Celtic Interconnector Project

Volume 4 UK Offshore

Non-Technical Summary

March 2021

Co-financed by the European Union
Connecting Europe Facility

Tionscadal Éireann
Project Ireland
2040

EIRGRID

Report for

EirGrid plc
RTI

Main contributors

Issued by

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Approved by

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Wood

Doc Ref. 43171-WOOD-XX-XX-RP-OM-0014_B_P01

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Document revisions

No.	Details	Date
1	Draft for client review	March 2021
2	For Draft Application File	March 2021

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1 Introduction

1.1 Introduction and document purpose

The Celtic Interconnect Project (hereafter 'the Project') 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"), 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 Report (ER) has been prepared to accompany an application for a Marine Licence from the Marine Management Organisation (MMO) for works within the UK EEZ.

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

2 The Project need and Alternatives

2.1 Need for the Project

The proposed Celtic Interconnector, with an estimated cost of €930M, is recognised as a Project of Common Interest (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

Early desktop studies identified six main corridors for the marine cable route. These six route options were assessed in detail and then ranked based on a range of different constraints 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 was the target of detailed marine survey in 2014 - 2015.

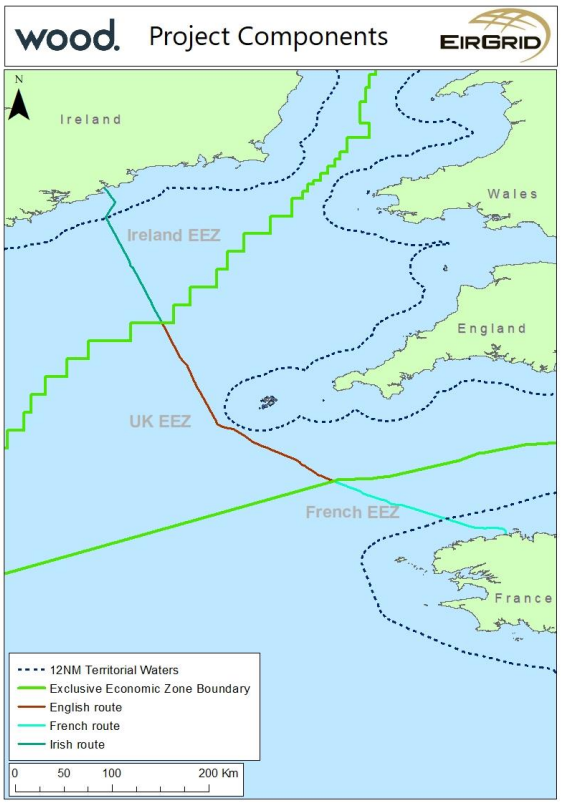
See Volume 4 ER UK Offshore - Chapter 6: Alternatives considered for further information on alternatives considered.

3 Description of the Proposed Scheme

3.1 Location of the Project

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, through Irish, UK and French waters, and beyond to the landfall point in France.

Figure 3.1 Overview of Celtic Interconnector across all Jurisdictions



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3.2 Description of the project

The Celtic Interconnector will require the installation of secondary cable protection in specific sections 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 and structures to enable the subsea cable and the onshore cables to be connected. Once installed, the cable will transmit electricity using high voltage direct current (HVDC) technology between Ireland and France.

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The Celtic Interconnector cable route is approximately 497 kilometres (km) long with 34km in Ireland's Territorial Waters, 117km 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.

The main elements of the interconnector consist of:

- A submarine circuit, approximately 497km in length placed on or beneath the seabed between France and Ireland. The submarine circuit will pass though the Territorial Waters of Ireland and France and through the Exclusive Economic Zones (EEZ) of Ireland, the UK and France, as shown in Figure 3.1.
- 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, with onshore infrastructure at each landfall, including:
    - A HVDC land circuit between the landfall point and a converter station;
    - A converter station, to convert the electricity from HVDC to High Voltage Alternating Current (HVAC);
    - An underground HVAC land circuit between the converter station and the connection point to the grid;
    - A connection point to an existing substation on the transmission grid, in France and Ireland; and
- A fibre optic cable link would also be laid along the entire route for operational control, communication and telemetry purposes.

See Volume 4 ER UK Offshore - Chapter 5: Project Description, for further information on the description of the project.

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4 Approach to preparing the ER

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

The preparation of the Environmental Report (ER) is one of the key stages in the EIA process, as it brings together information about any significant environmental effects, which the Marine Management Organisation (MMO) will use to inform its decision about a Marine Licence for the works can be awarded.

While the proposed development being submitted to the MMO is not a type of development requiring formal EIA, it is still of imperative importance that adequate environmental (and other) information is before the MMO to support it making a robust decision in respect of the Marine Licence application. Therefore, this ER contains a comprehensive environmental appraisal of topics that the MMO asked to be included in this ER and other relevant material.

5 Population and Human Health

5.1 Introduction

This section summarises the likely significant effects of the Proposed Development on Population and Human Health within the vicinity of the project. The full assessment is described in Volume 4 ER UK Offshore - Chapter 9: Population and Human Health.

5.2 Installation Phase

The main impacts on marine users in the area arise from the additional vessel movements and disturbance to the existing marine environment resulting from the operations to prepare the sea floor and install the cable as well as any prior investigatory operations. The main impact on marine users is related to the lack of flexibility in the positioning of the vessels.

Effects on marine users who are involved in shipping and navigation would include the presence of one or more vessels classed as restricted in their ability to manoeuvre whilst undertaking project works. This has the potential to increase risk of collision; however, through implementation of best practise, and adherence to standard regulations, the effects have been assessed as minor and not significant. As a result, it is considered that there will be no significant effects on the shipping community from an economics perspective.

