

# Hornsea 4

# Ørsted



## Hornsea Project Four: Preliminary Environmental Information Report (PEIR)

### Volume 4, Annex 5.5: Onshore Cumulative Effects

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## Glossary

Term	Definition
Cumulative Effects	The combined effect of Hornsea Four in combination with the effects of a number of different projects, on the same single receptor/resource.
Cumulative Impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with Hornsea Four.
Design Envelope	A description of the range of possible elements that make up the Hornsea Four design options under consideration, as set out in detail in the project description. This envelope is used to define Hornsea Four for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
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.
Hornsea Project Four offshore wind farm	The proposed Hornsea Project Four offshore wind farm project; the term covers all elements within the Development Consent Order (i.e. both the offshore and onshore components). Hereafter referred to as Hornsea Four.
Ørsted Hornsea Project Four Ltd.	The Applicant of proposed Hornsea Project Four offshore wind farm.

## Acronyms

Acronym	Definition
BEIS	Department of Business, Energy and Industrial Strategy
CEA	Cumulative Effects Assessment
DCO	Development Consent Order
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
IROPI	Imperative Reasons of Overriding Public Interest
MHWS	Mean High Water Springs
NPS	National Policy Statements
NSIP	Nationally Significant Infrastructure Project
PEIR	Preliminary Environmental Information Report
PINS	The Planning Inspectorate
SoS	Secretary of State
ZoI	Zone of Influence

## 1 Introduction

- 1.1.1.1 A fundamental requirement of undertaking the Cumulative Effects Assessment (CEA) is to identify those projects, plans and activities with which Hornsea Project Four offshore wind farm (hereafter Hornsea Four) may interact to produce a cumulative impact. These interactions may arise within the construction, operation and maintenance or decommissioning phases.
- 1.1.1.2 The objective of this annex is to provide details on the proposed methodology for the Hornsea Four onshore CEA, justification for the approach taken regarding cumulative impacts, and to detail the long list of projects, plans and activities that have been considered within the onshore CEA. The approach for cumulative impacts is based upon the Planning Inspectorate (PINS) Advice Note 17: Cumulative Effects Assessment. The approach to the CEA is intended to be specific to Hornsea Four and takes account of the available knowledge of the environment and other activities around the Hornsea Four boundary.
- 1.1.1.3 It should be noted that although Hornsea Four is aware of the proposed upgrades to the Creyke Beck substation, no information is available in the public domain at this time. Therefore, this has not been included in the CEA. In the event of further information becoming available this will be included in the CEA carried out and submitted with the Development Consent Order (DCO) application.

## 2 Policy and legislative context

- 2.1.1.1 The Planning Act 2008 underpins the consenting regime for certain types of development classed as Nationally Significant Infrastructure Projects (NSIPs). The Secretary of State (SoS) for the department of Business, Enterprise and Industrial Strategy (BEIS) has confirmed that Hornsea Four will require development consent under the Planning Act. The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017) implemented the requirements of the Environmental Impact Assessment (EIA) Directive (Directive 2014/52/EU) into UK law.
- 2.1.1.2 The overarching National Policy Statement (NPS) for Energy (EN-1) and the NPS for Renewable Energy Infrastructure (EN-3) both identify the need to address the maximum potential adverse impacts. Matters considered to affect the maximum adverse impact are topic impacts, inter-relationships between topics, and cumulative impacts. The maximum adverse scenario, or envelope, is termed the Design (or 'Rochdale') Envelope.
- 2.1.1.3 PINS has produced 'Advice Note 9: Rochdale Envelope' (2012) setting out the views of PINS regarding how this approach should be used in the context of the Planning Act 2008. The Rochdale Envelope approach is a well understood concept that involves ensuring that any EIA is based on assessing the realistic worst-case scenario where flexibility or a range of options is sought as part of the consent application. This guidance confirms that in order to ensure a robust application of the Rochdale Envelope principle to the EIA process, this principle must also be applied to cumulative as well as individual effects.

2.1.1.4 PINS have produced 'Advice Note 17: Cumulative Effects Assessment' (PINS,2015), which provides guidance on a staged process that can be used for cumulative effects assessments for NSIPs. Advice Note 17 (AN17) detailed a four-step process that can be followed by developers and which has been applied here.

