



Chapter 20

Transboundary and Cumulative Impacts

Offshore EIA Report: Volume 1

Revision history

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Acronyms

Acronym	Description
CCS	Carbon capture and storage
CGNS	Celtic and Greater North Seas
CIA	Cumulative Impact Assessment
EaS	East Scotland
EEA	European Economic Area
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
GHG	Greenhouse gas
HES	Historic Environment Scotland
HRA	Habitat Regulation Appraisal
HVDC	High voltage direct current
INTOG	Innovation and Targeted Oil and Gas
MHWS	Mean high water spring tide
MINNS	Marine invasive non-native species
MoF	Moray Firth
MS-LOT	Marine Scotland Licensing Operations Team
MSS	Marine Scotland Science
MU	Management Unit
O&M	Operation and maintenance
TIA	Transboundary Impact Assessment
UK	United Kingdom
UXO	Unexploded Ordnance

Glossary of Terms

Term	Description
Applicant	Green Volt Offshore Windfarm Ltd.
Buzzard	Buzzard Platform Complex.
Buzzard Export Cable Corridor	The area in which the export cables will be laid, from the perimeter of the Windfarm Site to Buzzard Platform Complex.
Green Volt Offshore Windfarm	Offshore windfarm including associated onshore and offshore infrastructure development (Combined On and Offshore Green Volt Projects).
Horizontal Directional Drilling	Mechanism for installation of export cable at landfall.
Inter-array cables	Cables which link the wind turbines to each other and the offshore substation platform.
Landfall Export Cable Corridor	The area in which the export cables will be laid, from the perimeter of the Windfarm Site to landfall.
Mean High Water Springs	At its highest and 'Neaps' or 'Neap tides' when the tidal range is at its lowest. The height of Mean High Water Springs (MHWS) is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest (Spring tides).
Moorings	Mechanism by which wind turbine generators are fixed to the seabed.
NorthConnect Parallel Export Cable Corridor Option	Landfall Export Cable Corridor between NorthConnect Parallel Landfall and point of separation from St Fergus South Export Cable Corridor Option.
NorthConnect Parallel Landfall	Southern landfall option where the offshore export cables come ashore.
Offshore Development Area	Encompasses i) Windfarm Site, including offshore substation platform ii) Offshore Export Cable Corridor to Landfall, iii) Export Cable Corridor to Buzzard Platform Complex.

Offshore export cables	The cables which would bring electricity from the offshore substation platform to the Landfall or to the Buzzard Platform Complex.
Offshore infrastructure	All of the offshore infrastructure, including wind turbine generators, offshore substation platform and all inter-array and export cables.
Offshore substation platform	A fixed structure located within the Windfarm Site, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Onshore Export Cable Corridor	The proposed onshore area in which the export cables will be laid, from landfall to the onshore substation.
Project	Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development.
Safety zones	An area around a structure or vessel which must be avoided.
St Fergus South Export Cable Corridor Option	Landfall Export Cable Corridor between St Fergus South Landfall and point of separation from NorthConnect Parallel Export Cable Corridor Option.
St Fergus South Landfall	Northern landfall option where the offshore export cables come ashore.
Windfarm Site	The area within which the wind turbine generators, offshore substation platform and inter-array cables will be present.

CHAPTER 20: TRANSBOUNDARY AND CUMULATIVE IMPACTS

20.1 Introduction

1. This chapter of the **Offshore Environmental Impact Assessment (EIA) Report** provides a summary of the Transboundary Impact Assessment (TIA) and Cumulative Impact Assessment (CIA) for the offshore topics of the Project (in this instance the Project refers to the offshore elements of the Green Volt Offshore Windfarm only, up to Mean High Water Springs (MHWS)). Whilst each technical assessment chapter within the EIA (**Chapters 7 to 19**) provides its own CIA section in relation to that topic (including transboundary impacts, where applicable), the purpose of this chapter is to present a complete overview of potential transboundary and cumulative impacts of the project.
2. Note that an in-combination assessment has been completed as part of the Habitats Regulations Appraisal (HRA) process. In-combination assessment is required for HRA and is the equivalent to the EIA CIA, therefore there are elements of the approach to CIA that are mirrored by the in-combination HRA process, in particular the method used to identify other plans, projects and activities that are taken forward in each assessment. The **Report to Inform Appropriate Assessment** is submitted with the application and should be consulted for further information relevant to the assessment of effects on European Sites (i.e. Special Areas of Conservation and Special Protection Areas for birds).
3. This chapter draws information from and should be read in conjunction with the TIA and CIA sections within the following **Offshore EIA Report** technical chapters:
 - **Chapter 7: Marine Geology, Oceanography and Physical Processes**
 - **Chapter 8: Marine Sediment and Water Quality**
 - **Chapter 9: Benthic Ecology**
 - **Chapter 10: Fish and Shellfish Ecology**
 - **Chapter 11: Marine Mammal Ecology**
 - **Chapter 12: Offshore and Intertidal Ornithology**
 - **Chapter 13: Commercial Fisheries**
 - **Chapter 14: Shipping and Navigation**
 - **Chapter 15: Offshore Archaeology and Cultural Heritage**
 - **Chapter 16: Aviation and Radar**
 - **Chapter 17: Infrastructure and Other Marine Users**
 - **Chapter 18: Climate Change**
 - **Chapter 19: Socioeconomics, Tourism and Recreation**

