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Bord na Móna

Oweninny Wind Farm Phase 3

Volume A: Non-Technical Summary

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1. INTRODUCTION

1.1 The Site Location

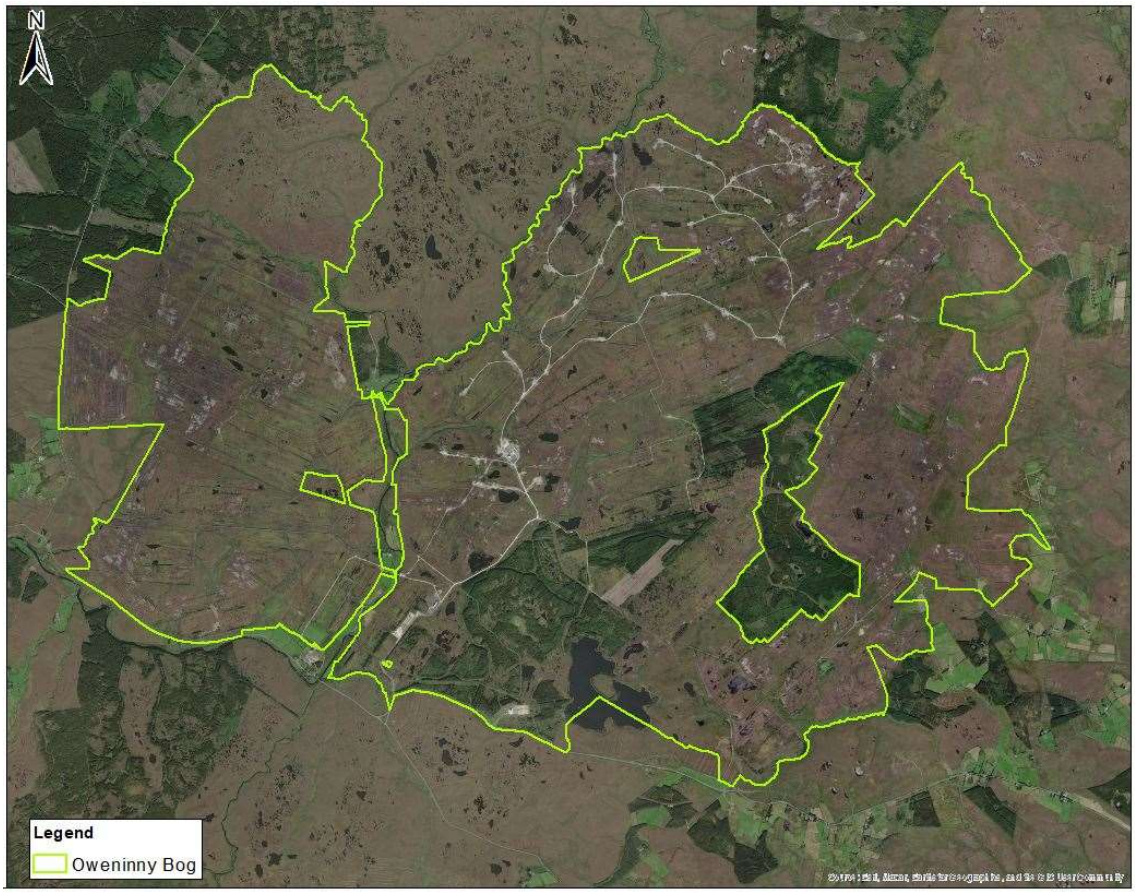
Bord na Móna Powergen Ltd. intends to apply for planning permission to construct a wind farm development at the substantially cutaway Oweninny Bog near Bellacorick in north County Mayo. The proposed development will be referred to as Oweninny Wind Farm Phase 3, and will have an electrical output of an estimated 90MW.

Oweninny Bog is situated approximately 12km west of Crossmolina, 8km east of Bangor Erris, and just north of the N59 National Road. The closest settlement to the site is Bellacorick village which is located at the southwestern extents of the bog.

The lands associated with the Oweninny Bog are owned by Bord na Móna Energy Ltd. Oweninny Bog encompasses a total of 5,090 hectares, all of which comprised primarily of rehabilitated cutaway bog, partly developed bog, yards, railway lines and areas of upland and undeveloped bog. The proposed development, planning application site area, extends to an area of approximately 2,282 hectares.

Figure 1.1 below shows the extent of the Oweninny Bog.

Figure 1.1: Oweninny Bog



1.2 The Applicant

The applicant for this development is Bord na Móna Powergen Ltd., a subsidiary of Bord na Móna Plc, a publicly owned commercial semi-state company.

Bord na Móna was originally established in 1946 to develop and manage some of Ireland's extensive peat resources on an industrial scale, in accordance with government policy at the time. Bord na Móna's lands extend to approximately 80,000 hectares in total and are located mainly in the Irish midlands.

Bord na Móna Powergen Ltd. currently manage and operate a portfolio of thermal and renewable assets that supply energy to the National Grid including Edenderry Power Plant, a peat/biomass co-fired generating unit, Cushaling peaking plant, the Drehid landfill gas facility, Bellacorick Wind Farm and Oweninny Wind Farm Phase 1 (a joint venture with ESB) in County Mayo, Mountlucas and Cloncreen Wind Farms in County Offaly and Bruckana Wind Farm, situated on the borders of counties Tipperary, Kilkenny and Laois.

Bord na Móna Powergen Ltd. is also in the final stages of the construction phase of Oweninny Wind Farm (Phase 2) and the initial stages of Derrinlough Wind Farm project, in counties Mayo and Offaly respectively. In addition, Timahoe North solar farm located in Co. Kildare has commenced construction.

1.3 Purpose and Structure of the Environmental Impact Assessment Report

An Environmental Impact Assessment (EIA) is required to ensure that projects that are likely to have significant effects on the surrounding area and the environment are properly assessed. Any significant impacts discovered in the assessment must be avoided or minimized where possible. The findings and outcome of the EIA are presented as a report, known as an Environmental Impact Assessment Report (EIAR).

TOBIN Consulting Engineers has prepared the EIAR in accordance with relevant and specific environmental legislation, guidance and advice notes. The report has been compiled in consultation with statutory bodies, interested parties and the local community. Further details on the consultation process are provided below.

This document is **Volume A** of the EIAR and is a Non-Technical Summary (NTS). This document gives an overview of the main EIAR using non-technical language. It is a standalone document which presents a clear and concise summary of the existing environment, characteristics of the proposed development, a clear outline of the potential significant impacts which could result from the proposed development and mitigation measures adopted into the design of the development to minimise impacts on the surrounding environment.

Volume B comprises the main EIAR Report. The information contained in an EIAR is specified in Schedule 6 of the Regulations and in the EIA Directive. The EIAR comprises the following chapters:

- Chapter 1: Introduction
- Chapter 2: Background to the Proposed Development
- Chapter 3: Description of the Proposed Development
- Chapter 4: Consideration of Reasonable Alternatives
- Chapter 5: Policy, Planning and Development Context
- Chapter 6: Population and Human Health
- Chapter 7: Biodiversity – Flora and Fauna
- Chapter 8: Biodiversity – Ornithology
- Chapter 9: Soils and Geology, Geotechnics and Ground Stability
- Chapter 10: Hydrogeology
- Chapter 11: Hydrology and Water Quality

- Chapter 12: Air Quality and Climate
- Chapter 13: Noise and Vibration
- Chapter 14: Shadow Flicker
- Chapter 15: Landscape and Visual Impact
- Chapter 16 Aviation, Telecommunications and Electromagnetic Interference
- Chapter 17: Traffic and Transportation
- Chapter 18: Archaeological, Architectural and Cultural Heritage
- Chapter 19: Interaction of Effects
- Chapter 20: Schedule of Mitigation and Monitoring Measures.

Volume C of the EIAR contains the various appendices that are referred to in the individual chapters of the main EIAR Report. These include graphics and tabular data that if they were included in the main EIAR Report, would make that report difficult to read. Photomontages are also contained in Volume C of the EIAR.

1.4 The Need for the Project

The development of wind energy as an after use for cutaway peatlands is specifically identified in the Bord na Móna, 'Strategic Framework for The Future Use of Peatlands, May 2011'.

When considering the need for this wind farm development, and wind energy as an energy source in general, it is important to place its development in an international, national, regional and local policy context from the perspectives of environment, energy and planning.

National policy drives the need for this type of development is set out. Of particular relevance is the Energy White Paper – Ireland's Transition to a Low Carbon Energy Future, as well as the targets outlined by the Climate Action Plan 2023. Ireland faces significant challenges to meet its EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050.

A key target of the Climate Action Plan 2023 is to increase the share of electricity demand generated from renewable sources to 75% where achievable and cost effective, without compromising security of electricity supply. A key element of this ambition is a target of 9GW of installed onshore wind energy by 2030.

The proposed development is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels.

2. BACKGROUND

Over 5,140 hectares of Bord na Móna owned bogland forms the Oweninny Bog, of which approximately 3,250 hectares were used for the production of milled peat to supply the ESB Bellacorick power station.

Industrial scale peat production operations began at Oweninny Bog in the 1950s and continued for over half a century to supply the ESB Bellacorick peat burning power station. Initial drainage works commenced on Oweninny Bog in 1951, however, it took nine years to develop the bog characteristics to enable its first milled peat harvest. This was followed by the commissioning of the power station in 1962 to which milled peat was supplied until the station was decommissioned.

Peat production on the Oweninny Bog Complex ceased in 2003 and the peat fired power station was subsequently decommissioned in 2005 with the power station's cooling tower demolished in 2007.

In 2011, Bord na Móna published a 'Strategic Framework for The Future Use of Peatlands'. The strategy establishes a framework for the on-going assessment of the company's approximately 80,000 hectares total land bank and provides for the formulation of appropriate strategies, policies and actions. The development of wind energy as an after use for cutaway peatlands is clearly indicated in this strategy.

In January 2021 Bord na Móna announced that it had ceased all peat extraction nationally and was wholly focused on climate energy solutions. Since 2018 Bord na Móna has been actively pursuing a *Brown to Green* strategy, transitioning away from peat extraction and focusing on delivering low carbon energy, security of energy supply and climate solutions.

In June 2016, An Bord Pleanála granted planning permission (An Bord Pleanála Ref PA0029) for the development of Oweninny Wind Farm consisting of 61 turbines with an overall tip height of up to 176m. The Oweninny Wind Farm has been developed to date in two phases.

- Oweninny Wind Farm Phase 1 is located immediately west / northwest of the proposed development site. This wind farm consists of 29 turbines (93 MW) and was commissioned in 2019.

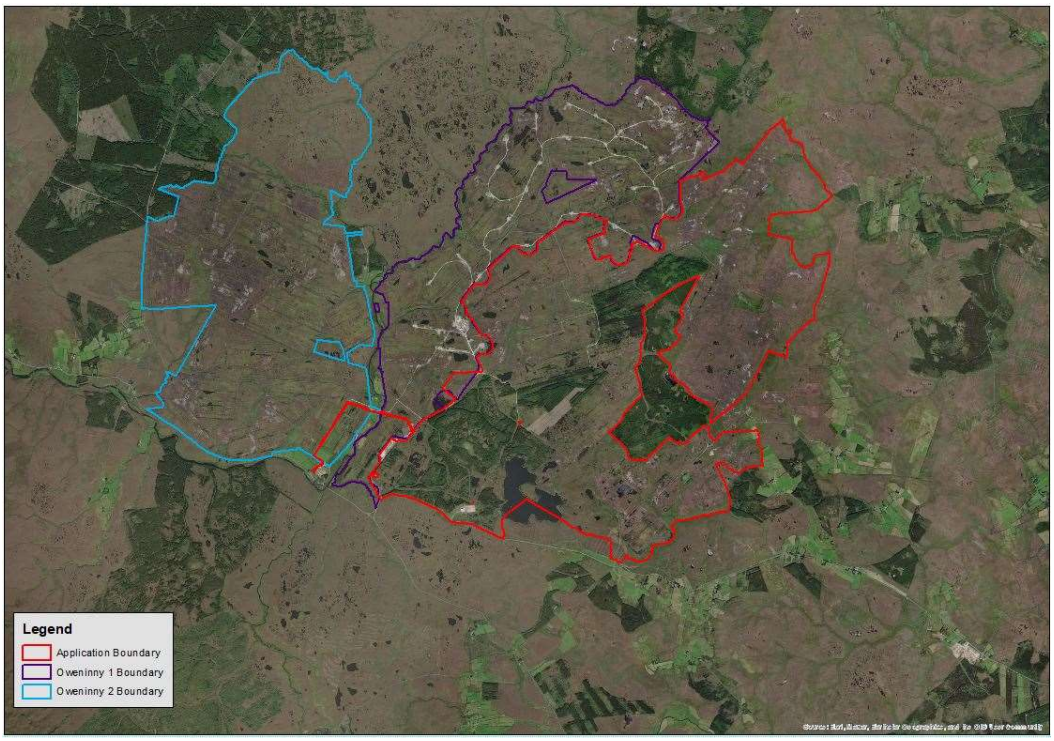
- Oweninny Wind Farm Phase 2 is located west of the proposed development site. This wind farm consists of 31 turbines (99 MW) and is due to be commissioned in 2023.

