



Hornsea Project Four

Updated Onshore and Offshore Cumulative Assessment

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Glossary

Term	Definition
Cumulative Effects	The combined effect of Hornsea Four in combination with the effects from a number of different projects, on the same single receptor/resource. Cumulative impacts are those that result from changes caused by other past, present or reasonably foreseeable actions together with Hornsea Four.
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	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') may be carried out.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).

Acronyms

Term	Definition
AEoI	Adverse Effect on Integrity
BS	British Standard
CEA	Cumulative Effects Assessment
CTMP	Construction Traffic Management Plan
DBS	Dogger Bank South Offshore Wind Farms
DCO	Development Consent Order
DML	Deemed Marine License
ECC	Export Cable Corridor
EGL2	Eastern Green Link 2
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
ExA	Examining Authority
HRA	Habitats Regulations Assessment
HVDC	High Voltage Direct Current
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect

MHWS	Mean High Water Springs
MLA	Marine Licence Application
MMO	Marine Management Organisation
MPA	Marine Protected Areas
MS-LOT	Marine Scotland Licensing Operations Team
NGET	National Grid Electricity Transmission plc
NSIP	Nationally Significant Infrastructure Project
PINS	Planning Inspectorate
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SBP	Sub-Bottom Profiler
SHE	Scottish Hydro Electric
SMWWC	Scottish Marine Wildlife Watching Code
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
SSEN	Scottish and Southern Electricity Networks
TO	Transmission Operator
USBL	Ultra Short Base Line
UXO	Unexploded Ordnance

1 Introduction

- 1.1.1.1 Orsted Hornsea Project Four Limited (hereafter the Applicant) has submitted a Development Consent Order (DCO) application to the Planning Inspectorate (PINS), supported by a range of plans and documents including an Environmental Statement (ES) which set out the results of the Environmental Impact Assessment (EIA) (including a cumulative effects assessment (CEA)) for the Hornsea Project Four Offshore Wind Farm (hereafter Hornsea Four) and its associated infrastructure.
- 1.1.1.2 During the Hornsea Four Examination process, Interested Parties suggested that the Hornsea Four CEA should have considered the Eastern Green Link 2 (EGL2) (previously referred to as SEGL2 in Hornsea Four DCO application documents) (a submarine High Voltage Direct Current (HVDC) link between Peterhead in Aberdeenshire and Drax in North Yorkshire), and the Dogger Bank South Offshore Wind Farms (DBS). Both the Marine Management Organisation (MMO) and Natural England queried the exclusion of EGL2 from the Hornsea Four offshore CEA, with the Examining Authority (ExA) posing questions on EGL2 (in relation to the Hornsea Four offshore CEA) in the ExA's written questions and requests for information (ExQ1 and ExQ2). Natural England alone queried the exclusion of DBS from the Hornsea Four offshore CEA.
- 1.1.1.3 It should be noted in this regard, that in order to inform and complete the CEA element of the Hornsea Four ES that accompanied the DCO application, and in line with PINS Advice Note 17 (Cumulative effects assessment relevant to nationally significant infrastructure projects), a final review of the long list of 'other existing development and/or approved development' against the most recent data sources was made in June 2021 to account for any changes to the status of the projects, plans and activities considered prior to the DCO application submission in September 2021.
- 1.1.1.4 The Applicant notes that at the time of drafting the Hornsea Four ES, no Marine Licence application had been submitted in relation to the offshore elements of EGL2 and as such, this project was considered a Tier 3 project within the Hornsea Four CEA in line with the PINS Advice Note 17.
- 1.1.1.5 The Applicant notes that DBS was not on the PINS' Programme of Projects at the time of the cumulative cut-off date for Hornsea Four, and in line with the PINS Advice Note 17, was not considered a Tier 3 project and not considered within the Hornsea Four DCO application.
- 1.1.1.6 In July 2022, information for both EGL2 and DBS were made publicly available in the form of a Marine Licence application and town and country planning application for EGL2 with accompanying environmental assessment and a request for a scoping opinion for DBS, supported by the publication of a Scoping Report.
- 1.1.1.7 In light of the recent availability of EGL2 and DBS information, the Applicant has prepared this document to give due consideration to both projects in the context of the Hornsea Four CEA. Having regard to the nature, early stage of and extent of information available for each of EGL2 and DBS, and given that the relevant information in each case has become available with less than a month remaining of the Hornsea Four Examination process, the Applicant has considered these projects in a proportionate and meaningful way in accordance with the process advised by PINS Advice Note 17.
- 1.1.1.8 Based on the level of detail available on these projects at the time of writing, the Applicant is confident that there would be no additional likely significant cumulative effects beyond those previously described in the Hornsea Four ES (noting that the DBS Scoping Report does not include sufficient information in order to allow the Applicant to undertake any

meaningful assessment of any cumulative impacts with Hornsea Four). However, the Applicant notes that detailed consideration of the potential cumulative effects of Hornsea Four, ELG2, and DBS will need to be considered by the relevant Regulatory Bodies as part of the determination processes for both of those later projects. Such determination will be fully informed by the information that has been (ELG2) or will need to be (DBS) provided as part of the respective applications and in line with relevant legislation, policy and best practice, fully informed by the information available from the Hornsea Four application and subsequent Examination (DCO determination process for DBS and town and country planning and Marine Licence determination process for ELG2).

