# Celtic Interconnector

## Volume 3B

## Ireland Offshore Environmental Impact Assessment Report - Non-Technical Summary

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## Report for

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Table of Contents

# 1 Introduction

## 1.1 Introduction and document purpose

The Celtic Interconnect Project (the marine elements of which, within Irish waters, hereafter 'the Proposed Development') is a proposed electrical link between Ireland and France that will enable the import and export of electricity between the two countries. It will be the first direct energy link between Ireland and France and is being jointly developed by EirGrid plc (EirGrid) and Réseau de Transport d'Électricité (RTE) ('the Project Promoters'), and the Transmission System Operators (TSOs) in Ireland and France, respectively.

The connection will link the electricity substation located in Knockraha (in east Cork, Ireland) to the substation in La Martyre (in Brittany, France). Recognised as a Project of Common Interest (PCI) by the European Union (EU), the Celtic Interconnector Project responds to European challenges regarding energy transition and addresses climate change by facilitating progress towards a low-carbon electricity mix. It will contribute to more secure, more sustainable, and better priced electricity.

An Environmental Impact Assessment Report (EIAR) has been prepared covering the cable route through the Irish Territorial Waters and Irish EEZ to accompany an application for statutory approval to An Bord Pleanála (ABP), and a foreshore licence application to the Department of Housing, Planning and Local Government (DHPLG), for this element of the Celtic Interconnector Project.

This Non-Technical Summary (NTS) sets out a brief summary of the findings reported in full in the EIAR.

# 2 The need for the Proposed Development and the consideration of Alternatives

## 2.1 Need for the Proposed Development

The overall Celtic Interconnector Project, with an estimated cost of €930M, is recognised as a PCI by the EU. In addition, it will:

- Support Europe's transition to the Energy Union;
- Increase competition in the electricity market by applying downward pressure on the cost of electricity to the benefit of consumers in Ireland, France, and Europe;
- Enhance the security of supply for both Irish and French electricity consumers;
- Support Europe's transition to a low carbon energy future by increasing the market available for renewable electricity and supporting the development of the renewable energy sector; and
- Provide Ireland's only energy connection to an EU Member State following the UK's departure from the EU.

## 2.2 Consideration of alternatives

There were initially five main Irish landfall options considered before Claycastle Beach was chosen. The landfalls were spaced along a 27km section of the east Cork coast. Geophysical and geotechnical marine surveys have been undertaken on all routes into the landfalls.

Claycastle emerged as the overall best performing option following an evaluation of route options for the following five constraint types – technical, environmental, deliverability, socioeconomic and economic.

Early desktop studies identified six main corridors for the cable route itself. These six route options were assessed in detail and then ranked based on a range of different factors such as environmental, technical, third-party, and commercial constraints. Overall, and although marginally greater in length, the best performing option, shown in Figure 3.1, was identified and went through detailed marine survey in 2014/2015.

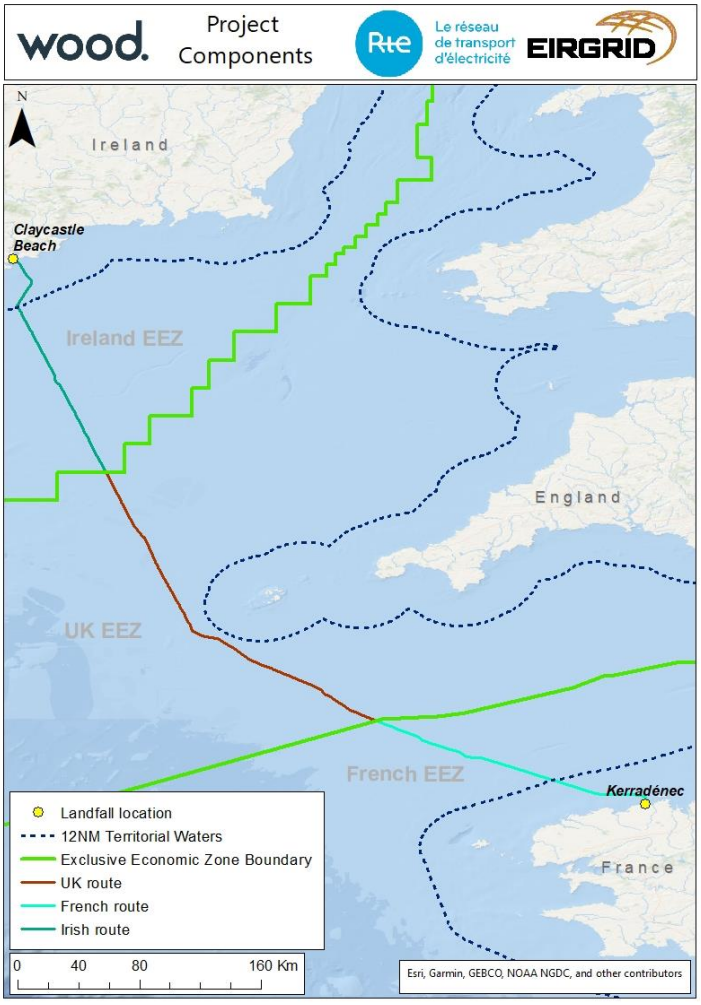
See Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 7: Alternatives Considered for further information on alternatives considered.

# 3 The Proposed Development

## 3.1 Location of the Proposed Development

An overview of the Celtic Interconnector cable route is shown in Figure 3.1. It presents the entire offshore element of the proposed route, from the Irish landfall point at Claycastle Beach, through Irish, UK and French waters, and beyond to the landfall point in France.

**Figure 3.1 Overview of the Celtic Interconnector Project across all jurisdictions**




## 3.2 Description of the Proposed Development

The Celtic Interconnector cable route is approximately 497 kilometres (km) long with 35km in Ireland's Territorial Waters, 116km in the Irish Exclusive Economic Zone (EEZ), 211km in the United Kingdom's (UK) EEZ, 87km in the French EEZ, and 48km in French Territorial Waters (all distances stated are approximate). The cable route does not enter the Territorial Waters of the UK.

An overview of the Celtic Interconnector Project is shown in Figure 3.1. It presents the entire offshore element of the proposed route, from the Irish landfall point at Claycastle Beach, through Irish, UK and French waters, and beyond to the landfall point in France.

The main elements of the interconnector consist of:

- A submarine circuit, approximately 497km in length placed on or ploughed / trenched into the seabed between France and Ireland;
- The cable route within the UK EEZ passes approximately 30km to the west of the Isles of Scilly and approximately 75km to the west of Land's End on the UK mainland;
- A landfall point where the submarine circuit comes onshore, in France and Ireland;
- A HVDC land circuit between the landfall point and a converter station, in France and Ireland;
- A converter station, to convert the electricity from HVDC to High Voltage Alternating Current (HVAC), which is used on the respective transmission grids in France and Ireland;
- A HVAC land circuit between the converter station and the connection point to the grid, in France and Ireland. This circuit is proposed using underground technology;
- A connection point to an existing substation on the transmission grid, in France and Ireland; and
- A fibre optic cable would also be laid along the entire route for operational control, communication and telemetry purposes.

The proposed Celtic Interconnector Project will require the installation of cable protection in specific sections of the route. This will be in places where the burial depth of the cable cannot be guaranteed due to the nature of the seabed, or where the cable must cross existing infrastructure. Once installed, the cable will transmit electricity using high voltage direct current (HVDC) technology between Ireland and France.

Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 5: Description of the Landfall and Chapter 6: Description of the Offshore Cable, for further information on the description of the Proposed Development.

# 4 Approach to preparing the EIAR

Environmental Impact Assessment (EIA) is a process to identify the likely significant effects of a project (in this case “the Proposed Development”) on the environment. It should be systematic, analytical, impartial, consultative, and iterative allowing environmental issues to be addressed in the design of a Proposed Development.

The preparation of the EIAR is one of the key stages in the EIA process, as it brings together information about any significant environmental effects to inform the decision about whether the Proposed Development should be allowed to proceed.

The EIAR has been prepared to accompany an application for statutory approval to ABP, and a foreshore licence application to the Department of Housing, Planning and Local Government (DHPLG), for the Celtic Interconnector Project.

A Scoping Report was submitted to DHPLG on 15 October 2020 setting out the scope of the EIAR, including the environmental topics to be included, the baseline information, surveys, and technical assessments. All scoping consultation responses forwarded by the DHPLG Foreshore Unit were taken into account when producing the EIAR.

The EIAR brings together information about any likely significant environmental effects resulting from the Proposed Development. This Non-Technical Summary summarises its key findings. The topics addressed are discussed in Chapters 5 – 17.

# 5 Population and human health

## 5.1 Introduction

This section summarises the likely significant effects of the Celtic Interconnector Project on Population and Human Health within the vicinity of the Proposed Development. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 8: Population and human health.

A number of previous reports from EirGrid have been used to inform this assessment, as well as tourism surveys available from Fáilte Ireland, and supporting government data. Telephone contact was made with local business representatives to research the local use of Claycastle Beach and establish the extent of offshore uses that might be affected.

## 5.2 Installation Phase

### 5.2.1 Use of Claycastle Beach

The Celtic Interconnector crosses Claycastle Beach, within easy walking distance of Youghal town centre. Claycastle Beach is one of three beaches near Youghal and is visited regularly by residents and visitors making use of the town's facilities and attractions.

Youghal has a population of 8,339 people and lies around halfway between the two major towns of the southern and south eastern coasts, Cork, population 119,230 and Waterford, population 53,504, the second and tenth largest towns in Ireland respectively according to the latest Census in 2016.

The estimates of numbers of people using the beach are informed by the estimates of overall tourist numbers to Youghall. Of these, accommodation capacity is most representative of peak levels and it indicates, using 2014 data, that up to 3,500 visitors might be staying at any one time in the town. In addition, there may be day-trippers, as well as residents who make use of the beach. This is almost certainly an under-estimate compared to current provision due to the implementation of improvements planned at the time.

The site works and use of construction equipment will reduce the width of the beach and for this reason alone, will have a negative impact on beach users. In addition, use of the car parking area will be required temporarily for transfer of construction equipment which will reduce parking capacity and access.