The installation of the cable will require the deployment of a workforce and purchase of services in a chain of supply. The execution of the complete project requires a range of services some of which are common to all parts, such as cable manufacture, while others are focused on marine or terrestrial elements, such as vessel hire.

As the project is linking the Irish and French electricity networks, and being delivered by Irish and French utility providers, it is unlikely that these services will be obtained from the UK economy. However, although no economic benefit is anticipated, neither are any adverse effects predicted.

5.3 Operational Phase

Effects on marine users arise from impacts on populations involved in or affected by impacts on commercial fishing or related to shipping and navigation.

Effects on commercial fishing activities could lead to a fall in the value of catches as well as loss or damage to fishing gear. Commercial fishing is considered in the operational phase as potentially affected by; seabed obstructions interfering with demersal fishing (trawling); exposed cable causing a safety risk; and disruption to fishing activity from cable maintenance (ER UK Offshore - Chapter 20: Commercial Fisheries.) and the effects on commercial fishing are assessed as not significant.

Effects on marine users who operate existing cables are unlikely because of the known positions of cables and knowledge of the installation used for the Proposed Development.

5.4 Mitigation

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Increased vessel traffic during installation of the cable, has the potential to increase risk of collision; however, through implementation of best practise, and adherence to standard regulations, the effects have been assessed as minor and not significant. As a result, it is considered that there will be no significant effects on the shipping community from an economics perspective.

As outlined above, effects on marine users who are involved in shipping and navigation are centred primarily on the risk of collision. However, the presence and number of project-related vessels will be minimal during the operational phase, limited to periodic surveys of the cable route, and completion of maintenance, as required. Through adherence to guidance and regulations, as outlined in ER UK Offshore - Chapter 19: Shipping and Navigation, the risk has been considered to be negligible and not significant.

5.5 Conclusion

Therefore, it is concluded that there will be no significant effect on population and human health as a result of the Celtic Interconnector Project.

6 Air Quality and Climate

6.1 Introduction

This section summarises the likely significant impacts of the Celtic Interconnector Project on sensitive ecosystems as a result of changes to regional air quality during operation and the impact of the greenhouse gas (GHG) emissions associated with the Project on the global climate. The full assessment is described in Volume 4 ER UK Offshore - Chapter 10: Air Quality and Climate.

The Project could result in a net change in emissions from the power generation sector. Net changes in nitrogen oxides (NOx) and sulphur dioxide (SO^2) have been assessed in terms of contribution to acid and nutrient deposition.

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Given the global impacts of climate change and the globally recognised requirement to limit GHG emissions to maintain global average temperature increase below 2°C, as laid out in the Paris Agreement, climate change is considered highly sensitive to emissions. Provisional data for 2019 suggest the UK's GHG emissions from energy supply accounted for approximately 21% of total GHG emissions.

Pollutants will be emitted to air during the installation of the cable as a result of the movements of vessels and the operation of ancillary equipment and machinery with combustion engines for activities related to seabed preparation, cable laying, and the installation of cable protection and cable crossings.

6.2 Installation Phase

The materials used during installation of the Project, particularly the cable itself, will have an associated carbon footprint. During operation, it is anticipated that the Project will lead to reduced emissions. The Project will connect regions currently isolated from European energy markets, strengthen existing cross-border interconnections, and help integrate renewable energy sources. The increased reliance on variable renewable energy sources generation means that weather will have a greater impact on the future energy system. In this context, the Project 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.

6.3 Operational Phase

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

6.4 Conclusion

The Project is assessed as having a net beneficial effect on GHG emissions over its lifetime, 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.

7 Sediment Quality

7.1 Introduction

This section provides a summary of the marine sediment quality likely to be present along and adjacent to the proposed Celtic Interconnector route and considers the potential significant impacts that the installation and operation of the Celtic Interconnector may have on marine water quality. The full assessment is described in Volume 4 ER UK Offshore - Chapter 11: Sediment Quality.

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

7.2 Installation Phase

During the installation phase of the Celtic Interconnector, surficial sediments will be disturbed along the marine cable route. Seabed sediments will be re-suspended into the water column, increasing local turbidity levels and creating sediment plumes that can have an effect, either positive or negative, on habitats and species.

The release of contaminants usually occurs within a localized area for a short period of time during the installation (and potentially during any maintenance activities or decommissioning) and should only be of concern near industrialised areas. Contamination arising from seabed disturbance is only a risk in heavily contaminated locations. Sediment samples collected as part of cable route surveys indicate that the seabed along the cable route in the UK EEZ is not 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.

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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 Mitigation

Commented [A9]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

During the pre-construction engineering and design phase for the Celtic Interconnector, a detailed analysis of the nature of the seabed along the route of the Celtic Interconnector will be undertaken. From this, the most appropriate installation techniques will be established, as determined by seabed type. In addition, where external cable protection is required, this will also be designed according to seabed type.

Where the need for external rock protection or mattressing is identified, this will be designed according to the receiving environment, based on seabed type. Cable protection will be designed to minimise scour, and hence re-suspension of sediments. Rock placement would be sourced from certified quarries, with inert natural stone material used to minimise the degree of impact.

Vessels used for installation will be expected to be compliant with MARPOL regulations. These regulations cover the prevention of pollution from accidents and routine operations. 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.

Throughout the Project'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.

7.5 Conclusion

Therefore, it is not anticipated that the Celtic Interconnector project will have any significant adverse impact on sediment quality.

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 proposed Celtic Interconnector, and associated cable protection, as required. The full assessment is described in Volume 4 ER UK Offshore - Chapter 12: 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 waters deepen, the Project is outside the influence of localised changes in coastal activities that might affect physical processes at the seabed.

