The Great Grid Upgrade

Sea Link

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Volume 6: Environmental Statement

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Part 4 Marine
Chapter 10
Intra-Project Cumulative Effects

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10. Intra-Project Cumulative Effects

10.1 Introduction

10.1.1 This chapter of the Environmental Statement (ES) presents how the intra-project cumulative effects assessment has considered the potential significant cumulative effects that may arise from the Proposed Project in relation to the Offshore Scheme (where a single receptor is affected by multiple aspects of a project, worsening the effect). A description of intra-project cumulative effects and the methodology is presented in **Application Document 6.3.1.5.A Cumulative Effects Assessment Methodologies**.

10.1.2 The Order Limits, which illustrate the boundary of the Proposed Project, are illustrated on **Application Document 2.2.1 Overall Location and Master Key Plan**.

10.1.3 This chapter should be read in conjunction with:

- **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project;**
- **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology;**
- **Application Document 6.2.1.6 Part 1 Introduction Chapter 6, Scoping Opinion and EIA Consultation;**
- **Application Document 7.5.2 Outline Offshore Construction Environmental Management Plan;**
- **Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice;** and
- **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC).**
- This chapter is supported by the following appendices:
- **Application Document 6.3.1.5.A Appendix 1.5.A Cumulative Effects Assessment Methodologies.**

10.1.4 Intra-project cumulative effects (sometimes referred to as combined or interactive effects) occur where a single receptor is affected by more than one source of effect arising from different aspects on the Proposed Project. An example of an intra-project effect would be where a local community is affected by dust, noise, and traffic disruption during the construction of the Proposed Project, with the result being a greater level of nuisance than each individual effect alone.

10.1.5 A full assessment on Onshore Scheme intra-project cumulative effects is presented in **Application Document 6.2.2.12 Part 2 Suffolk Chapter 12 Intra-Project Cumulative Effects** and **Application Document 6.2.3.12 Part 3 Kent Chapter 12 Intra-Project Cumulative Effects**.

10.1.6 The assessment of intra-project cumulative effects of the Offshore Scheme uses a three-stage approach. The first stage consists of a pre-screening exercise to determine whether a marine receptor such as fish and shellfish is exposed to more than one type of effect.

10.1.7 Those marine receptors identified as experiencing more than one type of effect, such as temporary disturbance from subsea cable trenching, are taken through to the second stage. The second stage consists of a screening exercise to identify the significance each type of effect has on each marine receptor. Those receptors exposed to two or more types of effect, with a significance of effect greater than negligible, are then taken forward to the third stage. The third stage is the main intra-project assessment, which considers if the combination of effects is likely to lead to overall effects of greater significance.

10.1.8 Details of the regulatory and planning policy for intra-project cumulative effects is presented in **Application Document 6.3.1.5.A Appendix 1.5.A Cumulative Effects Assessment Methodologies**.

