



GALETECH
ENERGY SERVICES

Islandmore Wind Farm

Environmental Impact Assessment
Report

Chapter 14: Material Assets

Islandmore Wind Farm Limited

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14.0 INTRODUCTION

Material assets are “resources that are valued and that are intrinsic to specific places” which can be of human or natural origin¹. While the meaning is less clear than other factors, Material Assets are taken to mean “built services and infrastructure”². The majority of assets of natural origin are assessed elsewhere within this EIAR such as biodiversity, water quality, air quality and landscape. This chapter addresses, therefore, Material Assets which are of human origin, including transport, access, aviation, telecommunications, and resources & utility infrastructure. Another Material Asset of human origin, archaeology and cultural heritage, is addressed in **Chapter 11**.

14.0.1 DESCRIPTION OF THE PROJECT

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

- 10 no. wind turbines, 3 no. with an overall height of 185m and 7 no. with an overall height of 150m;
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and forestry felling;
- Works to the public road network along the turbine component haul route; and,
- 110kV electricity substation and installation of c. 7km of underground electricity line to facilitate connection of the wind farm to the existing Tonroe 110kV electricity substation at Ballaghaderreen, County Roscommon.

The project is located in north County Roscommon; c. 2km north of Ballaghaderreen, c. 13km east of Charlestown (Co. Mayo) and c. 6km southwest of Gorteen (Co. Sligo); and is located in close proximity to the county boundaries between counties Roscommon, Sligo and Mayo.

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

14.0.2 STATEMENT OF AUTHORITY

The assessment of likely significant effects on material assets, and preparation of this EIAR chapter, has been undertaken by various members of the GES Environment & Planning Team. GES has substantial experience in this discipline having prepared Material Assets chapters for multiple permitted and proposed developments which have been subject to EIA.

14.1 TRANSPORT & ACCESS

14.1.1 INTRODUCTION

14.1.1.1 Background and Objectives

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

¹ Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015)

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

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**.

14.1.2 METHODOLOGY & STUDY AREA

14.1.2.1 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 site walkover;
- Windshield survey of the turbine component haul route and grid connection route including a walkover survey of all noteworthy locations (e.g. haul route upgrade locations);
- 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*;
- Roscommon County Development Plan 2022–2028 ('the Roscommon CDP');
- Department of Housing, Local Government and Heritage *The Design Manual for Urban Roads and Streets*;
- Transport Infrastructure Ireland *The Design Manual for Roads and Bridges*;
- Transport Infrastructure Ireland *Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions)* DN-GEO-03060 (May 2023);
- Transport Infrastructure Ireland *Rural Road Link Design* DN-GEO-03031 (May

2023); and,

- Transport Infrastructure Ireland *Traffic and Transport Assessment Guidelines*.

An assessment of the relevant transport policies and objectives of the Roscommon CDP are set out in **Table 14.1**, below. Policies and objectives which are not considered to be relevant have been excluded from further assessment.

Planning Policy / Objective	Assessed	Comment
ITC 7.12 : It is a policy objective of Roscommon County Council to:- Provide a safe and modern road network throughout the county, having regard to national and regional policies and guidelines as well as liaising with national agencies.	Yes	The requirements of this policy objective are incorporated within the assessment at Section 14.1.4 due to the proposed permanent upgrade works to the public road network.
ITC 7.13 : It is a policy objective of Roscommon County Council to:- Support and provide for improvements to the national road network, including reserving corridors for proposed routes, free of development, so as not to compromise future road scheme.	No	While the project will utilise and interact with the national road network, no permanent improvements to the road network are proposed. Additionally, it is assessed that the project (wind turbines) is sufficiently set back from the national road network such that it will not compromise any future road schemes.
ITC 7.14 : It is a policy objective of Roscommon County Council to:- Maintain and protect the safety, capacity and efficiency of national roads and associated junctions in accordance with the Spatial Planning and National Roads Guidelines for Planning Authorities (DECLG, 2012).	Yes	The temporary works at the junction of the N5 and R293 have been assessed at Section 14.1.4.1 for likely significant effects on the safety, capacity and efficiency of the national road network.
ITC 7.15 : It is a policy objective of Roscommon County Council to:- Protect the national road network from inappropriate new access points and the intensification of existing accesses onto or adjacent to National Roads in accordance with the requirements of Section 2.5 of Spatial Planning and National Roads Guidelines for Planning Authorities (DECLG, 2012) in order to maintain traffic capacity, minimise traffic hazard and protect and maximise public investment in such roads.	No	The project does not provide for the creation of new, or intensification of existing, access points onto the national road network.
ITC 7.16 : It is a policy objective of Roscommon County Council to:- Require all applications for significant development proposals to be accompanied by a Traffic and Transport Assessment (TTA) and Road Safety Audit (RSA), carried out by suitably competent persons, in accordance with the TII's Traffic and Transport Assessment Guidelines.	Yes	This assessment constitutes a traffic and transport assessment and is supported by a Road Safety Audit enclosed at Annex 14.1 .
ITC 7.17 : It is a policy objective of Roscommon County Council to:- Limited direct access onto national roads may be permitted in transitional zones approaching or exiting towns and villages i.e. between the 60kmh and 50kmh speed limits only, in order to facilitate orderly urban development. Any such proposal	No	The project does not provide for the creation of new access points onto the national road network.

Planning Policy / Objective	Assessed	Comment
will be subject to a Road Safety Audit. A proliferation of such entrances will not be permitted.		
ITC 7.18 : It is a policy objective of Roscommon County Council to:- New accesses onto Regional roads will not be permitted where access to a lower category road is available.	No	The project does not provide for the creation of new access points onto the regional road network.
ITC 7.19 : It is a policy objective of the Council to:- Seek to implement the Road Improvement Schemes indicated in Table 7.2.	No	The project will have no effect on the implementation of the road schemes indicated at Table 7.2.

Table 14.1: Roscommon CDP Infrastructure, Transport and Communications Policies Objectives

Desk Study

A desk study of the project; including wind farm, electricity line route, turbine component haul route and the surrounding area; was undertaken. The sources of information included documentary sources, outlined above, 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 turbine component haul route, likely construction material haul routes, and electricity line route; was undertaken in March 2025. All site entrances and noteworthy locations along the turbine component haul route and electricity line 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 visibility splays.

Evaluation of Likely Effects

Following the assessment of the baseline environment, the available data was used to identify and categorise likely effects on the road network to be used for the delivery of turbine components and construction materials.

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).

Impacts 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 transport infrastructure has been identified using the criteria outlined within the TII Guidance. These criteria are outlined in **Table 14.2** 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 14.2: Criteria for Rating Transport 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 14.3** 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 14.3: 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 14.4**.