A number of surveys were completed along the length of the cable route, covering a 500m wide corridor. A desktop survey was also undertaken to inform this section.

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. In general, the western UK section of the Celtic Interconnector route is characterised by weak currents and tides, high exposure to swells, and strong winds. The strength of currents and tides increases in the English Channel, although there is still a high level of exposure to swell, and strong winds. The highest wave heights along the cable route occur west of the Isles of Scilly, where maximum significant wave heights (Hs) of up to 14.7m have been recorded. Mobile and ripples are also present on the seabed along the route of the Celtic Interconnector.

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. Due to these conditions, the main direction of the overall sea state has a west-south-west incidence, with winds tending to create higher wind sea waves than those towards the French coast.

8.1.2 Currents

Tidal currents are strongest along the cable route during the spring and autumn. In the western half of the cable route, currents are weak, and decrease towards the Irish shoreline. The main current directions follow a west-south-west and east-north-east axes along most of the cable route. Currents accelerate around the Isles of Scilly, resulting in increased levels of sediment mobility being induced by currents rather than wave action.

8.1.3 Seabed conditions and depth

At a general level, the nature of the seabed sediment along the entire cable route is predominantly fine to coarse sands, with occasional gravel and pebbles, with the dominant sediment type represented by gravelly muddy sand. In areas of high energy in the offshore zone throughout the entire cable route's length, areas of mega-ripples have been recorded, generally oriented north-south, with coarser sediments associated with steeper gradients on the leeward side of the features.

Evidence of boulders was recorded throughout the survey corridor, including within the UK EEZ, often with shallow depressions produced by scour associated with them. For the majority of the cable route within the UK EEZ though, the mean particle size of sediments recorded was <3mm.

8.2 Installation Phase

Introduction of hard material into a predominantly sedimentary area 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 exhibits a number of features, including mobile sand ripples and waves.

It is anticipated that a low 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.

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Throughout the majority of the route, the cable will be buried at a minimum depth of 1m, therefore is not anticipated to have any effect on local bathymetry in terms of seabed features or overall water depth.

8.3 Operational Phase

In the UK EEZ, the water reaches a maximum depth of over 110m, never becoming shallower than ~80m. Throughout the majority of the route, the cable will be buried at a minimum depth of 1m, therefore is not anticipated to have any effect on local bathymetry in terms of seabed features or overall water depth.

External cable protection will be installed only in areas where optimum burial depth cannot be achieved, or where obstacles and/or cable crossings are required; not the full length of the route. The UK seabed displays a range of features, including ridges, occasional depressions, and mobile sediment features such as sand ripples. As a result, the introduction of a feature up to 1m in height is unlikely to result in a significant change to the seabed.

Introduction of hard material into an area that is predominantly sedimentary has the potential to result in localised changes to hydrographic conditions and associated sediment dynamics.

Studies along the cable route corridor have shown, however, that sediment mobility in the vicinity of the Celtic Interconnector cable route is very low, with a low risk of scour occurring. Scour protection, where deployed, will be designed in such a way to minimise the risk of scour, and should temporary scour occur in the area, this is likely to be infilled naturally, albeit at a low rate, from the surrounding sediment.

8.4 Mitigation

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

Where the need for external rock protection or mattressing is identified, this will be designed according to the receiving environment, based on seabed type. Throughout the Project'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.

8.5 Conclusion

No significant effects on marine physical processes are anticipated to arise from the Celtic Interconnector project.

9 Marine Water Quality

This section provides an overview of the marine water quality likely to be present along and adjacent to the proposed Celtic Interconnector cable route in the UK EEZ and considers the potential significant impacts that the installation and operation of the Celtic Interconnector may have on marine water quality. The full assessment is described in Volume 4 ER UK Offshore - Chapter 13: Marine Water Quality.

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 are not available from the route surveys, detailed geophysical, geotechnical and benthic surveys were undertaken in the UK EEZ along the proposed cable route. Additional baseline information has also been gathered from existing sources.

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9.1 Installation Phase

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 are all likely to cause seabed disturbance.

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. 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.

9.2 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. Mitigation measures are therefore required to remove the risk of accidental hydrocarbon or chemical spill.

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 this is not the case along the section of the Project's route through the UK EEZ. 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.

9.3 Mitigation

During the pre-construction engineering and design phase for the Celtic Interconnector, a detailed analysis of the seabed along the route of the Celtic Interconnector will be undertaken. From this, the most appropriate installation techniques will be established, as determined by seabed type. In addition, where external cable protection is required, this will be designed according to seabed type, again, minimizing sediment and seabed disturbance, and indirect effects on marine water quality.

Vessels used for installation will be compliant with MARPOL regulations. These regulations cover the prevention of pollution from accidents and routine operations. 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.

9.4 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 the seabed along the cable route in the UK EEZ is not contaminated.

The cable route does not pass through any habitats or areas of environmental sensitivity, therefore receptor value for water quality is 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 is not predicted to have a significant effect on the water quality in the vicinity of the project.

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Commented [A15]: Placeholder – to cross check against Ch7 to confirm whether contaminated sediments are present.

10 Biodiversity

10.1 Introduction

This section summarises the likely significant effects of the Project 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 4 ER UK Offshore - Chapter 14: Biodiversity.

Data on benthic habitats and fauna was gathered along the route of the Celtic Interconnector in two campaigns carried out in 2015 and 2018 respectively. Marine mammal observers (MMOs) were operational onboard the 2014 and 2017 geophysical survey vessels and the records from these surveys informed the Biodiversity assessment. A desk-study has also been undertaken to inform the assessment presented within this section.