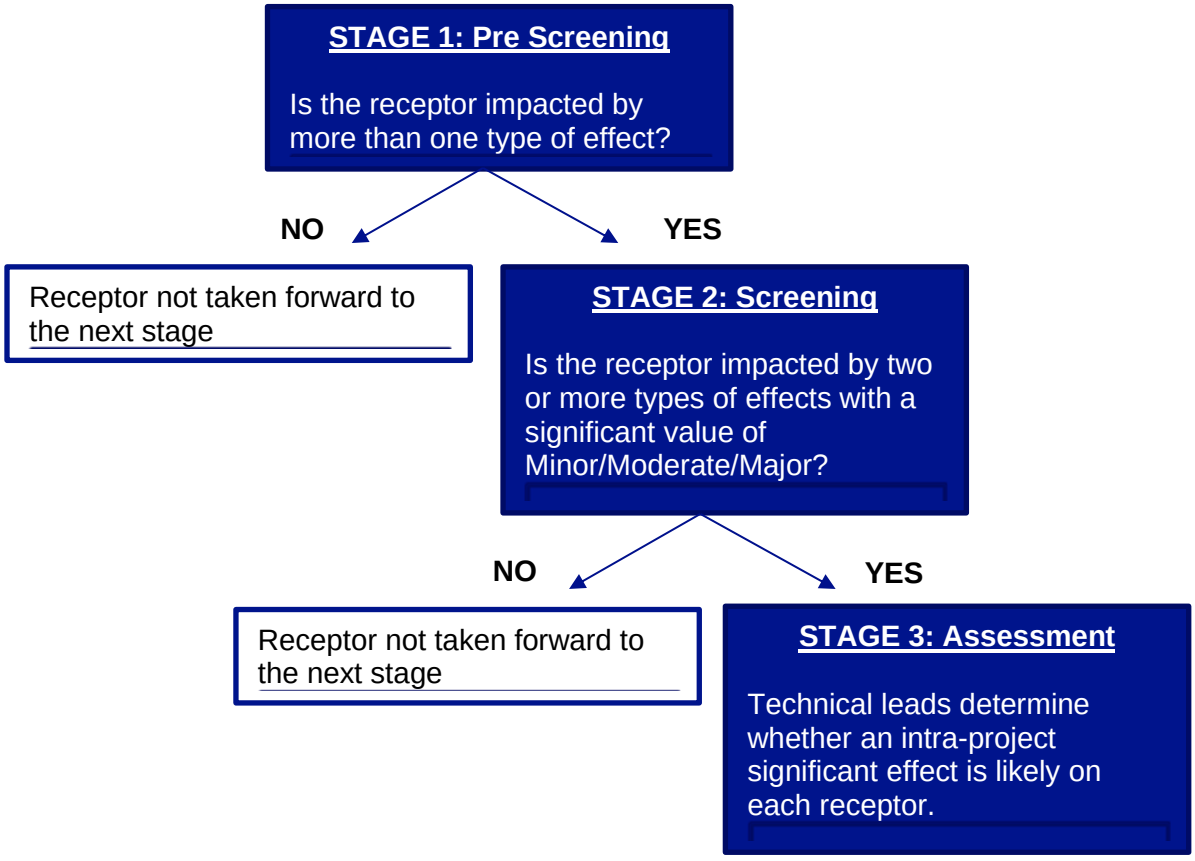

Plate 10.1 Methodological approach to identifying intra-project cumulative effects

10.2 Assessment

Stage 1 – Offshore Pre-Screening Assessment

10.2.1 The assessment considers residual effects only i.e., effects after the application of all mitigation including Control and Management Measures (**Application Document 7.5.3.1 Appendix A Outline Code of Construction Practice**), Embedded Mitigation and any additional mitigation listed within each topic chapter and **Application Document 6.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC).**

10.2.2 Residual effects are presented in each of the technical chapters in **Volume 6 Part 4 Chapters 1 to 9**.

10.2.3 Where this stage identifies that there was only one type of effect for a particular receptor, or only one topic had identified effects on that receptor, it is considered that there is no potential for an intra-project effect to occur and the receptor is not taken forward to screening stage 2. The pre-screening assessments are summarised in Table 10.1 and presented in detail within Table 10.2 to Table 10.10.

Table 10.1 Stage 1 – Pre- screening (shared receptors)

Receptor	Physical Environment	Benthic Ecology	Fish and Shellfish	Marine Mammals	Marine Ornithology	Marine Archaeology	Shipping and Navigation	Commercial Fisheries	Other Sea Users
Water column	■								
Water quality	■								
Seabed morphology	■								
Suffolk and Kent coastline	■								
Coraline Crag Ridges	■								
Sizewell B and C power plant water intake	■								
Seabed Bathymetry	■								
Benthic Habitats		■							
Benthic Species		■							
Fish and Shellfish			■						
Marine Mammals				■					
Seabirds and waterbirds.					■				
Sub-seabed heritage receptors						■			
Buried intertidal heritage receptors						■			
Seabed heritage receptors						■			
Historic seascape						■			
Passing vessels (all categories)							■		
Vessel frequently using established routes							■		

Receptor	Physical Environment	Benthic Ecology	Fish and Shellfish	Marine Mammals	Marine Ornithology	Marine Archaeology	Shipping and Navigation	Commercial Fisheries	Other Sea Users
Fishing vessels							■		
Anchoring vessels							■		
Deep draught vessels							■		
Vessels navigating with magnetic compass							■		
Mobile fishing gear								■	
Static fishing gear								■	
Recreational boating									■
Recreational fishing									■
Oil and Gas									■
Carbon Capture									■
Offshore Wind									■
Minerals and aggregates									■
Dredging and disposal									■
Military practice areas									■
Pipelines and cables									■
Aquaculture									■

Table 10.2 Physical processes – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Physical Processes					
Water Column & Water Quality	Physical Processes	***Construction, Operation and Decommissioning:*** Temporarily increased suspended sediment concentrations (SSC). Accidental release of oils, lubricants, fuels and other chemicals. Contaminant release from disturbed sediments.	**Not Significant**	Impacts on these receptors are assessed fully in **Application Document 6.2.4.1 Part 4 Marine Chapter 1 Physical Processes** and not shared and assessed separately within other topic chapters.	**No**
Offshore Seabed Morphology	Physical Processes	***Construction, Operation and Decommissioning:*** Changes in seabed morphology from the placement/removal of rock protection, route clearance and preparation, cable installation techniques and repair/maintenance. Scour around rock protection.	**Not Significant**		**No**
Landfall and nearshore seabed and beach morphology	Physical Processes	***Construction and Decommissioning:*** Changes to coastal morphology due to installation of the cable including	**Not Significant**		**No**

