

MWP

Chapter 16 Interaction of the Foregoing Ballycar Wind Farm

16. Interaction of the Foregoing

16.1 Introduction

This Environmental Impact Assessment Report (EIAR) has presented the environmental assessments of the proposed development under each required environmental factor. Where relevant, the interaction between the factors, which is the interactions between specific environmental aspects and effects, are already addressed within each of the individual assessment topic areas or chapters of this EIAR.

This chapter of the EIAR evaluates the potential interaction of impacts, which the proposed development may have on the receiving environment and sensitive receptors.

16.1.1 Scope and Methodology of Assessment

Article 3 of EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU stipulates that “*The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d)*”.

The purpose of this chapter is to draw attention to important interactions and interdependencies between one factor or topic and another. Consequently, this chapter now highlights those interactions of the environmental aspects and topics previously detailed and assessed throughout this EIAR. The potential for interactions between one aspect of the environment and another can result in direct or indirect effects, which may be positive or adverse. This chapter is completed based on a desktop review and by provision of a matrix to present the main interactions. The assessments and results have previously been presented in the preceding chapters of this EIAR.

16.2 Identification of Environmental Impacts

While all environmental aspects can be inter-related to some extent, the following outlines the key interactions identified between each of the various environmental subject areas considered in this EIAR for the construction, operational and decommissioning phases of the proposed development.

Where the potential for significant effects has been identified, the impacts have been avoided or reduced by mitigation measures, as outlined throughout the chapters of the EIAR.

A matrix has been generated to summarise the relevant interactions between specific environmental factors identified for the proposed development. The matrix is presented in **Table 16-1**. It contains each of the environmental factors or aspects, which were considered as part of this environmental impact assessment, on both axes. These interactions have been identified for both the construction, operation and decommissioning phases of the proposed development and positive effects are identified.

Full details of the significance of the effects and the relevant interactions of the environmental aspects along with any proposed mitigation are discussed within each of the individual preceding Chapters.

16.2.1 Population and Human Health

During the construction phase there is potential for adverse effects on population and human health in relation to traffic and transport, water, air quality, material assets, landscape and visual, noise and vibration. These effects

have an insignificant potential to pollute and create temporary disturbance for occupants of nearby dwellings. The interactive effects are **likely** to be **short term** and **insignificant**.

During the operational phase there is potential for long term adverse effects on population and human health in relation to landscape and visual, shadow flicker, and noise and vibration effects. At the same time the development will have slight positive effects on air quality, climate change and energy security. The interactive effects are **likely** to be **long term** and **insignificant**.

During the decommissioning phase there is potential for insignificant adverse effects on population and human health in relation to traffic and transport, and noise and vibration which could create a temporary disturbance for occupants of nearby dwellings. At the same time the removal of the wind turbines will have long term moderate positive effects on the visual landscape and noise (for occupants of nearby dwellings). The interactive effects are **likely** to be **short and long term** and **insignificant**.

16.2.2 Shadow Flicker

The proposed development has the potential to give rise to long term shadow flicker and visual effects on the health of residents of surrounding dwelling during the operational phase only. Wind turbines will, however, be equipped with a shadow flicker module to prevent shadow effects at critical times so that there will be no shadow flicker at sensitive receptors/nearby dwellings during the wind farm operational phase. Therefore, the proposed development will not have significant adverse interactive visual, and population and human health effects on residents of nearby dwellings as a result of shadow flicker (Refer to **Chapter 11 Shadow Flicker** for further details).

16.2.3 Landscape and Visual

During the construction phase, there is potential for short term insignificant adverse effects on population and human health in relation to landscape and visual effects related to the construction works, machinery and traffic. The interactive effects are **likely** to be **short term** and **moderate**.

During the operational phase, the proposed Ballycar wind turbines will be prominent in some views from very close to the site and will be visible from certain long distance viewpoints. Overall, the development will be visible from a number of different viewpoints and the significance of effects will range from **slight-significant**. This effect would **likely** have **slight adverse** interactive effects on population and human health. These interactive **long term** effects are **unlikely** to be **significant**.

During the decommissioning phase there is potential for **moderate positive long-term** effects on population and human health in relation to landscape and visual effects due to the removal of the turbines for all those able to see the turbines in the landscape. At the same time there is potential for **short term adverse** effects on population and human health from the visual effects associated with increased traffic during the removal of the turbines. The interactive effects are **likely** to be **short and long term** and **insignificant**.

16.2.4 Material Assets

The use of roads during construction will give rise to increased traffic including abnormal loads for delivery of turbine components and is likely to create some short term inconvenience to road users (with traffic and population and human health effects). A Construction-phase Traffic Management Plan will be implemented to manage traffic coming to and from the site. The underground grid route network will also affect existing forestry tracks and cross one small public road. Grid connection construction phase works are likely to create some short-term inconvenience and slight adverse effects to road users (with traffic, air quality and population and human health effects). The interactive effects are **likely** to be **short** and **insignificant**.