2 Dogger Bank South Offshore Wind Farms

- 2.1.1.1 RWE are developing two adjacent offshore wind farm projects that were part of The Crown Estate's Offshore Wind Leasing Round 4, Dogger Bank South (DBS) East and West. As the projects are offshore generating stations each exceeding 100MW installed capacity they are classified as Nationally Significant Infrastructure Projects (NSIPs). As such, a DCO is required for their development under the Planning Act 2008. RWE have confirmed that these projects will form the basis of a single DCO application and a request for a Scoping Opinion supported by the publication of a Scoping Report¹ for the two projects was submitted to the Planning Inspectorate on 26 July 2022.
- 2.1.1.2 The Applicant has reviewed the DBS Scoping Report and can confirm that the document does not include sufficient information on the proposed project, the existing baseline and likely significant effects arising from the project alone or cumulatively to allow the Applicant to undertake any meaningful assessment of any cumulative impacts with Hornsea Four. In relation to the Habitats Regulations Assessment (HRA) consideration, the DBS Scoping Report states that the HRA Screening for DBS will be undertaken in 2022 and as this is not presented within or alongside the DBS Scoping Report, the Applicant assumes that this HRA Screening will not be available in a timeframe compatible with the Hornsea Four Examination. As such, it is not possible for the Applicant to consider the potential for Adverse Effects on Integrity (AEoI) to arise in respect of any sites within the National Site Network when DBS is considered in-combination with Hornsea Four. As noted above, the subsequent EIA and HRA processes for the DBS project will need to take full account of the potential cumulative effects arising from those projects and Hornsea Four and will be informed by the extensive and detailed assessment provided by the DBS Applicant.
- 2.1.1.3 Notwithstanding this, the Applicant confirms that all significant Hornsea Four-alone effects have, in the opinion of the Applicant, been appropriately mitigated, with this mitigation secured in the DCO and Deemed Marine Licenses (DMLs) (where relevant). As such, no significant project-alone residual effects are predicted for Hornsea Four offshore, with only local-scale significant effects identified for landscape and visual impacts onshore at the onshore substation. This further mitigates the potential contribution of Hornsea Four towards any potential cumulative effects when considered with DBS. Where any additional control or mitigation is required, this will be developed in respect of the DBS projects as the EIA and HRA for those projects are completed and will be secured where necessary in the respective DCOs.

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010125/EN010125-000181-DBS%20-%20Environmental%20Impact%20Assessment%20Scoping%20Report.pdf>

2.1.1.4 Furthermore, the Applicant notes that Section 1.8.2.7 of the DBS Scoping Report provides details of the CEA methodology that will be employed as part of the DBS EIA.

“Cumulative Impact Assessment (CIA) forms part of the EIA process. The Planning Inspectorate Advice Note Nine (The Planning Inspectorate 2018) and seventeen (The Planning Inspectorate 2019) provide guidance on plans and projects that should be considered in the CIA including:

- *Projects that are under construction;*
- *Permitted applications not yet implemented;*
- *Submitted applications not yet determined;*
- *Projects on the Planning Inspectorate’s Programme of Projects;*
- *Development identified in relevant Development Plans, (and emerging Development Plans, with weight being given as they move close to adoption) recognising that information on any relevant proposals is likely to be limited; and*
- *Sites identified in other policy documents as their development is reasonably likely to come forward.*

Only projects which are reasonably well defined and sufficiently advanced to provide information on which to base a meaningful and robust assessment will be included in the CIA. Projects which are sufficiently implemented during the site characterisation for the Projects will be considered as part of the baseline for the EIA. Where possible RWE will use as-built project parameter information (if available) as opposed to consented parameters to reduce over-precaution (inaccuracies) in the cumulative assessment.

For some topics (where for example the receptors include highly mobile or migratory species, fishing or shipping) the CIA will have a large geographic scale and involve many plans and projects. For others where receptors (or impact ranges) are more spatially fixed the CIA will be narrower. The scope of the CIA will therefore be established on a topic-by-topic basis with the relevant consultees as the EIA progresses.

Offshore cumulative impacts may come from interactions with the following activities and industries:

- *Other wind farms;*
- *Aggregate extraction and dredging;*
- *Licensed disposal sites;*
- *Navigation and shipping;*
- *Commercial fisheries;*
- *Subsea cables and pipelines;*
- *Potential port and harbour development;*
- *Oil and gas activities, carbon capture and storage and hydrogen projects; and*
- *Unexploded Ordnance (UXO) clearance.*

Onshore plans or projects that may be considered include (but are not limited to):

- *Other offshore wind farm infrastructure;*

- *Other energy generation infrastructure;*
- *Building and / or housing developments;*
- *Installation or upgrade of roads;*
- *Installation or upgrade of cables and pipelines; and*
- *Coastal protection works.*

It is intended that screening of plans and projects to include in the CIA and Transboundary assessment will be undertaken for the Projects in 2022 and will be consulted upon with the relevant stakeholders through the EPP (section 1.7)."

2.1.1.5 The above methodology should provide confidence to the ExA that the cumulative impacts of Hornsea Four and DBS will be appropriately considered within the DBS DCO application, with opportunity for stakeholder consultation through the pre-application process on the CEA, as well as an opportunity for stakeholder participation and ExA examination of the DBS CEA during the DBS DCO examination and determination process.

3 Eastern Green Link 2 (EGL2)

3.1.1.1 National Grid Electricity Transmission plc (NGET) and Scottish and Southern Electricity Networks (SSEN) Transmission are jointly developing a submarine HVDC link between Peterhead in Aberdeenshire and Drax in North Yorkshire, referred to as the Eastern Green Link 2 Project. NGET will be the Transmission Operator (TO) within English jurisdiction and Scottish Hydro Electric (SHE) Transmission plc will be the TO within Scottish jurisdiction.