Significance of Impact					
Importance of Attribute		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 14.4: Rating of Significant Environmental Impacts

14.1.2.2 Study Area

The study area for the assessment of likely significant effects on transport and access comprises the public road network likely to be utilised in the delivery of turbine components and other construction materials to the project site and an area of 5km around the proposed wind turbines. This study area has been selected, and deemed to be appropriate, in order to assess any direct effects on the road network and indirect effects due to increased traffic volumes and traffic management measures.

14.1.3 DESCRIPTION OF EXISTING ENVIRONMENT

14.1.3.1 Site Location & Road Network Context

The road network in the vicinity of the project generally comprises local roads; as evidenced by the fact that all access points to the wind farm are from the local road network and the vast majority of the underground electricity line is located within the carriageway of locally-classed routes (the remainder being installed within private lands and a direct crossing beneath the N5 national primary route). The R293 is located c. 2km to the southeast of the wind farm; while, in terms of national routes, the N5 is located c. 500m to the south of the wind farm.

At the junction of the N5/R293, the temporary removal of roadside embankments, temporary widening of the roadside verge and removal of street furniture will be required to enable turbine components navigate the junction. From the N5/R293 slip road, the turbine delivery route continues to the L5501. Due to the characteristics of the R293/L5501 junction and the presence of a crest, it is proposed to permanently lower the carriageway of the R293 by approximately 100mm to enable turbine components navigate the junction. The process will utilise a methodology typically utilised during carriageway resurfacing works and will be undertaken by planing the existing road surface to the required depth before reconstructing the carriageway structure to the satisfaction of the Planning Authority. The adjoining sections of the R293 and L5501 will also be reprofiled to a lesser degree to maintain appropriate gradients at the junction.

From the junction of the R293 and L5501 to the respective wind farm site entrances, the public roads will be subject to permanent upgrade works including the widening of the existing carriageways, reprofiling of localised crests and temporary widening of junctions.

A total of 7 no. site entrances, comprising 6 no. new entrances and the upgrading of an existing access point, will be required to facilitate access to the project. 4 no. entrances will provide access from the L5501 while a further 2 no. entrances will provide access from the L55018 and 1 no. entrance from an unnamed local road.

The L5501 is a narrow single carriageway local road with a speed limit of 60kph which is generally of good condition and appears to be subject to regular maintenance. The road is generally bounded on each side by hedgerows, post-and-wire fencing or commercial forestry. The L55018, similarly, is a single carriageway road with a speed limit of 60kph. The carriageway surface displays evidence of deterioration through surface ravelling and the emergence of vegetation along the non-wheel bearing strip. The road corridor is poorly defined in parts due to an absence of hedgerow or fencing.

The unnamed local road is a narrow single-carriageway road with a speed limit of 60kph. The road surface is in poor condition and, in many parts, is unbound and

granular in nature. Between the L5501 and the unnamed local road, turbine components and construction materials will follow the L5506. Similar to other local roads in the area, the road is a single carriageway route with a speed limit of 60kph. The carriageway surface is generally of good condition; however, there is notable emergence of vegetation within the non-wheel bearing strip. The road corridors of the unnamed road and L5506 are generally poorly defined due to the general absence of hedgerows or fencing.

As prescribed at Section 12.24 and Figure 12.4 of the Roscommon CDP, sightlines of 90m in each direction have been provided at all entrances. The sightline shall be taken from a point 2.4m back from the road edge and, given that all roads from which access will be provided are single-carriageway roads, the sightline shall be to the centre of the carriageway which will ensure that appropriate visibility is provided for construction and public traffic to maintain road safety.

The electricity substation will be located within private lands, and accessed from the L55018, and connected to the Tonroe 110kV substation via c. 7km of underground electricity line. From the electricity substation, the electricity line will be located within wind farm access track before following the L55018, L5501, L5506, crossing beneath the N5 via horizontal directional drilling (HDD), L55019, L1203, L12032 and L12034 before following private lands to the Tonroe 110kV.

At the crossing of the N5, HDD launch and receptor pits will be excavated north and south of the N5, respectively; while the bore will be at a depth of 4.5m below the road carriageway.

14.1.3.2 Haul Routes

Turbine Component Haul Route

The turbine component haul route is heavily influenced by the selected port through which turbine components will be imported. 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 case³. The likely turbine component haul route is described in the Route Access Survey at **Annex 3.5** and utilises the L5048, R339, L5034, R336, N6, M6, M17, N17, N5, R293, L5501, L55018, L5506 and an unnamed local road.

Consequently, it is proposed that the Planning Authority will be advised of the selected port of entry as part of a final Traffic Management Plan and that any specific traffic control measures arising from the selected route (between the port of entry and the L5501) will be agreed with the Planning Authority prior to the commencement of development. Given that access from all potential port options to the L5501 is readily achievable via the national road/motorway network, the 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 both permanent and temporary upgrade works at a number of locations. The extent of these works are described in full at **Chapter 3** and at **Annex 3.5**.

³ Turbine components may also be imported through other ports including Dublin Port, Port of Waterford or Shannon-Foyes 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.

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 over-sized loads to be brought to site and no specific road improvements are required.

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 at this stage. 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 project site is also identified. While these haul routes do not always represent the most direct route to site, the routes have been selected to ensure, insofar as is practicable, that all movements occur on national and regional roads and, insofar as possible, 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 Traffic Management Plan to be agreed prior to the commencement of development.

It should be noted that, during the installation of electrical and communications cabling and underground electricity line within the L5501, L55018 and L5506; these routes will be closed to construction and public traffic as, due to their characteristics, it will not be possible to operate a 'Stop/Go' system. Accordingly, it is proposed that the installation of the electrical and communications cabling and underground electricity line within the above public roads will only be undertaken following the completion of main construction activities within the wind farm site and these works will be carefully scheduled to avoid deliveries of other construction materials and equipment. During the installation of infrastructure within these public roads, diversionary routes will be implemented for construction staff travelling to/from the project site and for local residents and landowners. The precise diversionary routes will be detailed in the Traffic Management Plan and agreed with the Planning Authority as part of the road opening licence application process; however, it is anticipated that traffic will be diverted to utilise the R293 and L1203 local road.

Material deliveries, other than turbine components, will use standard HGVs and utilise the local, regional and national road network, as necessary. Staff employed at the site will generally access the site via the N5, R293, L5501, L55018 and L5506 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 other than for the duration of the diversions as described above.

Electricity Substation & Grid Connection

The provision of construction materials for the electricity substation and underground electricity line 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.

14.1.3.3 Road Access to the Project Site

Access arrangements to the various elements of the project will comprise either the

upgrading or the creation of new entrances. All access points have been carefully considered as part of the project design process which has been particularly cognisant of the provision of appropriate sightlines to ensure compliance with the requirements of the Roscommon CDP.

