



Hornsea Project Four: Environmental Statement (ES)

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APFP Regulation 5(2)(a)

Volume A4, Annex 5.7: Transboundary Screening Report

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Table of Contents

1	Introduction.....	4
1.1	Overview	4
1.2	Purpose of this Document	4
2	Legislative Context.....	5
3	Habitats Regulations Assessment	6
4	Study Area.....	7
5	Consultation	9
6	Baseline Environment.....	9
6.1	Offshore Physical and Biological Environment	9
6.2	Human Environment.....	14
6.3	Onshore Transboundary Impacts	18
7	Conclusions	22
8	References	23

List of Tables

Table 1: Summary of approximate distance to nearest EEZ (median line) of other EEA state.....	7
Table 2: Offshore transboundary screening matrix for Hornsea Four – physical and biological environment.....	13
Table 3: Offshore transboundary screening matrix for Hornsea Four – human environment.....	17
Table 4: Onshore transboundary screening matrix for Hornsea Four.....	21

List of Figures

Figure 1: Location of Hornsea Four and relevant jurisdictional boundaries.....	8
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Glossary

Term	Definition
Cumulative effect	The combined effect of Hornsea Four in-combination with the effects from a number of different projects, on the same single receptor/source. Cumulative impacts are those that result from changes caused by other past, present or reasonably foreseeable actions together with Hornsea Four.
Development Consent Order	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIPs).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
EIA Regulations	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Order Limits	The limits within which Hornsea Four (the 'authorised project') will be built.
Orsted Hornsea Project Four Ltd	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Scoping	An early part of the EIA process by which the key potential significant impacts of the project are identified and methodologies identified for how these should be assessed. This process gives the regulator and key consultees opportunity to comment and define the full extent of the final EIA – which can also then be tailored through the consultation process.
Transboundary Impacts	Transboundary effects arise when impacts from the development within one European Economic Area (EEA) state affects the environment of another EEA state(s).

Acronyms

Acronym	Definition
AfL	Agreement for Lease
CCS	Carbon Capture And Storage
cSAC	candidate Special Area of Conservation
DCO	Development Consent Order
EBI	Energy Balancing Infrastructure
ECC	Export Cable Corridor
EEA	European Economic Area

Acronym	Definition
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
EU	European Union
HRA	Habitats Regulations Assessment
IMO	International Maritime Organization
IROPI	Imperative Reasons Of Overriding Public Interest
LAT	Lowest Astronomical Tide
MHWS	Mean High Water Springs
MSL	Mean Sea Level
NPS	National Policy Statement
NRA	Navigational Risk Assessment
PEIR	Preliminary Environmental Information Report
pSPA	potential Special Protection Area
PINS	Planning Inspectorate
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SCI	Sites of Community Importance
SPA	Special Protection Area
TJB	Transition Joint Bay

Units

Unit	Definition
km	Kilometre
kV	Kilovolt
m	Metre
nm	Nautical Mile

1 Introduction

1.1 Overview

- 1.1.1.1 Orsted Hornsea Project Four Limited (hereafter the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone (please see [Volume A1, Chapter 1: Introduction](#) for further details on the Hornsea Zone). Hornsea Four will include both offshore and onshore infrastructure, including offshore Wind Turbine Generators (WTGs), offshore substations, export cables to landfall and connection to the electricity transmission network (see [Volume A1, Chapter 4: Project Description](#) for full details on the Project Design).
- 1.1.1.2 The Hornsea Four Agreement for Lease (AfL) area was 846 km² at the Scoping phase of project development. In the spirit of keeping with Hornsea Four's approach to Proportionate Environmental Impact Assessment (EIA), the project has due consideration to the size and location (within the existing AfL area) of the final project that is being taken forward to Development Consent Order (DCO) application. This consideration is captured internally as the "Developable Area Process", which includes Physical, Biological and Human constraints in refining the developable area, balancing consenting and commercial considerations with technical feasibility for construction.
- 1.1.1.3 The combination of Hornsea Four's Proportionality in EIA and Developable Area process has resulted in a marked reduction in the array area taken forward at the point of DCO application. Hornsea Four adopted a major site reduction from the array area presented at Scoping (846 km²) to the Preliminary Environmental Information Report (PEIR) boundary (600 km²), with a further reduction adopted for the Environmental Statement (ES) and DCO application (468 km²) due to the results of the PEIR, technical considerations and stakeholder feedback. The evolution of the Hornsea Four Order Limits is detailed in [Volume A1, Chapter 3: Site Selection and Consideration of Alternatives](#) and [Volume A4, Annex 3.2: Selection and Refinement of the Offshore Infrastructure](#).
- 1.1.1.4 The Applicant published its PEIR for formal consultation in August 2019 and has since considered comments received from statutory and non-statutory consultees, incorporating feedback into the ES which this report accompanies as part of their application for Development Consent.

1.2 Purpose of this Document

- 1.2.1.1 Transboundary impacts relate to those impacts that may arise from an activity within one European Economic Area (EEA) state, that significantly affect the environment or other interests of another EEA state.
- 1.2.1.2 The Planning Inspectorate (PINS) are required to undertake a screening for significant transboundary effects under Regulation 32 of the EIA Regulations, utilising information provided in Annex K of the Hornsea Four Scoping Report. Following publication of the PEIR, PINS requested an update to that information to enable them to undertake a robust and accurate transboundary screening, given the time that had elapsed between Scoping and PEIR.