The existing or future use of forest resources are not expected to have significant adverse effects during the operational phase of the development. It is likely that the improvements to the on-site forest tracks would provide opportunities for further development and use of some of the forest areas for recreation, during the operational phase. This will likely have a **positive, slight** and **long-term** effect on the existing use of forest resources and the associated health benefits for users.

Energy production during the operation phase of the proposed development will **likely** have a **positive, slight** and **long-term** effect on the existing grid capacity and electrical infrastructure. This will likely have **positive, slight** and **long-term** interactive effects on population and human health, as well as climate change adaptation.

During the decommissioning phase, the removal of the turbines will have minor adverse traffic effects that may inconvenience local road users. It is likely that the grid route cables under the forest tracks and public road will be left in the ground as removing them is expected to have more adverse effects than leaving them in situ. A decision on this issue would be made during the planning phase for decommissioning. These adverse interactions of the decommissioning phase on material assets such as traffic and transport and population and human health are **not likely** to result in **significant effects**.

16.2.5 Biodiversity and Ornithology

During the construction phase, changes associated with biodiversity such as the removal of habitats, planting of new vegetation and landscaping works have the potential to cause interactions with other aspects of the environment including land and soils, water, air quality and climate, noise and vibration and traffic and transportation. The effects of water quality, land and soils, air quality and climate and disturbance from noise/vibrations and traffic effects were taken into consideration in the assessment of biodiversity effects (i.e. there will be some habitat loss and disturbance to fauna and birds during excavation of certain works areas.) With the proposed mitigation measures in place, the interactive effects are considered **short-term** and **insignificant**.

The potential associated effects and mitigation measures are described in full in **Chapter 6 Biodiversity** and **Chapter 7 Ornithology**, which includes biodiversity enhancement measures for the site.

With the proposed mitigation, the adverse interactions of biodiversity and ornithology, land and soils, water, air quality and climate, noise and vibration and traffic and transport are **not likely** to result in **significant effects** on biodiversity.

The operation of the turbines is unlikely to cause a significant displacement effect for most bird species, though hen harrier, buzzard and kestrel are identified as species which may avoid the areas around the turbines. While habituation to the presence of the turbines is likely with time, the residual effect is rated as a **Slight Significant short- to medium-term effect**. The proposed development includes rigorous ornithological monitoring (in line with best practice guidance) at pre-construction, construction, operational and decommissioning phases. There are no interactive effects during the operational phase.

Overall, the impacts of decommissioning a wind farm are potentially similar to construction impacts and will comprise temporary disturbance such as noise associated with decommissioning of turbines and on-site machinery and increased traffic. The interaction of biodiversity and water quality, and land and soils effects will not occur during the decommissioning phase.

16.2.6 Water

During the construction phase there is potential for the effects associated with surface water and ground water to interact with population and human health (due to water quality), land and soils (soil characteristics and

contamination) and biodiversity (habitat related to water quality). The interactive effects are **likely** to be **short** and **insignificant**.

These interactive effects are not relevant to the operational or decommissioning phases. The underground turbine hardstands and underground cables will likely stay in place during the decommissioning.

The potential effects associated with surface water and ground water due to the construction and operational phases of the proposed development are addressed individually and in detail, in particular in relation to suitable mitigation measures to minimise effects, within the preceding individual chapters.

A **CEMP** and **Surface Water Management Plan** have been completed as part of the EIAR to manage run-off, particularly of sediment laden water, as a means of protecting water quality and aquatic habitats.

16.2.7 Land and Soil

The excavation, stockpiling and movement of soil for the proposed development has the potential to effect air quality from increased dust emissions associated. There is also potential for related effects on surface and ground water, biodiversity, landscape, noise and vibration and traffic and transportation. The associated effects and interactions for each aspect are addressed individually in the preceding chapters.

Soil and rock will require excavating to accommodate the footprint of the turbines, substation and the grid connection. A minor interaction is with traffic and transport to import the materials required for the proposed development. A potential adverse effect on surface water can arise from construction works. The project will be developed in line with the drainage proposals for surface water management detailed in the **CEMP** as part of the civil works to ensure adequate protection of water courses during the construction phase.

These adverse interactions of biodiversity and ornithology, water, landscape, noise and vibration and traffic and transport effects are **likely** to result in **insignificant** effects during the construction phase only.

16.2.8 Noise and Vibration

Noise effects will occur during the construction phase of the project as a result of increased levels of site associated traffic and excavations during the construction phase. Noise and vibration has the potential to effect population and human health, biodiversity and traffic and transportation which are addressed individually and in detail within the preceding chapters. Appropriate noise mitigation measures and best practice methodologies provided in the **CEMP** will be implemented during the construction phase.

