emissions before the proposed mitigation measures are introduced is outlined here. Potential impacts from the construction, operational and decommissioning phases of the proposed development are outlined. Interactions and cumulative impacts with other environmental topics are also included in this evaluation.

The evaluation of the significance of the impact is also undertaken. Where possible, pre-existing standardised criteria for the significance of impacts will be used.

Such criteria can include Irish legislation, international standards, European Commission and Environmental Protection Agency (EPA) guidelines or good practice guidelines. Where appropriate criteria do not exist the assessment methodology section states the criteria used to evaluate the significance.

Mitigation Measures

If significant impacts are anticipated mitigation measures are devised to minimise impacts on the environment. Mitigation measures by avoidance, by reduction and by remedy can be outlined.

Residual Impacts

The assessment identifies the likely impact that will occur after the proposed mitigation measures have been put in place. These impacts are described in detail and assessment of their significance undertaken.

1.5.2 EIAR Structure

The EIAR has been prepared using the "grouped format structure" as outlined in EPA guidance documents (EPA, 2002; EPA, 2003) and in line with the draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017). The format of this EIAR is designed to ensure that standard methods are used to describe all sections of the EIAR.

Using this structure there is a separate chapter for each topic, e.g. air quality and climate, biodiversity, hydrology. The description of the existing environment, the proposed development and the potential impacts, mitigation measures and residual impacts are grouped in the chapter. The grouped format makes it easy to investigate topics of interest and facilitates cross-reference to specialist studies.

Given the scale of the proposed Ballinagree Wind Farm and consciousness of the need to ensure that the EIAR is readily accessible to the general public, as well as the statutory authorities, the EIAR team has structured the EIAR as described below.

The EIAR consists of the following chapters:

- Chapter 1 - Introduction
- Chapter 2 - Need for the Development and Alternatives Considered
- Chapter 3 - Description of the Proposed Development
- Chapter 4 - Policy
- Chapter 5 - EIA Scoping, Consultation and Key Issues
- Chapter 6 - Air Quality and Climate Change
- Chapter 7 - Noise and Vibration
- Chapter 8 - Biodiversity
- Chapter 9 - Land, Soils, Hydrogeology & Geology
- Chapter 10 - Hydrology and Water Quality
- Chapter 11 – Population, Human Health & Material Assets
- Chapter 12 – Shadow Flicker
- Chapter 13 - Traffic & Transportation
- Chapter 14 - Archaeology, Architectural and Cultural Heritage
- Chapter 15 - Landscape & Visual
- Chapter 16 - Telecommunications and Aviation
- Chapter 17 - Interactions of the Foregoing

The structure proposed for the EIAR is as follows:

Volume 1 – Non-Technical Summary (NTS)

Volume 2 – Main EIAR

Volume 3 – Appendices to the Main EIAR

Volume 4 – Landscape and Visual Maps and Photomontages

It should also be noted, for the sake of completeness, that a separate Natura Impact Statement (NIS) has also been submitted with the application. The application is also supported by Planning Drawings.

Annex IV of the EIA Directive requires the EIA to include a description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned.

Two key areas need to be considered namely;

- The Project's potential to cause accidents and/or disasters
- The vulnerability of the Project to potential disaster/accident, both natural and manmade.

The Construction and Environmental Management Plan submitted as part of this EIAR includes an emergency response plan in the event of emergencies or disaster situations.

It also outlines the statutory obligations of the Developer, Designer and Contractor pursuant to the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction) Regulations 2013 with regard to safety management.

The CEMP also includes mitigation in the event of a catastrophic event associated with operational wind turbines.

Chapter 11 – Population, Human Health and Material Assets assesses the projects vulnerability to major accidents and natural disasters and the potential adverse impacts on human health and the environment. The chapter examines potential disaster situations including;

- Flooding,
- Fire,
- Major incidents involving dangerous substances
- Catastrophic events; and
- Landslides.

1.5.3 Cumulative Impact

The potential cumulative impact of the Project has been assessed in line with Annex IV of the EIA Directive which provides that the EIAR must contain a description of the likely significant effects of the project on the environment resulting from the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

The assessment of projects in combination with other projects has four principal aims:

1. To establish the range and nature of existing projects within the cumulative impact study area of the Project.
2. To summarise the relevant projects which have a potential to create cumulative impacts.
3. To establish anticipated cumulative impact findings from expert opinions within each relevant field. Detailed cumulative impact appraisals are included in each relevant section of the EIAR.
4. To identify the projects that hold the potential for cumulative or in combination effects and screen out projects that will neither directly or indirectly contribute to cumulative or in combination impacts.