Designated Sites

A number of European sites that support mobile species that could interact with the Celtic Interconnector Project have been identified and are presented in Figure 10.1.

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The following SACs (within 300km) are designated for populations of marine mammals in the UK and could potentially interact with the Celtic Interconnector Project. These include SACs supporting bottlenose dolphin, harbour porpoise, and grey seal on the west coast of the UK and taking into account the MUs for these species, as highlighted above:

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- Isles of Scilly complex SAC (grey seal as a qualifying feature);
- Bristol Channel Approaches / Dynesfeydd Mor Hafren SAC (harbour porpoise as a primary reason for site selection);
- Pembrokeshire Marine / Sir Benfro Forol SAC (grey seal as a primary reason for site selection);
- West Wales Marine / Gorllewin Cymru Forol SAC (harbour porpoise as a primary reason for site selection)
- Cardigan Bay / Bae Ceredigion SAC (bottlenose dolphin as a primary reason for site selection and grey seal as a qualifying feature);
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (bottlenose dolphin and grey seal as qualifying features);
- North Anglesey Marine / Gogledd Mon Forol SAC (harbour porpoise as a primary reason for site selection); and
- North Channel SAC (harbour porpoise as a primary reason for site selection).

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-Site codes for all sites;
-Ramsar site as applicable
-MCZs

10.1.1 Intertidal and Benthic Habitats and Ecology

Within the UK EEZ, detailed surveys conducted during 2015 identified a range of habitats along the cable corridor. In summary, surface sediments were found to be generally characterised by very fine to very coarse sands, with occasional pebbles and gravels. The dominant sediment type present was gravelly muddy sand, with maximum levels of ~98% sand recorded from samples within the UK EEZ.

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There were no habitats categorised as environmentally-sensitive recorded along the cable route, or in the immediate vicinity, nor does the Celtic Interconnector route pass through any sites either designated, or under consideration for designation, for benthic habitats.

10.1.2 Natural Fish Ecology

The key demersal species identified within the Project Area include monk or monk or anglerfish *Lophius piscatorius*; common sole *Solea solea*; European plaice *Pleuronectes platessa*; turbot *Scophthalmus maximus*; European sea bass *Dicentrarchus labrax*; lemon sole *Microstomus kitt*; European hake *Merluccius merluccius*; brill *Scophthalmus rhombus*, john dory *Zeus faber* and pollack *Pollachius pollachius*.

The key pelagic species identified include European pilchard *Sardina pilchardus*; Atlantic mackerel *Scomber scombrus*; European anchovy *Engraulis encrasicolus*; European sprat *Sprattus sprattus* and horse mackerel *Sarda sarda*.

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The general timings, of the spawning season for the species, that are known to spawn in the Project area, are presented in Table 10.1.

Table 10.1 Spawning Season of Key Species in the Project Area (per ICES Sub-division)

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cod		x	x									
Whiting												
Ling												
European hake		x	x									
Horse mackerel					x	x						
Atlantic mackerel					x	x						
Common sole				x								
Monk or Anglerfish												
European plaice	x	x										

X = peak spawning period

Five SACs (within 200km) are designated for populations of migratory fish. These SACs notably support anadromous populations of Atlantic salmon, allis shad, twaite shad and sea lamprey on the south west coast of England. The purpose of these SAC designations is to maintain or, where necessary, restore their populations to a favourable conservation status in their natural range.

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10.1.3 Ornithology

Published data demonstrates that a wide range of seabirds are regularly recorded in the Project Area and or have the potential to occur in the area, based on direct observation and modelled distributions of seabirds. Species that could occur, during both the breeding and non-breeding season include Manx shearwater, Northern gannet, fulmar, Atlantic puffin, lesser black-backed gull and European storm petrel.

The cable route occupies a very small area of the seabed in comparison with the potential foraging ranges of the species identified. Whilst there is potential for seabirds to occur along the proposed cable route their presence would most likely be transient in nature as birds forage or migrate through the wider area. Modelled distributions suggest that species associated with the Isles of Scilly SPA / Ramsar such as European storm petrel and lesser black-backed gull may forage to the west of the islands, however such species are surface feeders who are not likely to interact with the with cable route.

Commented [A22]: Placeholder to confirm if potentially within the cable route corridor

Commented [A23]: Placeholder – text to be updated with reference to diver species.

10.1.4 Marine Mammals and Reptiles

The Celtic and Irish Seas support a variety of marine mammals, including cetaceans and seals. Around thirty different cetacean species have been recorded in the UK EEZ, with the most commonly recorded of these being bottlenose dolphin (*Tursiops truncatus*) (including a resident population within Cardigan Bay, Wales) and harbour porpoise (*Phocoena phocoena*). Other species recorded include minke whale (*Balaena acutorostrata*) and humpback whale (*Megaptera novaeanglilae*).

As well as sightings, records of strandings are a useful indicator of cetacean presence in an area. In the UK, the Cetacean Strandings Investigation Programme (CSIP) coordinates the investigation of all strandings which occur around the UK coastline. The most frequently-recorded stranded species are the harbour porpoise, short-beaked common dolphin (*Delphinus delphis*), and minke whale.

Both grey and common seals are also present in the UK EEZ, with populations present year-round, as well as regularly passing between Irish waters and the UK EEZ. It is estimated that there are around 120,000 grey seals in Britain, representing approximately 40% of the world's population.

During the 2017 MMO surveys, October-November 2017, a total effort of just under 136 hours of surveys was undertaken, recording 18 sightings of an estimated 92 individual animals and comprising four species: harbour porpoise, short-beaked common bottlenose dolphin, Atlantic white-sided dolphin *Lagenorhynchus acutus* and grey seal. A number of unidentified dolphins were also recorded. Across all MMO surveys along the route of the Celtic Interconnector, species were recorded in water depths ranging from 7.3m to 77.6m.