1.2.1.3 This document provides a final update to the transboundary screening document that was submitted at Scoping (and subsequently re-submitted to PINS in September 2019) and evaluates the likelihood of significant transboundary effects occurring and the transboundary consultation with other member states which has been undertaken to date.

2 Legislative Context

2.1.1.1 The need to consider transboundary impacts has been embodied by The United Nations Economic Commission for Europe Convention on Environmental Impact Assessment in a Transboundary Context, adopted in 1991 in the Finnish city of Espoo and commonly referred to as the 'Espoo Convention'. The Convention requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.

2.1.1.2 The Espoo Convention has been implemented in the European Union (EU) via the EIA Directive which (as noted above) is transposed into UK law by the EIA Regulations. Regulation 32 of the EIA Regulations requires that where the Secretary of State is of a view that an EIA application will have significant effects on the environment of another EEA State, or the Secretary of State receives a request for involvement from another EEA State, it must undertake a prescribed process of consultation and notification.

2.1.1.3 In relation to the UK's exit from the European Union (EU), the Environmental Assessments and Miscellaneous Planning (Amendment) (EU Exit) Regulations 2018 provide that the EIA regime under the EIA Regulations 2017 continue to apply in substantially the same form as they did prior to the UK leaving the EU.

2.1.1.4 PINS Advice Note 12: Transboundary Impacts (2020) sets out the procedures for consultation in association with an application for a DCO, where such development may have significant transboundary impacts. The note sets out the roles of PINS, other EEA States and developers. In respect of the latter, developers have no formal role under the Regulation 32 process, as the duties prescribed by Regulation 32 in notifying and consulting with other EEA States on potential transboundary impacts are the responsibility of the Secretary of State. However, developers are advised to:

- Carry out preparatory work to complete a transboundary screening matrix to assist the Secretary of State in determining the potential for likely significant effects on the environment in other EEA States;
- To submit the transboundary screening matrix along with the scoping request, if a scoping opinion is sought by the developer and with the DCO application; and
- Consider, when preparing documents for consultation and application, whether to undertake their own consultations with relevant EEA states.

2.1.1.5 This transboundary screening is provided in response to PINS Advice Note 12 and the bullet points noted above. It provides information about Hornsea Four which will be the subject of the DCO application and sets out information relating to the potential effects of the scheme and the interests of the other member states, to assist PINS in forming a view on the likelihood of significant transboundary effects arising from Hornsea Four.

2.1.1.6 Paragraph 2.6.124 of the National Policy Statement for Renewable Energy (NPS EN-3) notes the potential for impacts arising from offshore wind farms on fishermen from other nations who fish in UK waters. This is further considered in [Section 6.2.2](#) of this document.

3 Habitats Regulations Assessment

- 3.1.1.1 Article 6(3) of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora (the 'Habitats Directive'), requires an 'appropriate assessment' to be prepared where a plan or project is likely to have a significant effect upon the network of European sites. These include Special Areas of Conservation (SACs), candidate SACs (cSAC), Special Protection Areas (SPAs), potential SPAs (pSPAs), Sites of Community Importance (SCIs), Ramsar sites and priority natural habitat types. These sites may be located within the UK or another state.
- 3.1.1.2 The Habitats Directive is transposed into UK law by the Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2017 (as amended) (the 'Offshore Habitats Regulations') for offshore sites beyond 12 nautical miles (nm) and the Conservation of Habitats and Species Regulations 2017 (as amended) (The 'Habitats Regulations') for sites onshore and offshore sites laying within 12 nm. Regarding the UK's exit from the EU, the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 mean that the HRA regime under the Habitats Regulations continues to apply in substantially the same way as it did before the UK left the EU.
- 3.1.1.3 Regulation 24 of the Habitats Regulations sets out the procedure for the assessment of the implications of plans and projects on European sites. Regulation 28 of Offshore Habitats Regulations contain broadly similar statutory provisions to Regulation 24 of the Habitat Regulations. Under Regulation 24 of the Onshore Habitats Regulations and Regulation 28 of the Offshore Habitats Regulations respectively, if the proposed development is not directly connected with or necessary to the management of a site and is likely to significantly affect the site, the competent authority must undertake an appropriate assessment of the implications for that site in view of that site's conservation objectives. PINS Advice Note 10 (Habitat Regulations Assessment (PINS, 2017) recommends a four-stage process:
- Stage 1 Screening - Test of Likely Significance: Determining whether the plan or project "either alone or in-combination with other plans and projects" is likely to have a significant effect upon a site(s);
 - Stage 2 Appropriate Assessment - Where likely significant effects are identified during screening, determining whether, in view of the site's conservation objectives, the plan or project would have an adverse effect on the integrity of the site. If not, the plan can proceed;
 - Stage 3 Alternatives - Where the plan or project cannot be shown to avoid an adverse effect on the integrity of a site, there should be an examination of alternative solutions; and
 - Stage 4 Assessment of "imperative reasons of overriding public interest" (IROPI) - If it is not possible to identify alternative solutions that would avoid an adverse effect on integrity, it will be necessary to establish that IROPI exist. In the event of a negative appropriate assessment (stage 2 above), compensatory measures must also be included with the Habitats Regulations Assessment (HRA) report, which are considered during Stage 4 if there are no alternatives identified during Stage 3.
- 3.1.1.4 The stages of the process are collectively referred to as the HRA to clearly distinguish from the appropriate assessment, which is a single step within the whole HRA process.
- 3.1.1.5 Advice Note 10 also describes the information which is required to be submitted with the DCO application, and highlights the requirement for consultation and engagement with relevant bodies. Where significant effects are likely upon European sites in other EEA states,