This application is for the wind farm referred to as Oweninny Wind Farm Phase 3. The proposed Oweninny Wind Farm Phase 3 study area is shown in Figure 2.1. The site boundaries of Phases 1 and 2 of Oweninny Wind Farm are also shown for reference.

In 1991 Bord na Móna joined with a group of developers to establish a wind farm in County Mayo. The country's first commercial wind farm, a 21-turbine development known as the Bellacorrick Wind Farm, has been operational on this site since 1992. This wind farm is currently owned and operated by Renewable Energy Ireland Limited and has operated successfully since 1992 with an installed capacity of 6.45 MW.

If it is still operating at the time that the proposed wind farm commences construction, the existing Bellacorick wind farm will be decommissioned and new turbines forming part of the (3rd) final phase of the Oweninny Wind Farm project will be installed near where the existing turbines are located.

Figure 2.1: Site Boundaries (Phase 3 in red)



2.1 Other Relevant Projects

Sheskin Wind Farm (Under Construction)
The Sheskin wind farm lies 6km north-west of the Oweninny Wind Farm Phase 3 site and consists of 8 turbines (33 MW). This wind farm was consented under planning reference 19457 and construction commenced on the development in early 2023.

Dooleeg Wind Turbine (Proposed)
Planning permission has been granted for a single wind turbine, with a 180m tip height, at Dooleeg, 600m south of the Oweninny Wind Farm Phase 3 site, under planning reference 20467.

Killala Wind Farm (Proposed)
The Killala wind farm lies 16km north-east of the Oweninny Wind Farm Phase 3 site and consists of 6 turbines (18 MW) with a 126m tip height. This wind farm was consented under planning reference 17619.

Sheskin South Wind Farm (Proposed)
The Sheskin South wind farm is proposed by SSE Renewables and FutureEnergy Ireland, within an area of Coillte forestry 8km northeast of Bangor Erris. The site is approximately 4.5km west of the proposed Oweninny Wind Farm Phase 3. The proposed layout for the development includes 21 turbines with a proposed tip height of 200m, hub height of 115m and rotor diameter of 170m. The overall capacity of the proposed wind farm is 136MW. A planning application was made to An Bord Pleanála for this development on 1st March 2023 (ref: ABP-315933-23).

Kilsallagh Wind Farm (Proposed)
A 13-turbine wind farm development, known as the Kilsallagh Wind Farm, is planned by EDF Renewables approximately 8km south-west of the proposed Oweninny Wind Farm Phase 3. The developers have stated that they plan to submit a planning application for the development in 2023.

Gas Transmission Pipeline (Existing)
A high-pressure gas transmission pipeline runs close to N59 along the southern boundary and has been taken account of in the assessment of the proposed development. It crosses into the site to the east of Lough Dalybaun and travels along the southern section of the site, before crossing the existing entrance to Oweninny Wind Farm Phase 2. The gas pipeline then proceeds in a north-westerly direction away from the site and through the lands upon which the Oweninny Phase 2 wind farm is under construction..

Hydrogen Electrolysis Plant (Proposed)

A planning application was made to Mayo County Council (ref: 22/502) for a hydrogen electrolysis plant along Shranakilla Road, close to the western boundary of the development site.

Gas Fired Peaking Power Plant (Proposed)

A planning application was made to Mayo County Council (ref: 23/60028) for a 114MW gas fired peaking power plant along Shranakilla Road (which will be capable of running on a mix of natural gas and hydrogen). The electricity generating station will comprise of 2 no. open cycle gas turbine (OCGT) generators.

2.2 Scoping and Consultation

A Scoping Document was circulated in February 2021 to all statutory and key stakeholders (63 stakeholders in total), who were invited to respond with any comments or observations that should be considered as part of the assessment process and in the preparation of the EIAR.

Responses were received from 16 stakeholders. Comments from each of these stakeholders have been taken into consideration in the design and assessment process.

The applicant entered into pre-application consultation with An Bord Pleanála to determine the Strategic Infrastructure Development (SID) status of the proposed wind farm development. Two meetings were held with ABP on the 28th of April and 11th of November 2021. Following consultation, An Bord Pleanála confirmed that the project met the criteria of Strategic Infrastructure Development, and that the application should be made under Section 37B of the Planning and Development Act 2000, as amended. This was detailed in a direction dated 5th April 2022.

Consultation was also held with Mayo County Council in respect of the proposed development on 30th June 2021.

The project team engaged with the public through a number of different initiatives, as set out below.

A dedicated project website and e-mail address were set up in June 2020 as follows.

- oweninnywindfarmphase3@bnm.ie
- www.oweninnywindfarmphasethree.ie

In June 2020, Bord na Móna Powergen Ltd. appointed a dedicated Community Liaison Officer (CLO) to be the main point of contact for the local community. Their role is to represent, communicate, consult and inform residents through regular updates via formal and informal meetings such as house calls, one to one meetings and clinics.

The frequency of these updates was somewhat impeded by the Covid-19 restrictions implemented across the country during 2020 and 2021. However, the CLO endeavoured to provide updates when available and in line with Government Guidance on Covid 19 and house

visits. The Community Liaison Officer has visited circa 80 homes in the locality of the proposed development on a number of occasions to ensure they are kept informed about the project.

Bord na Móna Powergen Ltd. also engaged with the local community on an ongoing basis throughout the pre-planning stage through Community Information Sessions, written communication with households and meetings with local representatives.

In addition to this, at the request of individuals, Bord na Móna Powergen Ltd. also facilitated eight meetings with individual residents to discuss the proposed project and ideas/issues/concerns they had in relation to the proposed development via the clinics by appointment held in August 2021

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Overview of the Proposed Development

The proposed development comprises the construction of 18 no. wind turbines and ancillary works. The turbines will have a blade tip height of 200m above the top of the foundation level and will be accessible from internal access routes within the Bord na Móna site.

The proposed development will comprise:

- 18 no. wind turbines (including tower sections, nacelle, hub, and rotor blades) and all associated foundations and hard-standing areas in respect of each turbine;
- Decommissioning and removal of 21 no. existing Bellacorick Wind Farm wind turbines (including tower sections, nacelle, hub, and rotor blades);
- New internal site access roads, approximately 29,000m in length (permanent and temporary), passing bays, car parking and associated drainage;
- An amenity route through the site to the existing Visitors Centre with access from a local road off the N59 near Dooleeg;
- 2 no. borrow pits;
- 5 no. peat deposition areas;
- 1 No. permanent Meteorological Mast 120m high, and the decommissioning and removal of an existing 100m Meteorological Mast on site;
- 4 no. temporary construction compounds, including material storage, site welfare facilities, and site offices;
- 1 no. 110kV electrical substation compound. The electrical substation will have 2 No. control buildings, a 36m high telecommunications tower, associated electrical plant and equipment and a wastewater holding tank.
- All associated underground electrical and communications cabling connecting the wind turbines to the proposed substation;
- All works associated with the connection of the proposed wind farm to the national electricity grid, including a 110kV underground electrical cable from the proposed on-site electrical sub-station to the existing sub-station at Bellacorick;
- All related site works and ancillary development including (but not limited to):
    - Earthworks;
    - Peat management works;
    - Site security;

  - Groundwater and surface water management;
  - Overburden (soils/peat) storage and management; and
  - Site reinstatement, landscaping and erosion control.
- A 10-year planning permission and 30-year operational life from the date of commissioning of the entire wind farm.

In addition, there will be a requirement for improvements and temporary modifications to public road infrastructure to facilitate the delivery of abnormal loads.

A 10-year planning permission and 30-year operational life from the date of commissioning of the entire wind farm is being sought. Given the recent advances in turbine technology, and the anticipated lifespan of wind turbines, this is considered to be the optimal operational life for the proposed project.

The duration of this operational life allows the proposed turbines to be used to generate clean renewable energy until they have reached the end of their life, rather than being removed prematurely.

3.2 Wind Turbine Locations

The location of individual turbines is influenced by a range of design constraints. The key constraints that were established prior to the development of the final turbine layout are as follows:

- Setback distance to dwellings of 800m (four times maximum tip height setback distance);
- 100m from ancient monuments;
- 50m from rivers and lakes;
- Telecoms link plus a buffer of a size requested by the relevant telecoms providers;
- 100m buffer from boundary of Lough Dahybawn SAC; and
- 2 rotor diameter setback from the boundary of the site.

The proposed wind turbine layout has been optimised using wind farm design software to optimise the energy yield from the site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance.

3.3 Wind Turbine Specification

The exact rating and design of the proposed turbine will be subject to a competitive procurement process that will only commence if the project receives consent. However, the individual turbine rating will be within the range of 4.5MW to 6.5MW.

The proposed turbine will be detailed by the turbine manufacturer on award of the contract. However, the proposed Oweninny Wind Farm Phase 3 turbines will be the typical three bladed, horizontal axis type with installed capacities of approximately 5MW per turbine resulting in an estimated 90MW in total for the wind farm.

The key specifications of a wind turbine are (see Figure 3.1 below):

- Tip height
- Rotor diameter
- Hub height
- Blade length

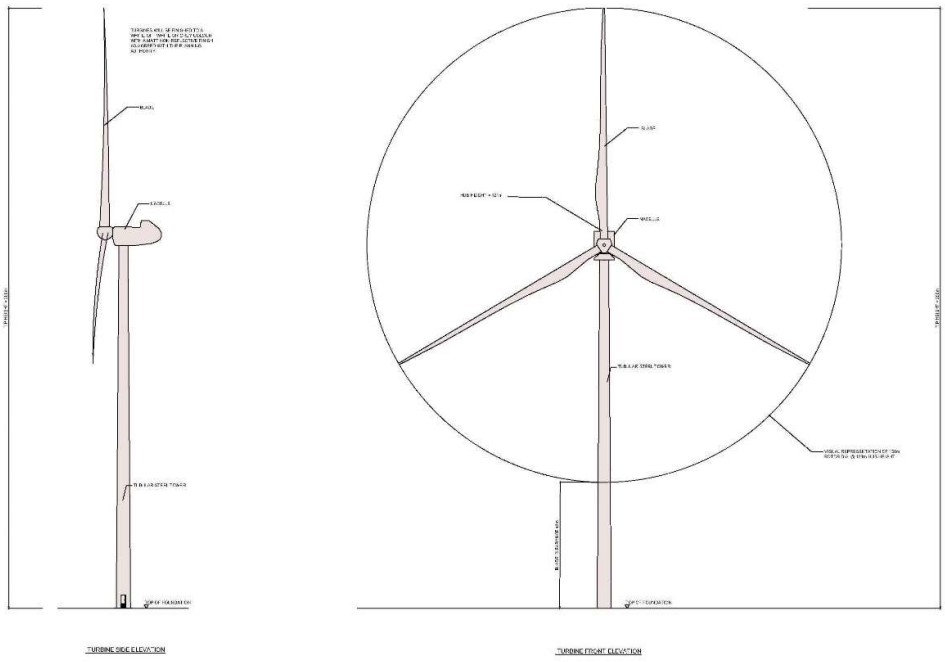


Figure 3.1: Key Specifications of the Proposed Wind Turbines

The turbines will have a tip height of 200m above the top of foundation level. The rotor diameter will be 158m. This rotor diameter corresponds to a blade length of 77.5m. The hub height will be 121m.