In addition, beach users who participate in water sports and angling may be more affected by parking curtailment, as it may affect transport of equipment to the beach. They are also affected by the parts of the Celtic Interconnector that extend offshore, which may limit access to parts of offshore areas and may, for example for windsurfers, affect the nature of the activity. Works will obstruct Claycastle Beach for around 10 weeks in winter and up to 4 weeks in summer, thus limiting access to launch small vessels such as personal watercraft, kites, and surf boards. Most of the restrictions will take place in winter months, outside the official bathing season, at a time of year when demand for access to the beach is at its lowest.

### 5.2.2 Tourism

County Cork is one of the most visited regions of Ireland, and Youghal has significant presence as a tourist location within it.

The number of tourists visiting Youghal is estimated to be between 30,000 and 50,000 according to Faillte Ireland, the main agency for tourism statistics in Ireland.

The majority of tourists are not likely to see construction works and associated operations generally as an attraction. However, because a cable installation is a one-off event, any minor impacts are likely to be tolerated and installation of the Celtic Interconnector Project is also likely to generate interest from some tourists. Nevertheless, it is assumed the Celtic Interconnector Project will not be associated with additional marketing to deliberately attract tourists even if the effects on beach users would allow this safely. Even with good practice procedures for communications in place, tourists will be unlikely to hear of Celtic Interconnector Project in advance of a planned visit and so are unlikely to change their plans as a result. As a result, there will be no effects from changes in demand for the tourist industry supplying them.

## 5.3 Operation Phase

### 5.3.1 Impacts on energy use and security

The cable will provide increased energy security and enable access to a larger wider energy market. A part of these overall effects can be considered applicable to the section of cable covered by the scope of this assessment.

### 5.3.2 Impacts on government revenues

The operation of the cable will generate revenue and trade flows which are taxable. A part of these overall effects can be considered applicable to the section of cable covered by the scope of this assessment.

## 5.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 5.5 Mitigation

The Celtic Interconnector Project is predicted to have a significant impact on beach users at Claycastle Beach since a proportion of the beach and parking areas will be inaccessible during construction works.

Construction activities are planned to take place over short periods, avoiding as far as possible the peak tourist season and to avoid specific events. The approach to design of the

construction plan includes flexibility to allow for circumstances such as the combination of a fixed date for an event, a weather window, and restrictions on vessel deployment schedules.

Public information will be provided about the works including: signage at and near the site; information at tourist information points; timely distribution of information to civic authorities and local organisations. There will be identification of and engagement with organisations assessed as likely to be particularly concerned or affected.

Regular physical monitoring of the site and additional monitoring of the construction site will be undertaken as appropriate before, during and after natural events, organised events (such as festivals) or other circumstances in which any aspect of works, barriers or associated safety equipment and procedures may be detrimentally affected. Further details can be found in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 14: Shipping and Navigation.

## 5.6 Conclusion

Therefore, it is anticipated that the Celtic Interconnector Project will not have any significant effect on population and human health.

# 6 Air quality and climate

## 6.1 Introduction

This section summarises the likely significant effects of the Proposed Development as a result of changes to regional air quality during operation and the impact of the greenhouse gas (GHG) emissions associated with the elements of the Proposed Development within Irish waters on the global climate. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 9: Air quality and climate.

The Proposed Development could result in a net change in emissions from the power generation sector. Net changes in nitrogen oxides ($NO_X$) and sulphur dioxide ($SO_2$) have been assessed in terms of contribution to acid and nutrient deposition.

Provisional data for 2019 suggest Ireland's GHG emissions were 59.90 million tonnes carbon dioxide equivalent. GHG emissions from energy industries accounted for 15% of GHG emissions and have been reducing since 2016, primarily due to reduced use of coal and peat, and an increased use of natural gas and renewables in electricity generation.

## 6.2 Installation Phase

The materials used during installation of the Proposed Development, particularly the cable itself, will have an associated carbon footprint. In addition, pollutants will be emitted to air as a result of the movements of road vehicles and vessels, and the operation of ancillary equipment and machinery with combustion engines. These will be used for activities related to seabed preparation, cable laying, and the installation of cable protection and cable crossings. However, the short-term and temporary nature of the works has led to the conclusion that operations will have negligible emissions relative to regional emissions.

## 6.3 Operational Phase

During operation, it is predicted that the Proposed Development will lead to reduced GHG emissions. The Proposed Development will connect regions currently isolated from European energy markets, strengthen existing cross-border interconnections, and help integrate renewable energy sources. In this context, the Proposed Development will help to maintain security of supply while optimising the efficient use of energy resources.

The increased reliance on variable renewable energy sources means that weather will have a greater impact on the future energy system. In this context, the Proposed Development will help to maintain security of supply while optimising the efficient use of energy resources. As a result, the amount of power generated by combustion of fossil fuels will be reduced.

## 6.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 6.5 Mitigation

As the Project as a whole will reduce emissions of $NO_x$, $SO_2$ and $CO_2e$, no further mitigation is considered to be necessary.

## 6.6 Conclusion

The Proposed Development is assessed as having a beneficial effect on GHG emissions over its lifetime. Estimating the scale of that beneficial effect would require an assessment of the GHG emissions associated with the entire Celtic Interconnector Project, rather than just the UK EEZ element of it. However, given the low operational emissions, the estimations of onshore GHG and Irish offshore GHG emissions produced concurrently, and the operational lifespan of at least 40 years, it is clear that a net GHG benefit to the global climate would be apparent. From an air quality perspective, the temporary nature of the works means that emissions of pollutants are small compared to the wider region. Overall, is it is predicted that the Celtic Interconnector Project will not have a significant effect on air quality and climate.

# 7 Marine sediment quality

## 7.1 Introduction

This section provides a summary of the marine sediment quality present along and adjacent to the proposed Celtic Interconnector Project route and considers the potential significant impacts that the installation and operation of the Celtic Interconnector Project may have on marine sediment quality. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 10: Marine Sediment Quality.

A desktop study and field surveys were carried out to inform this assessment, including collection of sediment chemistry samples, and marine and coastal surveys along the proposed cable route.

## 7.2 Installation Phase

During the installation phase of the Proposed Development, surficial sediments will be disturbed at both the landfall at Claycastle Beach and along the marine cable route. Disturbed seabed sediments will be resuspended into the water column and will then settle out again, which can have an effect, either positive or negative, on water quality, benthic habitats, and species.

Contamination arising from seabed disturbance is only a risk in heavily contaminated locations, which is not the situation in the case of the Celtic Interconnector Project's route. Sediment samples collected as part of cable route surveys indicate that neither Claycastle Beach nor the seabed along the cable route in Irish waters is contaminated. Sediments which are suspended due to cable burial are not expected to settle out more than 10km away from the installation area, with the majority (>90%) being deposited within 1km. The sediment is expected to settle out within a single tidal cycle.

## 7.3 Operational Phase

Once the cable and its associated infrastructure are installed and operating, it is anticipated that they will require minimal maintenance. For offshore components, the cable may need to be cut at the appropriate location and brought to the surface for repair before being put back into place on the seabed or replaced. Operational maintenance activities would typically comprise similar vessels, activities, and locations as the installation works.

Sediments are likely to be disturbed during cable maintenance activities, and effects are considered to be the same as for the installation phase.

## 7.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 7.5 Mitigation

Once the cable and its associated infrastructure are installed and operating, it is anticipated that they will require minimal maintenance. Throughout the Proposed Development's lifespan, periodic monitoring of the cable route will be undertaken; should such monitoring identify significant changes in the bathymetry or seabed features (i.e. sediment type) in the vicinity of the cable route, appropriate measures will be taken, including replacement or addition of further external cable protection, as necessary. Such works will include activities similar to initial installation of the cable or cable installation, using equipment and methods as presented within Chapter 6: Description of the offshore cable. Where this is required, potential effects will be of a similar type and magnitude as described and assessed above, during the construction phase.

## 7.6 Conclusion

The release of contaminants usually occurs within a localized area for a short period of time during the installation and should only be of concern near industrialised areas. Sediment samples collected as part of the cable route surveys in 2015 and 2018 indicate that neither Claycastle Beach nor the seabed along the cable route in Irish waters is contaminated.

Furthermore, the cable route does not pass through any designated / protected habitats or areas of particular environmental sensitivity (for example designated sites), therefore impacts on sediment quality is considered to be low. The area of seabed with potential to be affected by temporary disturbance is small within the wider setting of Irish waters. Effects because of disturbance to seabed sediments during the installation phase are therefore considered to be not significant.

# 8 Marine physical processes

## 8.1 Introduction

This section summarises the potential for effects to arise on physical coastal and sedimentary processes associated with the marine components of the Proposed Development, between the Irish High Water Mean (HWM) and EEZ boundary, and focusing on the immediate corridor area. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 11: Marine Physical Processes.

The field of marine physical processes considers the natural cycle of tides, currents, wave climate and the resulting sediment transport regime. Installation and placement of structures on the seabed has the potential to influence the flow of water and the associated characteristics of waves and currents, thus potentially altering the sedimentary regime. In general, as water depths increase, the Proposed Development is outside the influence of localised changes in coastal activities that might affect physical processes at the seabed.

In addition to desktop assessments, a number of field surveys were completed along the length of the cable route in Irish coastal and offshore waters, covering a 500m wide corridor.

### 8.1.1 Wind and wave conditions

Spatial variations in wind and wave conditions were recorded along the length of the cable route, with an average wind velocity greater than 8m/s along most of the route. The wind strength weakens approximately 50-75km off the Irish coast, where the wind is less regular and affected by turbulence. Westerly and south-westerly winds are dominant along the length of the cable route. Maximum wind speeds (up to 31.1m/s in the nearshore zone) were recorded from December to February, with minimum speeds from June to August.

Due to the prevailing wind conditions, the main direction of the overall sea state has a west-south-west incidence, with these winds tending to create higher wind sea waves than those towards the French coast. Maximum significant wave heights of up to 7m were recorded within the nearshore zone in Irish Territorial Waters.

### 8.1.2 Sea level

The highest positive storm surges (where tides and waves combine to push water onshore) occur during winter, with stronger winds blowing in from the south-west, and lowest negative storm surges (where water is pushed away from the shore) occur during spring, when winds from the north-east / east-north-east become stronger.