3.1.1.2 It is important to note that the EGL2 project was included in both the onshore and offshore CEA for Hornsea Four within the DCO Application. Publicly available information (although limited) was used to inform these assessments, with no significant cumulative effects predicted (with the exception of commercial fisheries where the effect of future management measures for Marine Protected Areas (MPAs) is unmitigable by the project and this impact would remain significant without the *de minimis* cumulative contribution from Hornsea Four).

3.1.1.3 NGET and SHE Transmission are submitting Marine Licence Applications (MLAs) to the Marine Scotland Licensing Operations Team (MS-LOT) and to the Marine Management Organisation (MMO) for the marine elements of the Project referred to as the 'Marine Scheme', which extend up to Mean High Water Springs (MHWS) at both the Scottish and English landfalls.

3.1.1.4 In relation to the EGL2 elements of relevance to Hornsea Four, a Marine Licence application was submitted to the MMO on 30 June 2022 and published on the MMO's Public Register on 26 July 2022 (MLA/2022/00273²).

3.1.1.5 NGET and SHE Transmission have also submitted a planning application to East Riding of Yorkshire Council (ERYC) for the Construction of sub-surface cable route from Drax Power Station to Fraisthorpe Coastline with associated accesses and temporary construction compounds in association with the Scotland to England Green Link (22/01990/STPLFE³). The application was submitted on the 14 June 2022 and validated (and made publicly available) by ERYC on the 29 June 2022 and is currently pending consideration.

² [REDACTED]

³ <https://newplanningaccess.eastriding.gov.uk/newplanningaccess/simpleSearchResults.do?action=firstPage>

3.1.1.6 The Applicant has reviewed both the Marine Licence application and the planning application for EGL2 which includes an Environmental Appraisal Report, with offshore topic-specific chapters (Volume 2: Environmental Appraisal Report) including a Cumulative Effects chapter (Volume 2, Chapter 16: Cumulative Effects), onshore topic-specific environmental statement chapters (Volume 2: Chapters 7 (Ecology & Nature Conservation), 8 (Landscape & Visual), 9 (Archaeology & Heritage), 10 (Geology & Hydrogeology) ,11 (Hydrology & Land Drainage), 12 (Agriculture & Soils), 13 (Noise & Vibrations), 14 (Traffic & Transport) and 15 (Socio-Economics) and a HRA Report (Volume 3, Appendix 8.2: Habitats Regulations Assessment Report). The Applicant's review of the available environmental appraisal report and all other relevant documents has focused on the potential for likely significant effects to arise as a result of EGL2 when considered cumulatively with Hornsea Four ([Table 1](#)), as well as the potential for adverse effects on integrity to arise in respect of any sites within the National Site Network when EGL2 is considered in-combination with Hornsea Four ([Table 2](#)).

Table 1: Consideration of potential cumulative effects of Hornsea Four with EGL2.

Topic	Potential for cumulative effects
<i>Offshore</i>	
Marine Geology, Oceanography, and Physical Processes	<p>The EGL2 Environmental Appraisal Report excluded all potential cumulative impact pathway interactions between EGL2 and Hornsea Four for marine geology, oceanography, and physical processes in respect of temporary seabed disturbance, localised permanent seabed disturbance due to displacement and removal of debris and boulders, and temporary increases in suspended sediment concentrations (SSC). Justification is provided within the assessment as to why all potential impact pathways were excluded (factors such as proximity/crossing agreements and collaboration between developers) and it was concluded that no significant cumulative effects are expected to occur. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for marine geology, oceanography, and physical processes.</p> <p>The Applicant would like to highlight that the Hornsea Four offshore export cables and the EGL2 cables do not overlap or require a crossing, and additional mitigation and monitoring (as set out in G5.33 Clarification Note on Marine Processes Mitigation and Monitoring (REP5a-017) and the updated Deadline 7 version of F2.7: Outline Marine Monitoring Plan) has been proposed to minimise impacts from Hornsea Four on marine geology, oceanography, and physical processes receptors. It is also important to note that no significant effects on marine geology, oceanography, and physical processes receptors were identified in the Hornsea Four EIA or CEA. Furthermore, the Applicant highlights that detailed consideration of potential cumulative effects of Hornsea Four and ELG2 will be part of the Marine Licence determination processes, providing further confidence to ExA that the cumulative impacts on marine geology, oceanography, and physical processes will be appropriately considered in the decision-making process.</p>
Benthic and Intertidal Ecology	<p>The EGL2 Environmental Appraisal Report excluded all potential cumulative impact pathway interactions between EGL2 and Hornsea Four for benthic and intertidal ecology in respect of temporary physical disturbance to benthic habitats and species, permanent loss of benthic habitats and species, increased SSC in subtidal habitats, and Electromagnetic Field (EMF) and thermal emissions. Justification is provided within the assessment as to why all potential impact pathways were excluded (factors such as recovery of habitats after disturbance, burial of EGL2 cables, and the spatial and temporal separation of works) and it was concluded that no significant cumulative effects are expected to occur. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for benthic and intertidal ecology.</p> <p>The Applicant would like to highlight that the Hornsea Four offshore export cables and the EGL2 cables do not overlap or require a crossing, and a commitment has been made to limit rock protection across Smithic Bank (in the vicinity of EGL2) to 5% of the cable lengths crossing the bank (as set out in G3.6 Clarification Note: Justification of Offshore Maximum Design Scenarios (REP3-035)), thus reducing the contribution of Hornsea Four in relation to cumulative disturbance and habitat loss. It is also important to note that no significant effects on benthic and intertidal ecology receptors were identified in the Hornsea Four EIA or CEA. Furthermore, the Applicant highlights that detailed consideration of potential cumulative effects of Hornsea Four and ELG2 will be part of the Marine Licence determination processes, providing further confidence to ExA that the cumulative impacts on benthic and intertidal ecology will be appropriately considered in the decision-making process.</p>