Modern turbines typically turn at 9 to 18 revolutions per minute (rpm) depending on wind speed and type of turbine.

Rotors of all 18 No. turbines will rotate in the same direction.

When operating, the rotational energy of the blades is utilised to drive the wind turbine generator. The generated power is in the form of low voltage and connected via low voltage cables to the wind turbine transformer. This transformer steps up the generated low voltage to medium voltage. The medium voltage from the wind turbine transformers connects to the proposed on-site substation which again will be stepped up to high voltage for connection to the transmission system.

The **turbine tower** is a conical steel tube with triple paint finish. Modern tower design also provides for the use of concrete sections. Towers comprise a steel ring at the base of the tower which is assembled on top of the concrete foundations using locally supplied concrete and then pre-stressed. The tower is delivered to site in three to six sections. The first section is bolted to the steel base, which is cast into the concrete foundation. The base of the tower is approximately 4m in diameter, tapering to approximately 2m where it is attached to the nacelle. The tower is accessed by a galvanised steel hatch door, which will be kept locked except during maintenance.

Wind **turbine blades** are airfoil-shaped blades that harness wind energy and drive the rotor of a wind turbine. The blades of modern turbines are generally made of fibreglass or carbon fibre reinforced polyester and are aerodynamically shaped to improve efficiency and lower noise production. The wind farm has been designed to accommodate turbines with a blade length of 77.5m.

Construction of the **turbine foundations** will require excavation of the surrounding soil or peat from the foundation and crane hardstanding area to founding level with access being provided from adjacent tracks at or near the surrounding ground level. The soil or peat will be replaced with granular fill where required. Each wind turbine will require piled foundations or a gravity foundation of reinforced concrete.

Hardstand areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are typically used to accommodate cranes used in the assembly and erection of the turbine, offloading and storage of turbine components, and generally provide a safe, level working area around each turbine position.

The turbines will be of an off-white or light grey colour to blend into the sky background. This minimises visual impact.

The proposed wind farm has the potential to produce up to 268,056 MWh (Megawatt hours) of electricity per year. This would be sufficient to supply the equivalent of 63,823 Irish households with electricity per year.

3.4 Other Elements

Internal **site roads** will be constructed as part of the initial phase of the construction of the wind farm. Material will either be imported into the site or won from the proposed borrow pits within the site to provide the required base of the internal roads.

The proposed development includes a 110 kV **electrical substation**, approximately 135 metres in length by approximately 75 metres in width. The substation will include two control buildings.

Clusters of turbines will be connected to the on-site proposed 110 kV substation via underground Medium Voltage (MV) **cables**. Fibre-optic cables will also connect each wind turbine to the wind turbine control system located within the substation. The electrical and fibre-optic cables running from the turbines to the substation compound will be run in cable ducts approximately 1.2 metres below the ground surface alongside the proposed wind farm internal site roads. In addition to these medium voltage cables, approximately 5km of 110 kV underground cable will be required from the 110 kV substation to the existing ESB Bellacorick 110 kV substation. These will be installed along the existing wind farm access roads.

A permanent **anemometry mast** is proposed as part of the proposed development, equipped with wind monitoring equipment at various heights. The mast will be a slender, free-standing lattice structure up to 120 metres in height.

The proposed development will include **peat deposition areas, borrow pits, and drainage works**.

An **amenity track**, approximately 4.8km in length, will be provided as part of the development facilitating a route from a local road off the N59 at Dooleeg to the existing visitor centre. The amenity track will be suitable for both walking and cycling.

In addition to the permanent elements discussed above, the proposed development will also include **temporary construction elements**, including temporary security cabins, a temporary wheelwash, and temporary construction compounds.

Decommissioning of the existing turbines in the Bellacorrick windfarm will be carried out during the construction phase. The proposed development will include the decommissioning of 100m high meteorological mast on the site.

3.5 Construction

Approximately 100-120 persons will be employed during the peak construction period, and it is estimated that the construction phase will take approximately 24 months from starting onsite to completion of commissioning of the turbines.

The construction phase can be broken down into three overlapping main phases:

- civil engineering works: approximately 18 months;
- electrical works: approximately 18 months (will commence shortly after the civil works and will then run in parallel); and
- turbine erection and commissioning: approximately 10 months.

3.6 Wind Farm Operation

The proposed wind farm development is expected to have a lifespan of 30 years. During this period, on a day-to-day basis the wind turbines will operate automatically, responding by means of anemometry equipment and control systems to changes in wind speed and direction.

Each turbine will be subject to a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane.

3.7 Wind Farm Decommissioning

As stated previously, the wind turbines proposed as part of the proposed development are expected to have a lifespan of 30 years. Following the end of their useful life, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the site may be decommissioned fully, with the exception of the electricity substation.

The on-site substation will not be removed at the end of the useful life of the wind farm project as it will form part of the national electricity network. Therefore, the substation will be retained as a permanent structure and will not be decommissioned.

4. CONSIDERATION OF REASONABLE ALTERNATIVES

4.1 Approach

Any Environmental Impact Assessment includes an assessment of reasonable alternatives to the proposed development and a comparison of environmental effects. This will include the 'Do-Nothing' scenario, which is an outline of what would happen to the proposed wind farm site should the proposed project not be implemented.

The other alternatives that are considered are those relating to:

- Alternative Locations;
- Alternative Layouts;
- Alternative Design;
- Alternative Processes;
- Alternative Mitigation Measures

4.2 Do Nothing Scenario

The assessment found that the Do Nothing alternative would represent a missed opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources coupled with a consequent reduction of greenhouse gas emissions, including those commitments set out in *Climate Action Plan 2023*, and also a missed opportunity to increase the security of Ireland's energy supply.

4.3 Alternative Land Use

As peat production has ceased, Bord na Móna is presented with the opportunity to allow or facilitate new landscapes to develop. Research work, mainly in the form of demonstration projects, has been ongoing since the 1970's. The alternative uses that have been examined over that timeframe include renewable energy (in particular, wind energy), biomass, coniferous forestry, horticulture, grassland, cereal growing, growth of cranberries and blueberries, biodiversity/ecosystem services and amenity/tourism related after uses.

Notwithstanding the range of uses considered and explored by Bord na Móna over its lands, the proposal to develop the Oweninny Wind Farm Phase 3 has been identified as the most

appropriate and sustainable use of the cutaway bog at the proposed site. The use of Oweninny Bog as an optimum location for a wind farm development has been demonstrated through the construction and operation of Oweninny Phase 1 and 2 Wind Farms.

4.4 Alternative Locations

Bord na Móna owns circa 80,000 hectares of land, primarily in the midlands of Ireland. An assessment of potential future uses of 80,000 hectares of land was published by Bord na Móna in 2011 in a document entitled *'Strategic Framework for the Future Use of Peatlands'*. The report clearly identified the potential for the development of renewable energy (in particular Wind Energy) and other developments on Bord na Móna lands.

In 2015 Bord na Móna published *Sustainability 2030*, which sets out the company's ambition for a sustainable future. The development of renewable energy as an after use for cutaway peatlands is a central part of the vision in Sustainability 2030. The assessment carried out for the determination of a suitable location for proposed renewable energy development was a two-stage process. The first stage comprised the identification of a number of candidate sites, including the Oweninny bog, while the second phase comprised a site-specific assessment.

When considering suitable locations for the proposed development, the assessment was confined to lands within the Bord na Móna landholding only as these lands have been identified in a regional context as being suitable for this type of development.

The proposed development site for the Oweninny Wind Farm Phase 3 was considered to be suitable for the development of a wind farm in terms of potential environmental sensitivities and in with no obvious commercial barrier to its development.

4.5 Alternative Layouts

During the EIAR stage, all site constraints were identified. The locations of county roads, streams, residential dwellings, landowner boundaries, telecommunication links, ecologically sensitive areas, areas of deep subsoil and peat depositions, archaeological sites and visually sensitive areas were noted. Separation distances to identified constraints were determined.

In 2013 a layout for a proposed wind farm for the Oweninny Bog was developed and in June 2016, An Bord Pleanála granted planning permission for the development of Oweninny Wind Farm consisting of 61 turbines with an overall tip height of up to 176m. The development site

for the 2013 layout included the lands that form the application site for this Oweninny Wind Farm Phase 3 development.

The 2013 layout was initially examined in terms of suitability for Oweninny Phase 3 Wind Farm but was not considered appropriate on the basis of environmental constraints and the capacity of existing grid infrastructure.

The site layout design stage considered the size, number and positioning of turbines and layout of associated site infrastructure i.e. internal roads, temporary construction compounds, met masts, substations, borrow pits etc. This was an iterative process comprising input from the design team, environmental specialists, internal and external stakeholders. As an iterative process, environmental effects were reduced or eliminated through changes to the design, where possible., and the layout reflected in the planning application was determined to be the optimum one in terms of balancing power output from the site and minimising environmental effects.

4.6 Alternative Site Entrances

In the first iteration of the proposed development, three site entrances were proposed to the site. The first entrance (existing) off the N59 national road is on the westernmost boundary of the site and currently provides access to Oweninny Wind Farm Phase 1. The second entrance (also existing) is approximately 1.2km further east along the N59 and provides access to the Oweninny Works site. A third existing entrance further east leads onto an unsurfaced track which joins the N59 at two points, 1.6km and 2.7km east of the second entrance. This entrance would require significant upgrade works to be suitable for construction and operational traffic.

The current design will use only the most western entrance during both construction and operation. The location of the previously proposed third entrance off the unsurfaced track will only be used as an access point to the proposed amenity track.

4.7 Summary of Alternatives

Table 4.1 below summarises the alternatives considered and compares these alternatives on the basis of key considerations.

Table 4.1: Summary of Alternatives Considered

Alternative	Summary
'Do-Nothing' Alternative	The Do-Nothing alternative would represent a missed opportunity in terms of Ireland meeting its commitments under the Climate Action Plan 2023, and also in terms of energy security
Alternative Locations	All suitable sites within the Bord na Móna landholding were assessed for their potential for renewable energy developments. The proposed development site was one of a number of sites to make the final shortlist. Of these sites, the proposed Oweninny Wind Farm Phase 3 site was selected as a site with low potential for environmental effects.
Alternative Layouts	A number of turbine layouts were assessed as part of an iterative process that took into consideration the size, number and positioning of turbines and the layout of associated site infrastructure. The final layout chosen represents the optimum layout in terms of the impact on receptors, constructability and delivery of the required output from the wind farm.
Alternative Design	<u>Turbine Configurations</u> The optimum design envisages 18 No. turbines in the 4.5 – 6.5MW range. Smaller turbines (for example 45 No. 2 MW machines could also achieve the same site output, but the use of smaller turbines would be a less efficient use of the wind resource available having regard to the nature of the site

Alternative	Summary
	<u>Site Entrances</u> Three possible site entrances were examined. The existing entrance off the N59 national road currently provides access to Oweninny Wind Farm Phase 1. A second entrance 1.2km further east along the N59 provides access to the Oweninny Works site. A third existing entrance further east leads onto an unsurfaced track which joins the N59 at two points. It was concluded that the existing entrance off the N59, which currently provides access to Oweninny Wind Farm Phase 1, is suitable for access to the proposed Oweninny Wind Farm Phase 3 and other entrances would require significant upgrade works to be make them suitable for construction and operational traffic. <u>Internal Access Roads</u> A number of internal road layouts were examined as part of the iterative process for selection of the optimum turbine configuration. The final layout was chosen to minimise construction of new roads by following the existing access tracks where possible and linking turbine locations via the most direct route. <u>Substation Locations</u> Two potential substation locations were examined, both located north of Lough Dahybaun and within 100m of each other. The location furthest west was considered less favourable following a review of data from the ground investigations undertaken and in terms of environmental impact, and for this reason it was discounted from further consideration.

