

**MWP**

**Chapter 17 Interaction of the  
Foregoing Effects  
Brittas Wind Farm**

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## 17. Interaction of the Foregoing

### 17.1 Introduction

This Environmental Impact Assessment Report (EIAR) has presented the environmental assessments of the proposed project 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 project may have on the receiving environment and sensitive receptors.

#### 17.1.1 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.

### 17.2 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 project.

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 project. The matrix is presented in **Table 17-1**. 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 project 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.

### 17.2.1 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, cultural heritage, 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 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**.

### 17.2.2 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.) These are considered **short-term not significant** and **mitigatable**.

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

The operation of the turbines is unlikely to cause a significant displacement effect for bird species, though some species identified in Chapter 7 may avoid the areas around the turbines. While habituation to the presence of the turbines is likely with time, no significant residual effects have been identified. The Project includes rigorous ornithological monitoring (in line with best practice guidance) at pre-construction, construction and operational phases. There are no likely interactive effects during the operational phase.

Overall, the impacts of decommissioning a wind farm are potentially similar but less than those associated with the 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.

### 17.2.3 Land and Soil

The excavation and stockpiling and movement of soil for the proposed project has the potential to effect air quality from increased dust emissions associated. Soil and rock will require excavating to accommodate the footprint of the turbines, access tracks, substation, BESS and the grid connection. The delivery and removal of soils, rock and fill to and from the site will have interactions with traffic and transport. The excavation and blasting

for the borrow pit, and the vehicular transport of soil/rock materials around the site will also have some noise effects which are not considered significant. The construction and earth works will also have some visual and landscape effects and potential effects on unidentified cultural heritage resources in the ground.

A potential adverse effect on surface water can arise from construction works and this could have knock-on effects for biodiversity and ecology. 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.

The associated effects and interactions for each aspect are addressed individually in the preceding chapters.

These interactions of potential adverse effects between biodiversity, water, landscape/visual, noise and vibration, cultural heritage and traffic and transport are **likely** to result in **insignificant** effects during the construction phase only.

#### **17.2.4 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 term** and **insignificant**.

These interactive effects are not relevant to the operational or decommissioning phases. The foundations, turbine hardstands and grid route connection will be left in situ during the decommissioning phase and no significant ground works are expected.

The potential effects associated with surface water and ground water due to the construction and operational phases of the proposed project 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.

#### **17.2.5 Material Assets**

Material assets in the project area such as telecommunications networks, aviation, and electricity, gas and water/wastewater networks are minor for the wind farm site which is on agricultural land, but more significant along the grid connection route where there are existing services under the roads. There is some potential for the project to adversely affect these existing material assets and the users who depend on them. This could have interactive effects with population and human health that are rated as **brief/occasional** and **not significant**.

Effects to the road infrastructure are discussed in the traffic section below (section 17.2.12).

The production of energy, and the operation of the new substation, BESS and grid connection network during the operational phase of the proposed project 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 turbines will be disassembled and removed. The developer's IPP electrical control room and BESS will be removed. The substation and grid connection will remain in place and continue to be operated and maintained by EirGrid/ESB. It is likely that the on-site grid route cables under the access tracks 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. The main adverse effect to material assets during the decommissioning phase will be the loss of power generation and storage capacity – which will adversely affect climate change adaptation policies and objectives.

These interactions of adverse decommissioning phase material assets effects with population and human health effects are **likely** to result in **not significant** effects.

### **17.2.6 Cultural Heritage**

The excavation of soils during the construction of the proposed project 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** interaction with visual effects due to the removal of the wind turbines.

### **17.2.7 Noise and Vibration**

Noise effects will occur during the construction phase of the project as a result of increased levels of site 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. Noise also has potential for in combination effects with dust emissions. Appropriate noise mitigation measures and best practice methodologies recommended and provided in the **CEMP** will be implemented during the construction phase.