20.2 Legislation

4. As stated in Schedule 4, section 6 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (Scottish Government, 2017):

'The description of the likely significant effects on the factors specified in regulation 5(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the works. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the works including in particular those established under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora(1) and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds'.

5. In line with this requirement, a description of likely significant transboundary and cumulative effects is provided in each technical chapter of the **Offshore EIA Report** (where relevant) and summarised in this chapter.
6. The United Nations Economic Commission for Europe Convention on Environmental Impact Assessment in a Transboundary Context (referred to as the Espoo Convention) requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts (United Nations Economic Commission for Europe, 2017).
7. Further detail is provided in **Chapter 3: Policy and Legislative Context**.

20.3 Consultation

8. Consultation is a key requirement within the EIA process as it enables stakeholders to present their comments regarding the proposed works. This requirement is explained in further detail in **Chapter 6: EIA Methodology** of this **Offshore EIA Report**.
9. Table 20.1 provides an overview of consultation responses received that are relevant to transboundary and cumulative impact assessment.

Table 20.1 Summary of consultation relating to transboundary and cumulative impact assessment.

Consultee	Date / Document	Comment	Response / where addressed in the EIA Report
Marine Scotland Licensing and Operations Team (MS-LOT)	13/06/2022 Email Correspondence	<p><u>Offshore Wind projects</u> We would advise that offshore wind projects should be ranked as follows for consideration:</p> <ul style="list-style-type: none"> • Operational Offshore Windfarm– Beatrice, Moray East, HyWind, European Offshore Wind Deployment Centre and Kincardine. (There may also be a need to consider Offshore Windfarm either in English waters or in other non-UK parts of the North Sea.) The consideration of which Offshore Windfarm to be included will depend on species and their foraging ranges / management units. The work on HRA screening should inform this for marine birds and for marine mammals' consideration should be given to their management units and for all species what impact pathways are being considered. • Under construction - SeaGreen, Neart na Gaoithe • Consented, but not yet under construction – Moray West, Inch Cape • In planning / ScotWind lease sites – [...] will depend on their timescales 	Included in Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment

Consultee	Date / Document	Comment	Response / where addressed in the EIA Report
		who needs to take account of who first	
MS-LOT	13/06/2022 Email Correspondence	<p><u>Non wind projects</u></p> <ul style="list-style-type: none"> We agree that Acorn CCUS should be considered. Dredging and disposal sites – [...] these can vary on an annual basis, and we suggest this is in respect of the export cable route works only. Cables and Pipelines – we agree with the consideration of both NorthConnect and Eastern Link. Depending on timings there may also be activities related to the Offshore Transmission Network Review - Holistic Network design that may require to be considered, but currently this is not yet published, so it is unclear what activities might occur when and where. Other works – the 3 projects listed seem sensible. There may however be other works around Peterhead / cable route that guidance should be sought from all regulators e.g. Scottish Environment Protection Agency, Marine Scotland, Aberdeenshire Council etc. as NatureScot will not be aware of all activities that may need to be considered.” 	Included in Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment
MS-LOT	April 2022 Offshore Scoping Opinion	<p>[Ref: 5.9.1] Transboundary Impacts: In Section 5.8 of the Scoping Report the Developer states that no transboundary impacts have been identified as part of the physical processes review due to the low current speeds, distance from international boundaries and the very localised potential to transport mobilised material. The Scottish Ministers advise the Developer to include this conclusion in the EIA Report for each of the receptors in Sections 5.2 to 5.7 above for completeness.</p>	Transboundary impacts on physical processes are assessed in Chapter 7: Marine Geology Oceanography and Physical Processes , and summarised below in Table 20.3
MS-LOT	April 2022	<p>[Ref: 2.3.1] Onshore/Planning: The EIA Report for the Proposed Development must consider the cumulative impacts with the onshore works.</p>	<p>All onshore works will be undertaken before offshore construction. Works at the landfall will be undertaken onshore first and with the selection of horizontal directional drilling, intertidal receptors will be avoided. It is therefore considered that there is no pathway for impacts from onshore works on offshore receptors and vice versa.</p> <p>A separate Onshore EIA Report will provide an assessment of the Project's onshore infrastructure. Where a technical topic is required to be assessed for both offshore and onshore, such as socioeconomics, a separate chapter is provided in the Onshore EIA Report for the</p>