Alternative	Summary
	<u>Borrow Pit Locations</u> Three potential borrow pit locations were identified. The material in Area 2 was considered to provide the most suitable material at the required volumes. <u>Visitor Centre Access</u> A number of options for accessing the Oweninny Visitor Centre, which was completed in 2019, were examined. The chosen route for the access path utilizes the existing internal tracks across the site and was considered to be the most favourable in terms of impact on the existing environment.
Alternative Processes	<u>Land Uses</u> A number of alternative uses for cutaway peatlands, including Oweninny bog, have been examined by Bord na Mona over the years. These include: • *Forestry*. Trials have proven to be poor performance in terms of growth potential • *Horticulture*. Early successes in some trials were difficult to replicate on other sites • *Grassland/cereals/berries*. None of these alternative uses were found not to be economical <u>Sources of Energy</u> A number of alternative sources of energy for the Oweninny bog have been examined by Bord na Mona, as follows: • *Solar*. Large scale solar farms require a significantly higher footprint than wind farms to produce the equivalent level of electricity and this technology can therefore have a greater impact on sensitive habitats. • *Co-firing of peat and biomass*. This utilises existing peat fired power stations and is dependent on the

Alternative	Summary
	continuation of peat extraction. As the Bellacorick power station no longer exists the option is not feasible for the development • *Landfill gas production*. This is only possible through colocation with an existing municipal landfill and is not an option for Oweninny. • *Biogas production*. This is a viable alternative use of the site but is dependent on the availability of feedstock within a commercially viable distance. Due to the relatively small footprint, this option would not rule out the development of the site for wind energy.
Alternative Mitigation Measures	The chosen mitigation measures are those that are considered to have the least environmental effects.

All reasonable alternatives were assessed as part of this consideration, including alternatives in respect of the project as a whole, and alternatives relating to specific aspects of the design of the development.

5. PLANNING

5.1 Context

The site for Oweninny Wind Farm Phase 3 is located in an area with a number of large wind farms, commercially harvested cutover peat bog and forestry, some dispersed rural housing and farming activity.

Oweninny Wind Farm Phase 1 is located immediately west/northwest of the proposed development site and was commissioned in 2019, while Oweninny Wind Farm Phase 2 has been consented further to the west and will be commissioned in 2023. In addition, since 1992, Ireland's first commercial wind farm, a 21-turbine development known as Bellacorick Wind Farm has been operating on the site.

5.2 Planning Policy

The wind farm site and the associated areas lie within the functional area of Mayo County Council and is thus informed by the provisions of the Mayo County Development Plan 2022-2028. The site is currently identified in the Renewable Energy Strategy for County Mayo 2011-2020 as a 'Tier 1 (large Wind Farms)' location, suitable for the erection of large-scale wind farms, as shown below.

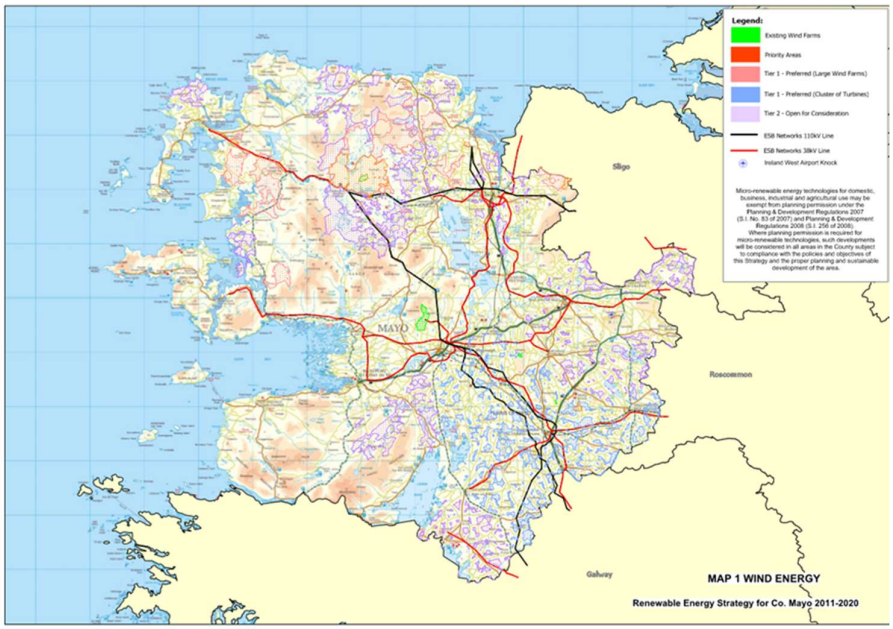


Figure 5.1: Wind Energy Designations – Mayo Renewable Energy Strategy 2011-2020

The proposed wind farm will contribute to the expansion of the renewable wind resource in Ireland and contribute towards Governmental, National and Regional goals and targets by generating more power from renewable resources.

The 2009 EU Renewable Energy Directive set Ireland a legally binding target to meet 16% of our energy requirements from renewable sources by 2020. In 2018, the Directive was recast to move the legal framework to 2030 targets, setting a new binding target of at least 32% with a clause for a possible upwards revision by 2023. Ireland is committed to meeting 40% of electricity demand from renewable sources, with 10% for transport and 12% for heat.

The Government's Climate Action Plan 2023 (CAP23) sets out Ireland's ongoing and urgent response to the climate crisis. The Plan implements carbon budgets and sectoral emission ceilings, first introduced in 2022 and builds on previous climate action plans, which set a roadmap to halve Ireland's emissions by 2030 and reach net zero no later than 2050. The Plan sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

The updated action plan has a greater focus on system change and recognises the milestones already achieved such as the start of Ireland's offshore wind energy programme. The Plan lists six vital high impact sectors, with Powering Renewables identified as being critical to decarbonising the power section as well as enabling the electrification of other technologies. The Plan seeks to accelerate the delivery of onshore wind by providing up to 9 GW of onshore wind.

The Plan retains one of the most important measures of the previous action plan (CAP21) which is to increase the share of electricity demand generated from renewable energy sources to up to 80% by 2030.

5.3 Wind Energy Development Guidelines

In 2006, the Department of the Environment, Heritage and Local Government (DoEHLG) published '*Wind Energy Development Guidelines for Planning Authorities*' under Section 28 of the Planning and Development Act, 2000. The Wind Energy Development Guidelines (WEDG) provide statutory guidance for wind energy development, including consideration of environmental issues, such as noise and shadow flicker, design, siting, spatial extent and scale,

cumulative effect and spacing, as well as the layout and height of wind turbines having regard to the landscape and other sensitivities.

Planning authorities must have regard to the Guidelines on planning for wind energy through the development plan process and in determining applications for planning permission. The guidelines are intended to ensure a consistency of approach throughout the country in the identification of suitable locations for wind energy projects and in the treatment of planning applications for wind energy developments.

Relevant points include:

- Visual impact is among the more important considerations and advice is given on spatial extent, spacing, cumulative effect, layout, and height. There is an emphasis on the distinctiveness of landscapes and their sensitivity to absorbing different types of development;
- Environmental considerations such as the impact on habitats and birds and the need for habitat management are discussed. It is noted that designation of an area of natural and cultural heritage does not in itself preclude development, unless it is judged to be such that it would impact on the integrity of such sites and their natural heritage interests;
- The need for information on the underlying geology of the area including a geotechnical assessment of bedrock and slope stability and the risk of bog burst or landslide. Geological consultants should be employed to ensure that sufficient information is submitted;
- Impacts on human beings such as noise and shadow flicker.

These guidelines have been considered in the preparation of this EIAR as at the time of writing they are the current guidelines.

The *Draft Revised Wind Energy Development Guidelines* were published in December 2019 and issued for public consultation, which concluded in February 2020. The revised guidelines primarily focus on addressing a number of key aspects including noise, visual amenity setback, shadow flicker, community consultation obligations, community dividend and grid connections.

The draft guidelines propose the following main changes to the 2006 Guidelines:

- New noise standards;
- Setback distances;
- Automatic shadow flicker control mechanisms;
- Community consultation;

- Community dividend;
- Grid connections;

These revised guidelines are still under review and until such time as the new guidelines are published, the 2006 guidelines remain the statutory policy guide in relation to all wind energy developments.

The proposed development will not result in any likely significant effects on the environment and is in accordance with the principles of proper planning and sustainable development and has been designed such that it is anticipated it is capable of adhering to the *Draft Revised Wind Energy Development Guidelines*.

5.4 Summary

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 legally binding commitment detailed in the Climate Action and Low Carbon Development (Amendment) Bill 2021 to support Ireland's transition to Net Zero and achieve a climate neutral economy by no later than 2050
3. A requirement to increase Ireland's national energy security as set out in the Energy White Paper;
4. A requirement to diversify Irelands 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);
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.

6. POPULATION AND HUMAN HEALTH

6.1 Population

The assessment of the impact of the proposed development on population considers the current land use of the proposed site, the current activities occurring within and in the vicinity of the site, local population information, employment profiles, tourism, visitor attractions and community gain opportunities.

A desktop study and a site visit were carried out in order to examine relevant information pertaining to this population impact assessment. The site visit was used to verify descriptions and information of the local area, and thus inform the impact assessment. Maps from Ordnance Survey Ireland (OSI) were used to identify current and historical land use in the area as well as relevant amenity facilities surrounding the proposed wind farm site and within the main settlement areas around the proposed project.

The local area historically consists of commercially harvested peat bog and forestry, some dispersed rural housing and farming activity. Oweninny Wind Farm Phase 1 is located immediately west / northwest of the proposed development site and was commissioned in 2019, while Oweninny Wind Farm Phase 2 has been consented further to the west and is currently under construction. In addition, since 1992, Ireland's first commercial wind farm, a 21-turbine development known as Bellacorick Wind Farm, which is owned and operated by Renewable Energy Ireland Limited, has been operating on the site.

The closest settlement to the site is Bellacorick village which is located approximately 2km from the southwestern extents of the proposed development. To the east of the site a local road (L5292) runs northwards from the N59 to the townlands of Shanvolahan and Formoyle. The area around Oweninny Bog is a relatively sparsely populated area. Within a buffer area of 2km from the proposed turbines, 9 sensitive receptors have been identified, while 78 sensitive receptors lie within 2km of the site boundary.

The closest sensitive receptor is located more than 1,000m from the nearest proposed turbine location which is in excess of the minimum setback requirement of 500m set out in the 2006 WEDGs. The Draft 2019 WEDGs recommend a minimum setback distance from a turbine to the curtilage of a residential property equal to 4 times the turbine tip height or 500m, whichever is largest. The proposed development includes for the installation of turbines with a height of up

to 200m, therefore the minimum setback distance required in accordance with the 2019 Draft WEDGs is 800m. The proposed development exceeds this requirement.

6.2 Human Health

This assessment of the potential impact of the proposed development on human health is based on a comprehensive review of the relevant published literature on the subject. Studies which are published in peer-reviewed journals are the most authoritative. Peer-reviewed means that only those with reasonable scientific substance which meets the scientific criteria of experts in the field are published.

Wind (and renewable) energy is a subject on which there is a lot of opinion available on the internet, with wide ranging and often contradictory information. The assessment of the impact of the proposed development on human health was based on peer reviewed research on areas such as noise induced hearing loss, sleep disturbance, infra-sound, electromagnetic interference, shadow flicker, and psychological effects.

There is currently no credible evidence to link wind turbines to adverse human health impacts. Emission limits, such as for noise or dust, are set to protect the most vulnerable in a community rather than the robust. Compliance with the limits set out in best practice guidelines will ensure that individuals and communities are protected.

Design stage considerations, such as turbine locations, and mitigation measures put in place to ensure that the emissions and effects from the proposed development are in compliance with the standards, will ensure that there will be no significant adverse effects on health, even amongst the most vulnerable.

7. BIODIVERSITY – FLORA AND FAUNA

7.1 Introduction

The Biodiversity Chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the proposed development may have on Biodiversity and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

The biodiversity assessment included: desk reviews; habitat and vegetation surveys; mapping of invasive species; surveys and assessments of the aquatic flora and fauna associated with the streams and lakes within the wind farm site; a two-year bat survey; and surveys of other protected fauna.