## 3 Consultation

3.1.1.1 As part of the PEIR for Hornsea Four, consultation in relation to cumulative effect has been undertaken with various statutory and non-statutory authorities and stakeholders as part of the evidence plan process. A record of the key areas of consultation is provided within [Volume 1, Chapter 6: Consultation](#), but consultation to date is also summarised in the topic-specific PEIR chapters.

3.1.1.2 A summary of responses from PINS relevant to the CEA from the Scoping Opinion (PINS, 2018) are provided in [Table 1](#) below.

**Table 1: PINS Scoping comments relating to the CEA.**

Comment	Response to issue raised and/or where considered in this annex
<p><u>Cumulative effects during decommissioning:</u> Decommissioning is not proposed to be addressed in the cumulative assessment on the basis that it is too far in the future for enough information to be available to form a robust assessment. The Inspectorate notes the intention to assess this phase of the Proposed Development and to commit to a decommissioning plan at the relevant time and is content with this approach. The Inspectorate agrees to scope cumulative effects during decommissioning out of the cumulative assessment; however, the Applicant should take into account comments in Section 3, Paragraph 2.3.11 of this Scoping Opinion.</p>	<p>Noted – no response required.</p>
<p><u>Cumulative effects on onshore environment:</u></p> <p><u>Cumulative flood risk at onshore substation:</u> The Inspectorate advises that the drainage design presented in the ES should take into account the potential cumulative flood risk impact.</p> <p><u>Cumulative visual effects: onshore construction:</u> While it is appreciated that these effects will be temporary, given the large scale of the Proposed Development and other developments identified in Section 8 the Inspectorate considers that significant effects could occur if developments fall within the same area and in the same temporal extent. The ES should assess cumulative impacts to visual receptors.</p> <p><u>Cumulative land and agriculture effects: onshore construction:</u> While it is appreciated that these effects will be temporary, given the large scale of the Proposed Development and other developments identified in Section 8 the Inspectorate considers that significant effects could occur if</p>	<p>This annex sets out the approach to the CEA with the long list of projects, plans and activities presented in <a href="#">Appendix A</a>. Topic-specific assessments are included in the relevant PEIR chapters (<a href="#">Volume 3, Chapter 2: Hydrology and Flood Risk</a>, <a href="#">Volume 3, Chapter 4: Landscape and Visual</a> and <a href="#">Volume 3, Chapter 6: Land Use and Agriculture</a>).</p>

Comment	Response to issue raised and/or where considered in this annex
<p>developments affect the same geographical area and in temporal extent. This might be when impacts are sequential or overlapping. The Inspectorate would expect to see an assessment in the ES where significant effects could occur.</p>	
<p><u>Zols for cumulative assessment:</u> The Zones of Influence (Zol) for the cumulative assessment differ from the environmental aspect chapter for some aspects. It is noted that some principles behind the Zol are given in Paragraph 8.4.3.2 and the Inspectorate would expect the ES to clearly explain how the Zol or study area(s) have been determined, based on the likely extent of impacts.</p>	<p>Zols have been defined in <b>Table 3</b> which have been derived based upon the likely extent over which cumulative impacts are likely to occur. Cumulative effect screening ranges specific to each EIA receptor topic are presented in <b>Table 6</b>.</p>

## 4 Definitions of cumulative effects for Hornsea Four

- 4.1.1.1 The PEIR addresses the cumulative effects for both the onshore and offshore elements of Hornsea Four. For the purposes of the Hornsea Four CEA process, cumulative effects are defined as those that result from incremental changes caused by other reasonably foreseeable actions alongside Hornsea Four. This includes the impact of other relevant developments that were not present at the time of data collection or survey. In-combination effects are defined as the combined effect of Hornsea Four, with the effects from a number of different projects, on the integrity of European Sites designated for their nature conservation value. In-combination effects are presented separately within the Report to Inform the Appropriate Assessment.
- 4.1.1.2 This definition is consistent with the definition provided by PINS in Advice Note 17 and has been applied consistently throughout the PEIR.