		trenchless techniques at landfall and repair/maintenance.			
Coraline Crag Ridges	Physical Processes	***Construction:*** Changes to the Coraline Crag Ridges and its associated role in the regional coastline morphology	**Not Significant**		**No**
Kent coastal geomorphology and associated sediment transport regimes	Physical Processes	***Operation****:* Changes to sediment transport regimes leading to change to coastal geomorphology due to the presence of rock protection at the HDD exit pits	**Not Significant**		**No**
Suffolk coastal geomorphology and associated sediment transport regimes	Physical Processes	***Operation****:* Changes to sediment transport regimes leading to change to coastal geomorphology due to the presence of rock protection at the HDD exit pits.	**Not Significant**		**No**
Coastal geomorphology	Physical Processes	***Operation****:* Coastal geomorphological change due to the effects of climate change.	**Significant**	Climate change impacts on this receptor are assessed fully in **Application Document 6.2.4.1 Part 4 Marine Chapter 1 Physical Processes** within paragraph 1.9.65	**No**

	and 1.9.66 and not shared and assessed separately within other topic chapters.

Table 10.3 Benthic ecology – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Benthic Ecology					
Benthic Ecology (Habitats and Species)	Benthic Ecology	***Construction and Decommissioning**:* Direct loss of subtidal benthic habitats and species due to placement of hard substrates on the seabed for cable protection. Temporary disturbance to subtidal benthic habitats and species from cable installation activities. Temporary increase in SSC and sediment deposition leading to increased turbidity and smothering effects and possible contaminant mobilisation during cable installation. Introduction of invasive non-native species. Underwater sound. ***Operation**:* Potential effects on benthic ecology due to subsea cable EMF emissions altering foraging behaviour. Potential effects on benthic ecology due to subsea cable thermal emissions altering foraging behaviour.	**Not Significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.2 Part 4 Marine Chapter 2 Benthic Ecology** and not shared and assessed separately within other topic chapters.	**No**

Table 10.4 Fish and shellfish – Summary of environmental information

Receptor	Relevant topic	Effects	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Fish and Shellfish					
Fish and Shellfish	Fish and Shellfish	***Construction:*** Temporary disturbance from cable installation activities. Permanent habitat loss for fish and shellfish due to the placement of hard substrate cable protection such as rock placement and concrete mattresses. Temporary increase in SSC. Underwater sound. ***Operation****:* Potential effects on fish and shellfish due to subsea cable EMF emissions altering foraging behaviour. Potential effects on fish and shellfish due to subsea cable thermal emissions altering foraging behaviour.	**Not Significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** and not shared assessed separately within other topic chapters.	**No**

Table 10.5 Marine mammals– Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Mammals					
All Marine Mammals	Marine Mammals	***Construction, Maintenance, and Decommissioning****:* Underwater noise disturbance from pre installation and cable/ cable protection activities. Indirect effects through impacts to prey species. Airborne sounds and visual disturbance. Vessel collision risk. ***Operation****:* EMF emissions disturbance.	**Not significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.4 Part 4 Marine Chapter 4 Marine Mammals** and not assessed separately within other topic chapters.	**No**

Table 10.6 Marine Ornithology – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Marine Ornithology Receptors					
All Species	Marine Ornithology	***All phases:*** Disturbance and displacement of birds. Alteration of water quality due to increased SSC and disturbance of contaminated sediment. Direct loss and disturbance of seabed habitat (including, associated prey) used by foraging seabirds and waterbirds.	**Not Significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.5 Part 4 Marine Chapter 5 Marine Ornithology** and not shared and assessed separately within other topic chapters.	**No**

Table 10.7 Marine archaeology – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Marine Archaeology					
Seabed heritage receptors (known and potential maritime and aviation features)	Marine Archaeology	***Construction:*** Indirect changes to hydrodynamic and sedimentary regimes. Disturbance from vessel activity. Disturbance from placement of cable protection. ***Operation:*** Indirect changes to hydrodynamic and sedimentary regimes. ***Maintenance:*** Indirect changes to hydrodynamic and sedimentary regimes. Disturbance from vessel activity. ***Decommissioning:*** Indirect changes to hydrodynamic and sedimentary regimes. Disturbance from vessel activity.	**Not Significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.6 Part 4 Marine Chapter 6 Marine Archaeology** and not shared and assessed separately within other topic chapters.	**No**
Buried intertidal heritage receptors (known and potential palaeogeography,	Marine Archaeology	***Construction:***	**Not Significant**		**No**