Topic	Potential for cumulative effects
Fish and Shellfish Ecology	<p>The EGL2 Environmental Appraisal Report excluded the following potential cumulative impact pathway interactions between EGL2 and Hornsea Four in relation to fish and shellfish ecology: permanent loss of spawning and nursery grounds, increased SSC in subtidal habitats, vessel collision, EMF and thermal emissions. Justification is provided within the assessment as to why these potential impact pathways were excluded (factors such as the outcome of the Hornsea Four project alone assessments, lack of pathways, and the spatial and temporal separation of works) and it was concluded that no significant cumulative effects are expected to occur. The EGL2 Environmental Appraisal Report identified the potential cumulative impact pathway interaction between EGL2 and Hornsea Four from temporary physical disturbance to benthic habitats and species supporting fish and shellfish species. The assessment concluded that there is the potential that a small area of seabed will be disturbed on two separate occasions in quick succession at the area where the two cable corridors are in close proximity and there is a potential for an impact of negligible magnitude. A medium sensitivity of demersal species was used in the assessment and therefore the conclusion was that cumulative impacts of negligible significance (and therefore not significant in EIA terms) could occur to fish and shellfish species. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for fish and shellfish ecology.</p> <p>It is important to note that no significant effects on fish and shellfish ecology receptors were identified in the Hornsea Four EIA. Furthermore, the Applicant highlights that detailed consideration of potential cumulative effects of Hornsea Four and ELG2 will be part of the Marine Licence determination processes, providing further confidence to ExA that the cumulative impacts on fish and shellfish ecology will be appropriately considered in the decision-making process.</p>
Marine Mammals	<p>EGL2 was screened out of the marine mammal cumulative assessment for Hornsea Four. As such, the Applicant considers that no updates to the cumulative assessment are required. However, for completeness, a summary of the EGL2 conclusions in relation to marine mammals is provided below.</p> <p>The EGL2 Environmental Appraisal Report identified the potential cumulative impact pathway interaction between EGL2 and Hornsea Four from underwater sounds and vessel movement. The assessment noted that with the exception of a few acoustic sources, the number of vessels generating underwater sound and the sound levels would not be significantly above background levels from regular vessel movements in the North Sea. The marine mammals chapter of the EGL2 Environmental Appraisal Report determined that the only activity with the potential to cause injury or disturbance in marine mammals were associated with the operation of a Sub-Bottom Profiler (SBP) and the Ultra Short Base Line (USBL) acoustic positioning system, noting that injury thresholds were only met in very close proximity to the vessel and considering the adoption of Joint Nature Conservation Committee (JNCC) measures for geophysical survey (JNCC, 2017) for SBP, and the very low density of cetaceans in the EGL2 corridor, injury was considered highly unlikely to occur and disturbance would be highly localised to the sound source. The assessment concluded that the potential effects from both underwater sound and vessel movement would be negligible and therefore not significant. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for marine mammals.</p>
Offshore and Intertidal Ornithology	<p>EGL2 was screened out of the offshore and intertidal ornithology cumulative assessment for Hornsea Four due to low data confidence. As such, the Applicant considers that no updates to the cumulative assessment are required. However, for completeness, a summary of the EGL2 conclusions in relation to offshore and intertidal ornithology is provided below.</p>

Topic	Potential for cumulative effects
	<p>Similarly, the EGL2 Environmental Appraisal Report excluded all potential cumulative impact pathway interactions between EGL2 and Hornsea Four for offshore and intertidal ornithology in respect of temporary disturbance and displacement from installation activities associated with sound, visual impacts, and presence from vessel and construction activity, changes in prey availability, and reduction of water quality due to unplanned releases, accidental leaks and spills from vessels. Justification is provided within the assessment as to why all potential impact pathways were excluded (factors such as the spatial and temporal separation of works and the stringent controls on unplanned releases and leaks from vessels) and it was concluded that no significant cumulative effects are expected to occur. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for offshore and intertidal ornithology.</p>
Commercial Fisheries	<p>The EGL2 Environmental Appraisal Report identified the potential cumulative impact pathway interactions between EGL2 and Hornsea Four from loss or restricted access to fishing grounds, displacement of fishing activity into other areas, interference with fishing activities, snagging risk – loss or damage to fishing gear, and impacts on fishing as a result of impacts on commercial species. The assessment concluded that any temporary loss of fishing grounds and associated displacement resulting from construction works associated with these potential developments would be localised and short to medium term, being limited to areas where safety zones/recommended clearance zones may be in place at a given time. Similarly, potential interference to fishing activities and increased snagging risk would also be expected to be short to medium term and localised, being predominantly related to vessel transit routes and areas around sections of cables awaiting trenching or protection. The conclusion was that cumulative impacts of minor significance (and therefore not significant in EIA terms) could occur to fish and shellfish species.</p> <p>It is important to note that the Hornsea Four commercial fisheries CEA predicted impacts of moderate significance and the change of EGL2 from Tier 3 to Tier 2 would not change that conclusion. The inclusion of Marine Protected Areas (MPAs) into the cumulative assessment has led to this moderate adverse assessment for demersal trawling fleets, assuming a worst case of restriction on all mobile trawling gear within these MPAs. No such restrictions are currently in place but management measures are anticipated to be implemented (of which the Applicant has no control over) at some stage. The effect of the MPAs is unmitigable by Hornsea Four and this impact would remain significant without the <i>de minimis</i> cumulative contribution from Hornsea Four.</p>
Shipping and Navigation	<p>EGL2 was screened out of the shipping and navigation cumulative assessment for Hornsea Four as there is no conceptual effect-receptor pathway as EGL2 is not in close proximity to Hornsea Four surface infrastructure resulting in limited vessel deviations. As such, the Applicant considers that no updates to the cumulative assessment are required. However, for completeness, a summary of the EGL2 conclusions in relation to shipping and navigation is provided below.</p> <p>The EGL2 Environmental Appraisal Report excluded the following potential cumulative impact pathway interactions between EGL2 and Hornsea Four in relation to shipping and navigation: interaction with vessel anchors and anchoring activity, interaction with fishing gear, reduction in under keel clearance, and EMF resulting in magnetic compass deviation. Justification is provided within the assessment as to why these potential impact pathways were excluded (factors such as the pack of likely pathways) and it was concluded that no significant cumulative effects are expected to occur. The EGL2 Environmental Appraisal Report identified the potential cumulative impact pathway interaction between EGL2 and Hornsea Four from vessel-to-vessel</p>