Commented [A24]: Placeholder – text to be updated to link these species to relevant sites.

Basking sharks have also been sighted in the UK EEZ - 3 sightings hotspots are known, including the southwest of England. The species show marked seasonality, with their greatest numbers seen during the northeast Atlantic summer (June to August).

Commented [A25]: Placeholder to confirm it they could potentially occur within the cable route corridor?

10.2 Installation Phase

During all works at sea and in the intertidal zone, there is the 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.

Through the use of preventative measures and various control plans in place, the risk of occurrence of such incidents is low. Coupled with the high capacity of the marine environment for dilution of pollutants, it is not predicted that a pollution event, which is any case unlikely to occur, would be significant.

Commented [A26]: Placeholder – control plans to be defined.

During installation of the Celtic Interconnector, disturbance of the seabed and associated loss of habitats will be unavoidable. As presented in Volume 4 ER UK Offshore - Chapter 7 – Marine Physical Processes, the assumption has been made that direct disturbance to the seabed will be limited to the immediate vicinity of the cable route.

Underwater noise and disturbance effects in the subtidal zone (marine mammals, reptiles, and fish) are possible during the installation phase due to 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 project 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.

Commented [A27]: Placeholder to confirm how embedded mitigation is taken into account within this conclusion.

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 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, described below, is anticipated to be sufficient in reducing the significance of this impact.

10.4 Mitigation

Commented [A28]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

Throughout works to install both the cable itself, and associated external rock protection, a number of embedded mitigation measures have been incorporated into project design. Mitigation measures specific to the biodiversity aspects of the assessment include:

- 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 UK marine environment will be undertaken in line with JNCC's 'Guidelines for minimising the risk of injury to marine mammals from geophysical surveys'; and
- Project-related vessels will adhere to international best practise regarding pollution control, including the MARPOL Convention.

Commented [A29]: Placeholder – to confirm any relevant JNCC guidance.

10.5 Conclusion

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

Commented [A30]: Placeholder to reference potential for increased habitat heterogeneity from rock protection.

11 Seascape and Landscape

11.1 Introduction

This section summarises the likely significant effects of the Celtic Interconnector Project within the UK EEZ with regard to the seascape and landscape. The full assessment is described in Volume 4 ER UK Offshore - Chapter 15: 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.

The Seascape Character Assessment for the South West Inshore and Offshore marine plan areas identifies that the UK EEZ length of cable route passes through two Marine Character Areas (MCAs). These are:

- MCA 51: Bristol Channel Approaches; and
- MCA 52: Western English Channel Approaches.

The overall character of MCA 51: Bristol Channel Approaches is described in the extant Seascape Character Assessment as having:

- "A *rich natural environment and important heritage. The deep offshore waters extend to Haig Fras, a submerged rock outcrop which locally reduces bathymetry to only 38m from 100m. This is one of several designated or proposed areas for MCZ due to their nationally and internationally important sediment habitats. Forming part of the Celtic Sea, the MCA has important historical connections with the Celtic nations of Wales and Ireland which are still apparent today with ferries, pleasure craft and submarine communication cables crossing from England to Ireland. Shipwrecks on the seafloor indicate the areas strategic positioning during periods of conflict, more recently during WWII*."

MCA 52: Western Channel Approaches borders French waters to the south and covers a large area of open water. The Seascape Character Assessment for the South West Inshore and Offshore marine plan areas describe the overall character as follows:

- "*Below the surface, a gradually shelving seafloor consistent of distinct geological bands is covered by mobile sediment layers which migrate to form crescent-shaped submerged dune systems. Seafloor features combine with aquatic thermal fronts to create a unique and rich marine environment; making this one of the most diverse habitats for fish, cetaceans and sea birds in the UK. The area has a long maritime heritage associated trade and*

military use which continues today – with much of the area used as a submarine training area and crossed by ferries or fishing vessels."

11.2 Conclusion

An assessment of landscape and seascape effects has been scoped out of the ER on the basis that significant effects are considered unlikely to occur. The ER includes a summary of the reasoning for scoping out this assessment.

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 the United Kingdom Exclusive Economic Zone (UK EEZ). The full assessment is described in Volume 4 ER UK Offshore - Chapter 16: Archaeology and Cultural Heritage.

Archaeological assessments and marine geophysical surveys of the entire route were undertaken, including a desk-based assessment, and assessment of marine geophysical survey data for the entire route and two landfall location options in Ireland.

The Celtic Sea has been 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, there is potential for such features (if present), to be affected.

Commented [A31]: Placeholder – confirm in comparison to.

Initial studies identified a number of recorded 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.

Commented [A32]: Placeholder to confirm number of potential wrecks.

12.2 Installation Phase

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

Commented [A33]: Placeholder to add ref to any specific areas of geological interest.

Commented [A34]: Placeholder – areas of rock-cutting to be defined.

The anticipated depth of burial of the cable would be sufficient to remove or disturb deposits of geoarchaeological interest in all 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.

Commented [A35]: Placeholder – consideration of further potential wrecks to be added.

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. Given the extent of preparation required in advance of cabling and disturbance arising from cabling, and the absence of known features within the cable route, it is not considered that placement of cable protection would give rise to disturbance of archaeological remains.

12.3 Operational Phase

Adverse effects would only arise during the operational phase of the Project 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; however, this is not the case within the UK EEZ.

12.4 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.

Commented [A36]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

Commented [A37]: Placeholder – description of already recovered material to be provided above.

Commented [A38]: Placeholder – wording to be checked.