consultation is required with the competent authorities of those states. It follows therefore that developers should commence engagement with these authorities at the screening stage of the HRA.

- 3.1.1.6 A Report to Inform Appropriate Assessment (RIAA - [B2.2 Report to Inform Appropriate Assessment](#)) is presented alongside the ES. The RIAA considers all terrestrial, marine and coastal European Sites that are potentially affected by onshore and offshore activities associated with Hornsea Four, and provides the information required for a HRA to be undertaken by the Secretary of State and informs the Secretary of State regarding whether Hornsea Four is likely to have significant transboundary effect on other EEA states.

4 Study Area

- 4.1.1.1 The Hornsea Four array area is located outside the 12 nautical mile (nm) limit in UK Exclusive Economic Zone (EEZ) waters. The distance of Hornsea Four from the boundary of the EEZ or 'median' of other EEA States considered is presented in [Table 1](#) and [Figure 1](#).

Table 1: Summary of approximate distance to nearest EEZ (median line) of other EEA state.

EEZ	Distance from Hornsea Four to nearest marine border (km)
The Netherlands	87
Germany	222
Denmark	235
Norway	247
Belgium	249
France	278
Republic of Ireland	333
Iceland	1,114

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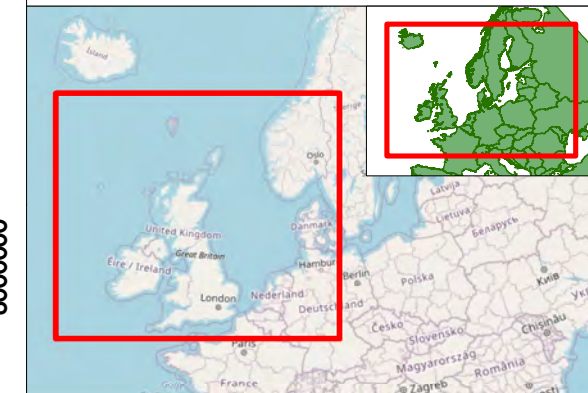
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Hornsea Four

Figure 1

Location of Hornsea Four and relevant jurisdictional boundaries

-  Order Limits
-  Exclusive Economic Zones



Coordinate system: ETRS 1989 UTM Zone 31N

Scale@A3: 1:6,000,000

0 100 200 Kilometres

0 50 100 Nautical Miles

REV	REMARK	DATE
---	First Issue for PEIR	03/09/2019
A	Updated following PEIR consultations, for DCO	03/08/2021

Transboundary Screening
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Icelandic Exclusive Economic Zone

Faeroe Exclusive Economic Zone

Norwegian Exclusive Economic Zone

Danish Exclusive Economic Zone

United Kingdom Exclusive Economic Zone

German Exclusive Economic Zone

Dutch Exclusive Economic Zone

Irish Exclusive Economic Zone

Belgian Exclusive Economic Zone
 France Exclusive Economic Zone

5 Consultation

5.1.1.1 Hornsea Four has conducted its pre-application consultation in accordance with the Planning Act 2008 plus associated guidance and Regulations, which includes the aforementioned 2017 Regulations. As part of this transboundary consultation, the following EU ministries, industries and organisations have been consulted:

- Dutch Ministry of Infrastructure and the Environment;
- German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety;
- Flemish Government Environment, Nature and Energy Department, International Environmental Policy Division;
- Environmental Protection Agency, Ministry of the Environment and Food of Denmark;
- Norwegian Environment Agency;
- French Ministère de l'écologie, du développement durable et de l'énergie Commissariat général au développement durable;
- Icelandic Ministry for Foreign Affairs;
- Irish Environmental Planning Policy, Department of Housing, Planning & Local Government;
- EU commercial fisheries organisations:
 - Rederscentrale (Belgian);
 - From Nord (French);
 - Cooperative Maritime Etaploise Producer Organisation (French);
 - VisNed (Dutch);
 - Danish Fishermen's Producer Organisation;
 - Swedish Pelagic Federation Producers Organisation;
 - Danish Pelagic Producers Organisation; and
 - Erzeugergemeinschaft der Nord- und Ostseefischer GmbH (German).

5.1.1.2 Hornsea Four have also consulted, and will continue to do so where required, with any additional consultees provided by the EU ministries, industries and organisations.

