



Cush Wind Farm

# Environmental Impact Assessment Report

## Chapter 13: Material Assets

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## 13.1 Introduction

Material assets are defined as “resources that are valued and that are intrinsic to specific places” which can be of human or natural origin<sup>1</sup>. While the meaning is less clear than other environmental factors, material assets are typically taken to mean *built services and infrastructure*<sup>2</sup>. Roads and traffic are included because, in effect, traffic consumes road transport infrastructure. The majority of assets of natural origin are assessed elsewhere within this EIAR such as biodiversity, water quality, air quality and landscape etc. This chapter therefore specifically addresses, material assets which are primarily of human origin and of relevance to the project, including transport and access; aviation; telecommunications; renewable and non-renewable resources; and utility infrastructure<sup>3</sup>. Another Material Asset of human origin, archaeology and cultural heritage, is addressed in **Chapter 10**.

### 13.1.1 Description of the Project

In summary, the project comprises the following main components as described in **Chapter 3**:-

- 8 no. wind turbines with an overall tip height of 200m, and all associated ancillary infrastructure;
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and forestry felling.
- Temporary alterations to the turbine component haul route; and,
- Construction of an electricity substation, Battery Electricity Storage System and installation of 5.6km of underground grid connection to facilitate connection of the proposed electricity substation to the existing 110kV substation at Clondallow, County Offaly;

The project site is located in rural Co. Offaly, approximately 4km north of the town of Birr and c. 28km south-west of Tullamore, County Offaly. Off-site and secondary developments; including the forestry replant lands and candidate quarries which may supply construction materials; also form part of the project.

The turbine component haul route, and associated temporary alteration works as described at **Chapter 3**, are located within counties Galway, Roscommon, Westmeath, and Offaly. It is envisaged that the turbines will be transported from the Port of Galway, through the counties of Galway, Roscommon, Westmeath and Offaly, to the project site.

A full description of the project is presented in **Chapter 3**.

### 13.1.2 Statement of Authority

This chapter has been prepared by various members of the GES Planning & Environment Team. GES has significant experience in preparing Material Assets chapters for multiple permitted and proposed wind energy projects which have been subject to EIA (see **Chapter 1**).

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<sup>1</sup> Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015)

<sup>2</sup> Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022)

<sup>3</sup> Waste Management is also a topic which may also be addressed in Material Assets. However, in this EIAR, Waste Management pertaining to the construction, operation and decommissioning of the project is addressed in **Section 3.65** and **Section 3.7** of **Chapter 3**.

## 13.2 Traffic & Transport

### 13.2.1 Introduction

#### 13.2.1.1 Background & Objectives

Galetech Energy Services ('GES') has undertaken an assessment of the likely significant effects on transport and access arising from the construction, operation and decommissioning of the project.

This chapter provides an assessment of the local road network for construction, operation and decommissioning traffic, including the turbine component haul route, and reviews the site access arrangements for construction, operation and decommissioning phases. The relevant sections of this chapter should also be read in conjunction with the Route Access Survey enclosed at **Annex 3.5**.

### 13.2.2 Methodology

#### 13.2.2.1 Assessment Methodology

This assessment used the following method, further details of which are provided in the following sections:-

- Legislation and guidance review;
- Desk study, including review of available maps and published information;
- Wind farm project site walkover;
- Windshield survey of the turbine component haul route and grid connection route including a walkover survey of all noteworthy locations (e.g. temporary haul route alteration locations etc.);
- Walkover survey of access points to forestry replant lands;
- Evaluation of likely effects;
- Evaluation of the significance of these effects; and,
- Identification of measures to avoid and mitigate any likely effects.

#### Planning Policy & Guidelines

This assessment has been prepared and carried out in accordance with guidance contained in the following published documents:

- European Commission (2017) *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report*;
- Department of Housing, Local Government & Heritage (August 2018) – *Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment*;
- Environmental Protection Agency (September 2015) *Draft – Advice Notes on Current Practice (in the preparation on Environmental Impact Statements)*;
- Environmental Protection Agency (May 2022) – *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*;
- Offaly County Council – *Offaly County Development Plan 2021–2027* ('the Offaly CDP 2021-2027');
- Department of Housing, Local Government and Heritage – *The Design Manual for Urban Roads and Streets ('DMURS')*<sup>4</sup>;
- Transport Infrastructure Ireland – *The Design Manual for Roads and Bridges ('DMRB')*; and,

<sup>4</sup> <https://www.gov.ie/en/publication/c808c-design-manual-for-urban-roads-and-streets-2019-low-res/>

- Transport Infrastructure Ireland ('TII') – *Traffic and Transport Assessment Guidelines*<sup>5</sup>.

An assessment of the relevant transport policies and objectives of the Offaly CDP 2021-2027 are set out in **Table 13.1**, below. Policies and objectives which are not considered to be relevant have been excluded from further assessment.

Planning Policy / Objective	Assessed	Comment
<b>SMAP 22:</b> It is the policy of the Council to:- <ul style="list-style-type: none"> <li>• facilitate development of the road network in Offaly and the midland region in accordance with the National Development Plan and with Government policy. The Council will also support the relevant agencies and bodies involved in achieving such development including Transport Infrastructure Ireland and the National Transport Authority.</li> </ul>	Yes	While this policy is not directly relevant, the project will be undertaken to ensure that all associated works are undertaken in accordance with the requirements of all relevant agencies and bodies.
<b>SMAP 23:</b> It is the policy of the Council to:- <ul style="list-style-type: none"> <li>• strictly control development, outside of identified settlements, which could generate significant additional traffic, thereby potentially compromising the capacity and efficiency of the national roads/restricted regional roads and associated interchanges and possibly lead to the premature and unacceptable reduction in the level of service available to road users. This policy will also apply to national roads which may be downgraded during the lifetime of this Plan but which will still comprise high quality regionally important links.</li> </ul>	Yes	The project will be undertaken to ensure that there are no adverse effects on the safety or capacity of the national road network.
<b>SMAP 24:</b> It is the policy of the Council to:- <ul style="list-style-type: none"> <li>• maintain and protect the safety, strategic transport function, capacity and efficiency of national roads, motorways and associated junctions and in accordance with Strategic Planning and National Roads Guidelines 2012 or any subsequent edition.</li> </ul>	Yes	As per above, the project will be undertaken to ensure that there are no adverse effects on the safety or capacity of the national road network.
<b>SMAP 34:</b> It is the policy of the Council to:- <ul style="list-style-type: none"> <li>• recognise the importance of hedgerows and roadside boundaries for wildlife and biodiversity when designing or inputting into road schemes. Retention of such features should be incorporated into design and where this is not possible, replacement planting with native species of indigenous provenance shall be provided.</li> </ul>	Yes	While this policy is not directly relevant, the project has been designed in such a way as to minimise the level of hedgerow and roadside boundary removal. Where removal is necessary, compensatory/replacement measures have been incorporated into the project design.
<b>SMAO 15:</b> It is an objective of the Council to:- <ul style="list-style-type: none"> <li>• improve and maintain regional and county roads in line with the annual roads programme and allocated budgets.</li> </ul>		While this objective is not directly relevant, project works will be undertaken in accordance with the requirements of all relevant agencies and bodies.

**Table 13.1: Offaly CDP 2021-2027 Transport Policies & Objectives**

<sup>5</sup> <https://www.tiipublications.ie/library/PE-PDV-02045-01.pdf>

### Desk Study

A desk study of the project, including wind farm, grid connection route, turbine component haul route and the surrounding area was undertaken. The sources of information included documentary sources, outlined at **Section 13.2.2.2**, and an evaluation of aerial imagery and visualisations (e.g. Google Maps and Streetview) to assess the nature and condition of the local road network.

### Fieldwork

A site visit; including a windshield survey of the proposed turbine component haul route, likely construction material haul routes and grid connection route; was undertaken on 28 July 2022. All proposed site entrances and noteworthy locations along the turbine component haul route and grid connection route were the subject of a walkover survey. The site visit was used to verify information obtained as part of the desk study and to visually assess site entrance locations and associated vehicle visibility splays.

### Evaluation of Likely Effects

Following the assessment of the baseline environment, the available data was used to identify and categorise likely effects to affect the local road network used for the turbine delivery route and construction materials haul route.

The statutory criteria for the assessment of impacts require that likely impacts are described with respect to their magnitude, nature (i.e. negative, positive or neutral), transboundary nature (if applicable), intensity and complexity, probability, duration, frequency, reversibility, cumulation and possibility of reducing the effects. The descriptors used in this chapter are those set out in the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022).

Effects may be categorised as follows:-

- Direct: where the existing traffic and transport environment in proximity to the project is altered, in whole or in part;
- Indirect: where the traffic and transport environment beyond the project is altered by activities related to the construction, operation, and decommissioning of the project; and,
- No Impact: Where the project has neither negative nor a positive impact upon the traffic and transport environment.

### Sensitivity

The sensitivity of the local road infrastructure attributes have been identified using the criteria outlined within the TII Guidance. These criteria are outlined in **Table 13.2** below.

Importance	Criteria
Very High	Attribute has a high quality, significance or value on a regional or national scale.
High	Attribute has a high quality, significance or value on a local scale.
Medium	Attribute has a medium quality, significance or value on a local scale.
Low	Attribute has a low quality, significance or value on a local scale.

**Table 13.2: Criteria for Rating Local Road Infrastructure Attributes**

## Magnitude

The magnitude of likely effects has been defined in accordance with the criteria provided in the EPA *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)* as outlined within **Table 13.3** below.

Magnitude of Impact	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

**Table 13.3: Impact Assessment Criteria**

## Significance Criteria

The significance of the likely effects of the project have been classified by taking into account the sensitivity of receptors and the magnitude of the effects on them, combined with the likelihood of an event occurring as defined in **Table 13.4**.