Topic	Potential for cumulative effects
	<p>collision and deviation from established and identified vessel routes and areas. The assessment noted that there is the potential that a temporary increase in vessel-to-vessel collision and vessel deviations is considered possible, particularly at or near the landfalls, and that the number of cable crossings and therefore seabed features which may cause a hazard to shipping and navigation may increase over time. The assessment concluded that any potential risk will be mitigated through consultation with the relevant project developers to confirm installation and operation dates, and otherwise rationalise activity schedules. Irrespective, it is not envisaged that the concurrent activities of Hornsea Four and EGL2 will affect the risk categorisation and no significant cumulative effects are anticipated. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for shipping and navigation.</p>
Aviation and Radar	<p>EGL2 was screened out of the aviation and radar cumulative assessment for Hornsea Four as there is no conceptual effect-receptor pathway. As such, the Applicant considers that no updates to the cumulative assessment are required. It is also important to note that no cumulative assessment in relation to aviation and radar is provided in the ELG2 Environmental Appraisal Report.</p>
Marine Archaeology	<p>The EGL2 Environmental Appraisal Report excluded all potential cumulative impact pathway interactions between EGL2 and Hornsea Four for marine archaeology in respect of direct disturbance to the seabed causing damage, direct damage due to use of anchors by vessels, and indirect changes to hydrodynamic and sediment transport regimes. Justification is provided within the assessment as to why all potential impact pathways were excluded (factors such as the lack of spatial overlap between the projects and the negligible impact from the project alone) and it was concluded that no significant cumulative effects are expected to occur. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for marine archaeology.</p> <p>The Applicant would like to highlight that the Hornsea Four offshore export cables and the EGL2 cables do not overlap or require a crossing, therefore there is no potential for cumulative direct cumulative effects to occur. It is also important to note that no significant effects on marine archaeology receptors were identified in the Hornsea Four EIA or CEA. Furthermore, the Applicant highlights that detailed consideration of potential cumulative effects of Hornsea Four and ELG2 will be part of the Marine Licence determination processes, providing further confidence to ExA that the cumulative impacts on benthic and intertidal ecology will be appropriately considered in the decision-making process.</p>
Seascape, Landscape and Visual Resources	<p>EGL2 was screened out of the seascape, landscape and visual resources cumulative assessment for Hornsea Four as there is no conceptual effect-receptor pathway. As such, the Applicant considers that no updates to the cumulative assessment are required. It is also important to note that no cumulative assessment in relation to seascape, landscape and visual resources is provided in the ELG2 Environmental Appraisal Report.</p>
Infrastructure and Other Users	<p>The EGL2 Environmental Appraisal Report excluded the following potential cumulative impact pathway interactions between EGL2 and Hornsea Four in relation to infrastructure and other users: disruption to vessel routeing and access to other sea users working area, and risk of damage to or interference with a third-party cable or pipeline asset. Justification is provided within the assessment as to why these potential impact pathways were excluded (factors such as the absence of cable crossings) and it was concluded that no significant cumulative effects are expected to occur. The EGL2 Environmental Appraisal Report identified a potential cumulative impact pathway interaction between EGL2 and Hornsea Four from disturbance to marine recreational users (up to MHWS). The assessment concluded that the construction of Hornsea Four is planned to overlap with the installation phase of EGL2, therefore marine recreational users, particularly at landfall, could be displaced from the area of spatial overlap, including any</p>