14.1.3.4 Delivery Vehicle Specification

The delivery of wind turbine components will be carried out by specialised HGVs. The largest vehicles to be used will facilitate the delivery of the wind turbine blades. **Figures 14.1-14.3** illustrate the typical suite of transportation vehicles which will be used in the delivery of components, including a transportation vehicle used to transport the blade component.

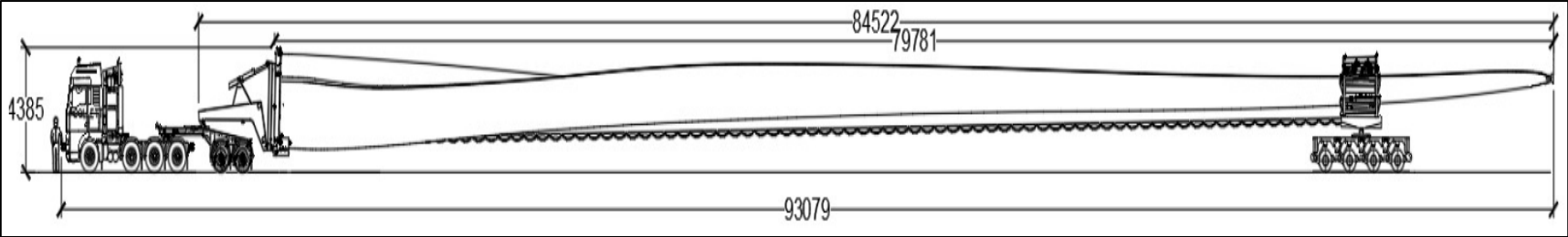


Figure 14.1: Typical Blade Section Transporter

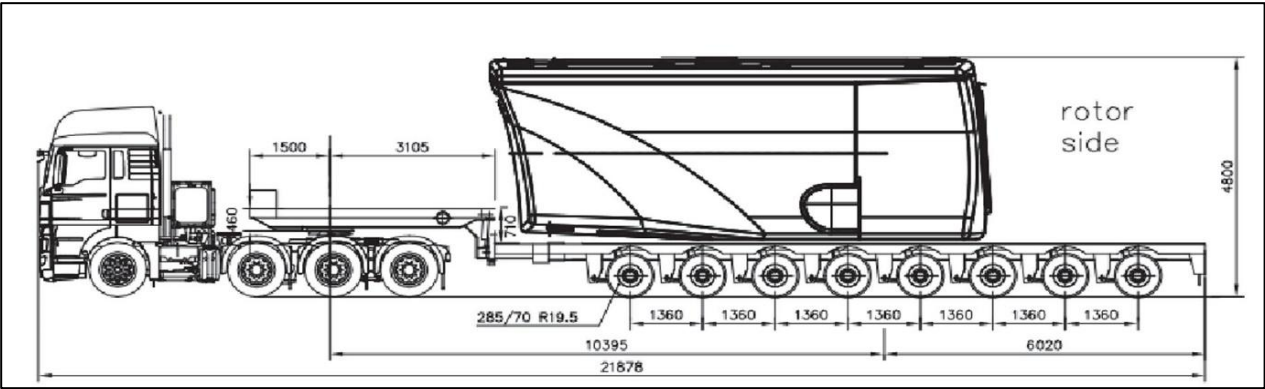


Figure 14.2: Typical Nacelle Transporter

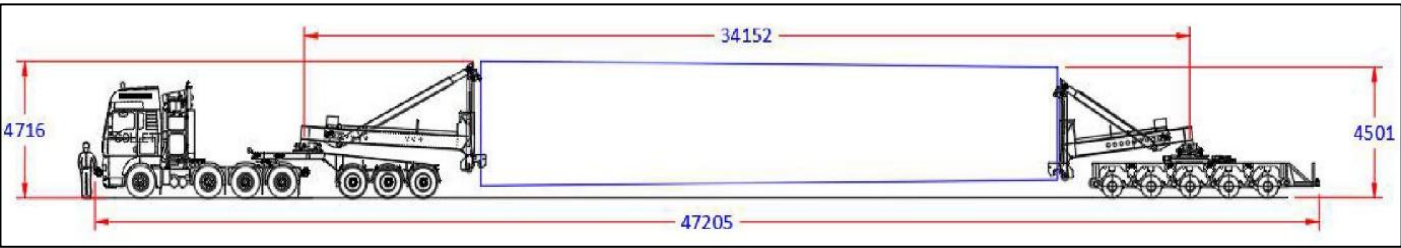


Figure 14.3: Typical Tower Section Transport

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 14.4**), the largest of which is anticipated to be a 16.5m articulated vehicle as shown at **Figure 14.5** below.