These interactions of potential adverse effects between biodiversity and ornithology, land and soils, water, air quality and climate, noise and vibration and traffic and transport 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. The interactive effects are **likely** to be **long term** and **insignificant**.

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**.

### **17.2.8 Shadow Flicker**

The proposed project has the potential to give rise to long term shadow flicker and visual effects for local 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 significant shadow flicker at sensitive receptors/nearby dwellings during the wind farm operational phase. Through the use of the proposed mitigation measures, the proposed project 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).

### 17.2.9 Air Quality and Climate

There is potential for emissions to air during the construction phases in the forms of temporary fugitive dust from excavations, stock piles and vehicle movements that could potentially have adverse interactive effects on population and human health of nearby dwellings and biodiversity. .

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 adverse interactions of air quality/climate, population and human health, traffic/transport and land and soils effects are likely to result in **not significant** 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.

Once operational, it is generally accepted that the proposed project will make a slight indirect positive contribution to air quality and climate and human population and health, as well as material assets (as it is renewable energy infrastructure). The wind farm will reduce the need for fossil fuels to generate electricity so will have a positive effect by reducing CO2 emissions.

These positive interactive effects are **likely** to be **long term** and **not significant**.

The potential and predicted effects of emissions associated with the construction and operational phases of the proposed project are addressed in **Chapter 14 Air and Climate**.

### 17.2.10 Landscape and Visual

During the construction phase there is potential for short term not significant adverse interactive effects on population and human health in relation to landscape and visual effects related to the construction earth works, machinery and traffic. The interactive effects are **likely** to be **short term** and **not significant**.

With regards to the operational phase visual effects, of the 25 No. viewpoint locations assessed, there is one viewpoint judged to be 'Significant' and 'adverse,' while there are two viewpoints judged to be 'Moderate-Significant' and 'adverse.' However, the overwhelming majority (i.e. 22 of the 25 viewpoints) are not likely to experience 'Significant' visual impacts. Indeed, two-thirds of viewpoints (i.e. 15 of the 25 No. viewpoints) were judged to have a significance of visual effect no higher than 'Slight,' with a 'Neutral' quality of effect. There are also no Significant cumulative landscape or visual effects associated with the proposed project.

Overall, the impacts of decommissioning the wind farm will comprise of temporary visual disturbance such as cranes and on-site machinery. In this regard, the visual effects of the decommissioning phase are likely to be similar to that of the construction phase, only in reverse and less apparent. Once the site is fully decommissioned, however, the visual effects of the turbines will be reversed, and while viewers at close proximity may still see the agricultural-type access tracks, the hardstands will gradually re-vegetate.

The interactive effects are **likely** to be **short and long term** and largely **not significant**.

### 17.2.11 Traffic and Transport

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 interaction between traffic and population and human health, air quality, material assets, landscape and visual, and noise and vibration effects). The interactive effects are **likely** to be **short term** and **insignificant**. A Construction-phase Traffic Management Plan will be implemented to manage traffic coming to and from the site.

The construction of the underground grid connection route will be likely to create some temporary inconvenience and slight adverse effects to neighbouring dwellings and businesses along the route, and road users (with traffic, air quality and population and human health effects). The interactive effects are **likely** to be **brief to short term** and **insignificant**.

Due to the very low volume of traffic added to the roads due to the operational of the wind farm, the potential for long term adverse interactive effects on population and human health, landscape and visual, and noise and vibration effects is considered imperceptible. The interactive effects are **likely** to be **long term** and **not significant**.

During the decommissioning phase, the removal of the turbines will have minor adverse traffic effects that may inconvenience local road users and create noise and vibrations that may affect population and human health for occupants of nearby dwellings. The interactive effects are **likely** to be **short term** and **insignificant**.

## 17.3 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. 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 the construction [C], operation [O] and decommissioning [D] phases of the proposed project. 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.



Figure 17-1: Matrix of Effects

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

	Interaction Occurs
	No Interaction

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