6 Baseline Environment

6.1 Offshore Physical and Biological Environment

6.1.1.1 Hornsea Four have completed a transboundary screening matrix for the offshore transboundary effects for the physical and biological environment ([Table 2](#)), in line with the suggested format set out in the Annex 1 of PINS Advice Note 12.

6.1.1.2 The conclusions of the transboundary screening for each environmental topic are presented, together with additional justification, in the following sections.

6.1.2 Marine Processes

6.1.2.1 The offshore components of Hornsea Four will lie wholly within UK territorial waters and any impacts on marine processes will be confined to a localised area within the footprint of the Hornsea Four array area and offshore Export Cable Corridor (ECC). Indirect effects are likely to be limited to one tidal excursion and therefore, no potential transboundary impacts upon marine processes anticipated. This is based on the current understanding of the baseline environment (e.g. sediment types and the tidal regime), along with modelling undertaken for Hornsea Four and the previous modelling work carried out for the Hornsea

Project One, Hornsea Project Two and Hornsea Three EIAs. These assessments and modelling concluded that impacts from sediment disturbance when installing foundations and cables were, and are, likely to be localised and of temporary duration due to resettlement of sediments. As a result, transboundary impacts are therefore not expected.

- 6.1.2.2 As described in [Volume A2, Chapter 1: Marine Geology, Oceanography and Physical Processes](#) of the ES, the transboundary screening submitted with Scoping concluded that impacts on marine processes would be limited to the UK EEZ. Based on the current understanding of the baseline environment, along with modelling work carried out for Hornsea Four, and at Hornsea Project One, Hornsea Project Two and Hornsea Three (all of which are located closer to the EEZ boundaries of other EEA states), any transboundary impacts were screened out of further assessment at the Scoping stage.

6.1.3 Benthic and Intertidal Ecology

- 6.1.3.1 It is considered that there is no pathway by which direct or indirect effects arising from Hornsea Four could significantly affect the benthic or intertidal ecology of another EEA State. The extent of any predicted impacts upon benthic and intertidal ecological receptors are likely to be limited in extent to the:

- Hornsea Four offshore footprint (i.e. the Hornsea Four array area and offshore ECC) for temporary/long term habitat loss and habitat modification (i.e. from the introduction of hard substrates); and
- One tidal excursion (10 km at the array area and 14 km at the ECC) for suspended sediment/deposition assessments.

- 6.1.3.2 Therefore, it is concluded that no potential transboundary impacts upon the benthic and intertidal ecology are anticipated, which as a result means that transboundary impacts on the benthic and intertidal ecological receptors are screened out of the EIA process.

6.1.4 Fish and Shellfish Ecology

- 6.1.4.1 It is considered that there may be potential transboundary impacts upon fish and shellfish ecology due to construction, operational and decommissioning impacts of Hornsea Four.

- 6.1.4.2 These include direct impacts as a result of underwater noise from piling operations during the installation of subsea infrastructure. Indirect impacts may occur in relation to fish and shellfish habitat or disturbance to habitat due to increased suspended sediment concentrations and deposition from the placement/removal of foundations and cables in or on the seabed. These activities have the potential to directly affect Annex II migratory fish species that are listed as features of European Sites in other EEA States, or species that are of commercial importance for fishing fleets of other EEA States.

- 6.1.4.3 Indirect effects may include loss of, or disturbance to, fish spawning and nursery habitats in the North Sea that are important for either migratory fish species designated as Annex II species or for fish species of commercial importance to other EEA states. The fish and shellfish receptors likely to be present within Hornsea Four fish and shellfish study area are outlined in [Volume A2, Chapter 3: Fish and Shellfish Ecology](#) of the ES, which also identifies the key spawning and nursery grounds located within and around the Hornsea Four array area and offshore ECC.

6.1.4.4 During construction, the probability of impacts arising from underwater noise is high. The potential effects associated with long-term habitat loss are, by nature, longer term effects which may be reversible depending upon the decommissioning strategy.

6.1.4.5 Therefore, transboundary impacts on fish and shellfish ecology and their nature conservation interests are screened into the EIA process. As such, a transboundary assessment has been completed and is included in [Volume A2, Chapter 3: Fish and Shellfish Ecology](#). Potential impacts upon European Sites with fish as a qualifying feature have been assessed within the RIAA ([B2.2 Report to Inform Appropriate Assessment](#)).

6.1.5 Marine Mammals

6.1.5.1 There is the potential for transboundary impacts upon marine mammals due to the mobile nature of marine mammal species and the proximity of Hornsea Four to the borders of surrounding EEA States, which are within migration ranges of certain species. The marine mammal species likely to be present in the Hornsea Four marine mammal study area are outlined in full in [Volume A2, Chapter 4: Marine Mammals](#) of the ES, and include harbour porpoise *Phocoena phocoena*, minke whale *Balaenoptera acutorostrata*, white-beaked dolphin *Lagenorhynchus albirostris*, grey seal *Halichoerus grypus* and harbour seal *Phoca vitulina*.