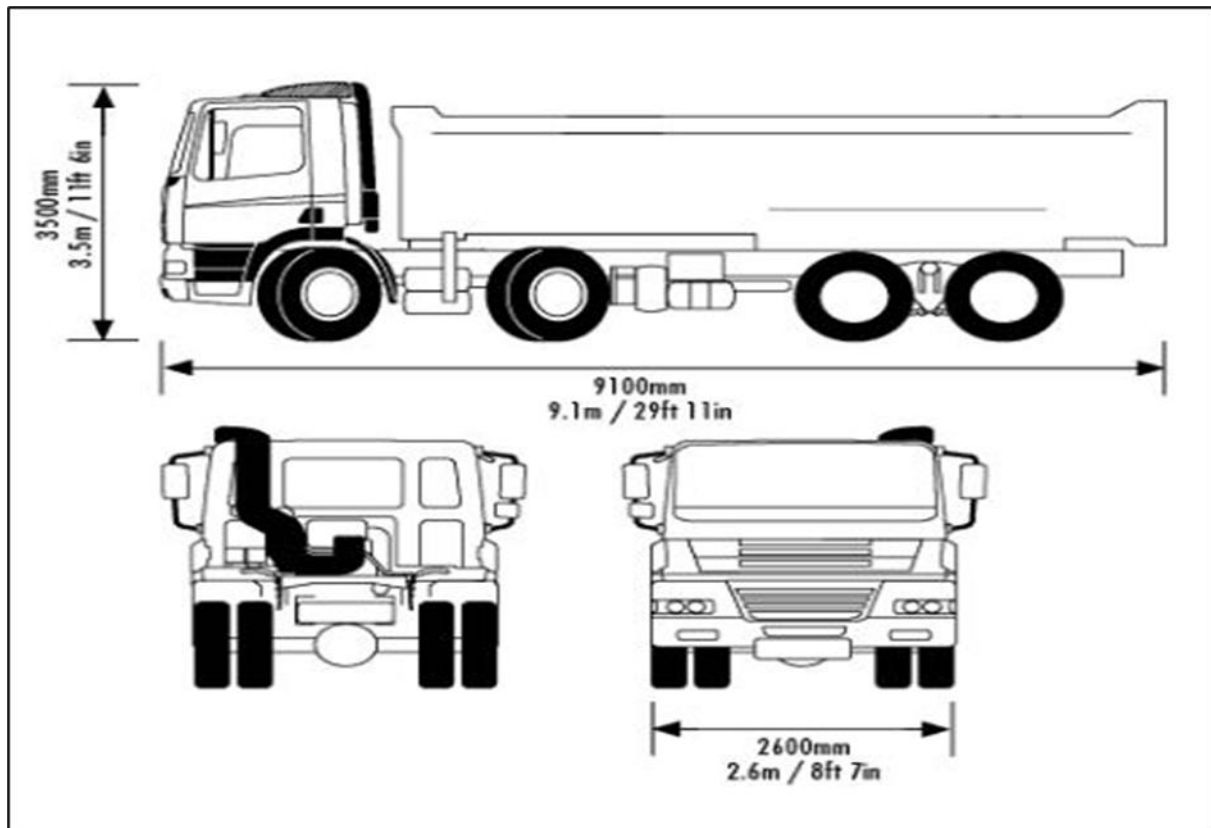


Figure 14.4: Standard Rigid Tipper Truck

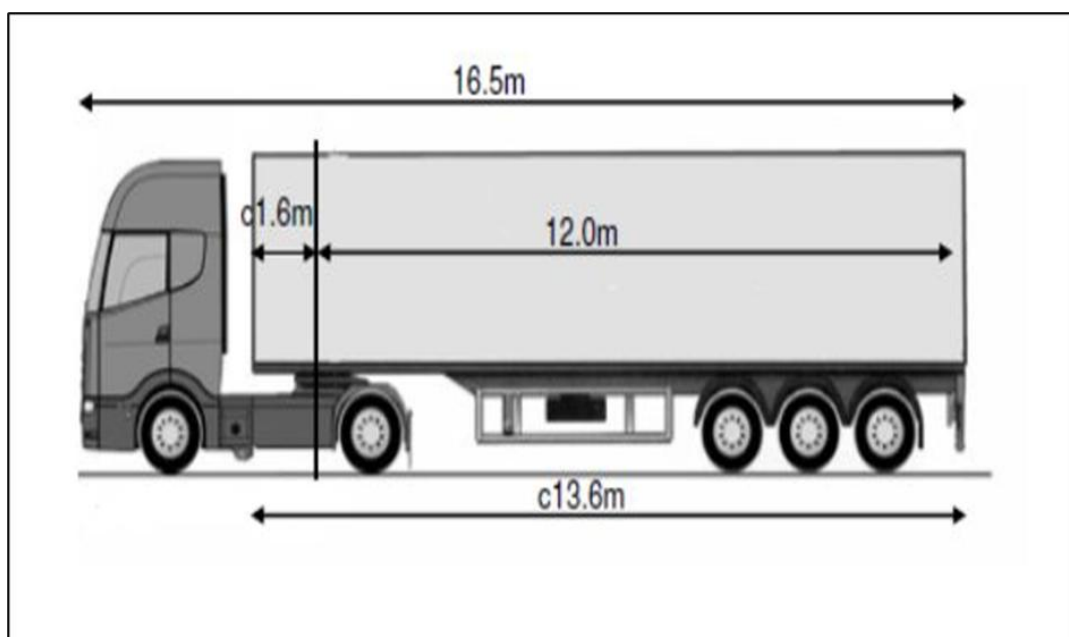


Figure 14.5: Standard HGV

14.1.4 DESCRIPTION OF LIKELY EFFECTS

14.1.4.1 Construction Phase

The construction period 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 electricity substation. During this period, there will 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 development 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 installation) or during extended concrete pours (turbine foundation pours must be completed within 24-hours). 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 7 no. site entrance to the proposed wind farm site. Appropriate visibility splays will be provided at each site entrance as described at **Section 3.4.4 (Chapter 3)**.

All works related to the construction of these entrances will be undertaken from private lands which will ensure that there are no significant direct or indirect transport and access effects on the local road network through disruption or delay to traffic flows during their establishment. However, some brief disruption may be experienced by public road users during the delivery of related construction materials and through the implementation of traffic management measures.

Consequently, effects are assessed to be likely, slight, negative, and short-term.

Electrical & Communications Cabling and Underground Electricity Line

The underground electricity line, from the electricity substation to the existing 110 kV Tonroe substation, will, having left the proposed substation site, be located entirely within the carriageway of the public road network and will follow the L55018, L5501, L5506, cross beneath the N5 via horizontal directional drilling, L55019, L1203, L12032 and L12034 before following private lands to the existing 110kV Tonroe substation. Consequently, the installation 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 reinstated in accordance with ESB Networks specification and finished to the satisfaction of the Planning Authority. Further, all local roads within which it is proposed to install the underground electricity line will be subject to a full-carriageway reinstatement thus ensuring that there are no long-term adverse effects on the public road network.

Further, the network of wind farm electrical and communications cabling (connecting each wind turbine to the electricity substation) will also involve the installation of cabling within the public road network.

The excavation of trenches and installation of the ducting within the road network will cause some disruption to traffic movements, although this will be temporary in duration. Due to the narrow profile of the local roads; it is highly likely that rolling full-road closures will be implemented during construction 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 local road network in the environs of the project site, diversionary routes are readily available. Additionally, local access for residents, landowners, and business operators will be maintained while pedestrians and cyclists will, where necessary, be escorted through the works area.

Therefore, effects are assessed to be likely, direct, indirect, moderate-slight and negative in the short-term; and likely direct, indirect, slight and positive in the long term.

Haul Route for Abnormal Loads

While the proposed turbine delivery haul route is assessed to be generally capable of accommodating abnormal loads, temporary and permanent works will be required at a number of locations, as discussed at **Chapter 3** and **Annex 3.5**.

Between the Port of Galway and the junction of the N5 and R293, these works will generally comprise the removal of street furniture and the temporary hardcoring/widening of verges at junctions and roundabout islands.

At the junction of the N5 and R293, the temporary removal of roadside embankments and temporary widening of the roadside verge and removal of street furniture will be required to enable turbine components navigate the junction. All works will be undertaken following consultation with Transport Infrastructure Ireland (TII) and the Planning Authority and, immediately following the delivery of turbine components, the works area shall be returned to its current condition or as may otherwise be agreed with TII and the Planning Authority.

From the N5/R293 slip road, the turbine delivery route continues onto the L5501. Due to the nature of the crest at the R293/L5501 junction, it is proposed to lower the carriageway of the R293 by approximately 100mm to enable turbine components navigate the junction. The adjoining sections of the R293 and L5501 will be reprofiled to a lesser degree to maintain appropriate gradients. Following the lowering of the carriageway, the road will be reinstated to the requisite specification and to the satisfaction of the Planning Authority. Traffic management measures will be implemented for the duration of the works at this location and will be agreed with the Planning Authority prior to the commencement of development. It is assessed that the effects of the proposed works will be likely, direct, indirect, slight, and negative in the short-term; but likely, direct, slight, and positive in the long-term.