The geographic extent of the cumulative assessment is considered on a case-by-case basis, in line with the Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission, 1999). Assessment material for this cumulative impact appraisal was compiled based on relevant developments within the vicinity of the proposed Ballinagree Wind Farm project, including the length of the proposed grid connection route, TDR and BEMP lands. For the purpose of Cumulative Assessment of Landscape and Visual, all existing and approved wind farms and wind farms pending a decision from the planning authority within 20km from the outermost turbines of the proposed Ballinagree Wind Farm were identified for Cumulative Visual Assessment. This study area is derived from the Wind Energy Development Guidelines (2006) and is further detailed in Section 15.1.3 of the EIAR.

All existing and approved projects and projects pending a decision from the planning authority within 20km of the proposed Ballinagree Wind Farm were considered for potential Cumulative Assessment in all other chapters of this EIAR. This measurement was taken from the outermost turbines of the proposed Ballinagree Wind Farm. A 20km distance was considered appropriate due to the size and extent of the proposed wind farm and the nature of the potential effects as detailed throughout the EIAR.

All existing and approved projects and projects pending a decision from the planning authority within 250m of the grid route, TDR and BEMP lands were considered for potential Cumulative Assessment in all other chapters of this EIAR. A 250m distance was considered appropriate due to the brief to temporary nature of the works involved along the grid route and TDR and due to the limited extent of the works required. Similarly, a 250m distance was considered appropriate for the BEMP lands due to the nature of the measures associated with the lands and the lack of works required on these lands.

The material for the cumulative assessment was gathered through a search of relevant County Councils' Online Planning Registers, the An Bord Pleanála website and the EIA Portal. Relevant EIA documents, planning application details and planning drawings were reviewed, which served to identify the locations of existing and approved projects and projects pending a decision from the planning authority, their activities and their environmental impacts.

The relevance of the projects was considered on a case by case basis in each chapter as necessary depending on the interaction and likelihood of in combination impacts.

A full list of projects identified for cumulative assessment is set out in Appendix 1.2 of Volume 3 of this EIAR.

Detailed consideration of the approach to afforestation requirements associated with the project is attached in Appendix 1.3. It should be noted that the clearfelling of trees in the State requires a felling licence. The associated afforestation of alternative lands equivalent in area to those lands being permanently clearfelled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. In light of the foregoing and for the purposes of this project, the developer commits that the location of any replanting (alternative afforestation) associated with the project will be greater than 10km from the wind farm site and also outside any potential pathways of connectivity with the proposed project. This will ensure that there is no potential cumulative impact associated with this replanting. In addition, the developer commits to not commencing the project until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority.

1.6 Contributors to the EIAR

Fehily Timoney and Company (FT) is a consultancy based in Cork, specialising in civil and environmental engineering, and environmental science. FT is well established as a leading consultancy in wind farm development in Ireland. The company has established a professional team specialising in wind farm development. This team has the support of many in-house engineers, scientists and planners.

FT was retained by the Developer to undertake the detailed environmental assessment and prepare the EIAR for the proposed development, as well as preparing the application for consent to An Bord Pleanála.

Specialist and competent contributors involved in the preparation of the EIAR are outlined in Table 1.1.

Curricula Vitae (CVs) of contributors are presented in Appendix 1.1 of Volume 3 of this EIAR. Each CV demonstrates the experience and expertise of each respective contributor. Statements of authority are included in Chapter 8 for contributors to the Biodiversity Chapter.