6.1.5.2 Direct impacts may occur due to underwater noise generated during construction and decommissioning, particularly piling during the installation of foundations. Indirect impacts may cause disturbance to prey (fish) species from loss of fish spawning and nursery habitat and suspended sediments and deposition. The operation and maintenance phase is considered less likely to result in significant transboundary impacts although the effects associated with the operational noise of turbines are, by nature, longer term effects which will be reversible depending on the decommissioning strategy.

6.1.5.3 Therefore, it is proposed that transboundary impacts upon marine mammals and their nature conservation interests are screened into the EIA process. As such, a transboundary assessment has been completed and is included in [Volume A2, Chapter 4: Marine Mammals](#). Potential impacts upon European Sites with marine mammals as a qualifying feature have been assessed within the RIAA ([B2.2 Report to Inform Appropriate Assessment](#)).

6.1.6 Ornithology

6.1.6.1 Transboundary impacts upon ornithological receptors (up to Mean High Water Springs (MHWS)) are possible due to the wide foraging and migratory ranges of typical bird species in the North Sea. In addition, a number of bird species that have been recorded during previous surveys include those that are listed as qualifying features of European Sites in other EEA States. The bird species likely to be present in the Hornsea Four array area and offshore ECC (based on the outputs of the Hornsea Project One, Hornsea Project Two and Hornsea Three boat-based surveys) are outlined in full in [Volume A2, Chapter 5: Offshore and Intertidal Ornithology](#) of the ES.

6.1.6.2 The key direct impacts for ornithological receptors are likely to arise during the operation and maintenance phase as a result of potential collisions (with rotating turbine blades which may result in direct mortality of individuals) and barrier effects (caused by the physical presence of structures which may prevent transit of birds between foraging and breeding

sites, or on migration). Direct impacts to ornithological receptors may also occur due to temporary habitat loss/disturbance across all development phases of Hornsea Four and permanent habitat loss during the operation and maintenance phase. Indirect impacts may cause disturbance to prey (fish) species from important bird feeding areas or changes to prey availability due to changes to physical processes and habitat as a result of the presence of operational infrastructure.

- 6.1.6.3 Therefore, it is proposed that transboundary impacts upon birds and their nature conservation interests are screened into the EIA process. As such, a transboundary assessment has been completed and is included in [Volume A2, Chapter 5: Offshore and Intertidal Ornithology](#). Potential impacts upon European Sites with birds as a qualifying feature have been assessed within the RIAA ([B2.2 Report to Inform Appropriate Assessment](#)).

Table 2: Offshore transboundary screening matrix for Hornsea Four – physical and biological environment.

Screening Criteria	Marine processes	Benthic subtidal and intertidal ecology	Fish and shellfish ecology	Marine mammals	Ornithology
<p>Characteristics of development (for a detailed description, see Volume A1, Chapter 4: Project Description of the ES)</p>	<p>Offshore The proposed development is an offshore generating station (wind farm) comprising of up to 180 wind turbines. A range of turbine models will be considered; however, it is anticipated that each turbine will have a maximum rotor diameter of 305 m and a maximum blade tip height of 370 m Lowest Astronomical Tide (LAT) (highest point of the structure). The minimum distance between the bottom of the blade and the water surface will be 40 m (Mean Sea Level). Foundation design has yet to be finalised with a final decision depending on final site investigation and procurement negotiations. The options under consideration include; steel monopile, a monopod suction caisson, a 3 or 4-legged suction caisson jacket, 3 or 4-legged piled jacket and Gravity Base Systems (GBS). Scour protection including rock and gravel dumping is being considered as part of the Project Description. Up to 10 offshore platforms will be installed which, depending on the transmission system, may include an offshore converter substation and offshore High Voltage Alternating Current (HVAC) booster substation. Offshore platform supporting accommodation facilities for operation and maintenance will also be required. The exact number of platforms to be installed is yet to be determined. Subsea array cables, offshore interconnector cables and subsea export cables will be installed to connect the turbines to the substations and to connect the substations to the onshore transition pits at the landfall. Cable protection (type not specified) will also be installed.</p> <p>Onshore Export cables will connect the offshore cables to the onshore substation located at Creyke Beck. The project is described in full in Volume A1, Chapter 4: Project Description.</p>				
Geographical area	The Hornsea Four array area is located approximately 69 km east from the coast of Yorkshire, and 87 km from the Dutch EEZ.				
Location of development (including existing use)	The Hornsea Four array area is located within the former Hornsea Zone, which covers approximately 4,735 km ² . Hornsea Four will cover an area within this approximately 468 km ² in area and will sit alongside the Hornsea Project One, Hornsea Project Two and Hornsea Three offshore wind farms.				
Cumulative impacts	See Volume A2, Chapter 1 .	See Volume A2, Chapter 2 .	See Volume A2, Chapter 3 .	See Volume A2, Chapter 4 .	See Volume A2, Chapter 5 .
Carrier	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	Transboundary assessment will be undertaken.	Transboundary assessment will be undertaken.	Transboundary assessment will be undertaken.
Environmental importance					
Extent					
Magnitude					
Probability					
Duration					
Frequency					
Reversibility					

6.2 Human Environment

6.2.1.1 Hornsea Four have completed a transboundary screening matrix for offshore transboundary effects for the human environment, in line with the suggested format set out in Annex 1 of PINS Advice Note 12. This screening is set out in [Table 3](#) below.