12.5 Conclusion

Following mitigation, it is anticipated that there would be no disturbance of known remains, either during the installation of the cable or the 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 anticipated 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 the UK 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 4 ER UK Offshore - Chapter 17: Material Assets.

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

13.2 Installation Phase

13.2.1 Renewable Power Developments

There are no offshore wind farm sites (existing, consented or in planning) located in the vicinity of the cable route to interfere with construction of the Celtic Interconnector cable within the UK EEZ. The nearest is the Erebus demonstration site, which is in early planning and located approximately 200km from the cable route off the coast of Pembrokeshire.

13.2.2 Marine Aggregate Resources

There are no marine aggregate licence areas near the proposed cable route in the UK EEZ. The nearest marine aggregates licence area is off the Welsh Gower coast approximately 200km to the northeast or near Bournemouth approximately 330km to the east. Given the location of these material assets in relation to the Project, there is no likely pathway for effects to these receptors and they are not considered further in the assessment.

13.2.3 Existing Cables

The routes of existing subsea cables have been identified from the previously mentioned subsea surveys undertaken for the Project. 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 with the relevant operators.

13.3 Operational Phase

Operational maintenance of the cable protection and cable crossings will be required where these occur in the UK EEZ, with repairs undertake where necessary to ensure the adequate protection of the Celtic Interconnector cable as well as of the cable crossed by the Project.

Survey work required to establish any possible need for operational maintenance of the cable protection and cable crossings in the UK EEZ would use non-intrusive methods such as sub-bottom profiling, and as such would not impact upon existing subsea cables. Any necessary operational maintenance of the cable protection and cable crossings will be undertaken in line with the relevant cable crossing agreements, so any consequential risk to existing subsea cables is anticipated to be low.

13.4 Mitigation

Commented [A39]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

The Celtic Interconnector Project has been designed to be protected and to offer protection to cables that it must cross. This has been achieved through subsea surveys to identify the location and status of the cables, which resulted in the cable route design maintaining appropriate distances from existing cables and optimising crossing angles as close to 90° as possible.

Consultation with relevant owners or operators also provides accurate data and information concerning the current status of the identified cables that has been used to inform design decisions. Initial contact has been made with all live cable owners and operators to establish the correct point of contact. An Information Pack has been prepared and is due to be shared with these consultees in 2021, which contains a presentation, route drawing, GIS route data, and typical crossing drawings. Further stages of consultation will include a request for accurate cable data from the owners or operators.

13.5 Conclusion

A slight adverse impact has been identified in relation to existing cables due to the high economic value of these material assets. However, the embedded mitigation including the design of each cable crossing, and which will be agreed with cable owners and operators and confirmed by Cable Crossing Agreements prior to commencement of works, ensures that this is limited to as low as reasonably practicable.

Therefore, it is anticipated that the Celtic Interconnector Project will not have a significant effect on material assets.

14 Noise and Vibration

Commented [A40]: Placeholder – receptors to be defined in this section with a cross reference to the biodiversity chapter.

14.1 Introduction

This section summarises the likely significant effect of the Celtic Interconnector Project on underwater noise and vibration in the vicinity of the cable route and defines the likely sound source levels and frequency ranges of the proposed works in the marine environment. The full assessment is described in Volume 4 ER UK Offshore - Chapter 18: 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 cable Project has the potential to introduce anthropogenic sound sources to the marine environment that could be above the ambient sound levels of the receiving environment in terms of sound source level as measured in decibels (dB) or that are within frequency ranges that coincide with those used by marine fauna and have a detrimental impact on marine life within the vicinity of the project.

No project-specific surveys of in-air or underwater ambient noise conditions undertaken during the planning and design phases of the Celtic Interconnector Project, 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 noise of the deploying vessel, 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 (DP) 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 later 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 Operation 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 Mitigation

Commented [A41]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

Vessels used by the Project will be operated and maintained in line with International Maritime Organization (IMO) Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.

14.5 Conclusion

No significant effects are anticipated to a rise from the Celtic Interconnector project in relation to noise and vibration.

15 Shipping and Navigation

15.1 Introduction

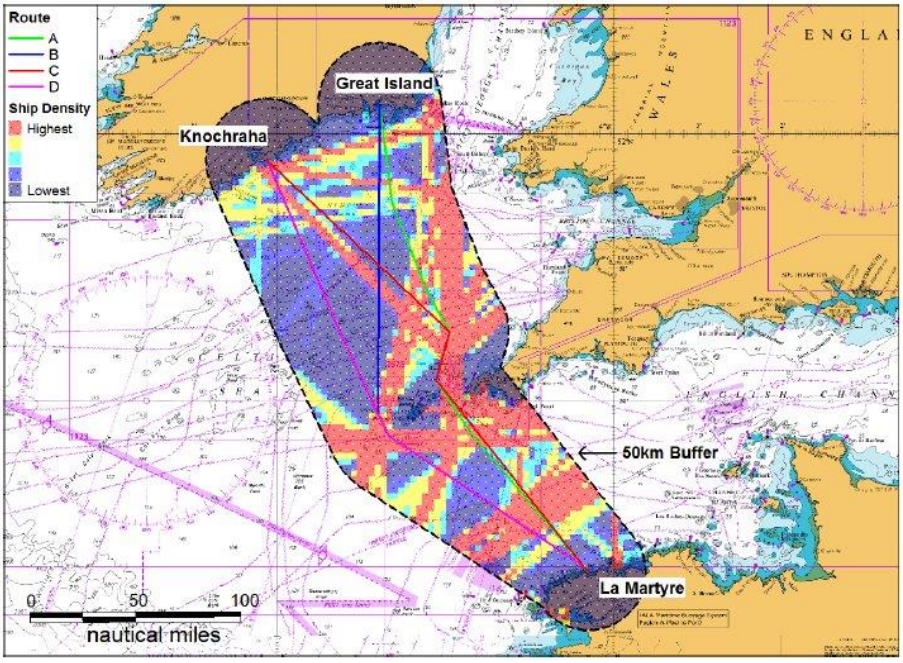
This chapter summarises the potential for effects to arise on the navigation of vessels within the UK Exclusive Economic Zone (EEZ), as a result of installation and subsequence presence of the proposed Celtic Interconnector. The full assessment is described in Volume 4 ER UK Offshore - Chapter 19: Shipping and Navigation.