### 8.1.3 Currents

Tidal currents are stronger during the spring and autumn. At the Irish end of the cable route, where tides are weaker, the strong winter winds have a non-negligible impact on peak current speeds which contributes to a higher seasonal variability. In the northern half of the cable route, in the offshore zone, current velocities average less than 0.25m/s (approximately 0.5 miles/hr) and decrease inshore towards the Irish shoreline.

### 8.1.4 Seabed conditions and depth

In general, the nature of the seabed sediment along the cable route is predominantly fine to coarse sands, with occasional gravel and pebbles, with the dominant sediment type represented by gravelly muddy sand. Where finer sediments are present in this area, due to the comparatively high energy environment (in particular in shallower waters), silts and clays may often remain suspended, being prevented from settling by tidal currents and wave action. Throughout the length of the Proposed Development, sediments form seabed features including mobile sand ripples and sand waves. Overall, in Irish waters, seabed sediments are sand dominated, with maximum levels of approximately 90% recorded at some sampling stations.

## 8.2 Installation Phase

Introduction of hard material into an area which is predominantly sedimentary has the potential to result in localised changes to hydrographic conditions, and associated sediment dynamics. As described above, the seabed along the route of the Celtic Interconnector Project exhibits a number of features, including mobile sand ripples and waves.

It is predicted that a level of scour may occur where external cable protection is installed. However, due to the purpose of the cable protection, its design will be as such to minimise this occurring, for example through the slope of the installed protection, minimising changes to micro-level water flows in the immediate vicinity. Further, due to the mobile nature of the seabed, should any temporary scouring occur, this is likely to be infilled in a short period of time. No environmentally sensitive habitats were recorded along the cable route, and low levels of scouring are anticipated. Effects on local sediment dynamics through the presence of external cable protection are therefore considered to be not significant.

Works at the landfall, at Claycastle Beach, and in the immediate intertidal area, have the potential to affect existing patterns of erosion / accretion within the coastal zone. However, as the purpose of works during installation is to ensure that the infrastructure is installed in a manner which is safe to both the surrounding environment and the cable itself, a key consideration is that the cable remains buried. Although there will be temporary disturbance of the sediment, restoration of the beach area will be undertaken, with the cable buried at a sufficient depth not to interact with surface sediments. On that basis, no significant changes to existing coastal processes are anticipated.

Throughout the majority of the route, the cable will be buried at a minimum depth of 1m below the seabed surface, and it is therefore predicted to have no significant effect on local bathymetry in terms of seabed features or overall water depth.

## 8.3 Operational Phase

The hydro-sedimentary study carried out for the Proposed Development assessed the potential for sediment mobility induced by currents and waves along the cable route. In Irish waters, wave-induced sediment mobility occurs close to the shore, in depths of up to 20m, decreasing as water depth increases to 60m, beyond which waves have no influence on

surficial sediments. In the offshore zone, the sediment thickness with the potential to be affected by wave- or current-induced mobility is generally less than 1m.

In Irish waters, the seabed depth drops away steeply in the first 20km of the proposed cable route, with the majority of the Celtic Interconnector Project cable being located in waters with a water depth of 60m plus, reaching maximum depths of over 100m.

## 8.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 8.5 Mitigation

During the pre-construction engineering and design phase for the Celtic Interconnector Project, detailed sub-bottom profiling and accompanying analysis of the seabed along the route of the Proposed Development will be undertaken. From this, the most appropriate installation techniques will be established, as determined by seabed type; this selection shall indirectly minimise sediment disturbance.

Where external rock protection is required, this will be designed according to seabed type, again, minimising sediment and seabed disturbance.

Where the need for external rock protection is identified, this will be designed according to the receiving environment, based on seabed type, and the need to reduce seabed disturbance. Throughout the Proposed Development's lifespan, periodic monitoring of the route will be undertaken; should such monitoring identify significant changes in the bathymetry or seabed features in the vicinity of the cable route, appropriate measures will be taken, including replacement or addition of further external cable protection, as necessary.

## 8.6 Conclusion

Due to the mitigation described above, no significant effects on marine physical processes are predicted to arise from the Celtic Interconnector Project.

# 9 Marine water quality

## 9.1 Introduction

This section provides a summary of the marine water quality likely to be present along and adjacent to the route of the Proposed Development and considers the potential significant impacts that the installation and operation of the Celtic Interconnector Project may have on marine water quality. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 12: Marine Water Quality.

With the exception of bathing and shellfish water areas, concentrations of contaminants in marine waters are not routinely measured under existing monitoring programmes, and no water samples were taken as part of the route survey. Baseline information regarding marine water quality in the water column along the Proposed Development route has therefore been drawn from existing sources.

The Irish landfall will be at Claycastle Beach near Youghal, County Cork. There is a designated bathing water area here (‘Youghal, Claycastle’). Claycastle Beach is an approximately 500m long gently sloping sandy beach that holds Blue Flag Bathing Water Status, which demonstrates that the beach complies with the 'excellent' standard outlined in the Bathing Water Directive. The bathing water quality at Claycastle Beach was classified as ‘excellent’ in 2019.

## 9.2 Installation Phase

Water quality has the capacity to be affected through release of contaminants held in marine and coastal sediments when those sediments are disturbed. While water chemistry data is not available from the route surveys, detailed geophysical, geotechnical, and benthic surveys were undertaken in Irish Territorial Waters and in the Irish EEZ along the proposed cable route, with this information, in particular on sediment quality, used to inform this assessment.

During preparatory works, activities likely to cause disturbance of the seabed include boulder removal and sandwave sweeping. During construction works, pre-lay grapnel runs, construction of infrastructure crossings, cable lay, and cable burial all are likely to cause seabed disturbance. However, sediments settle out of the water column relatively quickly and there is no significant contamination within the sediments that may cause impacts when disturbed and so there will be no significant effects.

The presence of installation vessels during marine construction works and surveys will marginally increase the risk of a pollution incident, which has the potential to negatively impact marine water quality. The running aground of a vessel or a collision could lead to a fuel spill. In addition, cleaning fluids, oils, and hydraulic fluids used onboard cable laying vessels could be spilled overboard or unintentionally discharged. However, a pollution incident would only occur in case of an accident and is therefore considered an unlikely effect, and is not significant.

## 9.3 Operational Phase

Use of vessels during maintenance works has the potential to impact marine water quality via the release of hazardous substances through loss of chemicals / fuels. The marine environment is highly sensitive to hydrocarbon and chemical spills, which can have major ecological effects. However, as outlined above, a pollution event would only occur in case of accident, and is therefore considered an unlikely effect, and is not significant.

Sediments are likely to be disturbed during cable maintenance activities, and effects are considered to be the same as for the installation phase.

Contamination arising from seabed disturbance is only a risk in heavily contaminated locations (OSPAR, 2009). Sediment samples collected as part of cable route surveys indicate that neither Claycastle Beach nor the seabed along the cable route in Irish waters is contaminated. Sediments which are suspended due to cable burial are not expected to settle out more than 10km away from the installation area, with the majority (>90%) being deposited within 1km. The sediment is expected to settle out within a single tidal cycle.

## 9.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 9.5 Mitigation

In line with guidelines outlined in BERR (2008) and OSPAR (2012), the cable route has been designed to avoid European designated sites (ie Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and candidate sites) and thus minimise any potential effects to areas of conservation importance.

During the pre-construction engineering and design phase for the Celtic Interconnector Project, a confirmatory analysis of the seabed along the route of the Proposed Development will be undertaken. From this, the most appropriate installation techniques will be established, as determined by seabed type, and by doing so, minimising sediment disturbance and hence effects on marine water quality. In addition, where external cable protection is required, this will be designed according to seabed type, again, minimizing sediment and seabed disturbance. Minimising seabed disturbance will minimise the potential resuspension of contaminants from seabed sediments to the water column.

Vessels used for installation will be compliant with MARPOL regulations (the International Convention for the Prevention of Pollution at Sea, initially adopted in 1973). These regulations cover the prevention of pollution from accidents and routine operations in the marine environment. In addition, mitigation measures will be taken to minimise the risk of collision between installation vessels and other vessels. All vessels will have shipboard oil pollution emergency plans (SOPEP) in operation; such plans may highlight measures

including an action plan for when any spillages occur, drawings of fuel lines, and the location of the SOPEP box, containing anti-pollution / cleaning equipment.

## 9.6 Conclusion

There is the potential for marine water quality to be impacted by any activity which causes disturbance of the seabed along the route through release of contaminants held in surficial sediments. However, changes in marine water quality arising from seabed disturbance is only a risk in heavily contaminated locations. Sediment samples collected as part of cable route surveys in 2015 and 2018 indicate that neither Claycastle Beach nor the seabed along the cable route in Irish waters is contaminated.

The cable route does not pass through any habitats or areas of environmental sensitivity, therefore receptor value for water quality is considered to be low. Any elevation in suspended sediment concentrations once installation works are complete will be temporary, with levels expected to return to baseline within a single spring-neap tidal cycle.

Therefore, the Celtic Interconnector Project is predicted to have no significant effect on marine water quality.