6.2.1.2 The conclusions of the transboundary screening for each offshore human environment topic are presented, together with additional justification, in the following sections.

6.2.2 Commercial Fisheries

6.2.2.1 Commercial fishing operates in the Hornsea Four commercial fisheries study area as outlined in [Volume A2, Chapter 6: Commercial Fisheries](#) of the ES and includes a number of fleets from EEA States.

6.2.2.2 Due to the highly mobile nature of both commercial fish species and fishing fleets and the proximity of the Hornsea Four array area to Dutch, German and Danish waters, and the presence of Belgian, Dutch, Danish, French and German fishing vessels with the Hornsea Four area, there is the potential for transboundary impacts upon commercial fisheries to arise from two sources:

- Effects on commercial fishing fleets as a result of impacts from Hornsea Four on commercial fish stocks in the waters of other EEA States, from the biological effects on fish stocks themselves; and
- Effects on commercial fishing fleets from all EEA countries as a result of constraints on foreign commercial fishing activities operating in Hornsea Four, including demersal trawling, beam trawling, demersal seining and other gears. These effects may include reduction in access to fishing grounds and potential displacement of fishing effort from Hornsea Four to alternative fishing grounds in other EEA States, which will have direct implications to that fishing ground.

6.2.2.3 As described in [Volume A2, Chapter 6: Commercial Fisheries](#) of the ES, effects on biological resources could occur over a range of tens of kilometres from Hornsea Four and could therefore interact with the Netherlands.

6.2.2.4 Effects on commercial fishing fleets from Hornsea Four could occur on non-UK fleets and could interact with commercial fishing interests from the following EEA states: the Netherlands, Germany, Belgium, Denmark, Norway, France and Ireland.

6.2.2.5 Therefore, it is proposed that transboundary impacts upon commercial fisheries are screened into the EIA process. As such, a transboundary assessment has been completed and is included in [Volume A2, Chapter 6: Commercial Fisheries](#).

6.2.3 Shipping and Navigation

6.2.3.1 Hornsea Four is situated in the Southern North Sea in an area where several international shipping routes pass between the UK and other European countries. The shipping and navigation baseline for the Hornsea Four array area and the offshore ECC is outlined in [Volume A2, Chapter 7: Shipping and Navigation](#) of the ES.

- 6.2.3.2 It has been identified that transboundary issues could arise from Hornsea Four on commercial shipping routes transiting between the UK and other EEA ports. This could also include impacts upon international ports, shipping routes and/or routes affected by other international offshore renewable energy developments. The potentially affected areas include ports within the Southern North Sea (as per [Section 10.7](#) of [Volume A5, Annex 7.1: Navigational Risk Assessment](#) (NRA) of the ES). The development of Hornsea Four could affect routes operating between the UK and ports located in the Netherlands, Denmark, Belgium and Germany. The results of the vessel deviation assessments in the NRA identified some deviations for routes; some deviations identified were found to be significant at this stage, and require further consultation as parts of the post-Section 42 Consultation process.
- 6.2.3.3 All EEA states that are likely to be affected by Hornsea Four ([Table 1](#)) have been consulted, and where required, will continue to be consulted as part of informal consultation post-application. Dialogue with these authorities will continue to take place throughout the development of Hornsea Four in relation to potential transboundary impacts. Consultation is also ongoing with specific shipping operators, notably DFDS Seaways, who operate ferry services between Immingham-Esbjerg, Immingham-Gothenburg, and North Shields and Ijmuiden which cross the Hornsea Four boundary.
- 6.2.3.4 Therefore, it is proposed that transboundary impacts upon shipping and navigation are screened into the EIA process. As such, a transboundary assessment has been completed and is included in [Volume A2, Chapter 7: Shipping and Navigation](#).

6.2.4 Aviation and Radar

- 6.2.4.1 The aviation and radar baseline for the Hornsea Four array area and the offshore ECC is outlined in [Volume A2, Chapter 8: Aviation and Radar](#) of the ES.
- 6.2.4.2 There is the potential for transboundary impacts to arise from the presence of the wind turbines during the operation and maintenance phase of Hornsea Four, disrupting civil and military radar coverage from the Netherlands.
- 6.2.4.3 Therefore, it is proposed that transboundary impacts upon aviation and radar are screened into the EIA process. As such, a transboundary assessment has been completed and is included in [Volume A2, Chapter 8: Aviation and Radar](#).

6.2.5 Marine Archaeology

- 6.2.5.1 The marine archaeology baseline for the Hornsea Four array area and the offshore ECC is outlined in [Volume A2, Chapter 9: Marine Archaeology](#) of the ES.
- 6.2.5.2 The extent of any predicted impacts upon marine archaeology receptors are likely to be limited in extent to the:
- Hornsea Four offshore footprint (i.e. the Hornsea Four array area and offshore ECC) for impacts associated with direct physical seabed disturbance; and
 - One tidal excursion for impacts associated with sediment deposition on the seabed.
- 6.2.5.3 As such, no potential transboundary impacts upon marine archaeology are anticipated and were scoped out of further assessment at the Scoping stage.