Topic	Potential for cumulative effects
	<p>recommended clearance zones. The sensitivity of these users was assessed as negligible as the activities associated with EGL2 and Hornsea Four will only disrupt recreational users in the short term and they will be able to use other areas in close proximity during those periods. Therefore, the cumulative effect is negligible, which is not significant in EIA terms. Therefore, following a review of the available information provided within the EGL2 Environmental Appraisal Report, the Applicant agrees with the findings of the EGL2 CEA and concludes that there would be no likely significant cumulative effects for infrastructure and other users.</p> <p>It is important to note that no significant effects on infrastructure and other user receptors were identified in the Hornsea Four EIA. Furthermore, the Applicant highlights that detailed consideration of potential cumulative effects of Hornsea Four and ELC2 will be part of the Marine Licence determination processes, providing further confidence to ExA that the cumulative impacts on infrastructure and other users will be appropriately considered in the decision-making process.</p>
Offshore Summary	<p>In summary, the EGL2 Environmental Appraisal Report concludes that there will be no likely significant effects from cumulative impacts with Hornsea Four (with the exception of commercial fisheries where the effect of MPAs is unmitigable by the project⁴ and this impact would remain significant without the <i>de minimis</i> cumulative contribution from Hornsea Four), and due to the limited nature of the EGL2 works in the vicinity of Hornsea Four, the Applicant agrees with these conclusions.</p>
<i>Onshore</i>	
Geology & Ground Conditions	<p>The Applicant considers that no updates to the Hornsea Four cumulative assessment for Geology & ground Conditions are required as a review of the data available does not change the conclusions of the assessment carried out for the Hornsea Four ES.</p>
Hydrology & Flood Risk	<p>Following the Applicant's review of the documents submitted by NGET and SHE Transmission, it is noted that the section of the cable route between the landfall at Fraisthorpe and Market Weighton inland will cross a lot of the same watercourse catchments (and indeed, in some cases, watercourses) as the Hornsea Four onshore Export Cable Corridor (ECC). Should construction of both projects happen concurrently then there is the potential for cumulative effects on surface drainage and the supply of sediment and contaminants to occur (during construction). However, cumulative effects were deemed to be non-significant in the original Hornsea Four CEA due to the various project commitments in place which will adequately mitigate for potential impacts. This conclusion remains and does not change the assessment carried out for the Hornsea Four ES.</p>
Ecology & Nature Conservation	<p>Any potential for construction programme overlap between projects remains focused around the landfall location (noting there is no overlap of project boundaries).</p> <p>The ecological impact assessment submitted by NGET and SHE concludes no significant effects on protected species and therefore, there is currently no potential for significant cumulative effects because the relevant regulatory regimes will require appropriate mitigation to be implemented.</p> <p>The Applicant commits to pre-construction surveys and mitigation for habitats having potential to/confirmed to support roosting bats, badger, water vole, otter and reptiles. In addition, habitats will be fully reinstated post-construction and therefore no significant effects are predicted. As such there is no required change to the assessment carried out for the Hornsea Four ES.</p>

⁴ Assuming a worst case of restriction on all mobile trawling gear within these MPAs. No such restrictions are currently in place but management measures are anticipated to be implemented (of which the Applicant has no control over) at some stage.

Topic	Potential for cumulative effects
Landscape & Visual	The Applicant considers that no updates to the Hornsea Four Landscape and Visual CEA are required as a review of the data available does not change the assessment carried out for the Hornsea Four ES.
Historic Environment	The Applicant considers that no updates to the Hornsea Four Historic Environment CEA are required as a review of the data available does not change the assessment carried out for the Hornsea Four ES.
Land Use & Agriculture	There is currently no potential for significant cumulative effects for Land Use and Agriculture because the relevant regulatory regimes will require appropriate mitigation for both projects to be implemented.
Traffic & Transport	<p>Given that the relevant information for EGL2 has only become available late into the Hornsea Four Examination process, there is insufficient time to undertake a full traffic modelling for purposes of a cumulative assessment for Traffic and Transport prior to the completion of the Hornsea Four Examination. Notwithstanding, it is noted the EGL2 Environmental Statement (Volume 2 Chapter 17: Cumulative and In-Combination Effects) contains an assessment of the cumulative traffic and transport effects which has identified the highway routes shared by the respective projects, assessed effects on sensitive receptors and assessed the potential cumulative impacts to be 'not significant'.</p> <p>The Applicant is confident with the assessment as presented in the ES and the control measures in the DCO documents and considers that should the construction of Hornsea Four and EGL2 overlap, the projects will be engaged in appropriate discussions and the final CTMPs for each project will be reviewed and approved by ERYC. As such the conclusion presented in the ES chapter remains and does not change the assessment carried out for the Hornsea Four ES.</p>
Noise & Vibration	<p>Following a review of the alignments of the two project's boundaries (based upon Figure 17.2 in the EGL2 Environmental Statement Volume 2 Chapter 17: Cumulative and In-Combination Effects), the receptors that are most likely to be affected by cumulative noise levels due to simultaneous working are those at Fraisthorpe – at this point the indicative distance between the two project boundaries are approximately 1.5 km apart. Table 8.32 of A3.8 Noise and Vibration (APP-032) shows that the noise levels due to construction works at the identified receptor in Fraisthorpe is predicted to be 40.9 dBA. Even if the contribution from the EGL2 works was equal in loudness to the Hornsea Four works at this location, this would only equate to a +3 dBA increase in noise level. In assessment terms, this is still below the British Standard (BS) 5228 threshold level of 45dB (A) (as cited in Table 8.32 of A3.8 Noise and Vibration (APP-032)) and therefore not significant. Simultaneous works, when undertaken using best practice noise mitigation measures are therefore unlikely to result in new significant adverse noise effects.</p> <p>Engagement with NGET and SHE Transmission (should the construction of both projects overlap) will be undertaken to manage any potential cumulative impacts through activity scheduling and exchange of delivery programmes and, if such measures are required, these will form part of the final CoCP and/or CTMP for each project which will be reviewed and approved by ERYC.</p>
Air Quality	As EGL2 scoped air quality out of the EIA the Applicant considers that no updates to the air quality cumulative assessment are required as a review of the data available does not change the assessment carried out by Hornsea Four for its ES.
Socio-Economics	CEA was scoped out for socio-economics and as such has not been considered in this review.
Onshore Summary	In summary, the EGL2 ES concludes that there will be no likely significant effects from cumulative impacts with Hornsea Four, and due to the limited nature of the EGL2 works in the vicinity of Hornsea Four, the Applicant agrees with this conclusion.