From the junction of the R293 and L5501 to the wind farm site entrances, the public roads will be subject to permanent upgrade works including the widening of the existing carriageways together with the minor reprofiling of some road crests. The carriageways of the public roads will generally be widened to a width of c. 5m utilising the existing road corridor where possible to accommodate construction traffic. The widening of the carriageways will involve, on occasion, the temporary removal of hedgerows and felling of forestry where required and the temporary widening of certain junctions to ensure safe passage. Additionally, the alignment of existing roadside drainage arrangements will be altered, where necessary, to maintain

drainage flows and to maintain the integrity of the road structures.

The completion of these works will cause some disruption to traffic movements, although this will be temporary in duration. Due to the narrow profile of the local roads; full-road closures will be implemented during construction 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 local road network in the environs of the project site, diversionary routes are readily available. Local access for residents, landowners, and business operators will be maintained while pedestrians and cyclists will, where necessary, be escorted through the works area.

The effects of the proposed works are assessed to be likely, direct, indirect, moderate and negative in the short-term; but likely, direct, slight and positive in the long-term due to the improvements to the road carriageways and the consequential improvement to road safety.

HGV Deliveries

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 electricity line, haul route upgrade works and installation and commissioning of turbines. This allows approximately 12-months for civil and construction activities and approximately 3-6 months for installation and commissioning of the turbines.

As detailed at **Table 14.5**, it is estimated that during the civil construction period, approximately 10,360 no. loads will be delivered to the project site. Assuming a 12-month civil works construction phase, this equates to approximately 863 no. loads per month or an average of 35 no. loads 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 deliveries per day will occur during the concrete pours for turbine foundation construction. An estimated average of 68 no. ready-mix trucks deliveries will be required per turbine foundation. Other materials are also likely to be delivered on such days, and therefore a realistic estimation of peak deliveries during the 10-days of foundation pours (1-day per foundation) is approximately 75 no. deliveries per day. These pours may take place from 06:00 and typically take 12-hours to complete and involve approximately 6 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.

Details of the volumes of construction materials to be sourced on-site and those to be imported from local suppliers are detailed at **Tables 3.3, 3.4 and 3.5 (Chapter 3)**; while the traffic/HGV volumes associated with imported materials are detailed at **Table 14.5** below. All spoil generated within the proposed wind farm site will be re-used for reinstatement of landscaping purposes or, where excess arises, stored permanently in the spoil deposition area.

Turbine components will be delivered to site over a period of approximately 4-6 weeks after civil works are substantially completed. It is estimated that approximately 141 no. loads of turbine components and crane parts will be delivered during this period.

Some of these loads (turbine tower sections, nacelles and blades) will be classified as oversized abnormal loads and the relevant approvals and permits will be obtained by the turbine supplier, or its appointed haulage contractor, before deliveries take place.

Following completion of the construction works, it is estimated that approximately 80 no. loads will be needed to remove all temporary equipment, plant and machinery and materials used on site e.g. temporary compound, fencing, cabins, storage containers etc.

As a consequence of increased traffic generation, effects on transport and access are assessed to be indirect, moderate, negative and short-term.

Electricity Substation & Grid Connection

All construction materials (e.g. rock and concrete) associated with the electricity substation and underground electricity line will be imported from approved local suppliers. Full details of the volumes of construction materials are detailed at **Tables 3.4 and 3.5 (Chapter 3)**; while the traffic/HGV volumes associated with imported materials and removal of excavated material are detailed at **Table 14.5** below.

It should be noted that all excavated material will be removed from the electricity line route and disposed of at the proposed spoil deposition areas as appropriate or, in the case of road cuttings (asphalt) or other material which may be unsuitable for on-site storage, disposed of at an approved waste handling facility.

Despite its linear extent, the electricity line 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 are assessed as likely to result in an indirect, slight, and short-term effect on transport & access.

Haul Route Upgrade Works

The completion of haul route upgrade 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 3.3 (Chapter 3)**; while the traffic/HGV volumes associated with imported materials are detailed at **Table 14.5** below.

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

Table 14.5 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	No. of Movements
Wind Farm		
Site mobilisation (incl. construction compound setup, plant, machinery, traffic management measures/equipment, etc.)	-	70
Miscellaneous construction materials (incl. geotextile mats, fencing, electrical ducting and cables, pipes/culverts, etc.)	-	180

Imported rock/stone for access tracks, crane hardstandings, turbine foundations and temporary construction compounds	37,000m ³	4,353
Tree felling	6.5ha	85
Concrete (turbine foundations)	5,400m ³	675
Turbine tower sections	-	40
Nacelles	-	30
Turbine blades	-	30
Wind turbine electrical equipment (incl. transformers, panels, cabling, etc.)	-	20
Crane deliveries (incl. ballast, booms, etc.)	2 Cranes	21
Site de-mobilisation (removal of plant, machinery, temporary structures, etc.)	-	80
Haul Route Upgrade Works		
Site mobilisation and de-mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	20
Imported rock/stone	9,000m ³	1,059
Road re-surfacing material (asphalt, etc.)	3,260m ³	384
Substation & Grid Connection		
Site mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	20
Imported stone for substation access track & compound	18,000m ³	1,765
Concrete (substation compound and buildings)	500m ³	63
Miscellaneous construction materials (incl. blocks, slates, doors, fencing, joint bays, communication chambers etc.)	-	35
Internal & external electrical equipment (incl. transformers, circuit breakers, lighting, etc.)	-	40
Removal/disposal of excavated material from grid connection trench	5,000m ³	589
Electrical ducting & cabling	-	35
Imported backfill material (stone)	2,400	283
Imported backfill material (concrete)	2,600	325
Road re-surfacing material (asphalt, etc.) ⁴	1,100m ³	138
Site de-mobilisation (removal of plant, machinery, temporary structures, traffic management measures/equipment, etc.)	-	20
Total	-	10,360

Table 14.5: Estimated Construction Materials and No. of Deliveries (based on design details and manufacturer's specifications)

⁴ It should be noted that the underground electricity line will be installed within a number of local roads which will be subject to haul route upgrade works and, accordingly, the asphalt requirements for the reinstatement of these sections of public road are included at the line item under 'Haul Route Upgrade Works' at **Table 14.5**.

The expected number of HGV deliveries is based on best estimates of trips generated by similarly sized wind farms, previous experience in wind farm planning and civil construction, and based on the design of the project to date. 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 appointed contractor.

Based on the above estimated vehicular movements, the predicted overall effect on the road network as a result of the increase in HGV movements associated with the entire construction phase is assessed as likely to be moderate, negative and indirect but short term. This assessment has been reached in consideration of the temporary duration of the proposed construction phase and the modest estimated average daily increase of 35 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, subject to public health guidance, 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; and effects are assessed as likely to be slight-imperceptible, 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 not assessed to be significant and are assessed as likely to be direct, indirect, moderate to slight-imperceptible, negative, positive, short-term and long-term.