7.2 Designated Sites

The potential for effects on European designated sites is fully described in the Natura Impact Statement (NIS) that accompanies this application. The findings presented in the NIS conclude that the proposed development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects.

The potential for effects on other designated sites (Natural Heritage Areas [NHAs], proposed Natural Heritage Areas [pNHAs], National Parks and RAMSAR sites) was fully assessed within the biodiversity chapters and concluded that the proposed development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects.

7.3 Habitats and Vegetation

The habitats within the proposed development site were the subject of a detailed survey and assessment by TOBIN ecologists and a habitat map was produced within the entire landholding of the proposed development site boundary.

The proposed development site is dominated by cutover blanket bog which was harvested commercially between the 1950s and the early 2000s. In addition to the cutover bog there are

a large number of remnant bog areas which lie scattered throughout the site. Although these remnant areas are dominated by lowland blanket bog, they also contain areas of dry heath and wet heath and patches of transition mires and quaking bog. Various lakes and ponds, some of recent origin, occur scattered through the proposed development site. In the western and central areas of the site there are a number of areas dominated by commercial conifer plantation on peat. Some peatland and aquatic habitats recorded, corresponded with Annex I category of EU Habitats Directive, however these occurred outside the footprint of the proposed development.

The construction of the proposed development will result in the permanent and temporary loss of approximately 93.3 ha habitat. Following the implementation of proposed mitigation measures, there will be no significant residual effects on the habitats, that will be temporarily and permanently lost. There will be an initial short term, slight negative effect immediately at the commencement of construction activities, but as this habitat will be reinstated, enhanced following the biodiversity enhancement plan and/or will naturally regenerate, there is potential for the proposed development to result in an overall long term positive effect within the site.

7.4 Invasive Species

Rhododendron (*Rhododendron ponticum*) was recorded within the western or north-western portions of the proposed development site, some of which recorded within the footprint of the proposed development. The number of stands ranged at each location from one to several plants. The majority of the recorded stands were capable of producing flowers and seeds. An Invasive Species Management Plan will be prepared to prevent the construction work from causing the introduction and / or spread of invasive species, details on this can be seen in the Biodiversity Enhancement Plan.

7.5 Aquatic Biodiversity

A number of lakes and ponds, some of recent origin, occur scattered through the proposed development site. The lakes were classified as acid oligotrophic or artificial lake habitat while the smaller lakes/ponds were classified as dystrophic lake habitat. Lough Dahybaun is the largest lake within the site and is designated as an SAC and an excellent example of an acid,

oligotrophic lake and contains a population of the legally protected (Flora Protection Order) and Annex II listed plant species slender Naiad (*Najas flexilis*).

Several small streams drain the proposed development site to the surrounding rivers of Owenmore, Cloonaghmore and Deel. These streams do have some suitable habitat for salmonid fish, lampreys, or eels which were recorded during aquatic surveys.

The streams and lakes and could potentially be affected by water quality impacts, particularly during the construction phase. However, following the implementation of the construction mitigation measures, the residual water quality impacts will result in temporary, slight significant negative effects on these water features.

7.6 Bats

Eight bat species were recorded within the development site: Soprano Pipistrelle, Common Pipistrelle, Leisler's Bat, Daubenton's Bat, Nathusius' Pipistrelle, Natterer's Bat, Whiskered Bat and Brown Long-eared Bat.

Roosting was recorded in six buildings within the proposed development site, including a maternity roost of Natterer's bats, this was a significant find as this is not a common bat species in west Mayo. Although there will be no direct impact to this or any roost, it is proposed to provide alternative bat roosting (in the form of a purpose-built bat house) to reduce risk to the local Natterer's bat population.

In the absence of mitigation measures, the proposed development will impact on local bat populations, and this is primarily due to the moderate to high levels of bat activity of three common bat species (Soprano Pipistrelle, Common Pipistrelle, Leisler's Bat). All three of these bat species are considered to be High Risk species in relation to wind farms.

The mitigation measures proposed require strict implementation to reduce the long-term impact of the proposed wind farm on local bat populations. The implementation of mitigation measures will reduce Impacts on local bat populations to a slight negative effect.

7.7 Other Fauna

In general, given the highly modified and bare nature of the exposed peat, limited suitable habitat occurs on site for protected faunal species. Evidence of badger, fox, red deer, pine marten, Irish hare, common frog, common lizard and otter were recorded within the proposed development site. No evidence of significant populations of these species at more than a local level was recorded, although in the absence of mitigation measures there is potential for some slight negative effects on otter and badger populations. However, following the implementation of mitigation measures there is no potential for significant negative effects.

8. ORNITHOLOGY

8.1 Introduction

The Ornithology Chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the proposed development may have on bird populations and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

The ornithology assessment included: desktop reviews; vantage point surveys, surveys for general breeding birds, breeding waders, breeding gulls, breeding raptors, breeding woodcock, general wintering birds, wintering waterbirds and winter hen harrier roost. Surveys were carried out from April 2019 to September 2022.

The results of the surveys were evaluated to identify Important Avian Features. These were bird populations of conservation importance that could potentially be affected by the proposed project. The impact assessment included assessments of construction disturbance, habitat loss, operational disturbance, displacement, barrier effects, collision risk and cumulative impacts.

8.2 Species Recorded

A total of 36 raptor, waterbird, songbirds and grouse species were recorded within the proposed development study area during the bird surveys.

The proposed development site has resident populations of Kestrel (in both the breeding and wintering seasons) and Hen Harrier (wintering season only). Merlin occurs in the moorland habitat around the proposed development site: there was no evidence of breeding within or close to the wind farm site, but the area may be part of the home range of Merlin breeding near by. There were also occasional or single records of Buzzard, Sparrowhawk, Peregrine Golden Eagle and Egyptian Vulture.

The peatland habitats within and around the proposed development site supports a resident Red Grouse population, as well as scattered breeding Snipe and Common Sandpiper. Ringed Plover was recorded on at a number of locations breeding on the large areas of cutover bog.

Common Gulls breed on lakes within 2km from the proposed development site. Lesser Black-backed Gulls regularly commute across the wind farm site. During the spring and autumn, Whooper Swans migrates across the site while in winter flocks of Golden plover were regularly recorded roosting within the site.

8.3 Important Avian Features

Key Avian Receptor (KARs) were determined using the results from the field surveys and the NRA evaluation guidelines as described in the Chapter. The identification of KARs and the assessment of effects followed a precautionary approach. A total of 25 species were identified as KARs.

The potential effects to the KARs, resulting from the proposed development are then described in terms of the construction, operation and decommissioning phases of the development. An accurate prediction of the effects is derived following a thorough understanding of the nature of the proposed development along with a comprehensive knowledge of bird activity within the study area. Potential impacts from disturbance, habitat loss, displacement, barrier effects, collision risk and cumulative effects, were assessed on each to KAR species and varied from being slight, moderate, or imperceptible.

8.4 Mitigation and Monitoring

The mitigation and monitoring will include preconstruction surveys, avoidance and implementation of a biodiversity enhancement plan (focusing on enhancing peatland habitats, benefiting bogland and ground nesting species).

A Post-construction, a bird monitoring programme will be enacted will include carcass searches to monitor collision mortality, vantage point surveys to help interpret the results of the carcass searches, and various breeding surveys to assess displacement impacts to breeding and wintering KARs.

8.5 Overall Effects

The proposed avoidance and mitigation measures associated with the KAR will ensure that all avifauna species are protected. Considering the effect significance levels identified and the recommended mitigation measures, significant residual effects on KARs with regards to disturbance, habitat loss, displacement, barrier effects, collision risk and cumulative effects are not anticipated.

9. LAND, SOILS AND GEOLOGY

9.1 Introduction

This chapter assesses the likely significant effects that the proposed development may have on land, soils and geology and sets out the mitigation measures proposed to reduce potential effects that are identified.

General information concerning the Quaternary geology was obtained from GSI online maps and database, which contain subsoil information from the Teagasc/EPA soil and subsoil mapping project. Glacial till and gravel are exposed in some areas where the Peat has been cutover. Some areas of blanket bog are still in place including to the north east of Lough Dahybaun, along the site boundaries and near the afforrested areas of Furnought Hill.

9.2 Management of Soils

The principal risks associated with soil and geology at the site are the management of soils. It is expected that these risks can be fully mitigated through the implementation of the identified mitigation measures. The proposed development will typically involve removal of peat and subsoils (spoil) to enable construction of the proposed development. No significant geological resources are known at the site and geological heritage is limited to the banks of the Bellacorick River.

9.3 Peat Stability

Due to the relatively flat, drained and cutaway nature of the site, peat stability risk is limited to localised construction areas at the site. A Peat Stability Assessment was undertaken for the site and it demonstrates that the site is suitable for the proposed wind farm development and is considered to be at low risk of peat failure. A number of control measures are given in the peat stability assessment to manage all risks associated with peat instability.

9.4 Summary

No significant Impacts on the land and soils and geology environment are anticipated during construction, operation, or during decommissioning phases of the proposed development.

10. HYDROGEOLOGY

10.1 Introduction

This chapter assesses the likely significant effects that the proposed development may have on hydrogeology and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. There are no groundwater wells or public water supplies impacted from the proposed development.

The bog is relatively flat lying, with cutover blanket peat overlying glacial till that in turn overly sedimentary bedrock of mixed lithology. No significant groundwater resources are present at the site, although localised perched groundwater may be associated with areas of granular overburden.

The principal risks associated with hydrogeology at the site is the loss of construction and operational materials (concrete, fuel and oil, etc) to groundwater.

10.2 Mitigation Measures

The proposed development layout is orientated to avoid impacts on Bellacorick Iron Flush SAC, flushes, springs and sensitive hydro-ecological sites. Remnant peatlands were avoided and will not be impacted by the proposed development. No significant residual effects on any ecological receptor or WFD surface bodies have been identified.

With the implementation of mitigation measures, the proposed development will not give rise to any significant cumulative impacts with regards to hydrogeology.

11. HYDROLOGY AND WATER QUALITY

11.1 Introduction

This chapter assesses the likely significant effects that the proposed development may have on water environment and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. There are no surface water supplies affected from the proposed development.

11.2 Catchment Description

The proposed development for Oweninny Wind Farm Phase 3 lies on the border of two Water Framework Directive (WFD) catchments. The western side of the windfarm belongs to the Blacksod-Broadhaven Catchment and the eastern side lies within the Moy and Killala Bay Catchment. The hydrological assessment identified water sensitive waterbodies downstream from the proposed infrastructure works. Water quality in the surrounding streams is good with salmonids present in the surrounding streams.

Runoff will be maintained at greenfield (pre-development) runoff rates. The layout of the development has been designed to collect surface water runoff from hardstanding areas within the development and discharge to associated surface water attenuation lagoons adjacent to the proposed infrastructure. It will then be managed by gravity flow at Greenfield runoff rates.

11.3 Flood Risk Assessment

Based on the results of the Flood Risk Assessment, the risk of flooding associated with the development site is minimal. The substation is positioned outside of the predicted fluvial flood extents and will not impede flow paths or floodplain storage during extreme flood events.

11.4 Surface Water Management Plan

All mitigation and management measures have been incorporated into the Surface Water Management Plan (Appendix 11.2 of the EIAR), which forms part of the CEMP (Appendix 3.1 of the EIAR). Mitigation measures are incorporated into the CEMP and will be incorporated into the specification for the Civil Engineering Works contract. The implementation of the Surface

Water Management Plan will be overseen by a suitably qualified ecologist/engineer and will be regularly audited throughout the construction phase.

11.5 Summary

No significant residual effects on any ecological receptor or WFD surface bodies have been identified. No significant residual effects were reported for any receptors within any of the nearby wind farm/other assessment reviewed. Taking into consideration other plans or projects no residual cumulative effects are anticipated.

Due to the localised nature of the proposed works within the site boundary, there is no potential for significant, negative cumulative effects in-combination with other local developments on the water environment.