# 10 Biodiversity

## 10.1 Introduction

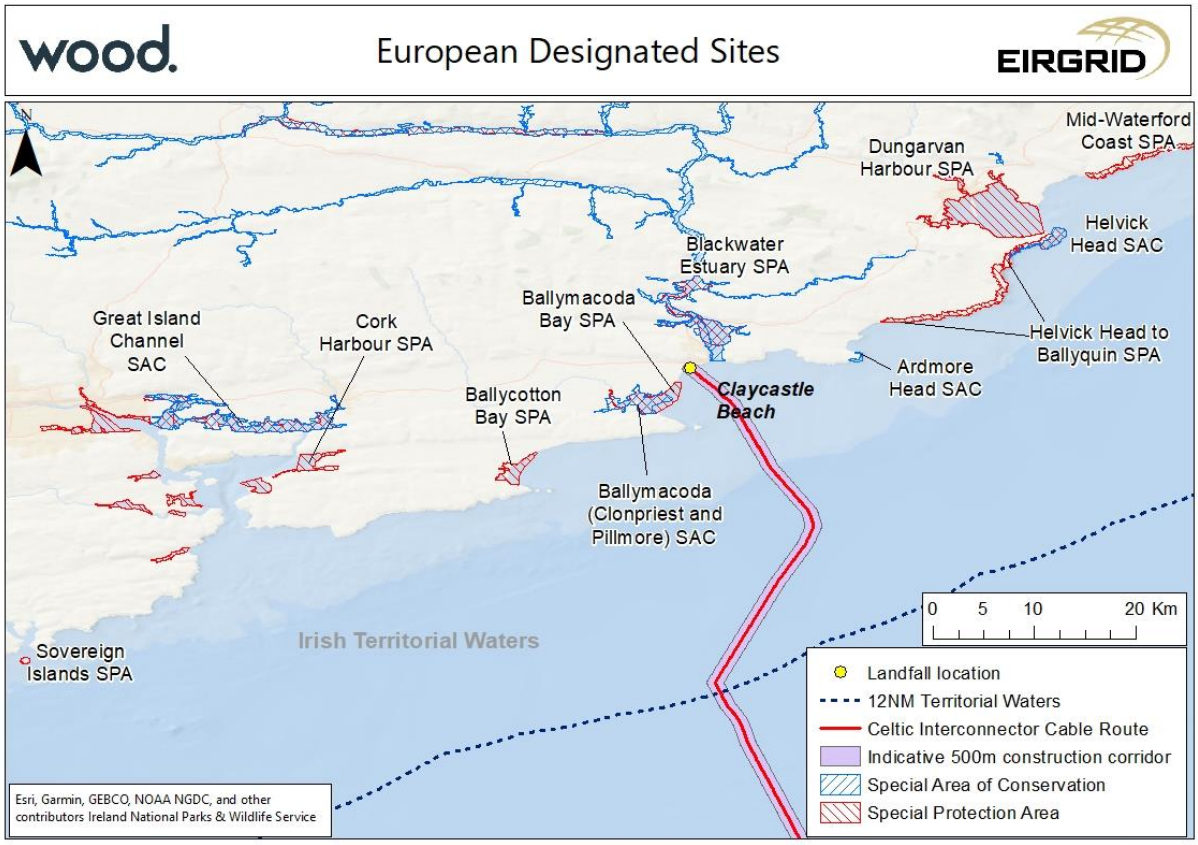
This section summarises the likely significant effects of the Proposed Development with respect to biodiversity, including intertidal and benthic habitats and ecology, natural fish ecology, ornithology, marine mammals, and reptiles. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 13: Biodiversity.

Data on benthic habitats and fauna was gathered along the route of the Celtic Interconnector Project in two campaigns carried out in 2015 and 2018 respectively. Ornithological surveys of the intertidal and nearshore environments have been carried out at the landfall location at Claycastle Beach. Marine mammal observers (MMOs) were operational onboard the 2014 and 2017 geophysical survey vessels, with their records used to inform the EIAR. A desk-study has also been undertaken to inform the assessment presented within this section.

### 10.1.1 Designated Sites

A number of European sites support mobile species which could interact with the landfall of the Celtic Interconnector Project have been identified and are presented in Figure 10.1. These comprise Special Areas of Conservation (SAC) for habitats and non-bird qualifying features, and Special Protection Areas (SPA) for bird species. Key effects considered on the sites depend on the potential ‘pathways’ which may exist between the Proposed Development, activities associated with it, and the sites / their qualifying features, but may include direct effects, disturbance, or indirect effects on predator species due to effects on their prey.

**Figure 10.1 Coastal European Designated Sites within the Study Area**




### 10.1.2 Intertidal and Benthic Habitats and Ecology

A number of intertidal, benthic, and other coastal habitats have been identified at Claycastle Beach including areas of littoral rock, littoral sand and muddy sand, coastal dunes and sandy shores and coastal shingle.

The sediment type observed during surveys within the Irish Territorial Waters and Irish EEZ showed substrate was variable, ranging from areas of soft rippled sand to large rocks and cobbles.

Along the cable route on the approach to Claycastle Beach, the benthic community is characterised by the presence of a range of species groups including marine worms, shelled species, such as mussels, sponges, and starfish. These form elements of marine and coastal foodwebs, providing prey species for fish populations, and subsequently birds and marine mammals. No protected or invasive species were recorded.

### 10.1.3 Natural Fish Ecology

A total of 24 fish species were recorded in the lower estuary around Youghal, ranging from freshwater species, e.g., dace (*Leuciscus leuciscus*), to fully marine species, e.g. cod (*Gadus morhua*). A number of migratory species such as Atlantic salmon (*Salmo salar*), sea tout (*Salmo trutta*), eel (*Anguilla anguilla*) and smelt (*Osmerus eperlanus*), were also recorded. The most commonly occurring species in the lower estuary were common goby which were recorded at 11 sites throughout the estuary and flounder, recorded at eight sites.

A number of commercial species of fish use areas of Irish Territorial Waters occupied by the proposed interconnector cable route for both spawning and nursery grounds. Such species include Atlantic herring, whiting, and haddock who spawn within Irish Territorial Waters throughout the year.

The sensitivity of spawning grounds has been assessed as low as although eggs present on the seabed at the time of ground preparation and cable installation would be removed or destroyed, populations are considered tolerant of this singular, localised event that will not result in a significant effect to the spawning stock biomass.

### 10.1.4 Ornithology

Wetland bird surveys undertaken in 2019, 2020 and 2021 within the intertidal areas and adjoining fields at Redbarn – Claycastle Beach identified a total of 22 species. The working area at the landfall point at Claycastle is approximately 20m wide, and therefore occupies only a small proportion of the survey area.

Overall, the data gathered from the Wetland Bird Survey shows that six of the 22 species were seen on a single occasion, only in very small numbers within the intertidal area or in fields behind the beach (mute swan (*Cygnus olor*), mallard (*Anas platyrhynchos*), eider (*Somateria mollissima*), water rail (*Rallus aquaticus*), grey plover (*Pluvialis squatarola*) and great black-backed gull (*Larus marinus*). A further seven species occurred, at peak, in numbers less than 0.1% of the all-Ireland totals - teal (*Anas crecca*), cormorant (*Phalacrocorax carbo*), grey heron (*Ardea cinerea*), oystercatcher (*Haematopus ostralegus*), turnstone (*Arenaria interpres*), dunlin (*Calidris alpina*) and redshank (*Tringa totanu*s).

The species of birds assessed do not occur in significant numbers (with the exception of sanderling) within the vicinity of the Proposed Development so are therefore not predicted to be significantly impacted by the Celtic Interconnector.

### 10.1.5 Marine Mammals and Reptiles

The Celtic and Irish Seas support a variety of marine mammals, including cetaceans and seals. A total of twenty-four cetacean species have been recorded in Irish waters, with the most commonly recorded of these being common dolphin (*Delphinus delphis*), bottlenose dolphin (*Tursiops truncatus*) and harbour porpoise (*Phocoena phocoena*), with populations present year-round. Other species recorded include minke whale (*Balaenoptera acutorostrata*) and humpback whale (*Megaptera novaeangliae*). The Irish Whale and Dolphin Group (IWDG) collates records of sightings and strandings within Irish waters. Recent coastal sightings have included a fin whale and a pod of 20 unidentified dolphins off Helvick Head, Co. Waterford.

Both grey and common seals are also present in Irish waters, with the majority of the populations being present along the western coast. Grey seals (*Halichoerus grypus*) resident off the Cork coast comprise part of the North-east Atlantic population, approximately 100,000 individuals, 80% of which are located around the shores of Ireland and Britain. For common harbour seals (*Phoca vitulina),* there are an estimated 30,000 in Irish and UK waters. Seals in the vicinity of the Celtic Interconnector, whether at the landfall or along the cable route,

are not linked to European sites, based on consideration of foraging ranges, and the nearest sites designated for these species.

Due to their similar wide-ranging nature, sea turtles have been included within this section, although the likelihood of encountering them during works on the Proposed Development are low. Of a total of 682 records of leatherback turtles (*Dermochelys coriacea)* between 1960 and 2004 in Irish and UK waters, 161 were from Irish waters. Other turtle species recorded in Irish waters have included the green turtle (*Chelonia* mydas), hawksbill turtle (*Eretmochelys imbricata*), Kemp's Ridley turtle (*Lepidochelys kempii*) and loggerhead turtle (*Caretta caretta*).

## 10.2 Installation Phase

During all works at sea and in the intertidal zone, there is limited potential for loss of chemicals, fuels, or other pollutants as a result of accidental spills from installation vessels and other associated heavy plant. This can result in both direct toxic effects on individuals in the water column and on the seabed, and subsequent effects on other species in the food-web, including predator species such as seabirds and marine mammals.

Underwater noise and disturbance effects on marine mammals in the intertidal zone (seals) and subtidal zone (all groups) are possible during the installation phase. Particularly, as a result of underwater noise from piling, to create and remove the cofferdam (causing potential disturbance, hearing loss/injury and/or direct mortality), subsea survey and monitoring equipment (causing potential disturbance, hearing loss/injury and/or direct mortality) and increased vessel movements (causing seal injury from ducted propellers).

The Proposed Development has the potential to cause disturbance to seabirds due to installation works, temporary habitat loss from installation works including due to increases in suspended sediment and pollution events reducing habitat quality or having direct toxic effects.

Installation of the cable will result in the mortality of any fish and shellfish trapped by the cofferdam, and not displaced by site disruption and noise. Cryptic species such as juvenile flatfish, and sessile species such as razor shell species, are more at risk than mobile and pelagic species of fish and crustacean. These mobile species have more potential to relocate to alternative habitat nearby during installation and may return once the temporary works are complete.

## 10.3 Operational Phase

Underwater noise and disturbance effects on marine turtles are possible during the operational phase. Particularly, as a result of subsea survey and monitoring equipment (causing disturbance, low frequency masking, possible hearing loss/injury and/or direct mortality).

Underwater noise from subsea survey and monitoring equipment (causing disturbance, low frequency masking, possible hearing loss/injury and/or direct mortality) is a short-term impact. Embedded mitigation is predicted to be sufficient in reducing the significance of this impact, as well as its short term, temporary nature.