Consultee	Date / Document	Comment	Response / where addressed in the EIA Report
			Project's onshore infrastructure. It is recognised that the onshore EIA assessment will be undertaken later than the submission of the Offshore EIA Report . To enable consideration of the on and offshore elements of the Project as a whole, an additional document has been prepared. This additional document is called the Summary of Offshore and Onshore Environmental Impact Assessments and provides a summary of the Offshore EIA Report and the predicted summary of the onshore EIA. It will be submitted to the Scottish Ministers along with the application documents and will be available on the Green Volt website ¹ . If required, it will be updated upon completion of the Onshore EIA Report .
MS-LOT	Offshore Scoping Opinion	[Ref: 2.4.2] Innovation and Targeted Oil & Gas: In the event that the Developer is awarded a lease option agreement by Crown Estate Scotland, the EIA Report must consider any plan level assessments included in the final Sectoral Marine Plan for INTOG [Innovation and Targeted Oil and Gas] and consider cumulative impacts with other INTOG projects awarded lease option agreements.	Included in Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment
MS-LOT	April 2022	[Ref: 2.5.8] The Scottish Ministers' Comments: The Scottish Ministers advise that the EIA Report must describe and assess the environmental effects, including in-combination effects, of the range of surveys which may be required such as geophysical and geotechnical survey activities and unexploded ordnance ("UXO") clearance.	Cumulative impacts of planned surveys are considered in Chapter 11: Marine Mammal Ecology , and summarised in Table 20.4 Due to the scale, duration and localised nature of survey effects these have not been considered as cumulative effects for any other receptor.
MS-LOT	Offshore Scoping Opinion	[Ref: 5.8.1] Potential Cumulative Impacts: In Section 5.7 of the Scoping Report the Developer states that there is potential for the predicted impacts on physical processes to interact with impacts from other projects and activities in the physical processes study area and lead to a cumulative effect on the receptors. The Scottish Ministers agree with the projects and activities identified to be included in a cumulative assessment for the physical processes study area and highlight the representation received from Shell. The Scottish Ministers advise that a cumulative assessment must be included in the EIA Report.	Cumulative impacts on physical processes are assessed in Chapter 7: Marine Geology Oceanography and Physical Processes , and summarised below in Table 20.4