6.2.6 Seascape and Visual Resources

- 6.2.6.1 The seascape and visual resources baselines for the Hornsea Four array area and the offshore ECC corridor is outlined in [Volume A2, Chapter 10: Seascape, Landscape and Visual Resources](#) of the ES.
- 6.2.6.2 Following the scoping for seascape, landscape and visual resources, the assessment presented in the PEIR, and further consultation with Natural England and East Riding of Yorkshire Council (ERYC), potential impacts of offshore operation and maintenance activities are considered likely to be not significant in EIA terms due to project commitments and therefore have not been considered in detail in this ES [Volume A2, Chapter 10: Seascape, Landscape and Visual Resources](#).
- 6.2.6.3 As such, no potential transboundary impacts upon seascape and visual resources are anticipated and were scoped out of the EIA process.

6.2.7 Infrastructure and Other Users

- 6.2.7.1 The baseline for infrastructure and other users for the Hornsea Four array area and the offshore ECC is outlined in [Volume A2, Chapter 11: Infrastructure and Other Users](#) of the ES.
- 6.2.7.2 Potential impacts upon infrastructure and other users are limited to activities surrounding oil and gas operations, cable and pipelines and carbon capture and storage (CCS). The potential impacts on these marine users and activities are predicted to be localised and limited to entirely within the UK EEZ with no meaningful pathway for effect outside the UK EEZ.
- 6.2.7.3 As such, no potential transboundary impacts upon infrastructure and other users are anticipated and were scoped out of the EIA process.

Table 3: Offshore transboundary screening matrix for Hornsea Four – human environment.

Screening Criteria	Commercial fisheries	Shipping and navigation	Aviation and radar	Marine archaeology	Seascape and visual resources	Infrastructure and other users
Characteristics of development (for a detailed description, see Volume A1, Chapter 4: Project Description)	See Table 2 for details.					
Geographical area	See Table 2 for details.					
Location of development (including existing use)	See Table 2 for details.					
Cumulative impacts	See Volume A2, Chapter 6.	See Volume A2, Chapter 7.	See Volume A2, Chapter 8.	See Volume A2, Chapter 9.	See Volume A2, Chapter 10.	See Volume A2, Chapter 11.
Carrier	Transboundary assessment will be undertaken.	Transboundary assessment will be undertaken.	Transboundary assessment will be undertaken.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.
Environmental importance						
Extent						
Magnitude						
Probability						
Duration						
Frequency						
Reversibility						

6.3 Onshore Transboundary Impacts

6.3.1.1 Hornsea Four have completed a transboundary screening matrix for onshore transboundary effects, in line with the suggested format set out in Annex 1 of PINS Advice Note 12. This screening matrix is set out in [Table 4](#) below.

6.3.1.2 The conclusion of the transboundary screening for each onshore topic are presented, together with additional justification, in the following sections.

6.3.2 Geology and Ground Conditions

6.3.2.1 Any impacts on geology and ground conditions arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area within the footprint of the Hornsea Four onshore transmission infrastructure. There is no pathway by which direct or indirect effects arising from the Hornsea Four could significantly affect the geology or ground conditions of another member state.

6.3.2.2 As described in [Volume A3, Chapter 1: Geology and Ground Conditions](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.3 Hydrology and Flood Risk

6.3.3.1 Any impacts on hydrology and flood risk arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area with the footprint of the Hornsea Four onshore transmission infrastructure. There is no pathway by which direct or indirect effects from arising from Hornsea Four could significantly affect the hydrology and flood risk of another member state.

6.3.3.2 As described in [Volume A3, Chapter 2: Hydrology and Flood Risk](#) of the ES all transboundary impacts were therefore scoped out of further assessment.

6.3.4 Ecology and Nature Conservation

6.3.4.1 Any impacts on onshore ecology and nature conservation arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area within the footprint of the Hornsea Four onshore transmission infrastructure. There is no pathway by which direct and indirect effects arising from Hornsea Four could significantly affect the onshore ecology and nature conservation of another member state including those that are listed as qualifying features of European Sites in other EEA states.

6.3.4.2 As described in [Volume A3, Chapter 3: Ecology and Nature Conservation](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.5 Traffic and Transport

6.3.5.1 Any impacts on the traffic and transport arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area of the UK road infrastructure. There is no pathway by which direct or indirect effects arising from Hornsea Four could significantly affect traffic and transport in another member state.

6.3.5.2 As described in [Volume A3, Chapter 7: Traffic and Transport](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.6 Historic Environment

6.3.6.1 Any impacts on the onshore historic environment arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area within the direct or indirect effects arising from Hornsea Four could significantly affect the onshore historic environment of another member state.

6.3.6.2 As described in [Volume A3, Chapter 5: Historic Environment](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.7 Landscape and Visual Resources

6.3.7.1 Any impacts on landscape and visual resources arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area in the vicinity of the Hornsea Four onshore ECC. There is no pathway by which direct or indirect effects arising from Hornsea Four could significantly the landscape and visual resources of another member state.