## 10.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 10.5 Mitigation

Throughout works to install both the cable itself, and associated external rock protection, a number of embedded mitigation works have been incorporated into project design. Mitigation specific to biodiversity aspects of the assessment, unless otherwise agreed with the NPWS and/or the Foreshore Unit includes:

- Project-related vessels to be operated in line with IMO Guidelines for the reduction of underwater noise to address adverse impacts on marine life;
- Operations in the Irish marine environment to be undertaken in line with the 'Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters', as published by DAHG (2014). This guidance recommends the use of MMOs for pre-start monitoring, ramp up procedure, breaks (>30 mins) in sound output and reporting;
- For the Proposed Development, different development activities have been assessed, including piling, geophysical acoustic surveys (not seismic), high frequency (>200kHz) bathymetric surveys, using multibeam and singlebeam echosounders, cable laying and cable protection. From these, and to be in line with this assessment and guidance (i.e. mitigation required >180dB and a ramp up procedure >170dB), an MMO (dedicated) is only required for piling and the geophysical acoustic surveys (not seismic). High frequency (>200kHz) bathymetric surveys, using multibeam and singlebeam echosounders, are above the low-mid hearing frequency ranges of marine mammals, basking shark, marine turtles and fish. Cable laying and cable protection have been assessed as being below level that would require mitigation (<180dB). Also, the sound pressure levels are expected to be in the same range, as those from the installation vessels;
- DAHG (2014) guidance outlines operational requirements concerning MMOs. These requirements require MMOs to be familiar with the Irish regulatory procedures, be provided with full details of all licence/consent conditions, be dedicated to and engaged solely in monitoring development activities and conducting survey effort for marine mammals in accordance with the guidance. The use of a crew member or team member with other responsibilities is not considered to be satisfactory. A sufficient number of MMO personnel must be assigned to ensure that the role is performed effectively and to avoid observer fatigue. General conditions for effective visual monitoring by MMOs are: (1) during daylight hours; (2) in good visibility extending 1km or more beyond the limits of the assigned Monitored Zone (1,000m for

piling and 500m for geophysical acoustic surveys, not seismic); and (3) sea conditions WMO Sea State 4 (*Beaufort Force 4*) or less. Efficacy in the visual detection of marine mammal species improves considerably below Sea State 3 (*Beaufort Force 3*);

- Unless otherwise agreed with the NPWS and/or the Foreshore Unit, MMOs must be located on an appropriate elevated platform from which the entire Monitored Zone (1,000m for piling and 500m for geophysical acoustic surveys, not seismic) can be effectively covered without any obstruction of view. For geophysical acoustic surveys and other moving platforms from which sound-producing activity is taking place, MMOs must be located on the source vessel;
- DAHG (2014) guidance also recommends that, in some cases involving the persistent significant risk of injury to marine mammals in Ireland, the supplementary use of passive acoustic monitoring (PAM) may be recommended, or required, as part of the licence/consent conditions, in order to optimise marine mammal detection around the site of a plan or project. It is also indicated that PAM has/should not be regarded as the primary or sole monitoring approach for risk management purpose. It was identified that for PAM be effective, animals are required to vocalise and their detection depends on the range capability of the technology. It should also be recognised that this was related to the method/technology that was available back in 2014;
- Use of noise-attenuation fencing, solid hoarding or other acoustic barriers to reduce in-air noise propagation and to conceal human activity. The barrier material shall have a mass per unit area exceeding 7kg/$m^2$ in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4;
- Use of piling types and techniques that limit noise propagation: namely vibratory sheet piling installation and piling at low tide;
- Use of ramp up/soft start procedures for piling and geo acoustic survey techniques to prevent receptors from being startled e.g. birds, marine mammals, marine turtles and fish (inc. basking shark);
- Project-related vessels will adhere to international best practise regarding pollution control, including the MARPOL convention; and
- Ensure appropriate burial depths and heat shielding from cable burial and rock placement (where applicable). This will indirectly reduce effects from heat emissions and electro-magnetic fields (EMF).

## 10.6 Conclusion

Due to the mitigation described above, it is predicted that the Celtic Interconnector Project will not have any significant adverse effects on biodiversity in the vicinity of the Proposed Development.

# 11 Seascape and landscape

## 11.1 Introduction

This section summarises the likely significant effects of the Celtic Interconnector Project within Irish Territorial Waters and the Irish (EEZ) with regard to the seascape and landscape. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 14: Seascape and Landscape.

Landscape is defined by the European Landscape Convention (ELC) as "*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*". It includes land, inland water, and marine areas. It concerns landscapes that might be considered outstanding as well as every day or degraded landscapes.

A desktop review of legislation, guidance documents, and current best practices in EIA was carried out to inform the assessment. Surveys of Claycastle Beach were also undertaken in 2017/2018, with a follow-up walkover survey carried out in late 2020. The walkover survey did not note any changes to the general beach environment since the initial survey conducted in 2018, with the exception of the introduction of a wooden boardwalk that is currently under construction to connect the eastern end of the car park with Beach Promenade.

The Cork County Draft Landscape Strategy identifies Claycastle Beach as being within Landscape Character Type (LCT) 2: Broad Bay Coast and more specifically with Landscape Character Area (LCA) 35 - Youghal Bay. This LCT "*stretches along the coast from the mouth of Cork Harbour in the west to the eastern boundary of County Cork at Youghal*" and features the following key characteristics:

- Land use, field, boundaries, trees, and wildlife:
    - The coastline sweeps in broad bays flanked by low promontories, terminating along the shore with low cliffs, and a combination of rocky shores and long crescent shaped bays.
    - Inland, moderately sized fertile fields bounded by low broadleaf hedgerows, are used mostly for dairy pasture but also some tillage.
- Built Environment:
    - Isolated cottages, two-storey houses and farmsteads are scattered across the landscape.
- Socio Economic:
    - Towns and villages include Youghal, Shanagarry, and Ballycotton.
- Ecology:
    - The freshwater marsh at Ballyvergan is Ireland's largest coastal freshwater marsh and is important for a number of breeding species including the Reed Warbler, and non-breeding birds including wintering raptors.

- Cliffs and offshore islands are important for breeding seabirds including cormorants, black guillemots, gulls and fulmar. Other coastal and estuarine habitats are important and support significant numbers of wintering birds.
- The Blackwater River and its associated woodlands and other habitats are the most noteworthy inland habitats within this area."

## 11.2 Conclusion

An assessment of landscape and seascape effects has been scoped out of the EIAR on the basis that significant effects are considered unlikely to occur.

# 12 Archaeology and cultural heritage

## 12.1 Introduction

This section summarises the likely significant effects of the Proposed Development with respect to the marine historic environment within Irish Territorial Waters and the Irish EEZ. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 15: Archaeology and Cultural Heritage.

Archaeological assessments of the entire route were undertaken in 2014 and 2015, including a desk-based assessment (DBA), and assessment of marine geophysical survey data for the entire route and two landfall location options in Ireland. Subsequent archaeological assessments were then completed on the new / revised routes.

The Celtic Sea is an area used historically for access to the Atlantic ports of Ireland, England, Wales, and France, and while recorded and potential wrecks and obstructions are more sparsely distributed, the potential that such features may be affected will remain.

Initial studies identified a number of recorded known ship losses within the cable study corridor (CSC), and subsequent analysis of marine geophysical survey has identified further potential wrecks. There are no formally designated wrecks within the CSC or wider study area, and a single recorded wreck is recorded within the CSC.

## 12.2 Installation Phase

Offshore deposits of geoarchaeological interest would be directly disturbed during the installation of the marine cable where the cable is buried by jetting or ploughing. These deposits are not present in areas where rock-cutting would be used.

The anticipated depth of burial of the cable would be sufficient to remove or disturb deposits of geoarchaeological interest in areas of the cable route where these remains have been observed to survive. However, these deposits also appear to be relatively extensive features and potential disturbance would be limited to small areas of these wider deposit sequences. There is the potential for disturbance of preserved silt and peat deposits within the intertidal zone; however, this would affect a relatively small part of a much larger heritage asset, the majority of which would remain undisturbed.

Preparation and clearance of the proposed route has the potential to give rise to disturbance of archaeological material on the seabed, while cable installation would primarily affect material buried under marine sediments. However, routeing has been undertaken to avoid all known archaeological features, any features identified during seabed surveys for the cable design have also been avoided and so the potential to cause significant impacts is low. Given the extent of preparation required in advance of cabling and disturbance arising from cabling, it is also considered that placement of cable protection would not give rise to disturbance of archaeological remains.

## 12.3 Operational Phase

Adverse effects would only arise during the operational phase of the Proposed Development where the installed cable protection altered local marine and coastal processes to induce or accelerate scour or differential deposition of marine sediments, affecting archaeological remains on the seabed. This would be anticipated in more dynamic environments, primarily in shallow water near shore, where localised high points caused by installation of cable protection could interact with tidal currents, potentially give rise to disturbance of marine archaeological remains. However, a requirement for cable protection is not predicted in the shallow nearshore environment due to the soft nature of the sediment in this area and any effect, if arising, would be very localised. Any cable protection would be designed to have regard to the need to minimise change to soils and processes and as a result, no significant adverse effect is predicted.

## 12.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 12.5 Mitigation

Mitigation of the disturbance of offshore deposits of geoarchaeological interest would be achieved by an agreed programme of further archaeological investigation and recordings, combined with analysis of archaeological material already recovered and appropriate publication/dissemination of the results.

Archaeological exclusion zones will be established round the sites of known and potential wrecks. These exclusion zones would be 100m from the recorded location or location of any high potential sites, and 50m from the location of any medium potential sites and would be used to minimise the potential for disturbance of wreck sites.

## 12.6 Conclusion

It is predicted that there would be no disturbance of known remains, either during cabling or installation of cable protection. There is however a limited potential for inadvertent disturbance of remains that have not yet been identified during installation of cabling and installation of cable protection.

Therefore, it is predicted that the Celtic Interconnector Project will not have a significant effect on the archaeology and cultural heritage within the area due to the mitigation measures described above.

# 13 Material assets

## 13.1 Introduction

This section summarises the likely significant effects of the Celtic Interconnector Project relating to or potentially interacting with material assets in Irish Territorial Waters and in the Irish EEZ. Material assets are defined as built services and infrastructure that have an economic or otherwise material value. These include those that may be operational or out of service. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 16: Material assets.

Magnetometer surveys were completed along the length of the cable route in UK waters, which have informed this chapter notably through the identification of existing subsea cables.