A high-level review of shipping and navigational features in the vicinity of four potential cable routes were examined between Ireland and France, to aid in cable routeing. Subsequently, a more detailed shipping and fishing study was commissioned in 2016.

Vessel traffic

Shipping traffic density for vessels carrying AIS is indicated in Figure 15.1. This figure shows that the principal concentrations of shipping traffic crossing the overall cable route relate to vessels passing between the Celtic Sea and the English Channel, the Bristol Channel, and the Irish Sea (via St George's Channel). The principal routeings for all these shipping connections cross the cable route within the UK EEZ or the French EEZ.

Figure 15.1 Marine traffic density in the vicinity of the Irish Coast (derived from Anatec report A3225-INT-TN-0)



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.

Compliance with the COLREGS by all vessels, including both those involved in the Celtic Interconnector project and those passing through the area, should be sufficient to ensure vessel safety. However, further steps will be taken by EirGrid and RTE to ensure that mariners are warned in advance of the presence of the cable laying operations, including circulation of information via Notices to Mariners and radio navigational warnings, in advance of and during the works, allowing advance passage planning, thereby reducing disruption to routeing and risk of inappropriate interaction.

Other than during periods of repair / maintenance, no further exclusion zones are anticipated once the Celtic Interconnector is operational.

15.3 Operational Phase

As the whole of the cable route within the UK EEZ is in water depths exceeding 90m, the presence of the cable will present no risk of grounding; therefore, the adverse effects are assessed as not significant.

The cable route within the UK EEZ does not pass through or near to any designated anchorage areas and AIS data examined have not identified any instances of ships anchoring close to this section of the cable route. Thus the effects of the presence of the cable on availability of anchorages or ability to anchor are assessed as not significant.

15.4 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.

The principal measure to minimise risks of adverse interaction between vessels and the cable is to ensure that information is supplied to appropriate authorities to enable marine charts and sailing directions to be updated to show the cable route.

Commented [A42]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

15.5 Conclusion

No significant effects have been identified in the UK EEZ, 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 4 ER UK Offshore - Chapter 20: Commercial Fisheries.

16.2 Installation Phase

16.2.1 Damage / Disturbance to Fishing Grounds during Installation

During the construction phase, there is potential for damage/disturbance to traditional fishing grounds during installation. This has been assessed as being a potential temporary loss in sediment areas (first 34km and last 57km of the route) and a permanent deformation in rock areas (120km of the route to the west of the Isles of Scilly).

For seabed preparation/boulder clearance and burial and trenching operations, the potential impact is considered to be not significant, with intermittent and temporary (less than one month) interference to localised fishing grounds.

The identified sediment areas will only be temporarily impacted, as their profile will be returned when the cable is buried/backfilled. These areas have moderate fisheries interest, with monk or angler fish, common sole, turbot, European hake, brill, brown crab, king scallop, European lobster, common whelk and Nephrops all known to occupy muddy, sandy and mixed substrate areas, but the impact is not expected to be significant.

16.2.2 Displacement of Fishing Activity by Cable Installation Activities

During the construction phase, there is potential for displacement of fishing activity by cable installation activities. Where cable burial is not possible simultaneously to laying, or where burial is not possible and protection such as mattressing is required (e.g. crossing of other infrastructure or areas of hard seabed), the cable may remain unprotected for a period of up to 6-8 weeks.

Fishing with static gear (gill nets, traps and pots) 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 otterboard and beam trawls and scallop 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.

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 or mattressing 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. Given the localised and temporary nature (up to 8 weeks) of the impact along with the proposed design mitigation the magnitude of this potential impact 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 approximately 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 repaired following it being lowered to the bed which 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 to 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 Mitigation

Commented [A43]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

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 in line with good practice during the operational phase should ensure the integrity of the cable is maintained, thus minimising snagging risk.

The developer will appointment a Fisheries Liaison Officer during the project 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.

Commented [A44]: Placeholder to reference the Kisorka site

16.5 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 not anticipated that the Celtic Interconnector will have any significant adverse effects on commercial fisheries in the vicinity of the project.

17 Major Accidents and Disasters

This section assesses the likely significant effects of the Celtic Interconnector Project with respect to major accidents and disasters in the marine environment. 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 4 ER UK Offshore - Chapter 21: 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.

17.1 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 Project requirement, vessel collisions have the potential to result in injury and fatality to other sea users and the offshore project workforce, although the effect is unlikely to be significant.

The use of plant and machinery during the installation of the Project creates a risk of accidental spills of fuel and lubricants in the marine environment with the potential for direct effects on localised water quality, although the effect is unlikely to be significant.

17.2 Operational Phase

During the operational phase, some periodic vessel movements will occur in the UK EEZ to enable the integrity of the cable burial and cable protection to be monitored. The necessary frequency of this monitoring is not yet known, but the presence of monitoring vessels has the potential to create a navigational hazard that could result in a risk of a vessel collision.