14.1.4.2 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 wind farm will require an average of 1-2 no. visits to the site per week by maintenance personnel using LGVs. Parking will be provided at the electricity substation or at the turbine hardstands during maintenance visits. In the case of a major fault; e.g. requiring the replacement of a turbine component; larger machinery may require access to the site.

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

14.1.4.3 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 is expected to last approximately 3-months. Overall, the impact of the decommissioning phase is assessed to be slight and negative of short-term duration and likely.

14.1.5 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 14.1.4.2**.

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 Largan Hill Wind Farm, Roosky Wind Farm and the Grady Joinery Wind Turbine; 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 constructed; it is assessed that none are located at a sufficient proximity such that cumulative traffic effects are likely to be experienced. In particular, the proposed Carrigeen Wind Farm is located c. 17km to the east, the Clooncunny Wind Farm is located c. 17km to the north of the project site and the Ballyfasy Wind Farm is located c. 38km to the southeast. Other small-scale wind energy developments; including the Curlew Energy Wind Farm, Natural Forces Renewable Energy Wind Turbine, Riverstown Locally Owned Wind Turbine; are not assessed as likely to generate sufficient traffic volumes such that significant cumulative effects could arise. 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 imperceptible, short-term (construction phase) and long term (operation phase).

Other developments which have been included within the cumulative assessment include the North Connacht 110kV Project and N5 Upgrade Works. If these developments and the subject project were to be constructed concurrently, cumulative effects on the N5 national primary road network and increased disruption to local residents/landowners could, in the absence of appropriate mitigation and traffic management measures, be likely, significant and indirect, but of temporary duration. It is however assessed that, due to the characteristics of these respective developments and the ability of the N5 to accommodate large traffic volumes, significant effects are not likely.

Therefore, it is assessed that there is no likelihood of significant cumulative transport & access effects arising and any effects are likely to be negative, imperceptible, short-term (construction phase), and long term (operation phase).

Significant cumulative effects, between the project and the above developments,

during the respective operation phases are assessed as unlikely due to the low traffic volumes generated by each development.

14.1.6 MITIGATION & MONITORING MEASURES

14.1.6.1 Mitigation

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

In order to reduce the predicted magnitude and significance of effects to the greatest possible degree during the construction phase, 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 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;
- All works to the public road shall be undertaken in consultation with, and to the satisfaction of, the Planning Authority. The detailed design process shall also been informed by a further Road Safety Audit to be carried out prior to the commencement of development;
- 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. A Planning-Stage Traffic Management Plan has been prepared and is enclosed at **Annex 14.2 (Volume II)**;
- 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 site shall be closed, and strictly secured, to the public during the construction phase;
- All reasonable steps shall be taken to ensure that national and regional routes are used to transport all materials to the site in so far as practicable;
- 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 (other than the locally classed routes at the project site which will be subject to upgrade works). 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 Planning Authority;

- Appropriate and adequate signage shall be provided at entrances providing access, safety and warning information;
- At the site entrances, roadside hedgerows and vegetation shall be trimmed or removed prior to the commencement of construction to ensure that sightlines are provided in advance of the delivery of construction materials;
- Speed limit compliance; particularly along the L5501, L55018 and L5506 and along the route of the underground electricity line; 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 compounds during the construction phase. Additionally, during construction of the underground electricity line, it is likely that agricultural (or other) 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 route of the underground electricity line);
- The project will involve the delivery of a number of abnormal and exceptionally abnormal loads to the site due to the size of the delivery/load. It should be noted that abnormal weight loads are not expected to feature as part of the project as 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);
- 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;
- Following the installation of the electricity and communications cable ducting, the trench will be backfilled with appropriate material and temporarily reinstated. Following the installation of the underground electricity line and electrical and communications cabling, all public roads within which it is proposed to install the infrastructure will be subject to a full-width carriageway reinstatement (re-surfacing) of the relevant road section. Road reinstatement specifications and methodologies will be agreed with the Planning Authority prior to the commencement of development and as part of the road opening licencing process;

- Wheel washing facilities will be provided at site entrances 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;
- Road sweeping, particularly along the route of the underground electricity line, will be carried out as appropriate to ensure construction traffic does not adversely affect road conditions; and,
- Due to the transient nature of the underground electricity line works, rolling road closures will be implemented where the electricity line is to be installed within the carriageway of public roads. Diversions and traffic restrictions shall be kept to minimum duration and extent.

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

14.1.6.2 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 (excluding those within the immediate environs of the project site which are proposed to be upgraded). 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.

14.1.7 RESIDUAL EFFECTS

14.1.7.1 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 offset any likely adverse effects and any residual effects are assessed to be slight, negative and short-term. The residual negative effects are likely to arise as a result of upgrade works along the turbine component haul route, increases in traffic volumes on local roads in the vicinity of the project site and direct construction activities along the local roads in the vicinity of the project site and electricity line route. Positive residual effects are likely to accrue as a result of permanent road upgrades (L5501, L55018, L5506 and unnamed local road) and improvements to the carriageway condition along the electricity line route.

14.1.7.2 Operation Phase

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

14.1.7.3 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 related significant effects on transport and access. Much of the site infrastructure, such as turbine foundations and crane hardstands, may simply be covered in soil and allowed to revegetate without removing the structures, which would significantly reduce the amount of vehicular movements during this phase.

14.1.8 SUMMARY

This section has assessed the likelihood of significant effects arising from the project on transport and access. The project has generally been assessed resulting in effects which are likely, moderate to slight-imperceptible, direct, indirect, negative (temporary), and positive (long-term). Following mitigation, the likely residual effects have been assessed as likely, slight-to-imperceptible, direct, indirect, negative (temporary), and positive (long-term).

Likely cumulative effects, with other developments in the vicinity, have been assessed as not likely to be significant. However, with the implementation of appropriate traffic management measures for the subject project, and the implementation of a similar suite of measures in respect of other wind energy and large infrastructure developments, the magnitude of effects can be substantially reduced and will not 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.

14.2 AVIATION

14.2.1 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."

14.2.2 METHODOLOGY & STUDY AREA

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 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 subject site. In this regard, the study area for this assessment comprises the entirety of the Republic of Ireland for effects on national and regional aviation infrastructure and within 20km of the project site for local/private aviation installations.

This assessment has had particular regard to the *Draft Air Corps Wind Farm/Tall Structures Position Paper* (August 2014) (**Annex 14.3**) which sets out the Air Corps position on the appropriate siting and management of wind farms 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'.

14.2.2.1 Consultation

Consultation was undertaken with the IAA and Department of Defence to establish if any effects on aviation were likely. A consultation letter was issued to both in September 2024 (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 1.4**) advised of the likely requirement to install aviation warning lighting and that consultation should be carried out with Ireland West Airport and AirNav Ireland to allow for further technical assessments of the likely effects of the project.