## 13.2 Installation Phase

### 13.2.1 Proposed Offshore Renewables Project Sites

Approximately 3.1km of the Celtic Interconnector Project cable route runs through an area designated for the Inis Ealga Marine Park. As the Inis Ealga Marine Energy Park is a floating wind proposal, it can be anticipated that a large number of mooring lines will be positioned across the site, anchored as appropriate depending on the local seabed geology. As the Celtic Interconnector Project will be developed before the wind farm Inis Ealga scheme will need to be micro-sited to avoid the Celtic Interconnector Project, and Cable Crossing Agreements put in place with the Project Promoters where necessary.

### 13.2.2 Marine Aggregate Resources

In 2008, the Irish Sea Marine Aggregate Initiative (IMAGIN) undertook an analysis of marine aggregate extraction potential in the Irish Sea, that included waters between 20-60nm from the coast at Claycastle Beach. Approximately 8km of the Celtic Interconnector Project cable route within Irish Territorial Waters intersects an area identified as having potential for the extraction of sand.

While the data available suggest that the sand deposit indicated has potential to be suitable for aggregate extraction, this is not an area currently licenced for this activity. There are additional, larger areas of similar deposit in the wider area, so installation of the Proposed Development is unlikely to restrict any future licensing of marine aggregate extraction.

### 13.2.3 Existing Cables

The routes of existing subsea cables have been identified from the previously mentioned subsea surveys undertaken for the Proposed Development. The interconnector cable route intersects with 10 existing in-service cable routes, which include several trans-Atlantic cables. Cable Crossing Agreements will be put in place where necessary.

## 13.3 Operational Phase

The intersection of the Celtic Interconnector Project cable route and indicative installation corridor with the area designated for the Inis Ealga Marine Park has the potential to sterilise the area designated for offshore wind development as penetrative construction methods will not be permitted to occur over or in proximity to the Proposed Development. As the Inis Ealga Marine Energy Park is a floating wind proposal, it can be anticipated that a large number of floating turbine mooring lines will need to be positioned across the site. These are typically anchored via a variety of possible engineering solutions depending on the local seabed geology, and that typically penetrate the seabed to variable depths. This infrastructure will need to be micro-sited to avoid the Proposed Development, and Cable Crossing Agreements will need to be put in place with the Project Promoters where necessary.

The length of cable that intersects the Inis Ealga Marine Energy Park is 3.1km. Assuming a worst-case whereby the 500m indicative cable corridor is maintained during the operational phase of the Proposed Development as an exclusion zone to further development, this would result in the sterilisation of 0.17 % of the seabed available for the Inis Ealga Marine Energy Park. Given the overall size of the Inis Ealga Marine Energy Park, the magnitude of this impact as a restriction to development is low.

## 13.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 13.5 Mitigation

Mitigation measures that will be embedded in the Proposed Development includes consultation with existing cable operators, use of crossing-specific cable protection specifications, and approval of Cable Crossing Agreements prior to works.

Consultation with the Inis Ealga Marine Park developers will be undertaken to determine the likelihood of the offshore windfarm proceeding in this location, the level of risk associated with the cable location and the cable installation methods including cable protection.

## 13.6 Conclusion

No significant impact was predicted to the proposed Inis Ealga Marine Park site due to the scale of the interaction. A slight adverse impact has been identified in relation to existing cables due to the high economic value of these material assets. However, the mitigation embedded into the Proposed Development through the design of each cable crossing and application of Cable Crossing Agreements, will ensure that this is limited to as low as reasonably practicable.

Therefore, it is predicted that the Proposed Development will not have any significant effect on material assets.

# 14 Noise and vibration

## 14.1 Introduction

This section assesses the likely significant effects of the Celtic Interconnector Project within Irish Territorial Waters and the Irish Exclusive Economic Zone (EEZ) with regard to noise and vibration. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 17: Noise and Vibration.

Certain marine species use sound for communication, navigation, and the identification of prey. Sound sources exist naturally in the marine environment, and marine fauna is typically adapted to these. The installation of the Celtic Interconnector Project cable has the potential to introduce sound sources to the marine environment that could be above the ambient sound levels of the receiving environment and have a detrimental impact on marine life within the vicinity of the Proposed Development.

No project-specific surveys of in-air or underwater ambient noise conditions were undertaken during the planning and design phases of the Proposed Development, so a desk study has been carried out.

## 14.2 Installation Phase

Underwater sound will be produced during the installation of the cable as a result of vessels, equipment and machinery, seabed preparation activities, cable laying, and the installation of cable protection.

Previous studies of rock deployment found that the noise of rock placement from vessels could not be detected by monitoring equipment above the vessel noise, with no clear difference between the vessel’s noise levels when placing and not placing rock protection.

Installation vessels primarily generate underwater noise from their engines, propellers, navigation systems, dynamic positioning systems, and on-board machinery. These types of sounds will be propagated during the installation of the cable and cable protection, as well as during maintenance activities during the operational phase. There is potential for these sound sources to influence the behaviour of cetaceans and pinnipeds and their use of sound for navigation, communication and for the identification of prey.

## 14.3 Operational Phase

The use of vessels deploying subsea survey and monitoring equipment for completion of periodic operational maintenance surveys will use similar equipment and methods to those described during installation. During the operational phase, this will typically occur over more limited and focused areas than during installation.

## 14.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 14.5 Mitigation

Vessels used by the Proposed Development will be operated and maintained in line with International Maritime Organisation (IMO) Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833) (IMO, 2014). Relevant design considerations from these guidelines will include:

- Propeller design to reduce cavitation (i.e. the formation and implosion of water vapour cavities caused by the decrease and increase in pressure as water moves across the propeller blade);
- Selection of onboard machinery and engines with in-built noise reduction technology and/or appropriate vibration control measures;
- Proper location of equipment in the hull;
- Optimisation of foundation structures such as vibration isolation mounts that may contribute to reducing underwater radiated noise; and
- Effective maintenance to reduce noise and vibration.

## 14.6 Conclusion

It is concluded that no significant effects on noise and vibration will arise from the Celtic Interconnector Project.

# 15 Shipping and navigation

## 15.1 Introduction

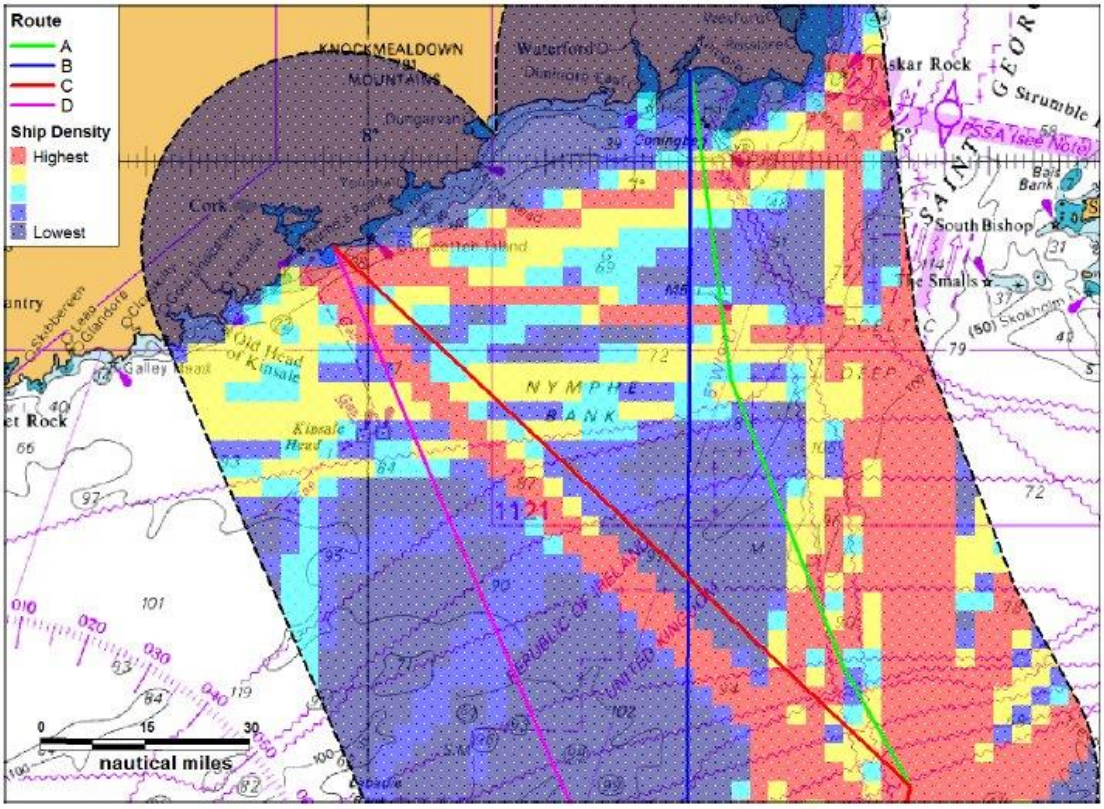
This chapter summarises the potential for effects to arise on the navigation of vessels within Irish Territorial Waters or the Irish EEZ, as a result of installation and subsequence presence of the proposed Celtic Interconnector. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 18: Shipping and navigation.

In 2013 a high-level review of shipping and navigational features in the vicinity of four potential cable routes being examined between Ireland and France was undertaken to aid in cable routeing. Subsequently EirGrid and RTE commissioned a more detailed shipping and fishing assessment for the preferred cable route west of the Scilly Isles, reported in 2016.

### 15.1.1 Vessel traffic

The principal shipping activity crossing or approaching the cable route in Irish waters is highlighted in Figure 15.1. These comprise principally shipping between Cork Harbour and the English Channel, the Bristol Channel and the Irish Sea, whose routes show up as three distinct corridors. In addition, there are lower levels of shipping following the Irish south coast to and from the west, destined for Waterford, the Irish Sea and Bristol Channel.

**Figure 15.1 Marine traffic density in the vicinity of the Irish Coast**



Vessel operation may present risks to the interconnector cables, for example through damage from ships' anchors, ships grounding or foundering or interaction with fishing gear.

## 15.2 Installation Phase

The cable installation process will involve one or more vessels classed as restricted in their ability to manoeuvre while cable laying or operating other underwater equipment. As required by the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs), these vessels will display appropriate lights and shapes to indicate this status and, in restricted visibility, emit the required sound signals. Other vessels will have a duty to keep a safe distance from these vessels, in accordance with regulations.