## 5 Approach to cumulative effects assessment

### 5.1 Overview

- 5.1.1.1 In the past, there has been a lack of guidance for CEA, and past projects have consequently tended to adopt different methods for assessment. PINS produced Advice Note 17: Cumulative Effect Assessment, to provide guidance on a staged process that can be used for CEAs for NSIPs (summarised in **Table 2**). In addition to Advice Note 17, the approach to cumulative assessment for Hornsea Four has also taken into account the Cumulative Impacts Assessment Guidelines issued by RenewableUK and PINS Advice Note 9: Rochdale Envelope.

**Table 2: Stages and activities involved in the CEA process (taken from PINS Advice Note 17).**

CEA stage	Activity
<p>Stage 1 – Establish the project’s Zol and establish a long-list of other developments</p>	<p>The Project undertakes a desk study to identify the Zol for the development for the topics that are proposed to be scoped into the EIA. The Zol analysis is documented (i.e. table of topics and Zol), with supporting GIS.</p> <p>The long list of other plans and projects/activities is drawn up through a desk study of planning applications, development plan documents, relevant development frameworks and any other available sources to identify ‘other development’ within the Zol.</p> <p>Information on each project (development type, when occurring, etc.) is documented, along with the certainty or tier assigned to the ‘other development’ (i.e. confidence it will take place in the current form and when it will take place in relation to the project).</p> <p>AN17 notes that the project should then consult with the relevant planning authority/authorities and statutory consultees regarding the long list (and ideally prior to the submission of the Scoping Report)<sup>1</sup>.</p>
<p>Stage 2 – Screening of long list: Identify a shortlist of other developments for the CEA</p>	<p>PINS have provided inclusion/exclusion threshold criteria, against which the potential for ‘other development to give rise to significant cumulative effects by virtue of overlaps in temporal scope, the scale and nature of the ‘other developments’ and/or receiving environment, or any other relevant factors is assessed. From this assessment, a shortlist of ‘other developments’ to be included in the CEA is produced. It is noted that documented information on each of the ‘other development’ is likely to be high level at this stage, outlining the key issues to take forward.</p> <p>AN17 notes that the proposed inclusion/exclusion should ideally be finalised prior to the request for a Scoping Opinion, and the project must consult with the relevant planning authorities and statutory consultees regarding the shortlist<sup>1</sup>.</p>
<p>Stage 3 – Information gathering</p>	<p>All available information on the ‘other developments’ within the shortlist generated at Stage 2 is collated to inform the CEA.</p>
<p>Stage 4 - Assessment</p>	<p>The project reviews each of the ‘other developments’ in turn to assess whether cumulative effects may arise, which in turn produces topic specific shortlists (for the topic specific CEA study area) that are referred to and considered within each technical onshore chapter in <b>Volume 3</b>. This should also include, where relevant, consideration of any mitigation measures where significant adverse cumulative effects are identified and should clearly signpost to the relevant means of securing mitigation (e.g. DCO requirements and associated mitigation plans).</p>

<sup>1</sup> Note that for Hornsea Four a long list for onshore issues was provided for consideration at scoping.

CEA stage	Activity
	While not to be used as a means to shift the burden of mitigation, it may be appropriate to ascertain the contribution of each development to the effect (done via professional judgement). However, it may be useful during the consultation with other developers to identify means to jointly address mitigation of significant adverse cumulative effects and the means to ensure delivery.

5.1.1.2 The following sections sets out the Hornsea Four approach to completing Stages 1 to 3, incorporating development of the long list, tiering of projects and development of the topic-specific short lists. These short lists have been considered in detail in each of the topic-specific PEIR chapters as part of the cumulative assessment process (Stage 4)

## 5.2 Stage 1 - Establish the Zols and identify long list of 'other development'

### 5.2.1 Approach to the long list

5.2.1.1 Under the first stage of the onshore CEA, a long-list of relevant projects, plans and activities occurring within a large study area around Hornsea Four has been developed. Given the scale of the onshore project and its location entirely within the boundary of East Riding of Yorkshire Council (ERYC) proposed or planned development information has been collated from within this local authority boundary and has been based on publicly available information available at the time of preparation.