Importance of Attribute	Magnitude of Impact				
		Negligible	Small	Moderate	Large
Extremely High		Imperceptible	Significant	Profound	Profound
Very High		Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High		Imperceptible	Moderate/ Slight	Significant/ Moderate	Severe/ Significant
Medium		Imperceptible	Slight	Moderate	Significant
Low		Imperceptible	Imperceptible	Slight	Slight/ Moderate

**Table 13.4: Rating of Significant Environmental Impacts**

### 13.2.3 Description of the Existing Environment

#### 13.2.3.1 Site Location & Road Network Context

The road network in the vicinity of the project comprises a mix of national road, regional road and local roads. The construction phase (temporary) access to the project site (wind farm) is proposed via 2 no. site entrances off the N62 national road, whilst the operation phase (permanent) access to the site is proposed via 2 no. local roads, the L300321 (eastern side of the project site) and the L30033 (western side of the project site). The proposed grid connection route is located, primarily, within the carriageway of locally-classed roads, with the exception of a small (c. 100m) section along the R439 regional road.



The N62 national road, which will provide access to the site for turbine component and construction material deliveries, is of a good condition and would appear to be subject to regular maintenance. The roads, proximate to the project site, including the N62, N52 and local road network, are generally flat with small pockets of undulation which is reflective of the surrounding topography and generally bounded by hedgerows and trees on either side. Notwithstanding the rural location of the roads, it is assessed that they are utilised by notable volumes of traffic given their location and classification as well as the connectivity to surrounding towns and villages.

As outlined above, and in detail within **Chapter 3**, temporary construction phase access will be provided via the upgrade of 2 no. existing agricultural/forestry access points from the N62. Both site entrances will be temporary and used for the construction phase of the project only.

Operation phase access will be provided using site entrances from 2 no. local roads, one located on the eastern section of the project site, along the L300321, and one located to the west, on the L30033. In both instances an existing agricultural access will be upgraded to provide adequate and safe access for operation phase site vehicles.

The L30033 is a narrow, lightly trafficked, single carriageway road which provides a local link between the N62 and R439. The L300321 is a cul-de-sac single carriageway road which provides local access to dwellings and farms from the nearby N52 (to the east). This road exhibits signs of deterioration; however localised remedial works (patching) has been completed. The existing access laneway from the edge of the L300321 to the proposed eastern side operation phase site entrance will be made good and maintained for the duration of the project

The site entrances from the L30033 and L300321 will be constructed in accordance with the requirements of the Local Authority regarding the provision of appropriate site visibility splays to ensure traffic safety<sup>6</sup>.

A comprehensive Road Safety Audit (**Annex 13.1**), based on the preliminary design measures, was undertaken and set out a number of further recommendations to ensure that road safety is maintained. The Developer, at **Annex 13.1**, has accepted each of the recommendations which have been incorporated into the design of the project as currently proposed.

The proposed electricity substation will be accessed from the N62 (western side) site entrance for the construction phase of the project and from the L30033 for the operation phase.

From the proposed substation, the underground electricity cables to connect the project (wind farm) to the national grid will be located within the proposed access track to the south where it runs west along the L30033 local road. The cables then enter private lands, to the north of Birr Golf Club, until it enters the R439 Regional Road (northward) for a short distance, before being placed within the L70151, L701521, and L70152 local road's to where it connects into the existing Dallow 110kV substation.

The local roads referred to above are generally in good condition; however, localised surface deterioration was identified at a number of locations. The local roads are generally single-carriageway routes fringed by grass verges, hedgerows and treelines.

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<sup>6</sup> Visibility splays will be provided in accordance with Section 13.9.11 (Transport and Infrastructure) – DMS 97 & DMS 98 of the Offaly County Development Plan 2021-2027.

Private residences and agricultural premises are also common along the roads which are not assessed as likely to carry notable volumes of traffic; with the majority of traffic being generated by local residents and landowners.

The R439 is a high quality double-carriageway regional road which connects Banagher, to the north, to Birr. Along the short section (c. 60m) of the R439 where it is proposed to install the grid connection infrastructure, the carriageway is bounded by a substantial grass verge, particularly on its western side. Given the connectivity provided by the R439 to/from Birr, it is assessed that the road is likely to carry substantial traffic volumes on a daily basis, including heavy goods vehicles (HGVs).

The forestry replant lands, located in County Monaghan, are accessed from the L7700 local road. Once again, this is a rural single carriageway road bounded by hedgerows and is assessed as only likely to experience low levels of traffic, generated by local residents and landowners.

### *13.2.3.2 Construction Material Haul Routes*

#### Turbine Component Haul Route

The likely turbine component haul route is described in the Route Access Survey at **Annex 3.5** and utilises the N6, M6, N52 and N62 before accessing the project site via the proposed construction phase site entrances. While the selection of a precise port of entry can only be determined following appointment of the chosen turbine manufacturer (to be completed post-consent subject to a competitive procurement process), it is considered likely that the Port of Galway will be utilised in this case<sup>7</sup>. Consequently, it is proposed that the Planning Authority will be advised of the selected port of entry as part of a final Transport/Traffic Management Plan, and that any specific traffic control measures arising from the selected route will be agreed with the Planning Authority prior to the commencement of development. Given that access from all potential port options to the construction phase project site entrances is readily achievable via the national road/motorway network, the ultimate selection of a port of entry has no bearing on the findings of the assessment undertaken in this chapter.

The delivery of turbine components along this route will require the completion of temporary alteration works at a number of locations. The extent of these works are described in full at **Chapter 3** and at **Annex 3.5**.

#### Construction Material Haul Routes

The undertaking of civil engineering works during the construction phase; including the construction of site entrances, access tracks, crane hardstands, and turbine foundations; will require the importation of aggregates and other general construction materials to the project site. However, the importation of construction materials will not require abnormal or oversized loads to be brought to site and no specific road alterations are required.

Site investigations have indicated that little to no rock will likely be encountered during the excavation of turbine foundations etc. and thus it is not anticipated that significant volumes of rock will be available for reuse in the construction of access tracks and crane hardstands. Consequently, it is assessed that the rock/stone to be imported to

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<sup>7</sup> Turbine components may also be imported through other ports including Dublin Port, Port of Waterford or Foynes/Shannon/Limerick Port. Each of these ports are regularly used in the transportation of turbine components and are readily accessible without the need for significant road upgrade works between their location to the national road network.

the project site will include rough stone as well as capping material (CL804). Other construction material, such as ready-mix concrete and sand, will be sourced from local licensed quarries, subject to a competitive tendering process.

As the selection of material suppliers will be subject to a competitive tendering process prior to construction, it is not possible to confirm the precise source of these materials. However, a number of candidate quarries have been identified as potential suppliers and are identified at **Annex 2.4**. In addition, the likely haul routes from these suppliers to the construction site entrances are also identified. While the haul routes do not always represent the most direct route, these routes have been selected to ensure, insofar as is practicable, that all movements occur on national and regional roads and to avoid local roads which may not be suitable to accommodate HGVs. The Planning Authority will be advised of the selected material suppliers as part of the Transport/Traffic Management Plan to be agreed prior to the commencement of development.

Other material deliveries will use standard HGVs and utilise the local, regional and national road network, as necessary. Staff employed on the site will use the site entrance closest to the temporary construction compounds but, as the majority of associated vehicular movements will comprise light goods vehicles (LGVs) or cars, they will not be restricted to the use of specific roads.

#### Electricity Substation & Grid Connection

Construction materials for the proposed connection to the national grid will, as above, be subject to a competitive tendering process prior to construction. It is likely that materials will be sourced from one (or more) of the quarries identified at **Annex 2.4**. Once again, suppliers will be encouraged to utilise the national and regional network and to avoid the local network insofar as practicable; however, the use of local routes will be unavoidable given the location of the grid connection infrastructure.

#### Forestry Replanting

The replanting of forestry will require the delivery of plant, machinery, conifer saplings and other materials to the identified replant lands. Access to the replant lands will be provided by existing agricultural entrances from the L7700. Prior access to the L7700 will; depending on the supplier of plant, machinery and various materials; be provided by the national, regional and local road network likely comprising the use of the N2, N53, R938, R181 and R182.

#### Road Access to the Project Site

Access arrangements to the various elements of the project will comprise the upgrading, and use, of existing agricultural/forestry access points to provide for both temporary (construction phase) site entrances and operation phase access to the project site. All access points have been carefully considered as part of the project design process which has been particularly cognisant of the provision of appropriate vehicle visibility splays (sightlines) to ensure compliance with the requirements of the Offaly CDP 2021-2027<sup>8</sup> and the Monaghan CDP 2019-2025<sup>9</sup>.

#### Delivery Vehicle Specification

The delivery of wind turbine components will be carried out by specialised HGVs. The

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<sup>8</sup> Section 13.9.11 (Transport and Infrastructure) – DMS 97 & DMS 98.

<sup>9</sup> Table 15.5 of the Monaghan CDP 2019-2025.

largest vehicles to be used will facilitate the delivery of the wind turbine blades. **Figures 13.1-13.3** illustrate the typical types of transportation vehicles which will be used in the delivery of components, including a transportation vehicle used to transport the blade components.