12. AIR QUALITY AND CLIMATE

12.1 Introduction

This chapter assesses the likely air quality and climate related impacts associated with the proposed Oweninny Wind Farm Phase 3. Oweninny Wind Farm Phase 1 is also located on Oweninny Bog and was commissioned in 2019, with Phase 2 currently under construction.

12.2 Summary

During the construction phase of the proposed development there is the potential for construction dust emissions to impact nearby sensitive receptors. The sensitivity of the area to dust soiling and human health impacts has been reviewed. There is an overall high sensitivity, due to the potential of ecological impacts. It is predicted that once the dust mitigation measures outlined in Section 12.5 and Appendix 12.2 are implemented construction phase potential effects will be short-term and imperceptible at nearby sensitive receptors.

During construction there is the potential to impact climate through embodied GHG emissions associated with construction materials and their transport to site as well as site activities. The embodied GHG emissions associated with the proposed development have been quantified and it is predicted that the proposed development will have an imperceptible, temporary, negative impact on climate during construction.

During operation there is predicted to be an overall positive impact to air quality due to the displacement of NOx emissions which otherwise would be generated through the use of fossil fuels for electricity generation. The operation of the proposed development is predicted to have a slight positive, long-term impact to air quality.

Once operational the proposed development will provide renewable electricity to the grid and thus reduce the reliance on fossil fuels as an energy source. It is predicted that the proposed development will provide up to approximately 268 GWh of renewable electricity once operational. This will be an overall slight, positive long-term impact on climate. In addition, the proposed development will contribute to Ireland meeting its up to 80% renewable electricity (RES-E) target as set out in the Climate Action Plan (Government of Ireland, 2022).

The overall potential effect on air quality and climate can be classed as long-term, beneficial and significant.

13. NOISE AND VIBRATION

13.1 Introduction

AWN Consulting Limited has conducted an assessment into the likely environmental noise and vibration impacts of the proposed Oweninny Phase 3 Wind Farm (the 'Proposed Development').

The relevant guidance in respect of environmental noise for wind energy developments is 'Wind Energy Development Guidelines for Planning Authorities 2006' (WEDG) with further detail on the methodology in 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' published by the Institute of Acoustics (IOAGPG).

13.2 Existing Baseline

The first part of the assessment is to establish the existing baseline and background noise environment in the area. This was done by way of simultaneous wind measurements on the site and noise monitoring at six locations over several weeks, to capture noise levels over a representative set of wind speeds and directions at each location. Typical background noise levels for day and night periods at various wind speeds have been derived from the measured data in accordance with best practice guidance contained in IOAGPG. Prevailing background noise levels are primarily attributable to local road traffic noise and other agricultural and anthropogenic sources in the area. The results of the background noise survey have been used to derived appropriate operational turbine noise criteria for the development in line with the guidance contained in the WEDG.

When considering a development of this nature, the potential noise and vibration effects on the surroundings must be considered for various stages: the short-term construction and demolition phase and the long-term operational phase.

The assessment of construction noise and vibration and has been conducted in accordance with best practice guidance contained in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration. Subject to good working practice as recommended in the EIAR Chapter, it is not expected that there will be any significant noise and vibration impacts associated with the construction phase and the likely noise from construction activity at the nearest Noise Sensitive Locations (NSLs) is

expected to be well below recommended significance threshold values. The associated construction noise and vibration impacts are not expected to cause any significant effects.

13.3 Summary

Based on detailed information on the site layout, the turbine noise emissions and assessment hub height for the proposed development, predicted turbine noise levels at 80 NSLs. The predicted turbine noise levels associated with the Proposed Development are well within the best practice noise criteria curves recommended the WEDG.

No significant vibration effects are associated with the operation of the site.

In summary, the noise and vibration impact of the proposed development is not significant considering national guidance for wind farm developments.

14. SHADOW FLICKER

14.1 Context

Wind turbines can cast long shadows when the sun is low in the sky. 'Shadow flicker' is an effect that occurs when the rotating blades of a wind turbine cast a moving shadow over a building. The effect is experienced indoors where a moving shadow passes over a window in a nearby property and results in a rapid change or flicker in the incoming sunlight.

The current 2006 Wind Energy Development Guidelines state that, *"Careful site selection, design and planning, and good use of relevant software, can help avoid the possibility of shadow flicker in the first instance. It is recommended that shadow flicker at neighbouring offices and dwellings within 500 m should not exceed 30 hours per year or 30 minutes per day".*

The Guidelines also state that, *"At distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low. Where shadow flicker could be a problem, developers should provide calculations to quantify the effect and where appropriate take measures to prevent or ameliorate the potential effect, such as by turning off a particular turbine at certain times".*

14.2 Shadow Flicker Model

The shadow flicker modelling approach presented in the assessment in the EIAR chapter is consistent with these guidelines.

The maximum rotor diameter of the turbines in this proposed project will be 158 m, therefore all sensitive receptors within 1.58 km of the proposed turbine locations (i.e. 10x rotor diameters) have been included in the shadow flicker model. A total of 78 no. shadow flicker receptors were identified and the property locations added to the model.

The modelling assessment undertaken is based on worst-case conditions, with the result that 39 no. shadow flicker receptors are predicted to experience daily shadow flicker in excess of the 2006 WEDGs threshold of 30 minutes per day. It is predicted that 38 no. receptors will experience shadow flicker in excess of 30 hrs per year in the worst-case scenario. The actual occurrence and incidence of shadow flicker over the course of a day and the year, when the above realistic conditions are taken into account, is likely to be significantly less than the predicted worst-case effects. When reduction factors for sunshine probability and wind

direction are taken into account in the model, there is 1 exceedance (at an unoccupied property for which a commercial agreement is in place) of the current guideline threshold limit of 30 hrs per year.

For the operational phase of the proposed project, the potential impact from shadow flicker in the worst-case scenario (i.e. without accounting for cloud cover, screening or wind direction, etc. and without any mitigation measures in place) at a defined number of receptors will be likely significant and periodic over the long-term and will have a brief effect with respect to the duration of the impact on a daily basis.

In the interests of developing best practice, the Applicant is committed to minimising any adverse effects from the proposed project on the local community and is committing to ensuring zero shadow flicker at all of the sensitive shadow flicker receptors identified within 1.64 km (ten rotor diameters) of the proposed wind turbine locations. This is subject to the technical capabilities of turbine technology where a controlled and safe slow-down of blade rotation is required in the event that shadow flicker on a receptor is predicted to occur.

14.3 Turbine Shutdown Scheme

Mitigation measures in the form of a Turbine Shutdown Scheme will be implemented during operation to ensure that shadow flicker does not occur at the affected properties. A process will be established by the wind farm operator whereby local residents can highlight any concerns or complaints about the operation of the scheme. All concerns raised will be investigated by the wind farm operator and the turbine shutdown software adjusted accordingly, as required.

If there is found to be sufficient existing screening (from vegetation, buildings, etc. which are not accounted for in the software) at a shadow flicker receptor, the Turbine Shutdown Scheme may not be necessary for that receptor. On operation of the proposed project, the Applicant will engage with any affected residents to investigate options for new or additional screening measures (such as planting), where appropriate and agreeable to the affected residents.

The implementation of mitigation measures to screen shadow flicker effects from sensitive receptors and/or implement wind turbine control measures in accordance with a defined Turbine Shutdown Scheme will ensure that any residual shadow flicker impacts from the proposed project will be eliminated at any shadow flicker receptors.

15. LANDSCAPE AND VISUAL

15.1 Introduction

This chapter describes the landscape context of the proposed Oweninny Wind Farm Phase 3 and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. **Visual Impact Assessment (VIA)** relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. **Cumulative landscape and visual impact assessment** is concerned with additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.

In accordance with the 2006 Wind Energy Development Guidelines and draft revised 2019 Wind Energy Development the Landscape and Visual study area for the Proposed Wind Farm is 20km radius.

15.2 Assessment Methodology

Production of this Landscape and Visual Impact Assessment involved baseline work in the form of desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects. This entailed the following:

Desktop Study

- Establishing an appropriate Study Area from which to study the landscape and visual impacts of the proposed wind farm;
- Review of a Zone of Theoretical Visibility (ZTV) map, which indicates areas from which the development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations;

- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity;
- Consideration of scoping responses received relating to landscape and visual.

Fieldwork

- Recording of a description of the landscape elements and characteristics within the Study Area.
- Selection of a refined set of VRP's for assessment. This includes the capture of reference images and grid reference coordinates for each VRP location for the visualisation specialist to prepare photomontages.

Appraisal

- Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the study area including landform, drainage, vegetation, land use and landscape designations.
- Consideration of the visual environment including receptor locations such as centres of population and houses; transport routes; public amenities and facilities and; designated and recognised views of scenic value.
- Consideration of design guidance and planning policies.
- Consideration of potentially significant effects and the mitigation measures that could be employed to reduce such effects.
- Estimation of the significance of residual landscape impacts.
- Estimation of the significance of residual visual impacts aided by photomontages prepared at all of the selected VRP locations.
- Estimation of cumulative landscape and visual effects in combination with other surrounding developments that are either existing or permitted.

15.3 Baseline Description

The proposed site is located within the central portion of the Bellacorick Basin, which is a vast, predominantly flat, peatland area. The study area encompasses the entirety of the natural extents of the Basin, which are defined by the upland spine known as the Nephin Beg range to the north, west and south. The range wraps around the site throughout the northern, western and southern quarters and divides the inland bog context from coastal context of the study area in these directions.

To the northwest, west and southwest, the landscape transitions down the western faces of the Nephin range towards gently sloping coastal bogs, with frequent small waterways and smooth, sloping topography. This area is defined by the relationship between the upland areas and the complex coastline (outside of the study area), with topography and waterways leading away from the site. The same is true to the south, however the upland areas through this section of the Nephin range are more dramatic and feature steeper topography with a high frequency of Loughs.

To the north and northeast, the Nephin range creates a relatively short and steep descent to the coastline at the northern extent of the study area, in the form of a brief coastal plateau that culminates ass sea cliffs for much of this coastline. To the east of the Bellacorick basin a rolling landscape of drumlin hills emerges, focusing around the coastline of Killala Bay and the path of the River Moy from Lough Conn, which is located at the south-eastern extent of the study area, outside of the main basin landscape, but a key feature of the wider inland area.

The predominant land cover within the central portions of the study area is peat bog, the vast majority of which was harvested commercially for power generation at the former Bellacorick peat fired power station. The Oweninny Bog also hosts the oldest and smallest (turbine height) wind farms in the Country (Bellacorick Wind Farm) as well as one of the newest and largest, being the Oweninny Wind Farm Phase 1 and Oweninny Phase 2 (under construction). Thus, wind energy development has become one of the defining features of the central study area in recent decades.

There are also large tracts of commercial conifer plantation within and around the bog particularly within the lower slopes of the Nephin range to the west. This represents the majority of tree cover in this otherwise open landscape. There are pockets of agricultural farmland on transitional elevated ground and also around lakes and rivers. This is a relatively sparsely populated area with occasional farmsteads and rural dwellings dotted throughout the periphery of the bog, but no area of continuous urban landcover.

Within the central study area, there is a very low density of population, however there are numerous smaller clusters of residences (1-10 dwellings). The larger population centres within the study area are located within the 10-20km distance. These are Ballycastle (14km to the north), Killala (17km to the northeast), the outskirts of Ballina (20km west), Crossmolina (11km southeast), Lahardane (15.5km southwest) and Bangor Erris (15.5km west), and the small coastal cluster of Belderrig, 15km to the northwest.

The most notable transport route in relation to the Oweninny Bog is the N59 national secondary road, which runs immediately to the south of the site on its journey between Crossmolina to the east and Bangor Erris to the west. The R312 branches from the N59 to the southeast near Bellacorrick and runs across the southern end of the Bellacorrick Basin.

A key tourist offering across the entirety of the study area, with varied distances and visibility to the site is the Western Way, which is one of the network of national long distance way-marked walking routes. The other linear feature through the study area is the Wild Atlantic Way, which passes through the north of the study area, showcasing the Atlantic coast of Ireland. In the southern half of the study area, the attractions remain focused on natural features, with the periphery of the Wild Nephin/Ballycroy National Pak located to the southwest of the site.