These adverse interaction of biodiversity and ornithology, land and soils, water, air quality and climate, noise and vibration and traffic and transport effects are **likely** to result in **insignificant** effects.

During the operational phase, the only minor noise effects will be associated with the turbine operations and maintenance traffic. This noise will have **long-term insignificant** effects on population and human health (for nearby residents) and biodiversity.

During the decommissioning phase, there will be some slight noise effects associated with the deconstruction and removal of the turbines. This will have interactive effects with population and human health and biodiversity. The interactive effects are **likely** to be **short term** and **insignificant**.

16.2.9 Air Quality and Climate

During the construction phase, there is the potential for short term, adverse effects on human health for residents of nearby dwellings and biodiversity in terms of dust emissions. Dust generated during the construction phase is

not likely to significantly affect the local air quality; however, there is the possibility of disturbance occurring from dust generated in the vicinity of the site entrances and along the local public road which could affect road users. Dust mitigation measures are presented in **Chapter 14 Air and Climate** to minimise the risk of any such effects. The interaction of adverse construction air quality effects and biodiversity and population and human health are not likely to be significant.

Once operational, it is generally accepted that the proposed development will make a slight indirect positive contribution to air quality and climate and population and human health. These interactive effects are **likely** to be **long term** and **slightly positive**.

During the decommissioning phase will have no effects on air quality and climate or interactions of effects.

The adverse interactions of air quality/climate, population and human health, traffic/transport and land and soils effects are likely to result in **insignificant adverse** effects during the construction. The same interactions during the decommissioning phase will be lower as no significant earth works are envisaged. The only air quality effects during the decommissioning phase will be associated with the use of vehicles and machinery in the short term, and a reduction in renewable energy production and associated greenhouse gas reductions in the long term (assuming the windfarm is decommissioned and not repowered). Any repowering proposals would be the subject of a new planning application.

16.2.10 Cultural Heritage

The excavation of soils during the construction of the development has the potential to have an effect on archaeology and cultural heritage, as well as land and soils. Given that cultural heritage is a component of landscape character, the indirect effects on cultural heritage also have potential to effect the landscape character during the operational phase. These effects are not significant and the interaction of these effects is **likely** to result in **insignificant short term** interactive effects.

During the decommissioning phase there will be a **long term moderate positive** interactive effect with landscape character due to the removal of the wind turbines.

16.2.11 Traffic and Transport

During the construction phase there is potential for adverse interactive effects between traffic and transport and population and human health, air quality, material assets, landscape and visual, and noise and vibration. These effects have an insignificant potential to pollute and create temporary disturbance for occupants of nearby dwellings. The interactive effects are **likely** to be **short term** and **insignificant**.

During the operational phase there is potential for long term imperceptible adverse interactive effects on population and human health, landscape and visual, and noise and vibration effects. The interactive effects are **likely** to be **long term** and **insignificant**.

During the decommissioning phase there is potential for insignificant adverse effects on population and human health and noise and vibration which could create a temporary disturbance for occupants of nearby dwellings. The interactive effects are **likely** to be **short term** and **insignificant**.

16.3 Summary

A matrix has been generated to summarise the relevant interactions and interdependencies between specific environmental aspects and a significance rating has been given. The matrix is presented in **Table 16-1**. It contains each of the environmental topics, which were considered as part of this environmental impact assessment, on both axes. These interactions have been identified for both the construction [C], operation [O] and decommissioning [D] phases of the proposed development. Full details of the significance of the effects and the relevant interactions of the environmental aspects along with any proposed mitigation are discussed within each of the individual preceding Chapters.

A number of interactions have been identified in the EIAR. These are set out below and have been addressed in the relevant chapters.

Table 16-1: Matrix of Interactions

	Population and Human Health	Biodiversity and Ornithology	Water	Land and Soils	Noise and Vibration	Shadow Flicker	Landscape & Visual	Cultural Heritage	Air Quality and Climate	Material Assets	Traffic and Transport
Population and Human Health			C	C	C/O/D	O	C/O/D		C/O	C	C/D
Biodiversity and Ornithology			C	C	C/O/D				C/O		
Water		C		C							
Land and Soils		C	C		C		C	C	C		C
Noise and Vibration	C/O	C/O									C/D
Shadow Flicker	O						O				
Landscape	C/O							C/O			
Cultural Heritage	C			C							
Air Quality and Climate	C/O	C/O		C						C/O	
Material Assets	C/O								C/O		C
Traffic and Transport	C/D	C/D			C/D		C/D		C/D	C/D	

	Interaction Occurs
	No Interaction

C	Construction Phase Effect
O	Operation Phase Effect
D	Decommissioning Phase Effect