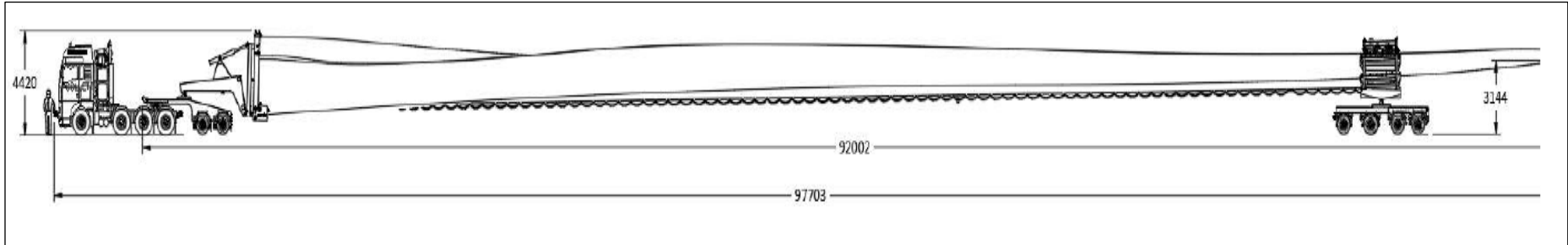


Figure 13.1: Typical Blade Section Transporter

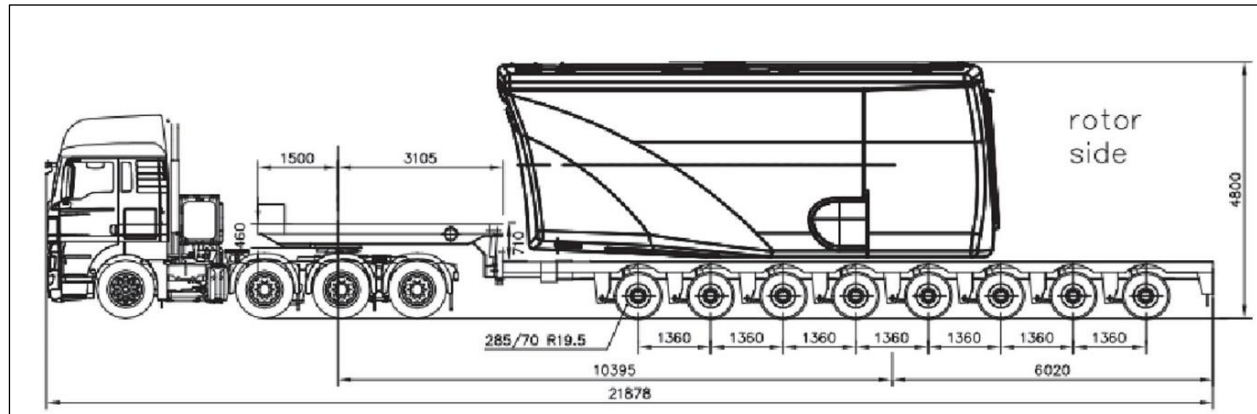


Figure 13.2: Typical Nacelle Transporter

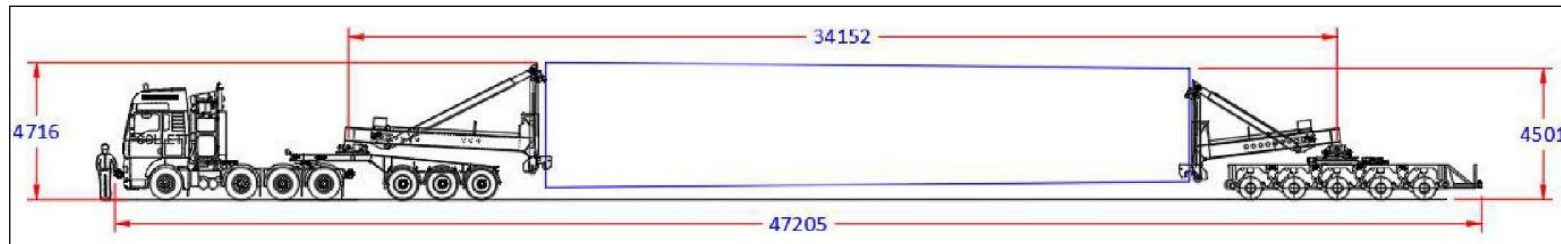
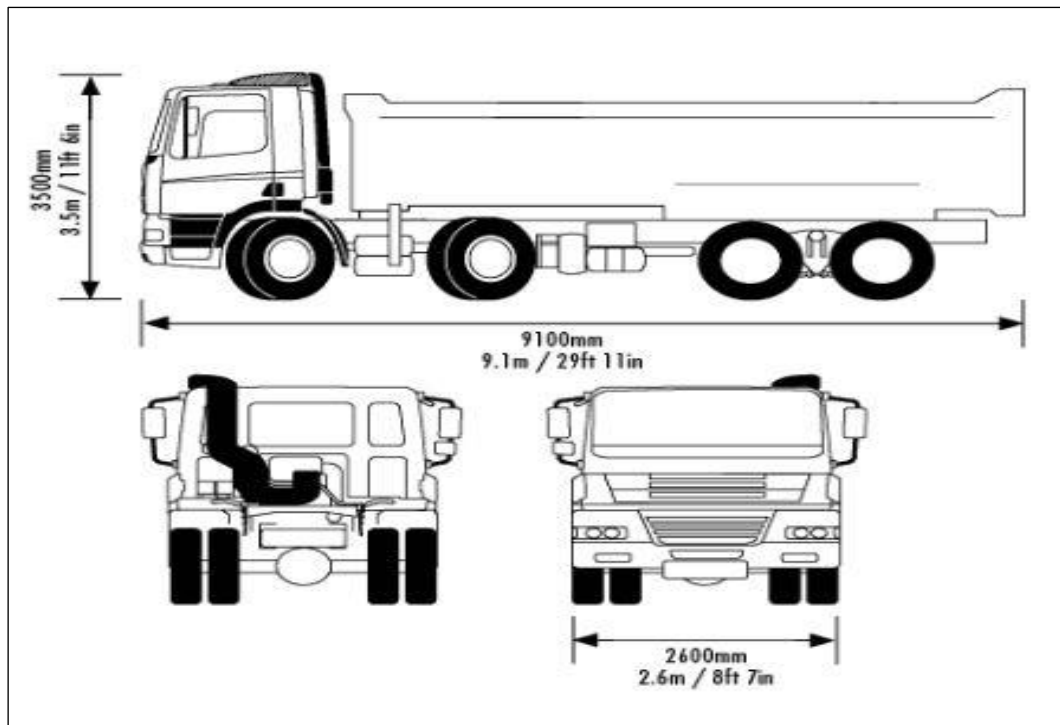
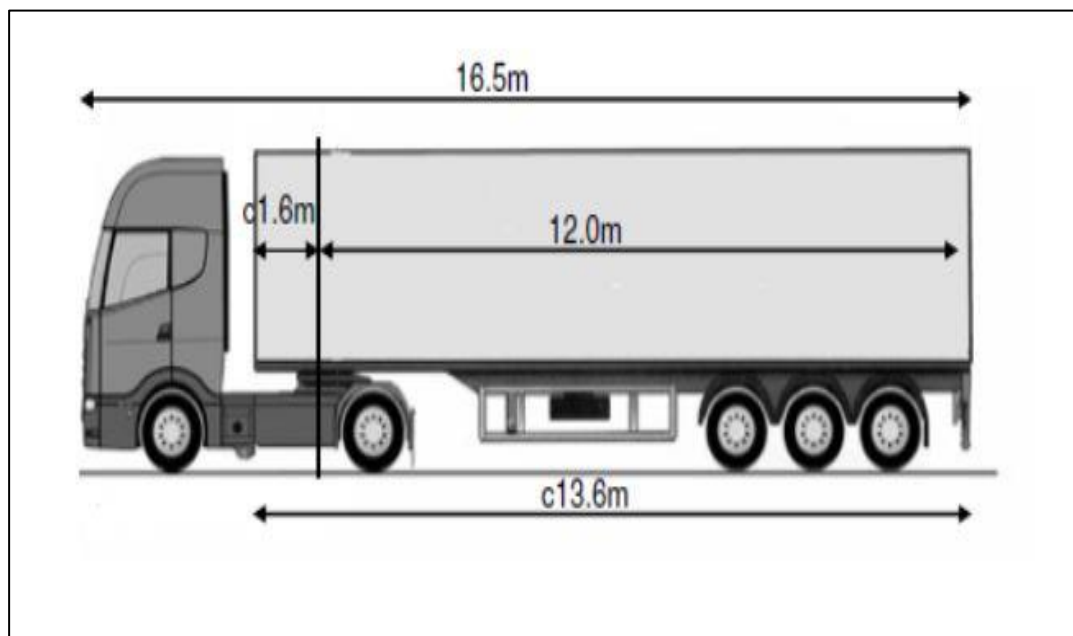


Figure 13.3: Typical Tower Section Transporter

Delivery of general construction materials and aggregates to site for the construction of the project will be undertaken using standard HGVs, cement mixer trucks and dump trucks (see **Figure 13.4**), the largest of which is anticipated to be a 16.5m articulated vehicle as shown in **Figure 13.5** below.



**Figure 13.4: Standard Rigid Tipper Truck**



**Figure 13.5: Standard HGV**

## 13.2.4 Description of Likely Effects

### 13.2.4.1 Construction Phase

The construction phase of the project is estimated to take approximately 15-18 months, with the majority of traffic movements being associated with the construction of access tracks, hardstands, turbine foundations and the grid connection. During this period, there will also be trips associated with the arrival and departure of construction staff and with the delivery of aggregates, reinforcing steel and ready-mix concrete. Staff trips will mainly be made using cars and vans, while deliveries of steel, concrete, stone and other general construction materials will be made by HGV.

The construction phase of the project will comprise a 6-day week with normal working hours from 07.00 to 19.00 Monday to Friday and 07.00 to 13.00 on Saturdays. It may be necessary to undertake works outside of these hours to avail of favourable weather conditions (e.g. during times of low wind speeds to facilitate turbine erection etc.) or during extended concrete pours (e.g. turbine foundation pours must be completed within 24 hours etc.). Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

#### Wind Farm Site Entrances

As discussed in **Chapter 3**, there will be 2 no. temporary construction phase site entrances and 2 no. permanent operation phase site entrances to the project (wind farm) site. Appropriate visibility splays will be provided at each site entrances as described at **Section 3.4.5 (Chapter 3)**.

All works related to the construction (upgrade) of these entrances will be undertaken within private lands which will ensure that there are no significant direct or indirect transport and access effects on the road network through disruption or delay to traffic flows. However, the implementation of road safety management measures (e.g. Stop/Go systems) may result in some brief disruption or delays. However, priority will be given to public road users at all times, thus avoiding any significant effects on traffic flows.

Consequently, the effects are assessed as not likely to be significant and likely to be slight, negative and short-term.