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
historic terrestrial, marine and aviation features)		Disturbance from trenchless installation activities at landfall (including entry/ exit points offshore).			
Historic seascape	Marine Archaeology	***Construction. Operation and Decommissioning:*** Project works that temporarily or permanently change the character of the historic seascape.	**Not Significant**		**No**

Table 10.8 Shipping and navigation – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Shipping and Navigation					
Passing Vessels (all categories)	Shipping and Navigation	***Construction:*** Vessel on vessel collisions leading to loss of life and major damage to equipment. Obstruction of navigation routes. Gear snagging on project infrastructure. ***Operation and Maintenance***: Vessel drags anchor across exposed cable causing vessel and cable damage. Reduction in Under-Keel Clearance for vessels. ***Decommissioning:*** Vessel on vessel collisions leading to loss of life and major damage to equipment. Obstruction of navigation routes. Gear snagging.	**Not significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.7 Part 4 Marine Chapter 7 Shipping and Navigation** and not shared and assessed separately within other topic chapters.	**No**
Vessels navigating with magnetic compass	Shipping and Navigation	***Operation:*** EMF Interference with marine navigational equipment. Obstruction of navigation routes.	**Not significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.7 Part 4 Marine Chapter 7 Shipping and**	**No**

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
		Maintenance: EMF Interference with marine navigational equipment. Obstruction of navigation routes.		**Navigation** and not shared and assessed separately within other topic chapters.	

Table 10.9 Commercial fisheries – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Commercial Fisheries					
Mobile gear fisheries	Commercial Fisheries	***All phases*:** Obstruction of navigation routes to commercial fishing grounds. Loss and alteration of fishing grounds. Displacement of commercial fishing activities. Loss or damage to fishing gear. Indirect effects on commercial fisheries as a result of impacts on the ecology of commercial species.	**Not significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.8 Part 4 Marine Chapter 8 Commercial Fisheries** and not shared assessed separately within other topic chapters.	**No**
Static gear fisheries	Commercial Fisheries	***All phases:*** Obstruction of navigation routes to commercial fishing grounds. Loss and alteration of fishing grounds. Displacement of commercial fishing activities. Loss or damage to fishing gear. Indirect effects on commercial fisheries as a result of impacts	**Not significant**		**No**

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
		on the ecology of commercial species.			

Table 10.10 Other sea users – Summary of environmental information

Receptor	Relevant topic	Impact	Effect	Potential for Intra-Project cumulative effects	Taken through to stage 2
Other Sea Users					
Recreational boating and fishing	Other Sea Users	***Construction:*** Physical presence of vessels and collision risk and interacting with stationary or slow-moving traffic. Cable installation activities causing displacement. ***Operation, Maintenance and Decommissioning:*** Physical presence of vessels and collision risk and interacting with stationary or slow-moving traffic.	**Not Significant**	Impacts on this receptor are assessed fully in **Application Document 6.2.4.9 Part 4 Marine Chapter 9 Other Sea Users** and not shared and assessed separately within other topic chapters.	**No**
Offshore Infrastructure	Other Sea Users	***Construction:*** Physical presence of vessels and collision risk and interacting with stationary or slow-moving traffic. Cable installation activities causing displacement. ***Operation and Maintenance:*** Physical presence of vessels and collision risk and interacting with stationary or slow-moving traffic. Occupancy of the seabed. ***Decommissioning:*** Physical presence of vessels and collision risk and interacting with stationary or slow-moving traffic.	**Not Significant**		**No**

Stage 2 – Screening Assessment

10.2.4 Detailed screening tables are presented in Table 10.2 to Table 10.10. As the structure of this ES for the Offshore Scheme separates out chapters by receptor, impacts to all marine receptors are therefore assessed fully within each of their respective topic chapters in **Volume 6 Part 4**.

Stage 3 – Intra-Project Effects Assessment

10.2.5 No shared receptors were present across the Offshore Scheme topic chapters. Therefore, all marine receptors have been wholly assessed with in topic chapter and no intra-project cumulative effects are anticipated for marine receptors during the Proposed Project.

10.3 Summary

10.3.1 Consideration has been given to the potential for various types of effects to affect the same receptor, a type of effect that is referred to as an 'intra-project effect' for the purposes of this assessment.

10.3.2 The assessment of intra-project cumulative effects resulting from the Offshore Scheme has been assessed in accordance with the methodology set out in **Application Document 6.3.1.5.A Cumulative Effects Assessment Methodologies**.

10.3.3 Shared receptors (receptors that are identified in more than one chapter) have been considered and an assessment of intra-project cumulative effects has been undertaken.

10.3.4 Where a receptor has been identified as only experiencing one effect or where only one topic has identified effects on that receptor, there is no potential for intra-project cumulative effects. Stage 1 identified that that no shared receptors were present across the Offshore Scheme topic chapters.

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