Table 2: Consideration of potential in-combination HRA effects of Hornsea Four with EGL2.

Offshore HRA Topic	Potential for cumulative effects
Benthic and Intertidal Ecology	<p>The EGL2 HRA concludes that the EGL2 works are not considered to have a Likely Significant Effect (LSE) on the integrity of any sites within the National Site Network designated for benthic and intertidal habitat features.</p> <p>The Hornsea Four Report to Inform Appropriate Assessment (RIAA) (B2.2 Report to Inform Appropriate Assessment (REP5-012)) considered the following sites in relation to benthic and intertidal ecology:</p> <ul style="list-style-type: none"> • Flamborough Head Special Area of Conservation (SAC) <ul style="list-style-type: none"> ○ Designated for Reefs ○ Designated for Submerged or partially submerged sea caves • Humber Estuary SAC <ul style="list-style-type: none"> ○ Designated for Atlantic saltmeadows ○ Designated for Salicornia and other annuals colonising mud and sand • Humber Estuary Ramsar <ul style="list-style-type: none"> ○ Designated for Saltmarshes • Humber Estuary Special Protection Area (SPA) <ul style="list-style-type: none"> ○ Designated for Saltmarshes (as supporting habitat of designated species). <p>As the EGL2 HRA has screened out the above sites in relation to benthic and intertidal ecology, it can be concluded that EGL2 would not act in-combination to cause an effect on any sites within the National Site Network designated for benthic and intertidal habitat features. Therefore, the Applicant concludes that there would be no Adverse Effect on Integrity (AEoI) caused by an in-combination impact from EGL2 and Hornsea Four.</p>
Fish and Shellfish Ecology	<p>The EGL2 HRA concludes that EGL2 works are not considered to have a LSE on the integrity of any sites within the National Site Network designated for fish and shellfish features.</p> <p>The Hornsea Four RIAA (B2.2 Report to Inform Appropriate Assessment (REP5-012)) concluded that all potential effects related to migratory fish were screened out, as confirmed within the Screening Report (Appendix A of B2.2 Report to Inform Appropriate Assessment (REP2-005)) and Screening Matrix (Appendix B of B2.2 Report to Inform Appropriate Assessment (AS013)).</p> <p>As such, it can be concluded that EGL2 would not act in-combination to cause an effect on any sites within the National Site Network with fish and shellfish ecology features. Therefore, the Applicant concludes that there would be no AEoI caused by an in-combination impact from EGL2 and Hornsea Four.</p>
Marine Mammals	<p>There are four SACs designated for marine mammal features that the EGL2 HRA concluded that there was potential for LSE in relation to disturbance from subsea noise. These sites are:</p> <ul style="list-style-type: none"> • Isle of May SAC (31.3 km to Hornsea Four array area and 88 km from EGL2 corridor) <ul style="list-style-type: none"> ○ Designated for Grey seal (<i>Halichoerus grypus</i>)

Offshore HRA Topic	Potential for cumulative effects
	<ul style="list-style-type: none"> • Berwickshire and North Northumberland Coast SAC (201.4 km to Hornsea Four array area and 36.4 km from EGL2 corridor) <ul style="list-style-type: none"> ○ Designated for Grey seal (<i>Halichoerus grypus</i>) • Humber Estuary SAC (79.7 km to Hornsea Four array area and 32.2 km to Hornsea Four ECC and 36.7 km from EGL2 corridor) <ul style="list-style-type: none"> ○ Designated for Grey seal (<i>Halichoerus grypus</i>) • Southern North Sea SAC (0 km to Hornsea Four array area and 18.8 km from EGL2 corridor) <ul style="list-style-type: none"> ○ Designated for harbour porpoise (<i>Phocoena phocoena</i>). <p>The Isle of May SAC is located 313 km from the Hornsea Four array area and therefore outwith the 145 km screening range for grey seal (as set out in Table A.4, Appendix A of B.2.2 Report to Inform Appropriate Assessment (REP2-005)).</p> <p>It is important to note that the Berwickshire and North Northumberland Coast SAC is also outwith the 145 km screening range of Hornsea Four, but the Hornsea Four HRA Screening Matrices (Appendix B of B.2.2 Report to Inform Appropriate Assessment (AS013)) notes some site connectivity is indicated from seal use at sea data and as such, there is the potential for some level of interaction between grey seal and underwater noise associated with Hornsea Four. The potential for LSE is therefore identified.</p> <p>The Applicant notes that no SACs designated for marine mammals overlap directly with EGL2 and Hornsea Four, thus reducing the likelihood of significant effects. Additionally, no piling works are associated with ELG2, with ELG2 noisy activities restricted to geophysical surveys, cable installation activities (such as trenching) and vessel noise.</p> <p>As stated in EGL2 Environmental Appraisal Report, the earliest EGL2 construction start date is 2025 and may take up to five years to complete avoiding winter months, where feasible. For Hornsea Four, the earliest possible construction start date is January 2024, with works at landfall expected broadly ~Q2 2025 – end 2027. The piling window is expected to fall within the window of ~Q4 2026 - ~Q4 2027, with any Unexploded Ordnance (UXO) clearance (if required) and associated geophysical survey work to occur within the pre-construction phase (specifically Q1 2026 – Q3 2026). The maximum total construction duration (onshore and offshore) is five years and one month (61 months). As such, it seems likely that construction programmes will overlap between the projects. Therefore, Hornsea Four is identified in the EGL2 HRA as a project which could contribute to in-combination effects with EGL2.</p> <p>The EGL2 HRA notes that with the exception of a few acoustic sources, the number of vessels generating underwater sound and the sound levels would not be significantly above background levels from regular vessel movements in the North Sea. The marine mammals chapter of the EGL2 Environmental Appraisal Report determined that the only activity with the potential to cause injury or disturbance in marine mammals were associated with the operation of a SBP and the USBL acoustic positioning system, noting that injury thresholds were only met in very close proximity to the vessel and considering the adoption of JNCC measures for geophysical survey (JNCC, 2017) for SBP, and the very low density of cetaceans in the EGL2 corridor, injury was considered highly unlikely to occur. The EGL2 HRA concluded that with the inclusion of the embedded mitigation measures for SBP operations and the extremely limited impact ranges for USBL (<10 m), there is no potential for injury to marine mammals as a result of underwater sound generated by the EGL2 works. The EGL2 HRA noted that there will be some behavioural disturbance however, particularly from the operation of the SBP, but with the inclusion of the</p>