5.2.1.2 The long-list, landward of Mean High-Water Springs (MHWS) has been produced based on the scale of other projects and the potential for them to interact with Hornsea Four. Any projects submitted for planning permission post-May 2019 have not been considered for inclusion in the PEIR. The long-list will be reviewed during the preparation of the Environmental Statement (ES) submitted with the DCO application, and any new (or amended) projects will be added at that stage.

5.2.1.3 **Table 3** defines the search area extents that have been applied in developing the long list of other projects, plans and activities for each of the onshore technical assessments included in the PEIR.

**Table 3: CEA onshore long list search areas extents or Zols.**

Project, plan or activity	CEA search area extents
Geology and Ground Conditions	1 km buffer around the onshore PEIR boundary.
Hydrology and Flood Risk	Surface water catchments containing onshore project activities.
Ecology and Nature Conservation	5 km buffer around the PEIR boundary.
Landscape and Visual	5km search area around the OnSS (no cumulative assessment of landfall/ECC is anticipated as the assessment assesses construction stage works only).
Historic Environment	1 km buffer around the PEIR boundary 5 km buffer around OnSS permanent infrastructure.



Project, plan or activity	CEA search area extents
Land Use and Agriculture	1 km buffer around the onshore PEIR boundary.
Traffic and Transport	Schemes of regional significance as agreed with ERYC.
Noise and Vibration	2 km buffer around the onshore PEIR boundary.
Air Quality	Schemes of regional significance as agreed with ERYC.
Socio-Economic	Scoped out during EIA screening.

5.2.1.4 All projects, plans, and activities within the search areas defined in the table above have been identified through a desktop study using, amongst others, the following data sources:

- ERYC Planning website (<https://newplanningaccess.eastriding.gov.uk/newplanningaccess/>)
- Developer and project proponent websites (e.g. <https://highwaysengland.co.uk/projects/a63-castle-street-improvement/>)

5.2.1.5 The Hornsea Four cumulative long list is presented in [Appendix A](#). All onshore projects, plans and activities considered within the CEA, based on the search areas set out in [Table 3](#) are presented in [Annex 5.6: Location of Onshore Cumulative Schemes](#).

## 5.2.2 Tiered approach

5.2.2.1 In assessing the potential for cumulative effects from Hornsea Four, it is important to bear in mind that projects, predominantly those 'proposed', may or may not be taken forward for development. Therefore, there is a need to build in some consideration of certainty (or uncertainty) with respect to the potential impacts which might arise from such proposals, in line with the approach set out by PINS in Advice Note 17.

5.2.2.2 For these reasons, all of the relevant long list plans and projects have been allocated into 'tiers', reflecting their current status within the planning and development process. This allows the cumulative impact assessment to present several scenarios if required, reflecting the varying levels of certainty of an activity proceeding and therefore the potential for impacts to arise that might act cumulatively with the impacts arising from Hornsea Four. Appropriate weight may therefore be given to each scenario (tier) in the decision-making process when considering the potential cumulative impacts associated with Hornsea Four. For example, it may be considered that greater weight be attributed to tier 1 than tier 2.

5.2.2.3 In accordance with PINS Advice Note 17, the proposed tiering structure is described in [Table 4](#). The tiers are listed in descending order of level of detail likely to be available (and certainty of effects arising). It is noted in PINS Advice Note 17 that where other projects are expected to be completed before the construction of the proposed NSIP and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline and may be considered as part of assessment in the construction and operational phase (noting that the assessment should clearly distinguish between projects forming part of the baseline and those in the CEA).

**Table 4: Description of tiers of other developments considered for CEA (adapted from PINS Advice Note 17).**

Tier 1	Project under construction.
	Permitted applications, whether under the Planning Act 2008 or other regimes, but not yet implemented.
	Submitted applications, whether under the Planning Act 2008 or other regimes, but not yet determined.
Tier 2	Projects on the Planning Inspectorate’s Programme of Projects where a Scoping Report has been submitted.
Tier 3	Projects on the Planning Inspectorate’s Programme of Projects where a Scoping Report has not been submitted.
	Identified in the relevant Development Plan (and emerging Development Plans with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

5.2.2.4 The tiering allocated to each of the long list projects is indicated as part of the long list presented in [Appendix A](#).