Table 1-1: Contributors to the EIAR

EIAR Topic	Company	Name and Qualifications
Chapter 1 – Introduction	FT	Eamon Hutton, BSc, MSc, MIPI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 2 - Need for the Development and Alternatives Considered	FT	Eamon Hutton, BSc, MSc, MIPI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 3 – Description of the Development	FT	Trevor Byrne, BSc, MSc, MIEI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 4 – Policy	FT	Eamon Hutton, BSc, MSc, MIPI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 5 – EIA Scoping, Consultation and Key Issues	FT	Eamon Hutton, BSc, MSc, MIPI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 6 – Air Quality and Climate	FT	Donna O'Halloran, BSoc.Sc., MPlan (Co-Author) Eoghan O Sullivan BEng, MIEI (Co-Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 7 – Noise and Vibration	FT	Dr. John Mahon, PhD BA BAI, MIEI, MIOA (Co-Author and Reviewer) Maureen Marsden, MEng (Co-Author)
Chapter 8 – Biodiversity	Ecology Ireland & Triturus Environmental	Dr. Katherine Kelleher BSc, PhD Dr. Gavin Fennessy, BSc, PhD, MCIEEM, MESAI Dr Daphne Rocroft, BSc, PhD Eamonn Delaney BSc, MSc, CIEEM. John Deasy, BSc, MSc. Michelle O'Neill, Tom O'Donnell BSc, MSc. Athena Michaelides, Ross Macklin BSc. PHD, HDip Bill Brazier, PHD, BSc
Chapter 9 – Land, Soil, Hydrogeology & Geology	FT	Tom Clayton, MEng, CEng (Reviewer) Emily Archer BEng, MSc (Author)
Chapter 10 – Hydrology and Water Quality	FT	Trevor Byrne, BSc, MSc, MIEI (Co-Author and Reviewer) Kristian Divjak MSc, B.Eng (Co-Author)
Chapter 11 – Population, Human Health & Material Assets	FT	Eamon Hutton, BSc MSc, MIPI (Author) David Moore, BA, MA, MBA, MSc, MIPI (Reviewer)

EIAR Topic	Company	Name and Qualifications
Chapter 12 – Shadow Flicker	TNEI Services Ltd.	Mark Tideswell, BSc, Dip, AMIOA (Co-Author) Jim Singleton, BSc, Dip, AMIOA (Co-Author) David Moore, BA, MA, MBA, MSc, MIPI (Reviewer)
Chapter 13 – Traffic and Transportation	FT	Trevor Byrne, BSc, MSc, MIEI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 14 Archaeology, Architectural and Cultural Heritage	John Cronin & Associates	John Cronin, BA, MRUP, MUBC (Reviewer) Tony Cummins, BA, MA (Author)
Chapter 15 – Landscape and Visual	Macro Works	Richard Barker BA PG Dip MLA (Co-Author) Cian Doughan BSc (Co-Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 16 – Telecommunications and Aviation	FT	Eamon Hutton, BSc, MSc, MIPI (Author) Jim Hughes, BA, EIA/SEA Dip, MSc (Reviewer)
Chapter 17 – Interactions of the Foregoing	FT	Eamon Hutton, BSc MSc, MIPI (Author) David Moore, BA, MA, MBA, MSc, MIPI (Reviewer)

1.7 Permission Period

A ten-year consent is being requested for this development. That is, planning consent for the construction of the development would remain valid for ten years following the grant of permission. We note that the Wind Energy Development Guidelines (2006) state that "Planning Authorities may grant permission for a duration longer than 5 years if it is considered appropriate, for example, to ensure that the permission does not expire before a grid connection is granted. It is, however, the responsibility of the applicants in the first instance to request such longer durations in appropriate circumstances". This text also appears in section 7.22 of the Draft Revised Wind Energy Development Guidelines (2019).

A 10-year planning permission is considered appropriate for a development of this size to ensure all consents are in place.

The expected physical lifetime of the turbine is approximately 35 years. After this time, the developer will make a decision whether to replace or decommission the turbines. It should be noted that section 7.20 of the Wind Energy Development Guidelines (2006) includes for the following:

> *'The inclusion of a condition which limits the life span of a wind energy development should be avoided, except in exceptional circumstances'*

In this respect, the applicant requests the grant of permission is on the basis of a 35-year operational period from the date of full operational commissioning of the wind farm. With permission for the onsite substation sought in perpetuity given that the substation could form part of the national electricity network. Therefore, the substation will be retained as a permanent structure and will not be removed.

35 years is the anticipated minimum useful lifespan of wind turbines which are being produced for the market today. The lifespan of wind turbines has been increasing steadily in recent years and allowing this duration will improve the overall carbon balance of the development, therefore maximising the amount of fossil fuel usage that will be offset by the wind farm. Leaving the wind turbines in-situ until the end of their useful lifespan would be optimum from an environmental viewpoint, particularly in relation to carbon savings.

1.8 Difficulties Encountered

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

1.9 Viewing and Purchasing of the EIAR

This EIAR is available for download at www.ballinagreewindfarm.ie

Copies of this EIAR including the Non-Technical Summary and the Appendices may be inspected free of charge or purchased by any member of the public during normal office hours at the following locations:

- The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1.
- Cork County Council Planning Department, Ground Floor, County Hall, Carrigrohane Road, Cork.

1.10 References

The Department of the Environment, Heritage and Local Government (2006), Wind Energy Development Guidelines. Available at: https://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/Planning/FileDownLoad%2C1633%2Cen.pdf

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