Correspondence received from the Department of Defence (see **Annex 1.4**) also advised in relation to warning lighting to be fitted to the turbines.

Additionally, the operators of local airfields, aerodromes and airstrips were also contacted.

14.2.3 DESCRIPTION OF EXISTING ENVIRONMENT

There are no major airports in the immediate vicinity of the project and the site is therefore assessed as being generally unconstrained. However, Ireland West Airport (Knock) is located approximately 14km to the west of the project; while Sligo Airport is located c. 37km to the north. Dublin Airport is located approximately 160km to the

southeast while Shannon Airport is located approximately 135km to the south.

There are also a number of aerodromes, airfields, and airstrips located in the wider environs of the project including Tibohine Airfield (c. 5km southeast) and Lough Conn Airfield (40km west).

The project site is not located within any 'Danger', 'Restricted' or 'Military Operating' area as identified at Annex A, B or C of the *Draft Air Corps Wind Farm/Tall Structures Position Paper*. Similarly, the subject site is not located within 3 no. nautical miles of any critical low level route identified at para. 2(2)(c) and illustrated at Annex D of the Paper.

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.

Rotating wind turbine blades within radar range can impart a Doppler shift to any radar energy reflecting off the blades. The radar's processor could detect this as a non-static target and therefore display the turbines as objects on the radar screen.

14.2.4 DESCRIPTION OF LIKELY EFFECTS

14.2.4.1 Construction Phase

Due to the general low altitude of activity during the construction phase, it is assessed that there will be no likely impact 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.

During consultations with Ireland West Airport, it was confirmed that the height of the crane during turbine installation will be less than the overall height of the wind turbines. Ireland West Airport confirmed, on this basis, that the operation of the crane was not likely to adversely affect the operation of the airport.

Likely effects are, therefore, assessed to negative, indirect, imperceptible, and short-term.

14.2.4.2 Operation Phase

During the operation 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 of the project are sufficiently aware of the presence of the project.

As described above, during consultation with the IAA and Ireland West Airport, it was recommended that various technical assessments should be undertaken to assess

whether, or not, the project was likely to have a significant effect on the operation of the airport. The assessments comprised a Technical Safeguarding Assessment (see **Annex 14.4**) and an Special Aeronautical Study (see **Annex 14.5**).

The Technical Safeguarding Assessment, carried out to determine whether the project would affect the performance of the Airport Air Navigation Equipment (AANE, concluded that the project does not infringe any of the AANE safeguarded areas at Ireland West Airport.

The Special Aeronautical Study, which evaluates whether structures will penetrate protected airspace surfaces (e.g., Obstacle Limitation Surfaces), is designed to assess whether the structures are likely to interfere with aircraft flight paths. The assessment found that the project does not pose a risk of likely significant effects on the operation of Ireland West Airport and that no mitigation measures are required.

The project site is not located within any low flying areas, restricted areas, danger areas, military operating areas or low level routes identified within the *Draft Air Corps Wind Farm/Tall Structures Position Paper*.

Therefore, it is concluded that, even in the absence of mitigation, the operation of the project will not result in a likely significant and long-term (for the operation duration of the wind farm) effect on aviation.

14.2.4.3 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 negative, indirect, imperceptible, and short-term.

14.2.4.4 Electricity Substation & Underground Electricity Line

No significant effects on aviation are assessed as likely as a consequence of the construction, operation or decommissioning of the electricity substation and electricity line. Due to the low height or underground nature of the infrastructure, there is no likelihood for effects on, or interactions with, aviation.

14.2.5 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. Given that the project, individually, is assessed as not likely to result in significant effects on aviation, the cumulative effect with other developments during the construction, operation and decommissioning phases is also assessed as not likely to be significant.

14.2.6 MITIGATION & MONITORING MEASURES

14.2.6.1 CONSTRUCTION PHASE

Due to the absence of likely 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 regarding the commencement of crane operations at the project site. Additionally, as is best practice and implemented as standard, warning lights will be fitted to cranes during the installation of the wind turbines.

14.2.6.2 Operation Phase

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

At a maximum of 30-days following the installation of all 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, via AISOPs@iaa.ie, as a matter of urgency, to request that a NOTAM (Notice to Airmen) 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.

It should also be noted, however, that the wind turbines will be fitted with an uninterruptable power supply (UPS) to ensure that the aviation warning lights remain operation 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.

14.2.6.3 Decommissioning Phase

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

14.2.7 RESIDUAL EFFECTS

No significant residual effects are assessed as likely to occur.

14.2.8 SUMMARY

This assessment concludes that the project is not likely to result in any significant effect on aviation. The project site is not located within an area identified as being of particular sensitivity or importance in the *Draft Air Corps Wind Farm/Tall Structures Position Paper*. With the implementation of appropriate mitigation measures to ensure the protection of aviation safety and the installation of aviation warning lighting, 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.

14.3 TELECOMMUNICATIONS

14.3.1 INTRODUCTION

As noted in the *Wind Energy Development Guidelines for Planning Authorities 2006*⁵, 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 electromagnetic communications including:-

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

14.3.2 METHODOLOGY & STUDY AREA

The methodology employed in assessing the likelihood of significant effects on telecommunication networks consisted of desk based research⁶ and consultation with various telecommunication companies 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 with:-

- An Garda Síochána;
- Broadcasting Authority of Ireland;
- BT Communications Ireland;
- Commission for Communications Regulation;
- Eir Limited;
- Enet Telecommunications Networks Limited;
- Imagine Group;
- Integrated Media Solutions Limited (Ajisko Limited);
- JFK Communications Limited;
- Magnet+;
- National Ambulance Service;
- Open Eir;
- Radio Services and Building Limited;
- Ripplecom;
- 2rn (RTE Transmission Network Ireland);
- Tetra Ireland Communications Limited;

⁵ And acknowledged in the *Draft Revised Wind Energy Development Guidelines 2019*

⁶ <https://siteviewer.comreg.ie/>

- Three (3) Ireland;
- Towercom;
- Viatel Ireland Limited
- Virgin Media Ireland; and
- Vodafone Ireland Limited.

The responses received from these organisations are summarised at **Chapter 1** and can be viewed at **Annex 1.4**.

While service providers which operate throughout the Republic of Ireland have been consulted thus providing an assessment of likely effects at a national level, the assessment focus on a core study area with a radius of 1km around the proposed wind turbines.

14.3.3 DESCRIPTION OF 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.

2rn (RTE Transmission Network) advised that there is potential for interference to the terrestrial television network and have requested that the Developer enter into a protocol arrangement to ensure the appropriate remediation of any adverse effects which may be experienced.