The Wind Energy Development Guidelines (2006) provide guidance on wind farm siting and design criteria for a number of different landscape types. These are currently replicated in the Draft Revised Guidelines 2019. The site of the proposed development is considered to be located within a landscape that is wholly consistent with the 'Flat Peatland' landscape type and the associated guidance is applicable.

The recently adopted Mayo County Development Plan features a Landscape Appraisal that has been carried through unaltered from previous development plan iterations. The landscape appraisal identifies that the site is located within Area F: North Mayo Inland Bog Basin. The site is located within Landscape Policy Area 3 – Uplands, moors, heath or bogs, with the description of *"distinctive and vast areas of the County form a single policy unit due to the similar visual characteristics of smooth topography, limited shelter vegetation, often steep slopes and prominent ridge lines, rendering this policy unit similar suitability to absorb development".*

There are a number of designated scenic views and routes within the study area, but only one scenic route within the context of the Bellacorrick basin to the south of the site. It should be noted that a section of scenic route that followed the R312 from the Keenagh Road up to its intersection with the N59 in previous County Development Plans has been removed in the latest County Development Plan iteration.

In terms of wind energy development, the site is generally zoned Tier 1 – Preferred (Large Wind Farms), or Tier 2 – Open for Consideration in the County Mayo Wind Energy Strategy.

15.4 Mitigation Measures

Given the highly visible nature of commercial wind energy developments, it is not generally feasible to screen them from view using on-site measures, as would be the primary form of mitigation for many other types of development. Instead, landscape and visual mitigation for wind farms must be incorporated into the early-stage site selection and design phases.

In this instance the main form of landscape and visual mitigation employed was:

- Siting the development in a vast cutaway peatland area where wind turbines are already a strongly characteristic landscape feature;
- The buffering of residential receptors.

15.5 Landscape Impact Assessment

There will be physical impacts on the land cover of the site as a result of the proposed development, but these will be relatively minor in the context of this much-modified, evolving landscape. While 18 turbines are being proposed for this development, they will be positioned across a site that is up to approx. 5km long and 5km wide. It is a 'Strategic Infrastructure Development' scale of development, but it is also a strategic scale site with a broad / consistent land form and land cover and an appropriate underlying strategic zoning for wind energy development. Thus, it can be considered to be fulfilling land use zoning objectives.

Mapping has been prepared as part of this assessment that outlines a Zone of Theoretical Visibility (ZTV) as shown below.

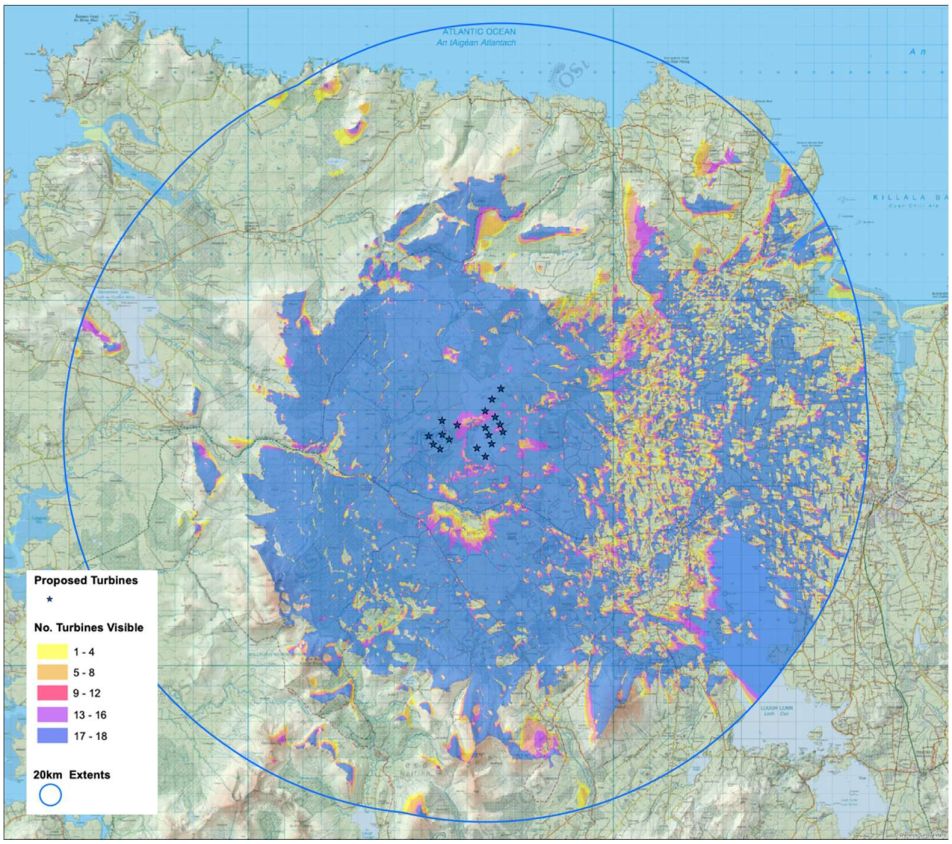


Fig. 15.1: Zone of Theoretical Visibility

The magnitude of landscape impact is reasonably high within the site itself because of the combined physical impacts and distinct increase in the level of built development resulting in marked change to the immediate landscape character. However, beyond the site boundary the impact on landscape character is deemed to reduce with separation distance as the wind farm becomes a proportionally smaller feature of a wider landscape context and is read as part of a larger group of turbines within the heart of the basin landscape. In essence the site and its immediate surrounds will be more strongly defined by wind energy development, whilst the landscape character beyond will principally remain that of a broad scale peatland basin that also incorporates substantial scale energy development.

The landscape units beyond the basin will be marginally more influenced by wind energy development, but only where there is some sense of physical and visual connection and even then, it will be as a familiar background feature – just a more intensive one.

15.6 Visual Impact Assessment

The visual impacts of the proposed Oweninny Phase 3 Wind Farm development were assessed across 24 different viewpoints where the sensitivity of each receptor varied widely from High to Low. The higher levels of sensitivity often related to elevated views from sensitive landscape features such as the summit of Nephin Beg or scenic designations. Low and Medium-low sensitivity tends to be attributed to less remarkable views that contain a varied mix of anthropogenic land uses, particularly the existing wind farms.

The highest significance of visual impact was Substantial-moderate and this was recorded at four locations (VP5, VP12, VP15 and VP16) within the central study area that represent local community receptors. Otherwise, there is only one Moderate significance of impact with all other views recording significance of Moderate-slight or less. These results reflect the fact that when close to the proposed development the turbines will be a prominent and the development expansive. However, at greater distances it will read as the further intensification of an established form of development in the northern Bellacorrick Basin. Notwithstanding some higher order localised impacts, there is not considered to be any significant visual impacts arising from the proposed development.

15.7 Cumulative Impacts

Based on the cumulative analysis and assessment above, it is considered that the proposed development will not give rise to significant cumulative impacts. Whilst this might seem counterintuitive given the number of large turbines represented by the three Oweninny developments and the Sheskin / Sheskin South developments, context is key. In this case, the cutaway peatland of the vast Bellacorrick Basin, which has a long legacy of power generation and distribution, is already characterised by large scale wind energy developments.

It is a landscape of vast scale that can absorb a strategic scale of wind energy development, and this is reflected in the Wind Energy Strategy where the northern basin is generally classed as a ‘Strategic’ location for ‘Large-scale’ wind energy development. There is almost nowhere else in the country that has this key combination of vastness, robustness and legacy in its receiving landscape to accommodate a strategic scale of wind energy development.

16. MATERIAL ASSETS – AVIATION AND TELECOMMUNICATIONS

16.1 Introduction

The proposed development will comprise an 18 turbine wind farm with a 200m tip height and all associated infrastructure, as described in Chapter 3 of this EIAR (Description of the Proposed Development).

16.2 Methodology

Aviation

The construction of large wind turbines near airports may have the potential to pose a physical hazard for frequently used flight paths, as well as pose an issue for nearby airport operations in relation to Obstacle Limitation Surfaces (OLS), Instrument Flight Procedures (IFPs) and Instrument Landing System (ILS) Calibration. The distance at which this may become an issue would depend on the size of the airport/airstrip (where smaller airstrips are less likely to be impacted at long distances compared to large airports), terrain elevations and the flight paths. For the purposes of this assessment study area, a 30km buffer of the site was used to identify the small airstrips/airfields. Larger airports within the wider region were considered.

Telecommunications

In order to assess if there would be any potential impacts on the existing telecommunications networks, and in line with Section 5.10 of the Wind Energy Guidelines (2006), a consultation exercise was carried out where a list of providers and stakeholders were consulted with over a number of weeks about the proposed development, and were asked to inform the project team of any communication links or infrastructure that they have in the area, or if they had any other comments/concerns relating to the proposed development.

Feedback was compiled into a datasheet. Further information was supplied where requested. Any transmission links or sites were noted and constrained out of the site layout design with appropriate buffers to minimise potential impacts from the proposed development. Further information on responses received from these telecommunications service providers can be found in Table 16-1 and in Appendix 1.2 of the EIAR.

Other Material Assets

In order to assess the potential for impacts to electricity and water infrastructure and waste services, a scoping exercise was carried out with a number of key consultees, including the Commission for Regulation of Utilities, ESB, Irish Water and Mayo County Council to obtain any information they might have relating to the site of the proposed project. Irish Water provided a response that was not project specific, outlining key impacts to their networks that should be considered in the EIAR. No other Material Assets responses were received. Maps of the gas distribution network, which are available online, were also consulted during the design of the proposed project.

16.3 Existing Environment

Aviation

The proposed wind farm is located in an area with class G airspace (uncontrolled) with a number of wind farms already operating in the area around the site of the proposed wind farm. The nearest significant airport to the proposed development is Ireland West Airport Knock, located approximately 48 kilometres southeast of the proposed wind farm site in County Mayo

Telecommunications

As described in Section 16.2 above, a comprehensive list of telecommunication operators was consulted in February 2021 to assess for any potential impacts to existing telecommunication links in the area. Table 16-1 provides information on all the responses received during this exercise, and any actions taken by the project design team resulting from these responses. Telecommunication scoping responses can be seen in Appendix 1.2 of this EIAR. Following receipt of telecom scoping responses, the turbine layout of the proposed development was reviewed and revised, as necessary, to minimise any potential impacts on telecommunications networks.

Other Material Assets

In order to assess the potential for impacts to electricity and water infrastructure and waste services, a scoping exercise was carried out to a number of key consultees, including ESB, Irish Water and Local Authorities.

While there are some 110kV electricity lines within the EIAR study area (Figure 1-1 of this EIAR), it is also possible that there might be some underground electricity cables discovered during the proposed works. There are existing underground cables in place adjacent to some parts of the proposed grid connection route. Damaging an underground electricity cable may have the potential to cause serious harm or death. All proposed works being carried out on overhead or underground electricity cables will be done in consultation with ESBN/EirGrid, as required. It is assumed as a worst-case scenario that there are likely to be underground water pipes occasionally occurring underground.

The former Bellacorrick Power Limited site, which used to have an IPC Licence is located in close proximity to west of the proposed wind farm site.

A gas pipeline passes near the proposed wind farm site and the grid connection cable will intersect the line of this. An existing similar 110kV underground cable crosses this gas pipeline in the same location. The same crossing methodology will be utilised for this location.

16.4 Potential Effects, Mitigation and Residual Effects of the Proposed Project

16.4.1 Construction Phase - Aviation

The proposed development will require certain lighting requirements for tall structures. The details for this lighting will be agreed with the Irish Aviation Authority and will be applied to the turbines and met mast. This will increase the visibility of the proposed development to any local aircraft. The final locations and dimensions of each turbine will be mapped and provided to the local authority and stakeholders (such as the Irish Aviation Authority) prior to erection to ensure that maps and databases are up to date for flight navigation. Notification will also be provided to them in advance of removal of old existing turbines.

16.4.2 Construction Phase - Telecommunications

The wind farm layout has been designed to avoid any impacts to the telecommunications links in the area, and there will be no potential for impacts during the construction phase.