#### Electricity Substation & Grid Connection

The proposed 110kV electricity substation will be accessed via the western temporary construction phase access to the project from the N62. Appropriate visibility splays will be provided at each site entrance as described at **Section 3.4.5 (Chapter 3)**. As outlined above, all works related to the construction of the project site entrances will be undertaken within private lands which will ensure that there are no significant direct or indirect transport and access effects on the road network through disruption or delay to traffic flows.

The grid connection cable infrastructure, from the proposed 110kV electricity substation to the existing Dallow 110kV substation, will, having left the proposed substation site, be located within the proposed access track to the south where it runs west along the L30033 local road before entering private lands, to the north of Birr Golf Club, until it enters the R439 Regional Road (northward) for a short distance, before being placed along the L70151, L701521, and L70152 local road's to where it connects into the existing Dallow 110kV substation. Consequently, the construction of the grid connection will result in direct effects on the road network. However, as part of the

design of the project; the trench will be fully reinstated in accordance with ESB Networks specification and to the satisfaction of the Local Authority. Further, all local and regional roads within which it is proposed to install the grid connection infrastructure will be subject to full carriageway reinstatement, thus ensuring that there are no long-term effects on the public road network.

The excavation of trenches and installation of the ducting along this route will result in some disruption to traffic movements, although this will be temporary in duration. Due to the narrow carriageways of the L30033, L70151, L701521, and L70152; it is highly likely that full road rolling closures will be implemented during construction phase which will necessitate the implementation of diversions and other traffic management measures to maintain traffic flows. However, it should be noted that only short sections of road will be closed at any one time and, given the extensive road network in the environs of the proposed grid connection route, diversionary routes are readily available. Additionally, local access for residents, landowners, and business operators will be maintained while pedestrians will, where necessary, be escorted through the works area.

Therefore, the effect on transport and access are assessed as not likely to be significant and to be direct, indirect, moderate-negative and temporary in nature.

#### Haul Route for Abnormal Loads

While the proposed turbine delivery haul route is assessed to be generally capable of accommodating abnormal loads. Temporary works will be required at a total of 17 no. locations, this will include temporary alteration works, including the removal of road signs and/or street furniture, to facilitate turbine component deliveries, as discussed at **Chapter 3** and **Annex 3.5**. It is also proposed to provide a temporary hardstand area to accommodate a reverse manoeuvre, considered necessary for abnormal load vehicles making a right-hand turn at the junction of the N52/N62 at Kennedy's Cross. Traffic management measures will be implemented for the duration of the works at this location and will be agreed prior to commencement with the Planning Authority.

Alterations along the remainder of the turbine component route are relatively minor in nature and will include, for example, temporary hardcore at roundabout islands and roadside verges, and temporary removal of street furniture and signage. The effects of the proposed temporary alterations are assessed as not likely to be significant and indirect, slight-negative and short-term.

Therefore, the overall effect on transport and access is assessed as likely to be direct, indirect, temporary and moderate-to-slight.

It is noted that while the delivery of 'abnormal size' loads are a common feature of wind energy developments (i.e. turbine components), 'abnormal weight loads' are relatively uncommon. Generally, and as will be the case in this instance, the appointed transportation contractor will select appropriate delivery vehicles, with a sufficient number of axles, to ensure that loadings do not exceed the standard axle weight requirements set out under Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003)(as amended). This will ensure that no load will constitute an 'abnormal weight load' and will ensure that the structural integrity and surface condition of the public road network; national, regional and local; is protected. Notwithstanding this, all relevant stakeholders, including local authorities, will be consulted prior to the delivery of turbine components and all necessary licences and permits will be obtained.



Because the project does not involve 'abnormal weight loads' it is considered that a capacity assessment along the haul route is not warranted in this instance. However, as part of the consultation with all relevant stakeholders (see above), in the event that a concern is raised in relation to a particular structure, the Developer will ensure that an assessment of that structure is undertaken to confirm its capacity to accommodate vehicles associated with the construction of the project<sup>10</sup>.

#### HGV Deliveries – Wind Farm

The estimated timescale for the completion of the construction phase is approximately 15-18 months, inclusive of all works related to the construction of the wind farm, electricity substation and grid connection, temporary haul route alteration works and erection and commissioning of turbines. This allows approximately 12 months for civil construction and approximately 3-6 months for erection and commissioning of the turbines.

As detailed at **Table 13.6**, it is estimated that during civil construction works, approximately 18,330 no. loads will be delivered to the project site. Assuming a 12-month civil works construction phase, this equates to approximately 1,528 no. vehicular movements per month or an average of 60 no. movements per day, excluding Sundays and public holidays. It should also be noted that vehicular movements will occur throughout the day and will not be concentrated at particular times.

The peak number of movements per day will occur during the concrete pours for turbine foundation construction. An estimated 145 no. ready-mix trucks and other truck deliveries will be required per turbine foundation. Other materials will also be delivered on such days, and therefore a realistic estimation of peak movements during the 8-days of foundation pours (1-day per foundation) is approximately 150-160 no. deliveries per day. These concrete pours may take place from 06:00 and typically take 12-hours to complete and involve approximately 13 no. trucks per hour.

The majority of civil construction material, such as aggregates (as required) and concrete, will be delivered to site using standard rigid trucks, HGVs and ready-mix trucks. Aggregates to be imported to the project site will generally comprise rough stone and capping material.

Full details of the volumes of construction materials to be imported from local suppliers are detailed at **Tables 3.5 (Chapter 3)**; while the traffic/HGV movements associated with imported materials are detailed at **Table 13.6** below. All spoil and peat generated within the project site (wind farm) will be re-used for reinstatement of landscaping purposes, where appropriate and possible, or, where excess arises, stored permanently in the spoil deposition areas.

Turbine components will be delivered to site over a period of approximately 4-9 weeks after civil engineering works are substantially completed. It is estimated that approximately 117 no. loads of turbine components and crane parts will be delivered during this period. Some of these loads (i.e. turbine tower sections, nacelles and blades) will be classified as oversized abnormal sized loads and the relevant approvals and permits will be obtained by the turbine supplier, or appointed haulage contractor, before deliveries take place. No abnormal weight loads are anticipated.

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<sup>10</sup> It is noted that the N52 & N62 National Roads were utilised as a haul route during the construction phase of the operational Meenwaun and Cloghan Wind Farm's. The permitted Derrinlough Wind Farm (currently under construction) also includes the use of the N52 & N62 as part of the consented haul route.

Following completion of the construction works, it is estimated that approximately 70 no. loads will be needed to remove all temporary construction equipment, plant and machinery and materials used on site e.g. temporary compound, fencing, cabins, storage containers etc.

#### HGV Deliveries – Electricity Substation & Grid Connection

All construction materials associated with the proposed 110kV substation and grid connection, including stone and concrete, will be imported from approved local suppliers. Full details of the volumes of construction materials are detailed at **Tables 3.6 & 3.7 (Chapter 3)**; while the traffic/HGV movements associated with imported materials and removal of excavated material are detailed at **Table 13.6** below.

The vast majority of excavated material (>98%) to facilitate the laying of the underground electricity cables will be removed and disposed of at the proposed spoil deposition area or, in the case of tarmacadam (tar & chip) road cuttings, disposed of at an approved waste handling facility.

Despite its linear extent, the grid connection is not assessed as likely to give rise to significant volumes of vehicle movements at any specific location. Furthermore, due to the linear nature of the grid connection, vehicle movements will be spread out across the route and will result in a likely indirect, slight and short-term effect on transport and access.

#### HGV Deliveries – Temporary Haul Route Alteration Works

The completion of temporary haul route alteration works will require the delivery of aggregates and other materials to the respective works locations. Full details of the volumes of aggregates to be imported from local suppliers are detailed at **Table 3.5 (Chapter 3)**; while the traffic/HGV movements associated with imported materials are detailed at **Table 13.6** below.

It is assessed that all excavated material, with the exception of tarmacadam road cuttings, will be re-used in the reinstatement process at each location. The effect on transport and access as a result of these HGV movements is assessed as likely to be indirect, slight and short-term.

#### HGV Deliveries - Forestry Replanting

The afforestation of the identified lands in County Monaghan will generate HGV movements associated with the delivery of plant, machinery and saplings etc. The volume of vehicular movements associated with these works are described at **Table 13.6** below.

**Table 13.6** details the estimated volume of HGV movements associated with the construction phase, including the importation of construction materials and movement/disposal of excess materials.

Material	Quantity	Movements
<b>Wind Farm</b>		
Site mobilisation (incl. construction compound setup, plant, machinery, traffic management measures/equipment, etc.)	-	50
On-site control building and Miscellaneous construction materials (incl. blocks, slates, doors, fencing, geotextile mats, electrical ducting and cables, pipes/culverts, etc.)	-	150
Imported stone (& sand) for access tracks, foundations & crane hardstandings	103,975m <sup>3</sup>	12,997

Material	Quantity	Movements
Tree felling	23ha	284
Concrete (turbine foundations)	9,040m <sup>3</sup>	1,130
Turbine tower sections	-	32
Nacelles	-	24
Turbine blades	-	24
Wind turbine electrical equipment (incl. transformers, panels, cabling, etc.)	-	16
Crane deliveries (incl. ballast, booms, etc.)	2 Cranes	21
Meteorological mast materials	-	4
Site de-mobilisation (removal of plant, machinery, temporary structures, etc.)	-	70
<b>Substation &amp; Grid Connection</b>		
Site mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	20
Imported stone for substation & compound	4,980m <sup>3</sup>	623
Concrete (substation compound, buildings, and grid connection)	4,020m <sup>3</sup>	503
Miscellaneous construction materials (incl. blocks, slates, doors, fencing, joint bays, communication chambers etc.)	-	30
Internal & external electrical equipment (incl. transformers, circuit breakers, lighting, energy storage modules, inverters, etc.)	-	130
Removal of excavated material from grid connection trench	9,530m <sup>3</sup>	1,192
Electrical ducting & cabling	-	40
Imported backfill material (stone)	4,100m <sup>3</sup>	513
Road re-surfacing material (tar & chips)	1,910m <sup>3</sup>	239
Site de-mobilisation (removal of plant, machinery, temporary structures, traffic management measures/equipment, etc.)	-	15
<b>Haul Route Alteration Works</b>		
Site mobilisation and de-mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	10
Imported stone	1,600m <sup>3</sup>	200
Road re-surfacing material (tar & chips)	10m <sup>3</sup>	2
<b>Forestry Replanting</b>		
Site mobilisation and de-mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	10
Importation of saplings, etc.	23ha	1
Total	-	18,330

**Table 13.6: Estimated Materials & Associated Number of Vehicle Movements for the Construction Phase**

The expected number of HGV movements is based on best estimates of trips generated by similarly sized wind farm projects, previous experience in wind farm planning and civil construction, and based on the design of the project. Subject to planning permission being granted, these figures will be subject to refinement following the detailed design process, detailed pre-construction site investigations and consultation with the contractor appointed by the Developer.