### 5.3 Stage 2 – Screening of long list (interactions)

5.3.1.1 Having developed the Hornsea Four long list, all projects, plans and activities have been screened based on the level of detailed information available and the potential for interaction with Hornsea Four, whether this interaction be temporal and/or spatial and where a potential pathway exists. This screening has produced EIA topic-specific short-lists of projects to be considered further within the CEA as part of each EIA topic chapter. It should be noted that this process may have screened a project in for one EIA topic, but screened it out for another. The individual short-lists are presented in each technical topic chapter in PEIR [Volume 3](#). The screening process has applied the criteria presented in [Table 5](#).

**Table 5: CEA long list screening criteria.**

Project screened-in	Project screened-out
<ul style="list-style-type: none"> <li>- Project, plan or activity is considered as part of the baseline environment but has ongoing effects;</li> <li>- Potential for an impact-receptor pathway to exist;</li> <li>- Potential for a spatial effect interaction to exist; and/or</li> <li>- Potential for temporal effect interaction exists.</li> </ul>	<ul style="list-style-type: none"> <li>- Project, plan or activity included as part of the baseline environment (therefore not a consideration in the CEA);</li> <li>- Low data confidence (meaningful assessment cannot be undertaken);</li> <li>- No potential impact-receptor pathway exists;</li> <li>- No potential for a spatial effect interaction; and/or</li> <li>- No potential for a temporal effect interaction.</li> </ul>

5.3.1.2 During the screening process, the steps above have been followed in the defined order to allow a clear justification for screening projects in/out. Definitions of relevance to [Table 5](#)

comprise:

- **Spatial effect interaction:** The impacts on a receptor from Hornsea Four and one or more other plans/projects have a geographical overlap. For example, noise from construction operations at Hornsea Four could overlap with those of another onshore construction project, if it is sufficiently close to Hornsea Four. If there is no spatial interaction, there is no potential for a cumulative effect.
- **Temporal effect interaction:** The impacts from Hornsea Four and one or more other plans/projects have the potential to occur at the same time. If there is no temporal interaction, there is no potential for a cumulative effect.
- **Potential impact-receptor pathway:** There is the potential that a pathway exists whereby an impact could have an effect on a receptor. For example, increases to suspended sediment concentration could have an impact on fish and shellfish receptors, but noise could not have an effect on geology and ground condition receptors.

5.3.1.3 Only where there is the potential for both spatial and temporal interaction between effects at Hornsea Four and one or more other plans/projects, has a cumulative impact been taken forward for consideration in the CEA. The screening of the long list is set out in [Appendix A](#), identifying those projects screened in or out for further consideration on the basis of one or more of the preceding criteria.

## 5.4 Stage 2 – Topic-specific screening of long list (impact ranges)

5.4.1.1 The screened long list identifies all of the other plans/projects and activities that might give rise to cumulative effects when considered alongside the potential impacts arising from Hornsea Four but does not identify the differences in impact ranges for different environmental receptors. In order to focus the topic specific CEAs presented in the PEIR chapters, the screened long list was subject to further topic specific screening to identify those relevant plans/projects and activities within the Zols of Hornsea Four for each topic. The topic-specific screening distances used to refine the screened long list into topic-specific short lists (along with justifications for the distances used) are provided in [Table 6](#).

**Table 6: Cumulative effect screening ranges specific to each EIA receptor topic.**

EIA topic	Maximum extent of impact and justification
Geology and Ground Conditions	With regards to the CEA the predicted effects predominantly relate to direct effects, a 1km buffer was selected to ensure that the indirect impacts on geology and ground conditions were appropriately included. It is considered unlikely that significant effects greater than this distance would occur given the impacts under assessment. Impacts greater than this distance had also previously not been assessed as part of the PRA which has been used to inform the PEIR chapter.
Hydrology and Flood Risk	Due to the inter-connected nature of surface hydrological system, activities in one part of a surface catchment have the potential to affect other parts of the catchment in which they take place and also affect other connected catchments