Installation of the cable landfall at Claycastle will involve construction of a temporary cofferdam and causeway down the beach. This will involve only land-based equipment, and its location means that the only potential interaction with navigation activity will be a temporary restriction on use of part of the beach, which may affect users of beach-launched craft, such as personal watercraft, kite surf boards, etc. The works affecting the beach are proposed to occur during winter to minimise effects on beach users and are estimated to take 10 weeks.

## 15.3 Operational Phase

For most of the cable route, the cable will be buried to the target depth, and the seabed restored to its original profile, resulting in no change to the bathymetry. However, a potential need has been identified to install rock armouring along up to 3km of the cable route in Irish Territorial Waters, and up to 30km of the route in the Irish EEZ.

As the need for rock armouring is only anticipated in water depths exceeding 60m, well in excess of the draught of any ship, the presence of the cable will present no risk of grounding. The adverse effects are therefore assessed as negligible and not significant.

The cable route does not pass through any designated anchorage areas and the only place where it approaches areas used for anchoring of cargo vessels or other large craft is in Youghal Bay. Within the bay the cable route runs from the landfall at Claycastle, across the west approach channel then southwards between the approach channels, on the opposite sides to the anchorages, so access to the anchorages will be unaffected. Cargo vessels typically anchor in the east approach channel while awaiting the tide to allow them to enter the port, but this does not take place in the shallower west channel. The cable route does not impinge at all on the east channel. Thus the effects of the presence of the cable on availability of anchorages are assessed as negligible and not significant.

## 15.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 15.5 Mitigation

During the construction phase, the key to vessel safety is compliance by both work and passing vessels with the COLREGS. This will be encouraged and facilitated by keeping all sea users fully informed of plans and progress regarding the cable installation and procedures in place to ensure their safety when navigating in the vicinity. This will be achieved through:

- The issuing of Marine Notices through appropriate and agreed channels;
- Radio navigational warnings by local ports and coastguards;
- Radio communication between work vessels and passing vessels;
- Direct contact with local commercial fishing organisations;
- Direct contact with clubs representing local recreational boat users; and
- Notices on the beach regarding landfall works and launching of personal watercraft or kite surf boards.

It is recommended that the cable contractor monitors and maintains records of radio communications with passing craft and reviews these at intervals to ascertain whether any changes or improvements to information dissemination would be appropriate.

## 15.6 Conclusion

No significant effects have been identified in Irish waters, which would result in either transfer of marine traffic from Irish waters to those of another state, or to an increase in hazards to shipping in another state. Therefore, it is concluded that the Celtic Interconnector Project will not have any significant effects on shipping and navigation.

# 16 Commercial fisheries

## 16.1 Introduction

This chapter summarises the likely significant effects that the installation and operation of the proposed marine cable may have on commercial fisheries and has been informed through a desktop study. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Chapter 19: Commercial Fisheries.

Fishing within the Irish Territorial Waters and EEZ is predominantly undertaken by Irish vessels using a diverse array of gear. Hand gathering of periwinkles occurs along rocky shores adjacent to the proposed landfall, whilst small vessels (<10m) operate inshore, typically targeting shellfish with static gear or demersal fish with trawls.

## 16.2 Installation Phase

### 16.2.1 Damage / Disturbance to Fishing Grounds during Installation

Cable burial will result in temporary disruption of the seabed during trenching operations along the length of the cable corridor (34km). Following installation, a small scar may be present but not likely to be an obstruction to commercial fishing interests.

Seabed preparation prior to cable laying is not currently anticipated within Irish Territorial Waters, however if required, this may result in disturbance over a wider corridor up to 15m in width. Disturbance may be as a result of sand wave sweeping and or boulder removal to minimise the subsequent risk of cable exposure from snagging by e.g., fishing gear.

### 16.2.2 Displacement of Fishing Activity by Cable Installation Activities

The proposed landfall installation method across the foreshore at Claycastle Beach requires a trench to be excavated across the intertidal foreshore. Fishing with static gear within the footprint of the cable lay corridor will not be possible during the period of installation and cable lay will result in short-term exclusion from the fishing grounds.

Similarly, trawl gear such as otter and beam trawls and dredges will also require to be excluded from a 500m safety zone around the cable lay operation and from any unprotected or temporary unburied sections of the cable.

It is estimated that trench excavation will be restricted to small areas of the cable route at any given time and the cable laying schedule will be designed to minimise exclusion periods. The proposed cable route avoids the principal *Nephrops* fisheries located to the east and south west of the cable route. The fisheries are assessed as having high recoverability following disturbance. Once installation is complete, static and trawl gear can be re-deployed in the area if desired. Therefore, no significant effects are predicted to occur.

## 16.3 Operational Phase

### 16.3.1 Seabed Obstructions (Cables on the Seabed)

Structures on the seabed represent potential snagging points for fishing gear and could lead to damage to, or loss of, fishing gear.

Rock placement as a means of primary cable protection is not envisaged along the section of the cable route within Irish Territorial Waters. However, it is possible that some secondary rock protection may be required where the target depth of cable lay is not fully achieved.

Once cable burial is complete or external cable protection installed, static and trawl gear can be re-deployed in the area (noting the need for periodic monitoring, to ensure the cable remains buried). Given the localised and temporary nature (up to 8 weeks) of the impact, along with the proposed design mitigation, the magnitude of this potential effect has been assessed as not significant.

### 16.3.2 Disruption of Fishing Activity from Repairs / Maintenance Work

The life expectancy for the cable is estimated to be 40 years; however, during the operational life there may be requirement for cable repair. Where a cable has been lifted from the seabed for repair there is the potential for a bight to form in the cable where it has been mended. Once the cable has been lowered back into position, the bight may stand proud of the seabed presenting a hazard to fishing activities e.g., potential for fouling by trawl doors.

The impact resulting from maintenance work along the offshore cable route is predicted to be of local spatial extent and of short-term duration. Disruption caused by maintenance works has been assessed as low, as seasonal fishing cannot be avoided if maintenance work becomes necessary, however the works would be temporary.

## 16.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 16.5 Mitigation

The impact resulting from maintenance work to the offshore cable route is predicted to be of local spatial extent and of short-term duration. Routine monitoring and maintenance of the cable corridor during the operational phase, in line with good practice, should ensure the integrity of the cable is maintained, thus minimising snagging risk.

The developer will maintain the appointment of a Fisheries Liaison Officer (FLO) during the Proposed Development who will maintain communication with fisheries representatives and organisations throughout construction and installation in accordance with good practice.

Advanced warning and accurate location details of construction operation and associated mobile safety zones will be given to vessels within the vicinity. Safety zones to be brought to the attention of mariners with as much advance warning as possible via frequent notice to Mariners and other means e.g., the Kingfisher Bulletin, VHF radio broadcasts etc. and through direct communications via the Fisheries Liaison Officer.

## 16.6 Conclusion

The sensitivity of commercial fisheries to displacement has been assessed as low. It is estimated that will be restricted to small areas of the cable route at any given time, and the cable laying schedule will be designed to minimise exclusion periods. The fisheries are assessed as having high recoverability following disturbance. Once installation is complete, static and trawl gear can be re-deployed in the area if desired.

Therefore, it is predicted that the Celtic Interconnector Project will not have any significant adverse effects on commercial fisheries in the vicinity of the Proposed Development.

# 17 Major accidents and disasters

## 17.1 Introduction

This chapter assesses the risk of major accidents and disasters in the marine environment as a result of the Proposed Development. It has been informed by a desktop study undertaken during the scoping phase and the outcomes of the relevant technical assessments. The full assessment is described in Volume 3D Part 2 EIAR for Ireland Offshore (Technical Chapters) - Offshore - Chapter 20: Major accidents and disasters.

Major accidents are defined as an occurrence resulting from an uncontrolled event caused by a man-made activity or asset leading to serious damage on receptors. Possible examples may include industrial or mechanical failures resulting in fire, explosions, or the accidental release of pollutants; accidents caused by the improper storage, transport or use of materials or substances and transport-related accidents such as vessel collisions.

## 17.2 Installation Phase

The movement of cable installation vessels during offshore cable installation works, notably the cable laying activities in the offshore environment has the potential to create a navigational hazard that could result in vessel collisions.

While the likelihood of the risk is low given that safe navigational practices will be a Proposed Development requirement, vessel collisions have the potential to result in injury and fatality to other sea users and the offshore Proposed Development workforce.

The use of plant and machinery during the installation of the Proposed Development creates a risk of accidental spills of fuel and lubricants in the foreshore or marine environment with the potential for direct effects on localised water quality.

The use of plant and machinery on and near the foreshore creates a risk of accidental spills of fuel and lubricants in the foreshore or marine environment with the potential for effects on coastal species, habitats, and nature conservation designations.

## 17.3 Operational Phase

During the operational phase, periodic vessel movements will occur to enable the integrity of the cable burial and any cable protection to be monitored. This has the potential to create a navigational hazard that could result in the risk of a vessel collision. The frequency of this monitoring will be confirmed but is anticipated to be at a frequency of every 3-5 years.

## 17.4 Decommissioning

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, as presented within Volume 3D Part 1 – Introductory Chapters, it is assumed that the equipment will be decommissioned and replaced with new equipment.

Decommissioning impacts have been considered within the impact assessment, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development.

## 17.5 Mitigation

Mitigation in place relates to the effective management of navigational safety as well as through emergency planning and the on-site and on-board management of leaks and spills. Risk to workers from on-site accidents such as slips, trips, and falls as well as from exposure to chemicals such as fuels and lubricants is reduced to as low as reasonably possible through a Project-wide requirement for all on-site and on-board personnel to be supplied with and to wear the appropriate PPE in line with standard requirements and regulations. Risk to the marine environment and to the public from exposure to contaminants is reduced to as low as reasonably possible through the prevention of leaks and spills being released into the environment. This is achieved through on-site and on-board good practice in line with The Control of Major Accident Hazards (COMAH) Regulations and the International Convention for the Prevention of Pollution from Ships (MARPOL) Convention.

## 17.6 Conclusion

The risk of major accidents and disasters from the Celtic Interconnector Project in the Irish marine environment is reduced to as low as reasonably possible. It is therefore concluded that there are no significant impacts predicted to arise in relation to major accidents and disasters.