Based on the above estimated vehicular movements, the predicted effect on the road network as a result of the increase in HGV movements associated with the entire construction phase is assessed as not likely to be significant and likely to be moderate-negative, direct and short term. This assessment has been reached in consideration of the temporary duration of the proposed construction phase and the estimated average daily increase of 60 no. HGV movements.

#### Construction Personnel

The number of staff employed at the project site will vary according to the phase of works, likely peaking at approximately 100 no. It is expected that the majority of workers will arrive on site in LGVs and crew vehicles. Vehicle sharing will be actively encouraged to reduce vehicular movements. It is expected that c. 30 no. vehicles will visit the site on a daily basis during the peak construction period.

Parking for staff will be provided at the temporary construction compounds. No parking will be allowed for construction workers on the public road network. The additional vehicular movements associated with staff travelling to site are not assessed as likely to result in significant effects on transport and access. Effects are assessed as not likely to be significant and likely to be imperceptible-slight-negative and short-term.

#### Overall Classification of Effects

The above sections have assessed the effects of the project on transport and access which may arise as a result of the construction phase. Overall, the effects are assessed as not likely to be significant and are likely to be of short-term duration and ranging between slight and moderate-negative.

#### *13.2.4.2 Operation Phase*

During the operation phase, the project will generally be unmanned. Operational and remote monitoring activities will be carried out on an ongoing basis. However, regular visits to the site will be undertaken for routine inspections and maintenance. Under normal circumstances, the operation of the project would require an average of 1-2 no. visits to the site per week by maintenance personnel. Parking will be provided at the site office, electrical substation or at the turbine hardstands during maintenance visits. In the case of a major fault (e.g. breakdown of a turbine component), larger machinery may require access to the site.

Overall, the volume of traffic movements predicted to be generated during the operation phase is very low. Therefore, the effect of traffic associated with the operation of the project on the existing public road network will be imperceptible as a result of the type of traffic and the low volumes typically generated.

#### *13.2.4.3 Decommissioning Phase*

During the decommissioning phase of the project, the total volume of HGV traffic will be significantly reduced compared to the construction period. This phase could be expected to last approximately twelve months. Overall, the impact of the

decommissioning phase is assessed as not likely to be significant and likely to be slight-negative and of short-term duration.

#### 13.2.4.4 Cumulative Effects

The above assessment has included consideration of the likely in-combination effects which may arise from the construction, operation and decommissioning of the overall project (wind farm, grid connection, & haul route works). In addition, it is necessary to assess the likelihood for the development to result in cumulative effects with other existing, permitted or proposed developments, including other wind farms.

Cumulative effects are assessed as only likely to occur during the construction and decommissioning phases of the project. Cumulative effects are unlikely to occur during the operation phase as wind farms do not generate a significant amount of traffic during operation, as outlined in **Section 13.2.4.2**.

Other developments which have been included within the cumulative assessment are listed at **Chapter 1**. The majority of developments listed; for example one-off rural dwellings, agricultural developments and forestry plantations; do not generate significant volumes of traffic during either the construction or operation phases such that would have the likelihood to result in cumulative effects. Furthermore, operational wind energy developments listed; including the Cloghan and Meenwaun wind farms; do not generate notable traffic volumes during their operation phase.

In relation to other permitted or proposed wind energy developments; but which, at the time of writing, have not yet been fully constructed and located within the wider environs of the project; the closest such development is the Derrinlough Wind Farm located c. 3km to the north of the project site. It is understood that the civil engineering work programme for the Derrinlough wind farm is currently underway, having commenced in Q4 2022.

Consequently, it is assessed that the construction of the development will not be undertaken concurrently with that of the project. Accordingly, there is no likelihood of significant cumulative transport and access effects arising and any effects are assessed as not likely to be significant and will likely be negligible-, short-term (construction phase) and long term (operation phase).

It is noted that the Derrinlough Wind Farm haul route, from the M6, also includes the N52 and N62 national roads: thus giving rise to a potential scenario where works carried out could be of a positive benefit for the proposed project and negating the requirement for temporary road alterations to be carried out along multiple routes.

Cumulative effects, with the above developments, during the respective operation phases are therefore assessed as unlikely due to the low traffic volumes generated by each development.

### 13.2.5 Mitigation & Monitoring Measures

#### 13.2.5.1 Mitigation

The likely adverse effects of the project have been identified as being slight-to-moderate, direct, indirect and associated with short-term construction and decommissioning activities.

In order to ensure the avoidance of significant effects and reduce the predicted magnitude and significance of effects to the greatest possible extent during the construction and decommissioning phases, the following mitigation measures will be

implemented:-

- Traffic movements will be limited to 07:00-19:00 Monday to Friday and 07:00–13:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours to avail of favourable weather conditions or during extended concrete pours. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification;
- A wheel washing facility will be provided, as necessary, to prevent any debris being transferred from site to the adjacent public roads. All drivers will be required to ensure that their vehicle is free from dirt and stones prior to departure from the project site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions;
- A Traffic Management Plan shall be agreed as part of the Construction Environmental Management Plan (CEMP) with the Planning Authority prior to the commencement of development. The Traffic Management Plan shall include *inter alia* confirmed details of construction material haul routes; confirmed details of vehicle specifications; a materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details;
- All works to the public road shall be undertaken in consultation with, and agreed in advance with, the relevant local authority;
- All reasonable steps shall be taken to ensure that only national and regional routes are used to transport all materials to the site, in so far as is possible;
- Prior to, and post, construction; pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials. Given the high-quality and well-maintained nature of motorways and national routes, it is not assessed as necessary to carry out surveys of these carriageways or structures. Following the completion of the pre-construction survey, any works which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken, while any deterioration of carriageways or structures identified in the post-construction survey shall be put right at the expense of the developer and to the satisfaction of the relevant local authority;
- The pavement on the private road at the operation phase site entrance, from the L300321, on the east of the project site, shall be made good and maintained throughout the operation phase of the project;
- Appropriate and adequate signage shall be provided at all entrances providing access, safety and warning information;
- Speed limit compliance; particularly along the L30033, L70151, L701521, and L70152 grid connection route; will be emphasised to all staff and contractors prior to the commencement of construction during site induction, and will be strictly enforced throughout the construction phase;
- Sufficient car parking spaces will be available at the temporary construction compound during the construction phase. Additionally, during construction of the proposed grid connection, it is likely that agricultural premises will be used for the temporary storage of materials (e.g. ducting, cabling, etc.) and for the parking of construction plant, machinery, and work vehicles (cars, vans, etc.). No parking of cars by persons associated with the project will be permitted on any part of the public road that is not closed to traffic. All staff will be instructed

to ensure that private entrances remain unobscured (particularly along the grid connection route);

- Road sweeping, particularly along the proposed grid connection route, will be carried out as appropriate to ensure construction traffic does not adversely affect road conditions;
- Traffic restrictions shall be kept to minimum duration and extent;
- Appropriate traffic management; including maintenance of local access, pedestrian access (where safe to do so) and diversions (where required); shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place. Precise details of these measures will be detailed in the Traffic Management Plan to be agreed with the Planning Authority prior to the commencement of development;
- The timing of oversized/abnormal loads shall be agreed with the relevant local authorities and An Garda Síochána, and all relevant licenses and permits shall be obtained in advance. All oversized/abnormal loads shall be accompanied by escort vehicles to ensure the maintenance of public safety;
- Maximum axle loadings for abnormal/oversized loads shall be strictly enforced in accordance with the Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003);
- A designated contact point and coordinator will be put in place to manage all access arrangements and to interface with the public and the respective local authorities; and,
- The site shall be closed, and strictly secured, to the public during the construction phase.

Likely effects during the operation phase have been assessed as being imperceptible and hence mitigation measures are not assessed as being required.

#### *13.2.5.2 Monitoring*

As described above; prior to and post construction, pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials. Following the completion of the pre-construction survey, any works (additional to those which have been identified and described at **Chapter 3**) which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken. Any deterioration of carriageways or structures identified in the post-construction survey shall be put right at the expense of the Developer and to the satisfaction of the relevant local authority.

#### *13.2.6 Residual Effects*

##### *13.2.6.1 Construction Phase*

There are no significant residual effects, positive or negative, assessed as likely to occur during the construction phase. Mitigation measures have been proposed to reduce any likely adverse effects and any residual effects are assessed as not likely to be significant and likely to be imperceptible-to-slight-negative and short-term. The residual adverse effects are likely to arise as a result of alteration works along the turbine component haul routes, increases in traffic movements on local roads in the vicinity of the project site and direct construction activities along the grid connection route. Positive residual effects are likely to accrue as a result of road upgrades and improvements to the carriageway condition along the grid connection route.

### 13.2.6.2 Operation Phase

There will be no likely significant residual effects during the operation phase as only occasional LGVs are envisaged as likely to visit the project site during operation for routine monitoring and maintenance. Positive residual effects are likely to accrue as a result of improvements to the carriageway condition along the grid connection route.