EIA topic	Maximum extent of impact and justification
	<p>downstream. For the purposes of this assessment, all river water body catchments (identified by the Environment Agency for the purposes of the Water Framework Directive) in which construction of operational activities would take place have been used to define the maximum theoretical extent of project impacts. It is considered unlikely that potential impacts on surface water receptors would occur outside of these catchments.</p>
Ecology and Nature Conservation	<p>A maximum search area of 5km has been selected for onshore ecology. This is in order to consider highly mobile bat and bird species. For other protected species and habitats, a maximum extent of impact is 2km, taking into consideration potential pathways (i.e. connecting habitats between projects) as well as temporal overlap on shared habitat resources.</p>
Landscape and Visual	<p>The Hornsea Four LVIA Study Area for the cumulative assessment was defined as a 5 km radius from the Hornsea Four scoping boundary. This considers the potential inter-visibility of other planned projects with the OnSS at operation. It also extends up to 10 km radius as a precautionary basis for potential inter-visibility of tall Hornsea Four substation structures with other tall structures from other planned development such as proposed onshore wind farms or overhead power lines.</p>
Historic Environment	<p>The 1 km &amp; 5 km buffers have been identified for the historic environment CEA to ensure indirect (non-physical) cumulative effects can be appropriately identified and assessed. It is considered unlikely that significant effects greater than these distances would occur given the impacts under assessment and the nature of this topic.</p>
Land Use and Agriculture	<p>Whilst most predicted effects relate to direct effects the 1 km buffer was selected to ensure that indirect effects on land use and agriculture were appropriately included. It is considered unlikely that significant effects greater than this distance would occur given the impacts under assessment and the nature of this topic.</p>
Traffic and Transport	<p>Agreement with the ERYC that the CEA should consider the, A164/ Jocks Lodge highway improvement scheme and the A63 Castle Street highway improvement scheme.</p> <p>The regions' local plan allocations (employment and housing) are included within the TEMPro growth factors applied to the future baseline traffic flows.</p>

EIA topic	Maximum extent of impact and justification
Noise and Vibration	It is considered unlikely that any direct significant effects outside of the 2 km buffer would occur given the impacts under assessment and the nature of this topic.
Air Quality	The maximum extent of impact for air quality are the same as those for Traffic and Transport.

5.4.1.2 These topic-specific ranges have been applied to the long list presented in [Appendix A](#) to identify relevant short list plan/projects/activities to be taken forward to the topic-specific CEA presented in each PEIR chapter (summary short list tables are presented in each of the onshore PEIR topic chapters).

## 5.5 Stage 3 (information gathering) and Stage 4 (assessment)

5.5.1.1 Following on from the production of the topic-specific long lists, EIA topics authors have undertaken an information gathering exercise in relation to all plans/projects/activities that have been screened in for each particular topic. This information gathering has then been used to inform the CEA assessments that are presented within each EIA topic chapter.

5.5.1.2 The CEA assessments are provided in each of the technical chapters in PEIR [Volume 3](#) and utilise topic specific criteria and rationales for individual assessments which are not repeated here.

## 6 References

DECC (2011). Overarching National Policy Statement for Energy (EN-1). Available at: <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure> Accessed May 2019.

DECC (2011). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure> Accessed May 2019.

PINS (2012). Advice Note 9: Rochdale Envelope. Available at <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/> Accessed May 2019.

PINS (2015). Advice Note 17: Cumulative Effects Assessment. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/> Accessed May 2019.

RenewableUK (2013). Cumulative Impact Assessment Guidelines: Guiding Principles for Cumulative Impacts Assessment in Offshore Wind Farms. Available at: <http://www.nerc.ac.uk/innovation/activities/infrastructure/offshore/cumulative-impact-assessment-guidelines/> Accessed May 2019.

**Appendix A**  
**Onshore Cumulative Screening Matrix**

PEIR Volume 4, Annex 5.5, Appendix A - Onshore Cumulative Effects Screening Matrix

**Abbreviations**  
 OnSS = Onshore Substation  
 onshore ECC = onshore Export Cable Corridor

**Key to Status of Listed Project**

	In Planning/Consenting/Pre-Construction
	Construction
	Operation and Maintenance
	Decommissioning

**Key to Topic Specific CEA Screening Status**

a	Included as part of the topic baseline and hence not considered within the cumulative impact assessment.
b	Part of the baseline but has an ongoing impact and is therefore considered relevant to the cumulative impact assessment. <b>Screened in to assessment.</b>
c	Potential cumulative impact exists. <b>Screened in to assessment.</b>
d	No potential effect-receptor pathway (including where located outside of topic specific screening buffer). <b>Screened out of assessment.</b>
e	Low data confidence. <b>Screened out of assessment.</b>
f	No physical effect-receptor overlap. <b>Screened out of assessment.</b>
g	No temporal overlap. <b>Screened out of assessment.</b>