Offshore HRA Topic	Potential for cumulative effects
	<p>embedded mitigation measures this will be reduced, and as the vessels are continuously moving any impacts are transient. In conclusion, the EGL2 HRA predicted no AEol on any of the four SACs designated for marine mammal features.</p> <p>The EGL2 HRA concluded that an AEol can be ruled out for all possible effects on marine mammals for the EGL2 project, both alone and in-combination. The Applicant agrees with the EGL2 conclusions and notes that the Applicant has already committed to manage noisy activities (specifically in relation to the Southern North Sea SAC) within F2.11: Outline Southern North Sea Special Area of Conservation Site Integrity Plan (APP-246). This will further limit the risk of AEol for in combination effects with Hornsea Four and EGL2 for all SACs designated for marine mammal features.</p>
Offshore and Intertidal Ornithology	<p>A single SPA (Buchan Ness to Collieston Coast SPA), designated for seabird features has been screened in for the EGL2 project. This site overlaps with the EGL2 corridor, near the landfall location in Scotland and is situated 381 km from the Hornsea Four array area. The site was also screened in to the Hornsea Four assessment in relation to kittiwake for operational collision risk and guillemot for disturbance and displacement during the construction phase of Hornsea Four (Appendix B of B2.2 Report to Inform Appropriate Assessment (AS013)). The Applicant notes that both species were screened in on a precautionary basis, noting that connectivity is limited due to mixing of wider North Sea populations and therefore any effect likely to be trivial and inconsequential</p> <p>The project alone assessment in the EGL2 HRA concludes that there will be no AEol of the Buchan Ness to Collieston Coast SPA as a result of EGL2 works. This conclusion takes into account embedded mitigation such as vessel complying with the Scottish Marine Wildlife Watching Code (SMWWC) to protect ornithological receptors, transiting vessels move at low speeds allowing any rafts of birds to disperse naturally well in advance of an approaching vessel, and Lighting on-board the vessels will be kept to the minimum level required. The EGL2 in-combination assessment screened out in-combination disturbance effects on birds.</p> <p>The Applicant agrees with the EGL2 conclusions and considers that connectivity with Hornsea Four and the Buchan Ness and Collieston Coast SPA is limited, and that an AEol can be ruled out for all possible effects on ornithology for the EGL2 project, both alone and in-combination with Hornsea Four.</p>
HRA Summary	<p>The potential for AEol to arise as a result of ELG2 in-combination with Hornsea Four was considered following a review of the EGL2 HRA. The EGL2 HRA concluded that there would be no AEol for sites within the National Site Network as a result of in-combination impacts with Hornsea Four. Having reviewed this, and as identified in the table above, the Applicant concludes that there will be no AEol from EGL2 in-combination with Hornsea Four.</p>

4 Summary

- 4.1.1.1 In summary, the Applicant has reviewed the information that is available in the DBS Scoping Report and EGL2 Marine Licence application and planning application.
- 4.1.1.2 The Applicant has concluded that the DBS Scoping Report does not include enough information and assessment of sufficient detail to allow the Applicant to undertake any meaningful assessment of potential cumulative EIA or in-combination HRA impacts with Hornsea Four. However, the Applicant considers that all significant Hornsea Four-alone effects have been mitigated, thus controlling the contribution of Hornsea Four towards any potential cumulative effects when considered with DBS. The detailed consideration of cumulative and in-combination impacts from Hornsea Four and DBS will be provided within the DBS DCO application and as such, provides the ExA with additional comfort that potential cumulative impacts will be fully assessed and, where necessary mitigate, as part of the DCO determination process for DBS.
- 4.1.1.3 In relation to ELG2, the Applicant agrees with the conclusions reached in both the cumulative impact assessments for the ELG2 Environmental Appraisal Report and the in-combination effects assessments for ELG2 HRA. For clarity, following the Applicant's review of the information provided, the Applicant concludes that there would be no additional adverse likely significant cumulative effects for any offshore topics beyond those previously described in the Hornsea Four application (and that there will be no additional AEol as a result of in combination effects on sites within the National Site Network).