6.3.7.2 As described in [Volume A3, Chapter 4: Landscape and Visual](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.8 Land Use, Agriculture and Recreation

6.3.8.1 Any impacts on land use, agriculture and recreation arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area within the footprint of the Hornsea Four onshore ECC. There is no pathway by which direct or indirect effects arising from Hornsea Four could significantly affect the land use, agriculture and recreation of another member state.

6.3.8.2 As described in [Volume A3, Chapter 6: Land Use and Agriculture](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.9 Noise and Vibration

6.3.9.1 Any noise and vibration impacts arising from the construction, operation and maintenance and decommissioning of Hornsea Four will be confined to a localised area in the vicinity of the Hornsea Four onshore ECC. There is no pathway by which direct or indirect effects arising from Hornsea Four could result in significant noise and vibration effects in another member state.

6.3.9.2 As described in [Volume A3, Chapter 8: Noise and Vibration](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.10 Air Quality and Health

6.3.10.1 Potential transboundary impacts to air quality and health arising from the construction, operation and maintenance and decommissioning of Hornsea Four are anticipated to be minor and localised in extent and will be confined to the duration of the construction phase

only. Any potential impacts to health related to air quality will also be localised and confined to the onshore construction phase. Potential transboundary health impacts due to the generation of an Electromagnetic Field (EMF) around the onshore ECC will be confined to the immediate vicinity of the onshore ECC.

6.3.10.2 As described in [Volume A3, Chapter 9: Air Quality](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

6.3.11 Socio-Economic Aspects

6.3.11.1 The socio-economic baseline for the Hornsea Four array area and the offshore ECC are outlined in full in [Volume A3, Chapter 10: Socioeconomics](#) of the ES.

6.3.11.2 There is the potential for transboundary impacts arising from interaction with the activities of commercial fisheries and shipping. These have been considered in [Volume A2, Chapter 6](#) and [Volume A2, Chapter 7](#) of the ES, respectively.

6.3.11.3 In addition, potential transboundary impacts upon the economies of other EEA states may arise through the purchase of project components, equipment and the sourcing of labour from companies based outside the UK. Under Regulation 32 part 6(a) of the 2017 Regulations, the Secretary of State must enter into consultation with any EEA State concerned regarding the potential significant effects of the development on the environment of that EEA State and the measures envisaged to reduce or eliminate such effects. However, the sourcing of materials and labour from other EEA states is assumed to provide beneficial effects in the economies of such states and so the consideration of “measures envisaged to reduce or eliminate such effects” is not relevant in the context of transboundary impacts.

6.3.11.4 As described in [Volume A3, Chapter 10: Socioeconomics](#) of the ES, all transboundary impacts were therefore scoped out of further assessment.

Table 4: Onshore transboundary screening matrix for Hornsea Four.

Screening Criteria	Geology and ground conditions	Hydrology and flood risk	Ecology and nature conservation	Traffic and transport	Historic environment	Landscape and visual resources	Land use and recreation	Noise and vibration	Air quality and health	Socio-economic characteristics
<p>Characteristics of development (for a detailed description, see Volume A1, Chapter 4: Project Description)</p>	<p>The offshore cables will be brought ashore and connected to the onshore cables in Transition Joint Bays (TJBs). From there, the onshore cables will be placed in up to six trenches to transfer the power generated across east Yorkshire to the onshore substation. The onshore substation will include Electrical Balancing Infrastructure (EBI) and 400 kV connection to Creyke Beck National Grid substation.</p> <p>The onshore infrastructure is described in full in Volume A1, Chapter 4: Project Description.</p>									
<p>Geographical area</p>	<p>N/A – The Hornsea Four array area is located approximately 69 km east of the Yorkshire Coast and 87 km from the Dutch EEZ.</p>									
<p>Location of development (including existing use)</p>	<p>The offshore export cable will make landfall on the Yorkshire coast with the onshore cable route extending to the Creyke Beck substation located in Yorkshire.</p>									
<p>Cumulative impacts</p>	<p>No significant transboundary impacts are predicted.</p>									
<p>Carrier</p>										
<p>Environmental importance</p>										
<p>Extent</p>										
<p>Magnitude</p>										
<p>Probability</p>										
<p>Duration</p>										
<p>Frequency</p>										
<p>Reversibility</p>										

7 Conclusions

7.1.1.1 This transboundary screening document has been prepared in accordance with PINS Advice Note 12. The primary purpose of this note is to provide a screening assessment of potential transboundary impacts which have the potential to affect other EEA States.

7.1.1.2 Transboundary impacts have been screened out for all onshore topics and for offshore, generally except in relation to the following topics where, based on current information available, Hornsea Four has the potential to have significant effects on the environment in other EEA States:

- Fish and Shellfish Ecology;
- Marine Mammals;
- Offshore Ornithology;
- Commercial Fisheries;
- Shipping and Navigation; and
- Aviation and Radar.

7.1.1.3 These topics have been screened in to the transboundary assessment and likely significant effects will be reported in the topic specific chapters of the Environmental Statement ([Volume A2, Chapters 1 to 11](#)).

8 References

PINS (2017). PINS Advice Note 10. Habitat Regulations Assessment. November 2017. Version 8.

PINS (2020). PINS Advice Note 12. Transboundary Impacts and Process. December 2020. Version 6.