Project	Data Source(s)	Data Confidence Assessment	Notes	Status of Development	Construction Period (red outline denotes the onshore construction period for Hornsea Four)											Location Description (relative to Hornsea Four Boundary)	Location in relation to project aspect (Landfall / Onshore ECC / OnSS)	Air Quality	Ecology	Geology & Ground Conditions	Historic Environment	Hydrology & Flood Risk	Land Use & Agriculture	Landscape	Noise & Vibration	Traffic & Transport		
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029												2030	2031-2050
Elm Tree Farm Substation and Access Track	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of a substation building and construction of an access track in connection with approved wind turbine	Approved														Substation is located approximately 196m from the Hornsea Four boundary. Construction access tracks due to extend west and north outside of the Hornsea Four boundary.	West of the landfall area, south of the Onshore ECC.	g	c	c	c	g	c	d	d	d
Bridge House Wind Farm Associated Facilities	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of a substation building and underground electricity cable in association with previously approved wind turbine	Approved														Located north-west of cable centreline, outside of the Hornsea Four boundary. Associated infrastructure including electricity cable will travel within the Hornsea Four boundary. 384m NW of PEIR Boundary	Located north-west of cable centreline, outside of the Onshore ECC.	f	c	c	c	g	c	d	d	d
Teckno Developments Site	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of a building for Business (B1), General Industry (B2) and Storage/Distribution (B8) uses and erection of boundary fence	Approved														Located approximately 210m west of the Hornsea Four boundary, south of the A1035.	Located approximately 210m west of the Onshore ECC.	f	c	c	c	g	c	d	d	d
Lawns Farm Park Battery Storage	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	High - Third party project details published in the public domain and confirmed as being 'accurate' by developer	Construction of a 49.5MW Battery Storage Facility (17 battery units) with associated infrastructure and landscaping	Approved														Works are located east of the Creyke Beck substation.	Works are located within OnSS adjacent to Creyke Beck substation.	f	c	c	c	g	c	c	c	d
Jocks Lodge Highway Improvement Scheme	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	EIA Screening Opinion - A164 and Jocks Lodge Highway Improvement Scheme	Approved														Works occurring on the A1079. 700m north-west of Hornsea Four boundary access track	Works occurring on the A1079. 700m north-west of Hornsea Four boundary access track	c	c	c	c	c	c	c	c	c
Dogger Bank - Creyke Beck A	<a href="https://portal.beis.gov.uk/EIP/pages/recent.htm">https://portal.beis.gov.uk/EIP/pages/recent.htm</a>	High - Third party project details published in the public domain and confirmed as being 'accurate'	The consent application submitted allows for up to 400 wind turbines in total, therefore currently being split across the two phases. Project Capacity 1000-1200MW.	Approved														Windfarm located 131km offshore. The converter station would be north of the A1709 between Beverley and Cottingham in the East Riding of Yorkshire. The cable route would then connect to the National Grid at the existing substation at Creyke Beck. Cable landing point is between Barmstone and Ulrome.	Adjacent to OnSS	f	c	c	c	g	c	c	c	d
Dogger Bank - Creyke Beck B	<a href="https://portal.beis.gov.uk/EIP/pages/recent.htm">https://portal.beis.gov.uk/EIP/pages/recent.htm</a>	High - Third party project details published in the public domain and confirmed as being 'accurate'	The consent application submitted allows for up to 400 wind turbines in total, therefore currently being split across the two phases. Project Capacity 1000-1200MW.	Approved														Windfarm located 131km offshore. The converter station would be north of the A1709 between Beverley and Cottingham in the East Riding of Yorkshire. The cable route would then connect to the National Grid at the existing substation at Creyke Beck. Cable landing point is between Barmstone and Ulrome.	Adjacent to OnSS	f	c	c	c	g	c	c	c	d
Retail Development on Land North East Of Killingwoldgraves Roundabout Bishop Burton	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of petrol filling station and retail store	Pending Consideration														Within Hornsea Four boundary.	Within Onshore ECC on the A1079 York Road.	d	c	d	d	c	d	d	d	d
Housing Development on Land South Of 21 Great Gutter Lane West Willerby	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of 131 dwellings of which 32 are affordable with associated access, parking, open space and infrastructure following demolition of 3 existing dwellings	Pending Consideration														4.3km south of the Hornsea Four boundary.	4.3km south of the OnSS. 300m east of the A164 (Great Gutter Lane), north west of Willerby.	d	c	d	d	d	d	d	d	d
Willow Lane Beverley Access Road	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Construction of a section of access road to link approved developments to North and South of Willow Lane	Pending Consideration														2.6km east of the Hornsea Four boundary.	2.6km east of the Onshore ECC.	d	c	d	d	c	d	f	d	d
Low Farm Dunswell Lane Dunswell Development	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of glasshouses, automated bedding units and wind breaks to outdoor planting beds, external and internal alterations to redundant agricultural buildings to allow conversion to offices and stores, relocation of workers caravans, construction of reservoir with installation of drainage infrastructure across the site and creation of access to low farm, 5 passing places along Long Lane and junction improvements onto the A1174 (Hull Road)	Pending Consideration														1.1km east of the Hornsea Four boundary.	1.1km east of the OnSS. 900m north of the A1079.	d	c	c	c	c	c	c	d	d
Storage Development on Land South Of Bob Stabler And Sons Carnaby Industrial Estate Lancaster Road Carnaby	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Change of use of agricultural land for use as open storage (Use Class B8), erection of 2.4m high wire mesh fencing and landscape bunding	Pending Consideration														3km north of the Hornsea Four boundary.	3km north of the Onshore ECC. 2.5km north west of the landfall search area.	d	c	d	d	d	d	d	d	d