17.3 Mitigation

Commented [A45]: Placeholder: All mitigation measures remain under review / discussion; the NTS will be updated accordingly, once confirmed, prior to submission of the final Application File.

The Project will adopt all appropriate good practice measures for site management in line with the requirements of the Management of Health and Safety at Work Regulations 1999 and the Control of Major Accident Hazards Regulations 2015. This will be ensured through the appointment of a Project Supervisor and binding commitments in the Construction Environmental Management Plan (CEMP), which will ensure that any potential environmental impacts are risk assessed and appropriate mitigation provided. Mitigation for minimising the likelihood of leaks and spills is also embedded into Project design through the use of spill contingency and emergency response plan and relevant UK regulations.

17.4 Conclusion

As a result of mitigation, the risk to human health and the environment will be reduced as low as is reasonably practicable. Therefore, it is not anticipated that the Celtic Interconnector Project would result in any major accidents and disasters having significant environmental effects.

18 Summary of Likely Effects

Commented [A46]: Placeholder: Section will be fully updated with any changes made to the main ER, as appropriate, prior to submission of the final Application File.

Table 18.1 Summary of effects

Commented [A47]: Placeholder – split into installation and operation

Receptor and summary of predicted effects	Significance	Summary rationale
Population and Human Health	Not significant	Increased vessel traffic during installation of the cable, has the potential to increase risk of collision; however, through implementation of best practise, and adherence to standard regulations, the effects have been assessed as minor and not significant. As a result, it is considered that there will be no significant effects on the shipping community from an economics perspective. Effects on marine users who are involved in shipping and navigation are centred primarily around the risk of collision. However, the presence and number of project-related vessels will be minimal during the operational phase, limited to periodic surveys of the cable route, and completion of maintenance, as required. Through adherence to guidance and regulations, as outlined in ER UK Offshore - Chapter 19: Shipping and Navigation, the risk has been considered to be negligible and not significant.
Air Quality and Climate	Not significant	During operation, it is anticipated that the Project will lead to reduced GHG emissions. The Project will connect regions currently isolated from European energy markets, strengthen existing cross-border interconnections, and help integrate renewable energy sources. In this context, the Project will help to maintain security of supply

Receptor and summary of predicted effects	Significance	Summary rationale
		while optimising the efficient use of energy resources.
Sediment quality	Not significant	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. The cable route does not pass through any habitats or areas of environmental sensitivity; therefore no ecological impacts are expected. Any elevation in suspended sediment concentrations once installation works are complete will be temporary, with levels expected to return to normal within a single tidal cycle.
Marine physical processes	Not significant	Throughout the majority of the route, the cable will be buried at a minimum depth of 1m below the seabed surface, therefore is not anticipated to have any effect on local bathymetry in terms of seabed features or overall water depth.
Marine Water Quality	Not significant	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 the seabed along the

Commented [A47]: Placeholder – split into installation and operation

Receptor and summary of predicted effects	Significance	Summary rationale
		cable route in the UK EEZ is not 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. Overall, a hydrocarbon or chemical release is considered unlikely as the presence of cable maintenance vessels will only marginally increase the risk of a pollution incident.
Biodiversity	Not significant	Project-related vessels will be operated in line with IMO Guidelines for the reduction of underwater noise to address adverse impacts on marine life. Operations in the UK marine environment will be undertaken in line with JNCC's 'Guidelines for minimising the risk of injury to marine mammals from geophysical surveys. Project-related vessels will adhere to international best practise regarding pollution control, including the MARPOL Convention; Use of appropriate installation equipment, determined by seabed type, will be used, to minimise seabed disturbance, subsequent release of sediment into the water column, and indirect effects on benthic habitats and species.

Commented [A47]: Placeholder – split into installation and operation

Receptor and summary of predicted effects	Significance	Summary rationale
Seascape and Landscape	Not significant	An assessment of landscape and seascape effects has been scoped out of the ER on the basis that significant effects are considered unlikely to occur.
Archaeology and Cultural Heritage	Not significant	It is not anticipated that any necessary disturbance remains would occur, either during cabling or installation of cable protection. 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.
Material assets	Not significant	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 inherent and embedded into the Project through the design of each cable crossing, and which will be agreed with cable owners and operators and confirmed by Cable Crossing Agreements prior to commencement of works, ensures that this is limited to ALARP.

Commented [A47]: Placeholder – split into installation and operation

Receptor and summary of predicted effects	Significance	Summary rationale
Noise and Vibration	Not significant	Vessels used by the Project will be operated and maintained in line with IMO Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.
Shipping and navigation	Not significant	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. The principal measure to minimise risks of adverse interaction between vessels and the cable is to ensure that information is supplied to appropriate authorities to enable marine charts and sailing directions to be updated to show the cable route.
Commercial fisheries	Not significant	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 in line with good practice during the operational phase should ensure the integrity of the cable is maintained, thus minimising snagging risk. 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

Commented [A47]: Placeholder – split into installation and operation

Receptor and summary of predicted effects	Significance	Summary rationale
		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.
Major Accidents and Disasters	Not significant	The Project will adopt all appropriate good practice measures for site management in line with the requirements of the Management of Health and Safety at Work Regulations 1999 and the Control of Major Accident Hazards Regulations 2015. This will be ensured through the appointment of a Project Supervisor and binding commitments in the Construction Environmental Management Plan (CEMP), which will ensure that any potential environmental impacts are risk assessed and appropriate mitigation provided. Mitigation for minimising the likelihood of leaks and spills is also embedded into Project design through the use of good practice site management, spill contingency and emergency response plan and relevant UK regulations.

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19 Cumulative Effects

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19.1 Introduction

There are no projects identified in the vicinity of the Project in the UK EEZ that could give rise to significant cumulative effects.