### 13.2.6.3 Decommissioning Phase

Decommissioning phase effects are assessed to be similar to those of the construction phase but of a reduced scale. In particular, the public road upgrades and improvements will be retained thus eliminating any likelihood of significant effects. Similarly, access tracks and some ancillary wind farm infrastructure is likely to be retained resulting in a reduction in vehicular movements associated with the decommissioning phase. Much of the site infrastructure, such as turbine foundations and crane hardstands, will simply be covered in topsoil and allowed to revegetate without removing the structures, which would significantly reduce the amount of vehicular movements during this phase.

### 13.2.7 Summary

This section has assessed the likelihood of significant effects arising from the project on transport and access. The project has generally been assessed as resulting in effects which are not likely to be significant and likely to be slight-to-moderate, direct/indirect-negative (temporary) and positive (long-term). Following mitigation, the likely residual effects have been assessed as likely to be imperceptible-to-slight, direct/indirect-negative (temporary) and positive (long-term).

Due to the timing and advanced nature of the works which have already commenced on the Derrinlough Wind Farm it is unlikely that cumulative effects will arise during the construction phase of the project. In addition, with the implementation of appropriate traffic management measures for the project, the magnitude of any residual effects will be substantially reduced and will not likely be significant.

Overall, this assessment has identified no likelihood of significant effects on transport and access which could arise as a result of the construction, operation or decommissioning of the project, either individually or in combination with other existing, permitted or proposed developments.



## 13.3 Aviation

### 13.3.1 Introduction

This section assesses the likelihood of significant effects on aviation arising from the construction, operation or decommissioning of the project. The requirement for an assessment of the likely effects on aviation is set in the *Wind Energy Development Guidelines for Planning Authorities 2006* which state:-

*"The siting of wind turbines may have implications for the operations of communications, navigation and surveillance systems used for Air Traffic Control for the separation and safety of aircraft. Wind turbine siting may also have implications for the flight paths of aircraft."*

### 13.3.2 Methodology

The assessment involved consultation with various stakeholders including the Irish Aviation Authority (IAA) and Department of Defence. In addition, publications issued by the IAA and the Department of Defence were reviewed to determine if the project site was assessed as being of significance or if significant effects were likely. A desktop study was also undertaken to determine the presence of aerodromes or airstrips within 20km of the project site.

This assessment has had particular regard to the *Draft Air Corps Wind Farm/Tall Structures Position Paper* (August 2014) (**Annex 13.2**) which sets out the Air Corps position on the appropriate siting and management of wind turbines and tall structures. This assessment includes a detailed review of this position paper, a comparison of the project site with identified 'Danger Areas', 'Restricted Areas' and 'Low Level Flying Areas'.

### 13.3.3 Consultation

Consultation was undertaken with the IAA, the Department of Defence and Ormand Flying Club (Birr Airfield) to establish if any significant effects on aviation were likely. A consultation letter was issued in June 2022 (see **Chapter 1**), which included a Preliminary Scoping Report, a general description of the project and site location drawings.

Correspondence received from the IAA (see **Annex 1.7**), advised that the project is proximate to the licenced Aerodrome - Birr Airfield (c. 7km south) and that Ormand Flying Club at Birr Airfield should be consulted and, in the event of planning consent being granted, suggested that a number of conditions be attached including in respect of future consultation.

At the time of writing, a response from the Department of Defence and/or Ormand Flying Club has not been received.

### 13.3.4 Description of the Existing Environment

There are no major airports in the vicinity of the project and the site is therefore assessed as being unconstrained. The proposed wind turbines are located c. 100km southeast of Ireland West (Knock) Airport, c. 82km northeast of Shannon Airport, and c. 110km west of Dublin Airport.

There are also a number of aerodromes, airfields, and airstrips located within 40km of the proposed wind turbines including:-

- Birr Airfield (Offaly) located c. 7km south;
- Spollens Airstrip, Tullamore (Offaly) located c. 27km northeast; and

- Limetree Airfield (Laois) located c. 40km east.

The project site is not located within any of the 'Danger' or 'Restricted' areas as identified at Annex A, B or C of the *Draft Air Corps Wind Farm/Tall Structures Position Paper*. The project site is located within a 'Military Operating' area (MOA 5) as defined in the Position Paper and per Section 2.b(2)(d) proposals for objects exceeding 45m in height above ground level must be referred to the Irish Air Corps for further assessment. As identified above, the Department of Defence (Irish Air Corps) was consulted but a response has not been received.

The project site is not located within 3 nautical miles (c.5.5km) of any critical low level route, such as motorways, as identified at para. 2(2)(c) and illustrated at Annex D of the Position Paper. The nearest proposed wind turbine to the M6 motorway is located at a distance of c. 13.5 nautical miles (c.25km) and the nearest turbine to the M7 motorway is located at a distance of c. 13.3 nautical miles (c.24.5km).

### 13.3.5 Description of Likely Effects

#### 13.3.5.1 Construction Phase

Due to the general low altitude of activity during the construction phase, it is assessed that there will be no likely significant effects on aviation. During the erection of wind turbines, cranes will be fitted with appropriate aviation warning lighting to alert pilots to the presence of tall structures. Likely effects are assessed as not likely to be significant and to be indirect, imperceptible, and short-term.

#### 13.3.5.2 Operation Phase

Air traffic control radar is of two types. Primary Surveillance Radar (PSR) equipment sends out pulses of electromagnetic energy which will reflect off objects in their path. The radar's receiver antenna detects the returning 'echoes' and these are displayed on the radar screen. The time taken for the pulse to travel out to the target and back gives an indication of the range of the object from the radar

Secondary Surveillance Radar (SSR) is the second type of radar equipment used for air traffic control. Like primary radar, SSR relies on an antenna rotating continuously through 360°. However the radar does not transmit raw pulses of energy; it transmits an interrogation signal. The signal is received at the SSR antenna, decoded, and the height and location of nearby aircraft are presented on the radar screen. This enables controllers to positively identify radar returns on their screens and (after verbal confirmation from the pilot) to confirm the aircraft's height.

Following the completion of the construction phase, no significant effects are assessed as likely to occur. The installation of aviation warning lighting is inherent to the project design; and its operation during the operation phase will ensure that any civil and military aviation activities occurring within the vicinity are sufficiently aware of the presence of the project.

It is concluded, therefore, that the operation of the project will not result in any likely significant effect on aviation, with effects being likely indirect, imperceptible and long-term (for the operational duration of the project).

#### 13.3.5.3 Decommissioning Phase

The likely effects during the decommissioning phase are assessed to be similar to those during the construction phase with no significant effects assessed as likely to occur. Likely effects are assessed to indirect, imperceptible and short-term.

#### 13.3.5.4 Electricity Substation & Grid Connection

No significant effects on aviation are assessed as likely as a consequence of the construction, operation or decommissioning of the proposed grid connection and electricity substation. Infrastructure associated with the proposed grid connection will be underground, therefore there is no likelihood for effects on, or interactions with, aviation.

#### 13.3.6 Cumulative Effects

Given the presence of other existing, permitted and proposed wind energy developments (tall structures) in the vicinity of the project, it is assessed that cumulative effects could occur. However, the implementation of aviation warning lighting is standard across all such developments and, consequently, cumulative effects are assessed to be likely indirect, imperceptible short-term (construction & decommissioning phases) and long-term (for the operational duration of the project).

Accordingly, significant effects are not likely to occur.

#### 13.3.7 Mitigation & Monitoring Measures

##### 13.3.7.1 Construction Phase

Due to the absence of likely significant effects, there are no specific mitigation measures proposed during the construction phase. As requested by the IAA in its consultation response, a minimum of 30 days prior notification will be provided in respect of the commencement of crane operations at the project site. Additionally, as is best practice and implemented as a general standard, warning lights will be fitted to cranes during the erection of the wind turbines.

##### 13.3.7.2 Operation Phase

The proposed wind turbines will, as requested by the IAA in their consultation response and implemented as a general standard, be fitted with aviation warning lighting in accordance with specification to be agreed with the IAA and the Planning Authority prior to the commencement of development.

At a maximum of 30 days following the installation of all proposed turbines, 'as-constructed details' will be provided to the IAA to allow for the updating of mapping charts, including:-

- The number of wind turbines;
- WGS-84 coordinates of each turbine;
- Ground elevation of each turbine (Malin Head OD);
- Blade tip elevation of each turbine (Malin Head OD);
- Height of turbine;
- Contour maps at the requisite scale; and,
- A note of which turbines have been fitted with obstacle warning lights.

In the event that the obstacle warning lights fail or if there are plans to withdraw them from use for a period of time, the IAA will be contacted as a matter of urgency to request that a 'Notice to Air Missions' (NOTAM) is issued concerning the absence of obstacle lighting. The following information will be provided to the IAA:-

- Obstacle ID;
- Obstacle type;
- Obstacle position;
- Elevation; and,

- Colour of light.

The proposed wind turbines will be fitted with an Uninterruptable Power Supply (UPS) to ensure that the aviation warning lights remain operational even in the event of a power outage. This UPS is sufficient for a period of 12 hours; after which, the warning lights can be powered by a small generator should the power outage continue.

#### 13.3.7.3 Decommissioning Phase

Mitigation measures proposed during the construction phase will also be implemented during the decommissioning phase.

#### 13.3.7.4 Electricity Substation & Grid Connection

Given that no significant effects are assessed as likely to occur as a result of the construction, operation or decommissioning of the proposed grid connection, no specific mitigation measures are proposed, or required.

#### 13.3.8 Residual Effects

No significant residual effects are assessed as likely to occur.

#### 13.3.9 Summary

This assessment concludes that the project is unlikely to result in any significant effect on aviation. The project site, whilst located within an area identified as being a 'Military Operating' area by the Department of Defence, is not located within the more sensitive 'Danger' or 'Restricted' areas or a critical low level route identified within the *Draft Air Corps Wind Farm/Tall Structures Position Paper* on military aviation. The project is not located close to any civilian aerodrome, airfield or airport. Accordingly, with the installation of appropriate mitigation measures, such as aviation warning lights, no significant effects are assessed as likely to occur. Therefore, it is assessed that significant effects on aviation are unlikely to arise as a result of the project, either individually or in combination with other existing, permitted or proposed developments.