14.3.4 DESCRIPTION OF LIKELY EFFECTS

14.3.4.1 Construction Phase

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

14.3.4.2 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 14.4.2** above, the early-stage consultation with telecommunication operators in the vicinity of the project site has confirmed that services are unlikely to be significantly 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*⁷ provides an overview for

⁷ 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

developers and planning authorities on how tall structures such as wind turbines may affect reception of wireless services.

There are two potential problems that can occur due to interference from tall structures: (1) signal blocking, and (2) 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 to be indirect, negative, slight, 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 assessed as likely.

14.3.4.3 Decommissioning Phase

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

14.3.4.4 Electricity Substation & Underground Electricity Line

Having regard to their characteristics and low height; it is assessed that the construction, operation, and decommissioning of the electricity substation and underground electricity line will not result in any likely effect on telecommunications.

14.3.5 CUMULATIVE EFFECTS

Having regard to the assessments carried out in the preceding sections and the absence of likely significant effects arising from the project, it is assessed that significant cumulative effects are also not likely to arise.

14.3.6 MITIGATION & MONITORING MEASURES

14.3.6.1 CONSTRUCTION PHASE

As significant effects are not assessed as likely to occur during the construction phase, no specific mitigation measures are proposed.

14.3.6.2 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 14.6**.

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 telecommunications 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.

14.3.6.3 Decommissioning Phase

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

14.3.7 RESIDUAL EFFECTS

No significant residual effects are assessed as likely to occur.

14.3.8 SUMMARY

It can be concluded that, on the basis of this desktop assessment and extensive consultation with stakeholders, the project will not result in likely significant effects on the telecommunications network. 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.

14.4 RESOURCES & UTILITY INFRASTRUCTURE

14.4.1 INTRODUCTION

This section assesses the likelihood of significant effects on or interactions with existing renewable and non-renewable resources and existing utility infrastructure. Within the wider environs of the project site there is evidence of the extraction and use of resources; particularly in relation to quarrying activities.

Utility infrastructure is also present, with overhead electricity lines connecting to the majority of dwellings, medium and high voltage electricity lines traversing the landscape, and telecommunication lines located adjacent to the majority of local roads.

14.4.2 METHODOLOGY & STUDY AREA

The methodology employed in assessing the likelihood of significant effects on resources and utility infrastructure consisted of desk based research to identify the presence of renewable and non-renewable resource locations and to evaluate the likelihood of an interaction with the project arising.

Having regard to the characteristics of this assessment, a study area of County Roscommon has been selected due to the potential for effects of receptors which are not located immediately proximate to the project site.

14.4.3 DESCRIPTION OF EXISTING ENVIRONMENT

14.4.3.1 Renewable Resources

There are 8 no. existing wind farm developments located within County Roscommon, as follows:-

- Skrine Wind Farm comprising 2 no. wind turbines located c. 7km south of Roscommon town;
- Sliabh Bawn Wind Farm comprising 20 no. turbines located c. 11km northeast of Roscommon town;
- Roosky Wind Farm comprising 2 no. wind turbines located c. 2.5km south of Ballaghderreen;
- Largan Hill Wind Farm comprising 9 no. wind turbines located c. 5km north of Ballaghderreen;
- Kilronan Wind Farm comprising 10 no. wind turbines located c. 2km west of Arigna;
- Seltenaveeny Wind Farm comprising 2 no. wind turbines located c. 3km north of Arigna;
- Tullynahaw Wind Farm comprising 11 no. wind turbines located c. 3km north of Arigna; and,
- Altagowlan Wind Farm comprising 9 no. wind turbines located c. 4km northwest of Arigna.

In addition to the above, there are a number of wind energy micro-generation sites located throughout the county; while a number of utility-scale solar energy

developments have been permitted and proposed but have not yet been constructed.

14.4.3.2 Non-Renewable Resources

County Roscommon has a significant industrial heritage of cutaway peat extraction for power generation with a number of now inoperative thermal power stations located in adjoining counties. As a consequence, there is a significant legacy of electricity grid infrastructure throughout the county. 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 wind energy production, as described above, and, more latterly, solar energy.

There are a number of extant quarrying activities within County Roscommon. There are no quarries located within the project site or in its immediate vicinity. While a borrow pit for the extraction of rock is proposed, capping material for access tracks and crane hardstandings, and concrete for turbine foundations and other uses, will be sourced from local quarries. The sources of such material will be selected during the pre-construction procurement process; however, a range of alternative construction material sources are provided at **Chapter 2** while further details on the delivery of materials are provided at **Section 14.1**.

There are no gas networks within the project site or in its environs and, therefore, no significant effects are assessed as likely.

14.4.3.3 Utilities Infrastructure

The electricity transmission network in County Roscommon 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 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 is responsible for the development of medium and low voltage lines ($\leq 38\text{kV}$).

In addition to the microwave-telecommunications network discussed at **Section 14.3** above, there is an extensive physical telecommunications network in the wider environs of the project site with poles and 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 is also present in the environs of the project site.

14.4.4 DESCRIPTION OF LIKELY EFFECTS

14.4.4.1 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 interaction with utility services (e.g. accidental collision with overhead wires or sub-surface cables/pipes during the construction phase), this can 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, may occur.

The construction phase will result in the extraction of non-renewable resources in the form of aggregates for the construction of access tracks and areas of hardstanding and concrete for turbine foundations and 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 haul route upgrades and felling operations are not assessed as likely to have any significant effect on resources or utility infrastructure. Where an effect could occur; e.g. utility infrastructure proximate to upgrade works along the proposed haul route; appropriate best-practice construction methodologies will ensure no likely significant effects.

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

14.4.4.2 Operation Phase

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

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 assessed that the project will have a likely overall positive effect in terms of carbon reduction and climate change (see **Chapter 9**).

Likely effects during the operation phase are assessed to be imperceptible-negative, positive, 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 as a result of the project, either individually or in combination with other existing, permitted or proposed developments.

14.4.4.3 Decommissioning Phase

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

14.4.4.4 Electricity Substation & Underground Electricity Line

The construction, operation, and decommissioning of the electricity substation and underground electricity line will not result in any likely effect on existing utility infrastructure or renewable or non-renewable resources. The project will significantly increase the volume of renewable electricity generated in County Roscommon without resulting in any likely significant adverse effects on resources or utility

infrastructure.

14.4.5 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.

14.4.6 MITIGATION & MONITORING MEASURES

14.4.6.1 Construction Phase

As identified above, accidental collision with overhead wires and sub-surface cables/pipes 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.

14.4.6.2 Operation Phase

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

14.4.6.3 Decommissioning Phase

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

14.4.7 RESIDUAL EFFECTS

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

14.4.8 SUMMARY

This assessment concludes that the project is unlikely to result in any significant adverse effect on renewable and non-renewable resources or on utilities infrastructure. The operation of the project will bring about a benefit 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 in combination with existing, permitted or proposed developments.