A confirmatory survey of all existing underground telecommunication services will be carried out prior to construction to verify the assumptions in this report and identify the precise locations of any services. The developer will liaise with the service provider where such services are identified. Digging around existing services, if present, will be carried out by hand to minimise the potential for accidental damage. There are no telecommunication impacts anticipated for the construction phase of the proposed development, so there are no other mitigation measures required.

16.4.3 Construction Phase - Other Material Assets

There is a large gas pipeline intersecting with the proposed grid connection route, and this will be crossed by the proposed grid connection cable using a flatbed formation, similar to the existing adjacent 110kV underground cable crossing for an existing wind farm. The existing 110kV underground cable has also been considered here and will be avoided with appropriate buffers kept to this.

16.4.4 Operational Phase- Aviation

The consultation exercise did not raise any specific operational phase concerns for the proposed development in relation to aviation. The proposed development will require certain lighting requirements for tall structures as prescribed by the relevant aviation authorities. The details for this lighting will be agreed with the Irish Aviation Authority and will be applied to the appropriate turbines and met mast.

16.4.5 Operational Phase- Telecommunications

The proposed development is not anticipated to have any impact on any telecommunication links in the region due to the distance between the existing links and the proposed turbine locations. The developer will sign an agreement with 2RN prior to construction to commit to restoring service to any end users that may have their service disrupted as a result of the proposed development. If required the developer could utilise general mitigation measures such as upgraded receiver antennae, signal relay antennae and/or signal amplifiers where appropriate in conjunction with the service providers to address any unforeseen issues that might arise. This is standard industry practice and will eliminate any potential impacts in this regard.

16.5 Cumulative Impacts

A cumulative assessment was carried out for the proposed development, to include the consideration of projects discussed in Section 5.6 of this EIAR. This included other wind farms in the immediate vicinity such as Oweninny Wind Farm Phase 1 & 2, Sheskin windfarm, Sheskin South windfarm. Other developments such as Mayo Hydrogen project and Constant Energy OCGT as well as smaller scale development such as one-off dwellings and agricultural developments were also considered.

Telecommunication links, overhead services (telecommunication and electricity lines), underground services (telecommunications, water and electricity) and aviation constraints are typically based on fixed infrastructure or well-defined areas (i.e. these do not move) and any individual project either has a potential impact which it is required to mitigate, or it does not. It is the responsibility of each developer for all projects considered in Section 5.6 of this EIAR to ensure that their project does not impact these services. Therefore, there were no potential cumulative impacts identified.

16.6 Summary

Following consultation with aviation, telecommunication and other material assets (Water and electricity supply, waste services, etc.) stakeholders, a number of potential areas of impacts were identified. With the application of the mitigation outlined in this chapter, the proposed development will not cause any significant effects in relation to material assets at any stage of the proposed development (i.e. construction, operational and decommissioning phases).

17. TRAFFIC AND TRANSPORT

17.1 Introduction

Traffic and transportation impact has been assessed for the construction phase, operational, decommissioning phases of the proposed development. To inform this assessment baseline traffic levels have been measured on the national road the proposed development access.

17.2 Site Access

The proposed site access to the development will be via the existing Oweninny Wind Farm Phase 1 site access on the northside of the N59, as shown in Figure 17.1. The existing access is a priority T-junction with existing "STOP" road marking and signage.

Figure 17-1 Site Access on N59

17.3 Haul Routes

For wind farm projects there are two types of haul routes required for the transport of the materials to the site during the construction stage:

- Construction Haul Route for standards axle loaded vehicles, and
- Construction Haul Route for Abnormal Indivisible Loads (AILs); the turbine component delivery and transformer delivery are a specialist operation due to the size of the loads transported. The AIL vehicles will accommodate transport of the tower, nacelle, blades, and substation transformers. The use of either blade lifter technology and or segmented blades has been assessed.

The construction traffic with the largest daily impact (i.e. peak) is associated with the importation of the aggregate for the site compound, internal haul routes, turbine hardstanding areas and the steel and blinding for the turbine foundations. The second largest impact is associated with the concrete pours for the turbine foundations.

The other materials required onsite will include met mast, building materials, fencing, drainage, culverts, water treatment, substation materials, welfare facilities etc., are assumed to be sourced locally and arrive to site via the N59 from the direction of Crossmolina or Bangor Erris.

During the scoping with Mayo County Council (MCC), the haul route for these materials by heavy goods vehicles (HGVs) was identified as via the N59. At scoping with MCC a potential source for the concrete for the turbine foundation pours was discussed. The delivery of other non-concrete materials was also assumed to predominantly arrive to site from the direction of Crossmolina.

Background traffic survey data was used to determine typical background traffic levels on the N59, which provides access to the development site via an existing priority T-Junction

A number of haul routes for Abnormal Indivisible Loads have been identified, as follows:

- Route A – Galway Port to Oweninny Wind Farm Site Access
- Route A1 – Shannon-Foynes Port to Oweninny Wind Farm Site Access
- Route B – Killybegs Port to Oweninny Wind Farm Site Access
- Route C – Killybegs Port to Oweninny Wind Farm Site Access

17.4 Construction Mitigation Measures

To mitigate the impact of the construction traffic, the Wind Farm will utilise all available resources within the existing site to reduce the requirement for importation of materials to site. Excavation of stone material from the borrow pits within the Wind Farm site to provide construction material will reduce the HGV volumes.

A Traffic Management Plan (TMP) has been developed as part of the mitigation measures to address the potential impact of the proposed Oweninny Wind Farm Phase 3.

17.5 Summary

When considering a development of this nature, the potential traffic effects on the surrounding route, road network and site access are considered for two scenarios with regards to the construction traffic:

- the peak construction traffic and
- the average construction traffic.

The N59 route assessment based on ADT and percentage HGV content on the road network due to the proposed development indicated the following potential impacts:

- the peak construction traffic with a moderate negative effect over a temporary duration and
- the short-term effect of the average construction traffic is slightly negative.

The impact of transporting the AILs to the site, will be moderate and temporary in nature.

The assessment of the junction on the N59, indicates that the junction (i.e. site access) will operate with a slight impact during the temporary peak traffic volumes from September to November 2025. On average the traffic impact will be not significant and of a short-term duration.

18. CULTURAL HERITAGE

18.1 Introduction

The assessment of cultural heritage determines, from existing records, the nature of the archaeological, architectural and cultural heritage resource in and within the study area of the proposed development using appropriate methods of study. The study area is defined as an area measuring 2km from the proposed turbines.

The proposed development is located within a former Bord na Móna bog in County Mayo. There are two recorded monuments within the overall project redline boundary, a ringfort (AH2) and a court tomb (AH1). A further five archaeological sites are located within the 2km study area, all of which are recorded monuments. One structure listed within the NIAH is located within the study area (BH1) but there are no protected structures located within the study area.

18.2 Likely Significant Effects – Construction Phase

There are no recorded archaeological, architectural or cultural heritage sites located within the footprint of the proposed project, therefore, there are no predicted impacts to the recorded heritage resources during the construction phase.

Previously unknown archaeological sites and features may survive below the current ground level across the proposed project. Ground disturbances associated with the proposed development, such as the construction of access roads and excavations for turbines bases, have the potential to result in direct and negative impacts on any such remains. Prior to the application of mitigation these impacts have the potential to range from moderate to profound negative (and permanent), depending on the nature, extent and significance of any such archaeological features.

All stripping of topsoil/peat across the proposed development area will be monitored by a suitably qualified archaeologist. Should any features of archaeological potential be discovered during the course of the works the DoHLGH will be informed immediately and archaeological excavation (preservation by record) or in-situ will be required. Any further mitigation, such as preservation by record, will require a licence and approval from the DoHLGH.

18.3 Likely Significant Effects – Operational Phase

Potential indirect negative impacts may occur in relation to the setting of AH1 but these are considered to be not significant in nature due to the fact that the remains of the court tomb are currently not identifiable above ground and the site is surrounded by existing commercial forestry.

Potential indirect negative impacts may occur in relation to the setting of AH3 but these are considered to be slight in nature due to the fact that the remains of the tomb are located c. 1.1km to the east of the nearest proposed turbine.

There are no predicted operational impacts to the setting of BH1, or the remaining AH sites, due to the distance of separation from the proposed turbines and the relevant sites.

19. INTERACTIONS OF THE FOREGOING

The potential effects of the proposed project and the measures proposed to mitigate these effects have been outlined in the EIAR. However, in any development with the potential for environmental effect there is also the potential for interaction between effects of the different environmental aspects. As part of the requirements of an EIAR, the interaction of the effects on the surrounding environment needs to be addressed.

Interactions have been clearly identified in the early stages of the project and where the potential exists for interaction between environmental impacts, the EIAR specialists have taken the interactions into account when making their assessment.

Potential interactions (both positive and negative) have been considered for the construction, operation and decommissioning phases of each of the different environmental aspects. Table 19.1 summarises the potential interactions between different aspects, and these are discussed further in the following sections.

Table 19.1: Potential Interactions

	Population & Human Health	Biodiversity - Flora and Fauna	Biodiversity - Ornithology	Soils & Geology	Water	Hydrogeology	Air Quality & Climate	Noise & Vibration	Shadow Flicker	Landscape & Visual	Aviation and Telecoms	Traffic &Transport	Cultural Heritage
Population & Human Health				■	■	■	■	■	■	■	■	■	
Biodiversity - Flora and Fauna				■	■	■	■	■				■	
Biodiversity - Ornithology				■	■	■	■	■				■	
Soils & Geology	■	■	■		■	■						■	■
Water	■	■	■	■		■						■	
Hydrogeology	■	■	■	■	■								
Air Quality & Climate	■	■	■									■	
Noise & Vibration	■	■	■									■	
Shadow Flicker	■												
Landscape & Visual	■												
Aviation and Telecoms	■												
Traffic &Transport	■	■	■	■	■		■	■					■
Cultural Heritage				■								■	

The proposed project will have some positive impacts on an international, national, regional and local level, particularly in terms of helping to achieve renewable energy targets. It is important to note that the physical, environmental and landscape and visual impacts are almost entirely reversible upon decommissioning of the development.

Table 19.2 below summarises the above text and outlines the different environmental aspects which have potential to interact as a result of the proposed development, in a positive or negative way.

Table 19.2: Summary of Potential Interactions

Potential Effect on	Potential Effect By	Construction	Operation	Decommissioning
Population & Human Health	Landscape & Visual	–	–	+
Population & Human Health	Shadow Flicker		–	
Population & Human Health	Soils & Geology	–		
Population & Human Health	Water	–		
Population & Human Health	Hydrogeology	–		
Population & Human Health	Noise & Vibration	–	–	–
Population & Human Health	Traffic &Transport	–		–
Biodiversity - Flora and Fauna	Soils & Geology	–	–	–
Biodiversity - Flora and Fauna	Water	–	–	–
Biodiversity - Flora and Fauna	Hydrogeology	–	–	–
Biodiversity - Flora and Fauna	Traffic &Transport	–	–	–
Biodiversity - Flora and Fauna	Air Quality & Climate	–	+	–
Biodiversity - Flora and Fauna	Noise & Vibration	–	–	–
Biodiversity - Ornithology	Soils & Geology	–	–	–
Biodiversity - Ornithology	Water	–	–	–
Biodiversity - Ornithology	Hydrogeology	–	–	–
Biodiversity - Ornithology	Traffic &Transport	–	–	–
Biodiversity - Ornithology	Air Quality & Climate	–	+	–
Biodiversity - Ornithology	Noise & Vibration	–	–	–
Soils & Geology	Water	–		–
Soils & Geology	Hydrogeology	–		–
Soils & Geology	Traffic &Transport	–		–
Water	Soils & Geology	–		–
Water	Hydrogeology	–		–
Water	Traffic &Transport	–		–
Hydrogeology	Soils & Geology	–		–
Hydrogeology	Water	–		–
Hydrogeology	Traffic &Transport	–		–
Air Quality & Climate	Traffic &Transport	–		–
Noise & Vibration	Traffic &Transport	–		–
Cultural Heritage	Soils & Geology	–		
Cultural Heritage	Traffic &Transport	–		–