## 13.4 Telecommunications

### 13.4.1 Introduction

As noted in the *Wind Energy Development Guidelines for Planning Authorities 2006*<sup>11</sup>, wind turbines, like all electrical equipment, produce electromagnetic radiation, and this can interfere with broadcast communications. This section considers the likely significant effects of the project upon a range of communications infrastructure, including telecommunications networks, broadcast radio and television, and fixed infrastructure, such as telecommunication masts. In theory, interference could affect all wireless transmission of electromagnetic communications including:-

- Satellite communications;
- Cellular radio communications; and,
- Television broadcasting signalling.

### 13.4.2 Methodology

The methodology employed in assessing the likelihood of significant effects on telecommunication networks consisted of desk based research<sup>12</sup> and consultation with various telecommunication operators and relevant authorities. Desk based research was undertaken to identify:-

- Locations of known telecommunications facilities;
- Known telecommunication fixed links; and,
- Known television broadcast and re-broadcast facilities.

During the EIAR scoping process (see **Chapter 1**), the following telecommunication service providers (operators) and authorities were consulted:-

- Airspeed Telecom;
- An Garda Síochana;
- Ajisko Limited;
- Broadcasting Authority of Ireland;
- BT Communications Ireland;
- Commission for Communications Regulation;
- Eir Limited;
- Enet Telecommunications Networks Limited;
- Imagine Group;
- Irish Aviation Authority;
- JFK Communications Limited;
- National Ambulance Service;
- Netshare Ireland;
- Open Eir;
- Radio Services and Building Ltd;
- Ripplecom;
- 2rn (RTE Transmission Network Ireland);
- Tetra Ireland Communications Ltd;
- Three (3) Ireland;
- Towercom;
- Viatel Ireland Ltd
- Virgin Media Ireland; and,

<sup>11</sup> Also acknowledged in the *Draft Revised Wind Energy Development Guidelines 2019*

<sup>12</sup> <https://siteviewer.comreg.ie/>

- Vodafone Ireland Ltd.

In addition to the above, and as discussed in **Chapter 1**, it was established that the project site was located within 5km of the Irish Low Frequency Array (I-LOFAR) system. The majority of the proposed wind farm (turbines) are located further than 5km from the closest point of the I-LOFAR, however 1 no. turbine (Turbine T2) is located just under 5km (c. 4.95km) away. I-LOFAR consists of 12 international stations in Germany, Poland, France, UK, Sweden and Ireland, with additional stations and a central hub in The Netherlands, operated by the Netherlands Institute for Radio Astronomy. I-LOFAR is the Irish addition to this network and is located within the grounds of Birr Castle, immediately west of Birr, County Offaly. As the project is located within 5km of I-LOFAR, consultation was also carried out with the I-LOFAR consortium.

The responses received from these organisations are summarised at **Chapter 1** and can be viewed at **Annex 1.7**.

### 13.4.3 Description of the Existing Environment

The desktop research and consultations undertaken confirmed that while there is telecommunications infrastructure located in the wider vicinity of the project site and there are microwave, and other, links present, the project site is not a strategically important location for telecommunication links.

During consultation, Eir advised that one transmission link was located close to the project, but that the proposed turbines were located outside of the buffer zone and thus not considered to be a risk to the Eir mobile and fixed network.

2rn (RTE Transmission Network) advised that there is potential for localised interference to broadcast services in the area. 2rn have requested that the Developer enter into a protocol arrangement to ensure the appropriate remediation of any significant adverse effects which may be experienced.

### 13.4.4 Description of Likely Effects

#### 13.4.4.1 Construction Phase

No significant effects are assessed as likely to occur during the construction phase.

#### 13.4.4.2 Operation Phase

#### Interference of Wind Turbines with Electromagnetic Transmissions

The operation of wind turbines can affect electromagnetic transmissions in two ways: by blocking or deflecting line of sight radio or microwave links or by 'scattering' transmission signals. However, given the findings of the desk based survey and consultation process, significant levels of blocking, deflecting or scattering are not assessed as likely to arise.

As described at **Section 13.4.2** above, the early-stage consultation with telecommunication operators in the vicinity of the project site has confirmed that services are unlikely to be affected.

Consequently, in the absence of mitigation, it is assessed that the project is unlikely to result in any significant effect on telecommunications in the area.

#### Analogue and Digital Television Signals

The United Kingdom's Office of Communications (OFCOM) document *Tall structures and their Impact on Broadcast and Other Wireless Services*<sup>13</sup> provides an overview for developers and planning authorities on how tall structures such as wind turbines may affect reception of wireless services.

There are two potential technical problems that can occur due to interference from tall structures: signal blocking and reflection. Signal blocking can occur when a tall structure is situated between the transmitter and receiver. This causes a shadow behind the structure that can reduce signal levels. The severity of the reduced signal can vary depending on a number of factors such as the height of the structure.

Signal reflection can occur when wireless signals are reflected from the sides of structures. In the case of wind turbines, because the blades are rotating, the reflections can fluctuate and be quite complex. Reflections from turbines can also vary depending on the speed at which the blades are rotating and the angles of the blades. According to OFCOM, digital television signals are much better at coping with signal reflections and pictures do not experience 'ghosting' i.e. when the same signal arrives twice at the viewer's location, having travelled through two or more different paths.

As analogue television has been phased out in Ireland, problems with ghosting and signal reflection due to interference from turbines will be reduced. The digital television signal is much better at coping with signal reflection. Since the digital switchover, the power of transmitters emitting the digital signal has been increased to deal with the demand. This higher output is likely to overcome any signal interference and is not likely to effect the reception received on televisions. Overall, the likely extent of any potential problems is much less significant with digital television than with analogue television.

While 2m have confirmed that there is no fixed link traversing the project site, it has been identified that there is a risk of interference to local digital terrestrial television viewers in the vicinity of the project. While any effects may be significant on an individual or residential basis; in EIA terms, effects are assessed as not likely to be significant and to be indirect, slight-negative and long-term.

#### Mobile Phone & Broadband Signals

Notwithstanding the presence of a number of telecommunication (mobile phone and broadband) masts in the wider area, the consultation process has not identified the likelihood for significant interference to occur. Consequently, no significant effects on mobile phone and broadband signals are not assessed as likely.

#### Irish Low Frequency Array (I-LOFAR)

Whilst a consultation response was not received from I-LOFAR, owing to the location of the system within 5km of the project site, it was considered appropriate to commission a specific Radio Telescope Impact Assessment (RTIA) in order to ascertain the significance and likelihood of effect on the frequency array, see **Annex 13.3**. The applicant commissioned Pager Power; a specialist consultancy based in Suffolk, U.K; to carry out the RTIA and the report was sent to I-LOFAR in May 2022 for comment. To date there has been no response from I-LOFAR.

The potential impacts of the wind turbines on I-LOFAR arise primarily due to the

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<sup>13</sup> OFCOM: Tall structures and their impact on broadcast and other wireless services, August 2009, [http://licensing.ofcom.org.uk/binaries/spectrum/fixed-terrestrial-links/wind-farms/tall\\_structures.pdf](http://licensing.ofcom.org.uk/binaries/spectrum/fixed-terrestrial-links/wind-farms/tall_structures.pdf)

following three mechanisms:

1. Obstruction of signals from space by the turbines as physical structures;
2. Reflections of existing terrestrial sources of noise (such as television transmissions); and
3. Radio frequency emissions from the turbines themselves.

Based on assessment of these primary mechanisms within the RTIA, the proposed development is not predicted as likely to have a significant impact on I-LOFAR.

The RTIA, see **Annex 13.3**, concludes the proposed wind turbines, as obstructions, will very slightly reduce the minimum horizon of the I-LOFAR antennae. The elevation angle from the antennae to the turbine tip ranges from approximately 1.6 degrees to 2.4 degrees, an increase of approximately 0.4 compared to the current maximum obscuration from the terrain. The presence of the turbine will therefore have a technical impact on the lowest unobscured angles; however, the change is small and likely to be insignificant because the elevation angles required for actual astronomical data are likely to be larger than the angle to the turbine blade tips.

Based on the typical radio frequency emissions emitted from the turbines, field calculations of extrapolated field values for the nearest turbine indicated values of up to 20.1 dB $\mu$ V/m (decibels voltage level referenced to 1 microvolt per metre). Emissions from the turbines are therefore not predicted as likely to be significant because the emissions are small, due to their compliance with International Electrotechnical Commission standards, and because they reduce significantly with distance. Any emissions from the turbines will therefore be significantly smaller than emissions from closer sources, such as vehicles, mobile phones, buildings, machinery, home appliances, etc. in and around Birr.

On the basis of the finding summarised above, and included in full within the RTIA, the likely effects are assessed as not likely to be significant and to be indirect, slight-negative and long-term.

#### 13.4.4.3 Decommission Phase

No significant effects are assessed as likely to occur during the decommissioning phase.

#### 13.4.5 Cumulative Effects

Given that effects on I-LOFAR have been identified as likely (in the absence of design/mitigation measures), there is the possibility of cumulative effects with other tall structures in the wider landscape. In particular, significant effects could potentially arise in respect of the operation of I-LOFAR in combination with the permitted Derrinlough Wind Farm and the operational Cloghan and Meenwaun wind farms.

Given that the aforementioned permitted and operational wind farms are located at a distance further away to I-LOFAR than those within the project site, it is assessed that any cumulative effects arising from the project, in combination with other existing, permitted and operational developments, are assessed as not likely to be significant; effects may arise and are assessed to be slight-negative and long-term.

#### 13.4.6 Mitigation & Monitoring Measures

##### 13.4.6.1 Construction Phase

As significant effects are not assessed as likely to occur during the construction phase,



no specific mitigation measures are proposed.