# 18 Cumulative and Transboundary effects

## 18.1 Introduction

This section presents the cumulative and transboundary effects that may arise as a result of the installation and operation of the Celtic Interconnector Project.

## 18.2 Cumulative effects

The cumulative effects assessment has focussed on the inter-project effects that arise as a result of the Proposed Development in combination with the Inis Ealga Marine Park. This is because there are no other developments that have been identified in the vicinity of either the landfall, or interconnector cable route in Irish waters (either in construction or in planning) that have the potential to give rise to significant cumulative effects.

Furthermore, the assessments carried out have not identified any intra-project effects that would occur as a result of two or more impacts from the Proposed Development acting together (i.e.) combined, to result in a new or changed effects on a single receptor.

The potential effects in combination with the Inis Ealga Marine Park are summarised below.

### 18.2.1 Inter-project effects

Section 13, Material Assets, describes the location of the Inis Ealga Marine Park off the coast of County Cork and County Waterford. As the Inis Ealga Marine Park is a floating wind proposal, it is likely that the Proposed Development will propagate underwater noise and vibration over an as yet undetermined period of time during the installation of mooring lines for each floating turbine. Given their early stage of planning, it is likely that the installation of the Celtic Interconnector Project will be complete by the time these possible offshore wind sites are under development. Therefore, any underwater noise considerations and assessments will be responsibility of the offshore wind developers and decision-makers at that time.

There is some potential for a cumulative increase in navigational risk as a result of the activities that may be planned to occur in relation to the Inis Ealga Marine Park. Given the paucity of data relating to the location and scheduling of any vessel-related activities for the Inis Ealga Marine Park, it is not possible to draw a clear conclusion in relation to the likelihood of this risk. It is anticipated that installation works for the Celtic Interconnector Project will be complete before the installation works of the Inis Ealga Marine Park. It will therefore be the duty of the Inis Ealga Marine Park developers to consult with the Celtic Interconnector Project promoters in relation to navigational safety concerns.

No other developments are currently planned at the foreshore of Claycastle so the near-shore peat deposits at Claycastle are not predicted to be affected by other developments such that any cumulative effect might arise. Similarly, the relatively limited spatial extent of marine archaeological remains means that cumulative effects are not predicted to arise.

### 18.2.2 Intra-project effects

In addition to potential effects arising as a result of the Proposed Development and other plans / projects, as described above, potential effects arising as a result of interactions with other elements of the Proposed Development were also considered. This focused particularly on the interaction between the onshore and offshore elements of the Proposed Development.

No significant intra-project effects were identified.

## 18.3 Transboundary effects

The need to consider transboundary effects has been enshrined in the United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context, adopted in 1991 (the Espoo Convention). The Espoo Convention has been ratified by the European Union, Ireland and the United Kingdom of Great Britain and Northern Ireland. Where a project's effects transcend the territory of a Member State the amended EIA Directive requires that its likely significant effects must be described. These are detailed in Volume 3D Part 2 Chapter 21 of this EIAR.

All activities associated with the construction, operation, and decommissioning of the Proposed Development were assessed for the likely significant transboundary effects and these are detailed in Part 2 Chapter 21 of this EIAR.

**Table 18.1 Summary of transboundary and cumulative effects**

| Topic | Transboundary effects | Cumulative Effects |
|---|---|---|
| Population and Human Health | No significant residual adverse effects on population and human health, including those of a transboundary nature, are anticipated. | There are no known other developments which could lead to cumulative effects on population and human health, in particular no other projects have been identified involving construction activity or new seabed installations on the open coast in the vicinity in the cable route. |
| Air quality and climate | No significant residual adverse effects on air quality and climate, including those of a transboundary nature, are anticipated. There will be a positive transboundary impact on air quality and climate change associated with providing a high capacity electricity transmission line between Ireland and France. This will arise from the Proposed | The receptor for CO2e emissions is the global climate and the impacts will be global and cumulative in nature. It is the cumulative effect of all CO2e emissions that contribute to climate change rather than the impacts of one specific project or indeed one country. Therefore, both the air quality and GHG assessments in this chapter can |

| Topic | Transboundary effects | Cumulative Effects |
|---|---|---|
| | Development allowing more renewable energy to be generated in Ireland and connected to the transmission network in France. | be regarded as a cumulative assessment of the impacts of NOx, SOx and CO2e emissions on the global climate. No further assessment has therefore been undertaken. |
| Marine sediments quality | No significant residual adverse effects on marine sediment quality, including those of a transboundary nature, are anticipated. | Currently at the pre-planning stage, DP Energy Ireland (DP Energy) is investigating the feasibility of developing an offshore floating wind energy prospect off the south coast of Ireland, the Inis Ealga Marine Energy Park (IEMEP).<br><br>As part of the IEMEP project, there are likely to be activities which will impact marine sediments and sediment quality, for example cable installation and construction of landfall infrastructure. However, given that the effects of the Celtic Interconnector Project Proposed Development on sediment quality are predicted to be both non-significant and temporary, no in-cumulative combination effects with the IEMEP project are expected. |
| Marine physical processes | No significant residual adverse effects on marine physical processes, including those of a transboundary nature, are anticipated. | There are no activities from the construction, operation, and decommissioning of the Ireland Onshore cable elements of the Celtic Interconnector Project that would have an effect on marine physical processes. It is therefore unlikely that the Proposed Development could interact with activities associated with the Onshore cable elements to have a likely significant cumulative |

| Topic | Transboundary effects | Cumulative Effects |
|---|---|---|
| | | effect on marine physical processes. |
| Marine water quality | No significant residual adverse effects on marine water quality, including those of a transboundary nature, are anticipated. | There are no activities from the construction, operation, and decommissioning of the Ireland Onshore cable elements of the Celtic Interconnector Project that would have an effect on marine water quality. It is therefore unlikely that the Proposed Development could interact with activities associated with the Onshore cable elements to have a likely significant cumulative effect on marine water quality. |
| Biodiversity | No significant residual adverse effects on biodiversity, including those of a transboundary nature, are anticipated. | There are no activities from the construction, operation, and decommissioning of the Ireland Onshore cable elements of the Celtic Interconnector Project that would have an effect on biodiversity. It is therefore unlikely that the Proposed Development could interact with activities associated with the Onshore cable elements to have a likely significant cumulative effect on biodiversity. |
| Seascape and Landscape | No significant residual adverse effects on seascape and landscape, including those of a transboundary nature, are anticipated. | There are no activities from the construction, operation and decommissioning of the Ireland Onshore cable elements of the Celtic Interconnector Project that would have an effect on landscape and seascape characteristics. It is therefore unlikely that the Proposed Development could interact with activities associated with the onshore cable elements to have a significant cumulative effect on |

| Topic | Transboundary effects | Cumulative Effects |
|---|---|---|
| | | the landscape and seascape environment. |
| Archaeology and cultural heritage | The deposit sequences of geoarchaeological interest are present over an extensive area, and could potentially be affected by other developments, which presents a potential for cumulative effects. These deposits also extend into the UK EEZ, although it is not considered that a transboundary effect would arise as disturbance of these deposits in the UK EEZ would be caused only by works carried out within the UK EEZ, which are assessed in their own right in Volume 4 UK ER. No significant residual adverse effects on archaeology and cultural heritage. | No other developments are currently planned at the foreshore of Claycastle so the near-shore peat deposits at Claycastle are not anticipated to be affected by other developments such that any cumulative effect might arise. Similarly, the relatively limited spatial extent of marine archaeological remains means that cumulative effects are not anticipated to arise. |
| Material assets | No significant residual adverse effects on seascape and landscapem, however, it is likely that the Project will have a positive transboundary impact on material assets associated with providing a high capacity electricity transmission line between Ireland and France. The wider need for the Celtic Interconnector Project and its benefits in terms of market integration, sustainability, and security of supply are described in Chapter 2 of the EIAR Volume 3D Part 1: Ireland Offshore. The Proposed Development will facilitate an increase in the use of renewable energy in Ireland and | The Inis Ealga Marine Energy Park is the only project identified as relevant to the cumulative assessment.<br>The Inis Ealga Marine Energy Park does not intersect with the existing subsea cables considered in this chapter as those crossed by the Celtic Interconnector Proposed Development are all located further offshore. There is therefore no potential for cumulative impacts in relation to these receptors. |

| Topic | Transboundary effects | Cumulative Effects |
|---|---|---|
| | France and support the development of a more. sustainable electricity mix on the transmission networks in Ireland and France, which is widely perceived to be a benefit to both nations as well as to the EU more widely. | |
| Noise and vibration | No significant residual adverse effects arising from noise and vibration, including those of a transboundary nature, are anticipated. | There are no further developments in the vicinity of the landfall or interconnector cable route in Irish Territorial waters of the Irish EEZ (either in construction or in planning) that have the potential to give rise to significant cumulative effects in terms of noise |
| Shipping and navigation | No significant residual adverse effects have been identified in Irish waters which would result in transfer of marine traffic from Irish waters to those of another state (notably the UK) or an increase in hazards to shipping in another state. Transboundary effects are therefore determined to be negligible. | No other projects have been identified involving construction activity or new seabed installations on the open coast in the vicinity in the cable route, so no potential cumulative effects are predicted. |
| Commercial fisheries | No significant residual adverse effects on commercial fisheries, including those of a transboundary nature, are anticipated. | None identified. |
| Major accidents and disasters | No significant residual adverse effects arising from major accidents and disasters, including those of a transboundary nature, are anticipated. | There is some potential for a cumulative increase in navigational risk as a result of the activities that may be planned to occur in relation to the Inis Ealga Marine Energy Park. Given the paucity of data relating to the location and scheduling of any vessel-related activities for the |

| Topic | Transboundary effects | Cumulative Effects |
|---|---|---|
| | | Inis Ealga Marine Park, it is not possible to draw a clear conclusion in relation to the likelihood of this risk. It is anticipated that installation works for the Celtic Interconnector Project Proposed Development will be complete before the installation works of the Inis Ealga Marine Park. It will therefore be the duty of the Inis Ealga Marine Park developers to consult with the Celtic Interconnector Project promoters in relation to navigational safety concerns. |