Construction Period (red outline denotes the onshore construction period for Hornsea Four)

Project	Data Source(s)	Data Confidence Assessment	Notes	Status of Development	Construction Period (red outline denotes the onshore construction period for Hornsea Four)											Location Description (relative to Hornsea Four Boundary)	Location in relation to project aspect (Landfall / Onshore ECC / OnSS)	Air Quality	Ecology	Geology & Ground Conditions	Historic Environment	Hydrology & Flood Risk	Land Use & Agriculture	Landscape	Noise & Vibration	Traffic & Transport
					2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029											
Housing Development on Land North Of 16 Bishop Burton Road Cherry Burton	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Erection of 2no. detached dwellings, erection of detached single garage to rear, erection of boundary wall (maximum height 2.25m) to side and 1.27m timber boundary fence to front and side, and construction of associated access (dropped kerb)	Pending Consideration																						
Focus School Campus Housing Redevelopment, Hallgate Cottingham	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Conversion of existing school buildings into 29 flats and the erection of a new building to provide 6 flats	Pending Consideration																						
A63 Castle Street Roadworks	<a href="https://highwaysengland.co.uk/projects/a63-castle-street-improvement/">https://highwaysengland.co.uk/projects/a63-castle-street-improvement/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Creation of new junction by lowering the level of the A63 at Mytongate junction. Ferensway and Commercial Road would cross the A63 creating a spill-level junction. Between Princes Dock Street and Market Place there are plans to widen the eastbound carriageway to three lanes. Plan to construct two new bridges over the A63: at Porter Street and another in front of Princes Quay Shopping Centre.	Under Consideration																						
BAE site conversion	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Hybrid application consisting of: a) Full Planning Permission for use of existing access through existing BAE site and construction of estate road from the relief road and b) Outline planning permission for the erection of commercial buildings (Use Classes B1, B2 and B8) (Access to be considered)	Pending Consideration																						
Housing Development on Land South West Of Stone Cottage Long Lane Woodmansey East Riding Of Yorkshire HU17 0RN	<a href="https://newplanningaccess.eastriding.gov.uk/">https://newplanningaccess.eastriding.gov.uk/</a>	Medium - Third party project details published in the public domain but not confirmed as being 'accurate'	Outline - Residential development, access, landscaping, open space and associated drainage and development infrastructure. (All matters reserved) [Phase 2a]	Pending Consideration																						