#### *13.4.6.2 Operation Phase*

In its consultation response, 2rn recommended that a protocol agreement be entered into to ensure that any complaints received from members of the public are appropriately managed, addressed, and remediated. This is a standard protocol for wind energy developments and has been agreed between the parties. A signed copy of the protocol is enclosed at **Annex 13.4**.

While assessed to be unlikely, if significant signal interference in any form is identified and is directly attributed to the project, appropriate remedial measures will immediately be undertaken. A range of technical measures are available to mitigate any instances of interference including signal amplifiers, active deflectors and relay transmitters, repeater stations, booster units, realignment of domestic aerials, installation of higher quality aerials and the installation of suppression equipment. Remedial works will be promptly undertaken, at the Developer's expense, to ensure uninterrupted telecommunication, broadcasting and mobile phone service provision.

#### *13.4.6.3 Decommissioning Phase*

As no significant effects are assessed as likely to occur during the decommissioning phase, no specific mitigation measures are proposed or required.

#### *13.4.7 Residual Effects*

No significant residual effects are assessed as likely to occur.

#### *13.4.8 Summary*

It can be concluded that, on the basis of this desktop assessment, the extensive consultation with stakeholders, and the Radio Telescope Impact Assessment, the project will not result in any likely significant effects on the telecommunications network. The implementation of mitigation measures will ensure that possible identified effects on telecommunication signals or links are appropriately managed and mitigated. Therefore, it is assessed that significant effects on telecommunications are unlikely to occur as a result of the project, either individually or in combination with other existing, permitted or proposed developments.

## 13.5 Resources & Utility Infrastructure

### 13.5.1 Introduction

This section provides an assessment of the likelihood of significant effects on, or interactions with, existing renewable and non-renewable resources, and other utility infrastructure. Within the wider environs of the project site there is evidence of the extraction and use of resources; particularly cutaway and cutover peat extraction, and quarries.

There is also the presence of utility infrastructure, with overhead electricity cables connecting to dwellings; medium and high voltage electricity transmission lines traversing the landscape; and other suspended telecommunication wires adjacent to the majority of local roads.

### 13.5.2 Description of the Existing Environment

#### 13.5.2.1 Renewable Resources

The 2013 Sustainable Energy Association of Ireland (SEAI) *Wind Speed Atlas* identified the project site as having an average wind speed of 6.5m/s at 50m height. An existing meteorological mast has been measuring wind speed at the project site since March 2022 and has, to date, recorded a mean wind speed of c. 7.3m/s, extrapolated to 114m i.e. proposed turbine hub height.

In the context of this available renewable wind resource, there are currently 5 no. operational wind farms across County Offaly<sup>14</sup>; including Meenwaun, Cloghan, Leabeg, Mount Lucas, and Clonreen Wind Farms. The permitted Derrinlough Wind Farm, within the study area of the project site, is currently under construction, as is the permitted Moanvane Wind Farm in the southeast of County Offaly and Yellow River Wind Farm in the northeast of County Offaly. Works on the permitted Cushaling Wind Farm, located on the eastern fringe of the county, are also set to begin at the end of 2023/beginning of 2024.

#### 13.5.2.2 Non-Renewable Resources

The environs of the project site, and the wider midlands region more generally, is notable for its lowland peatland bogs and has a significant industrial heritage of cutaway peat extraction for power generation, including a number of now inoperative thermal power stations, and the extraction of peat for domestic (briquettes) and horticulture use. As a consequence, there is a significant legacy of electricity grid infrastructure in the wider environs of the project site. Cutover peat extraction for private domestic use is also prevalent, including within the project site. As peat extraction is now gradually being phased out for ecological and climate change reasons, non-renewable energy production from peat extraction is gradually being replaced with renewable energy production, particularly wind, as described above, and, more latterly, solar energy.

There are also a significant number of extant quarrying activities within the wider environs of the project site. Specifically, there are several disused quarries to the immediate south of the project site together with one operational quarry and associated concrete batching plant (Loughnane Concrete). Despite the existence of quarries within its immediate environs, initial site investigation works on the project site have not encountered any significant levels of rock. As discussed in **Section 13.2.3.2**

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<sup>14</sup> Source: <https://gis.seai.ie/wind/>

above, it is anticipated that local quarries will be utilised for the importation of stone aggregates during the construction phase of the project. The precise source of such materials will, however, be selected during the pre-construction procurement process and a range of alternative possible sources are presented at **Chapter 2**. An assessment of the likely significant traffic and transport effects of the importation of such materials during the construction phase is provided at **Section 13.2**.

### 13.5.2.3 Utilities Infrastructure

The electricity transmission network in County Offaly predominately comprises 38kV and 110kV electricity transmission lines; with lower voltage distribution lines connecting individual properties to the transmission network. As discussed above, there is a significant legacy network of electricity grid infrastructure in the wider environs of the project site due to historic power generation from cutaway peat extraction.

EirGrid is the transmission system operator (TSO) responsible for both the planning and operation of Ireland's high voltage national grid ( $\geq 110\text{kV}$ ) while ESB Networks are responsible for the development of medium and low voltage lines ( $\leq 38\text{kV}$ ). Given the overall electrical output of the project, a connection to the transmission network at 110kV is considered the most appropriate connection method.

In addition to the wireless transmission of electromagnetic communications, discussed at **Section 13.4** above, there is an extensive wired telecommunications network in the wider environs of the project site with poles and suspended telecommunication wires running along the majority of local and regional roads; while local services such as water schemes (public and group schemes) and local authority roadside drainage infrastructure are also present along local roads.

## 13.5.3 Description of Likely Effects

### 13.5.3.1 Construction Phase

The construction phase of the project is not likely to have any significant effect on existing renewable or non-renewable resources, or utilities infrastructure. The construction phase will not inhibit the export of renewable energy generated from other sources, inhibit the development of other renewable energy projects, nor will it affect existing utility services. While there is a potential for effects on utility services (e.g. accidental collision with overhead wires or sub-surface cables/pipes during the construction phase etc.), this will be mitigated through good construction practices.

During the process of connecting the project to the national grid, some minor, temporary disruption to electricity supply at a local level could occur.

The construction phase will require the extraction of non-renewable resources in the form of stone aggregates for the construction of access tracks, hardstands and backfilling of underground electricity cable trenches etc. together with concrete for turbine foundations and the electricity substation construction. All such construction materials, which are not reused from on-site excavations, will be sourced, where possible, from local quarries and, specifically, only those which have full planning permission and have been subject to EIA. Accordingly, the likely significant environmental effects of this extraction have previously will have been fully assessed by the applicable competent authority.

Construction activities associated with the completion of the temporary haul route alterations and felling/re-planting operations are not assessed as likely to have any significant effect on resources or utility infrastructure. Where an effect could

potentially occur; e.g. utility infrastructure proximate to alteration works along the proposed haul route or present within the selected re-plant lands; appropriate best-practice construction methods will ensure no likely significant effect.

As a result, it is assessed that significant effects on resources and utility infrastructure are unlikely to occur as a result of the construction phase; either individually or in combination with other existing, permitted or proposed developments; with likely effects assessed as being slight-imperceptible, direct, indirect and short-term.

#### *13.5.3.2 Operation Phase*

The operation phase of the project will not result in any likely significant effect on existing utility infrastructure or renewable or non-renewable resources.

Existing cutover peat extraction for domestic use will likely continue. It may be necessary to occasionally import stone aggregates and other such materials to the project site during the operation phase to maintain access for service vehicles; however, materials will again be sourced from authorised quarries with full planning permission and no likely significant effects will occur.

The project will have no likely operation phase effects on existing renewable resources. It is further assessed that the project will enhance the use of renewable resources for energy production, replacing the former non-renewable energy production from peat extraction in the wider environs, and have a likely overall positive effect in terms of carbon reduction and climate change (see **Chapter 8**).

Likely effects during the operation phase are therefore assessed to be imperceptible, direct, indirect, and long-term. It is assessed, therefore, that significant effects on the environment are unlikely to occur in respect of resources and utility infrastructure during the operation phase, either individually or in combination with other existing, permitted or proposed developments.

#### *13.5.3.3 Decommissioning Phase*

No significant effects are assessed as likely to occur during the decommissioning phase in respect of resources and utility infrastructure.

#### *13.5.3.4 Electricity Substation & Grid Connection*

The construction, operation, and decommissioning of the electricity substation and grid connection will not result in any likely effect on existing utility infrastructure or renewable or non-renewable resources. The project will increase renewable electricity generated without resulting in any likely significant adverse effects on resources or utility infrastructure. This will result in the efficient use of the existing grid infrastructure in the wider vicinity, formerly used for the transmission of electricity produced from non-renewable cutaway peat extraction.

#### *13.5.3.5 Cumulative Effects*

The project is not assessed as likely to result in any cumulative effects on resources or utility infrastructure, either individually or in combination with other existing, permitted or proposed developments.

### *13.5.4 Mitigation & Monitoring Measures*

#### *13.5.4.1 Construction Phase*

As identified above, accidental collision with overhead wires, sub-surface cables/pipes and/or forestry will be mitigated through the implementation of good

construction practice and procedures.

The sourcing of aggregates locally and from facilities which have been subject to EIA, will mitigate against the likelihood of significant effects during the construction phase.

Additionally, during the process of connecting the project to the national grid, EirGrid will balance the loading on the network to ensure that no significant disruption occurs, and likely significant effects do not arise.

#### *13.5.4.2 Operation Phase*

No specific mitigation measures are proposed or required during the construction phase.

#### *13.5.4.3 Decommissioning Phase*

No specific mitigation measures are proposed or required during the decommissioning phase.

#### *13.5.5 Residual Effects*

No likely significant residual effects are assessed as likely to occur.

#### *13.5.6 Summary*

This assessment concludes that the project is unlikely to result in any likely significant adverse effect on renewable and non-renewable resources or on utilities infrastructure. The operation of the project will result in a likely significant positive effect in terms of electricity generated from renewable sources. This assessment similarly concludes that the project is unlikely to result in any significant adverse cumulative effects on resources or utility infrastructure in combination with existing, permitted or proposed developments.