¹ <https://greenvoltoffshorewind.com/>

Consultee	Date / Document	Comment	Response / where addressed in the EIA Report
MS-LOT	April 2022	[Ref: 5.11.3] Fish & Shellfish: With regards to EMF [electromagnetic field] impacts, the Scottish Ministers highlight and agree with the NatureScot representation which advises that EMF impacts should be scoped in, especially if cables are not able to be buried, as there are likely to be EMF effects from both the export and inter-array cables. The Scottish Ministers also advise that, in relation to the NorthConnect representation, modelling of the cumulative impacts of EMF should also be considered within the EIA Report. These should be considered along with research on edible crab, brown shrimp and European lobster as highlighted in the Marine Scotland Science (MSS) advice. Therefore, the Scottish Ministers advise that the Developer must scope in the impacts of EMF in the EIA Report.	Appendix 9.2: Green Volt Project EMF Assessment is appended to Chapter 9: Benthic Ecology . EMF is considered in Chapter 9: Benthic Ecology, Chapter 10: Fish and Shellfish Ecology and Chapter 11: Marine Mammal Ecology .
MS-LOT	Offshore Scoping Opinion	[Ref: 5.12.4] Marine Mammal Ecology: Scope in EMF effects during O&M [Operation & Maintenance], underwater noise from geophysical surveys during construction phase, and cumulative barrier effects from underwater noise from other windfarms in the vicinity	Appendix 9.1: Underwater Noise Technical Report and Appendix 9.2 Green Volt Project EMF Assessment are appended to Chapter 9: Benthic Ecology . EMF and Noise are considered in Chapter 9: Benthic Ecology, Chapter 10: Fish and Shellfish Ecology and Chapter 11: Marine Mammal Ecology
MS-LOT	April 2022	[Ref: 5.12.10] Marine Mammal Ecology: Screen in disturbance to marine mammals from physical presence of vessels and construction related activity. Address the underwater barrier effects from noise and physical presence of windfarms cumulatively	Cumulative impacts upon marine mammals are assessed in Chapter 11: Marine Mammal Ecology , and summarised below in Table 20.4
MS-LOT	Offshore Scoping Opinion	[Ref: 5.13.6] Offshore Ornithology: With regards to cumulative assessment, the Scottish Ministers advise that this should focus on the Proposed Development in combination with other consented projects in the Moray Firth including those granted lease agreements through ScotWind and sites identified in the draft Sectoral Marine Plan round for Offshore Wind for INTOG.	Cumulative impacts of ScotWind and INTOG projects in the Moray Firth granted lease agreement have been accounted for in Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment for cumulative impact assessment in EIA Report technical chapters. This is summarised in Table 20.4
MS-LOT	April 2022	[Ref: 5.16.4] Commercial Fisheries: In regard to cumulative effects, the Scottish Ministers highlight the NorthConnect representation in regard to cumulative EMF effects between the Proposed Development and the NorthConnect cable corridor and the implications of these on the commercial fishing industry and other receptors. The Scottish Ministers advise that the Developer must fully address these comments within the EIA Report in all relevant receptor chapters.	Appendix 9.2: Green Volt Project EMF Assessment is appended to Chapter 9: Benthic Ecology . EMF is considered in Chapter 9: Benthic Ecology, Chapter 10: Fish and Shellfish Ecology, Chapter 11: Marine Mammal Ecology and Chapter 13 Commercial Fisheries
MS-LOT	Offshore Scoping Opinion	[Ref: 5.17.2] Marine Archaeology and Cultural Heritage: In Table 7.11 of the	Cumulative impacts on marine archaeology and cultural

Consultee	Date / Document	Comment	Response / where addressed in the EIA Report
		Scoping Report the Developer summarises the potential impacts to marine archaeology and cultural heritage during different phases of the Proposed Development. The Scottish Ministers are broadly content with the impacts proposed to be scoped in to and out of the EIA Report. However, the Scottish Ministers advise that cumulative impacts on archaeology should be scoped in to the EIA Report and the Historic Environment Scotland (HES) and NorthConnect representations must be addressed in full by the Developer in this regard.	heritage are assessed in Chapter 15: Offshore Archaeology and Cultural Heritage and summarised below in Table 20.4 .
Marine Analytical Unit	April 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	<ul style="list-style-type: none"> It is important to look at the distribution of impacts at the national, regional and local level, and across different groups e.g. businesses, individuals, income levels, organisation, women, youth, elderly, disadvantaged etc. <p>Other economic considerations may include:</p> <ul style="list-style-type: none"> Cumulative effects - effects from multiple pressures and/or activities 	Cumulative impacts on Socioeconomics are assessed in Chapter 19: Socioeconomics, Tourism and Recreation and summarised below in Table 20.4 .
–Marine Scotland Science (MSS)	4th February 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	MSS recommend that if barrier effects from both underwater noise and physical presence of windfarms are to be included in the EIA Report (for their respective stages), they should also be considered cumulatively together with other developments in the project region.	Appendix 9.1: Underwater Noise Technical Report is appended to Chapter 9: Benthic Ecology . Barrier effects from underwater noise are considered in Chapter 10: Fish and Shellfish Ecology and Chapter 11: Marine Mammal Ecology .
NorthConnect	April 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	Sections 7.4.3.1 Potential Impacts During Construction and 7.4.3.4 Potential Cumulative Impacts with regards to Archaeology, put a level of reliance on the NorthConnect mitigation. It is understood the Green Volt cable may be laid within the consented NorthConnect corridor, which is nominally 500m wide, although it has been surveyed this does not preclude the potential for unexpected or incidental finds. Hence, NorthConnect have a protocol for archaeological discoveries in place for cable installation works. However, the actual cable lay footprint will be much narrower than the consented corridor and any unexpected or incidental finds during construction will be limited to the cable lay area. As such it should not be assumed that where the Green Volt cable will be laid will be free from archaeological artifacts, therefore Green Volt will need to have their own appropriate mitigation in place to manage archaeology finds.	Mitigation for managing archaeological finds and cumulative impacts on marine archaeology and cultural heritage are assessed in Chapter 15: Offshore Archaeology and Cultural Heritage and summarised below in Table 20.4 .
NorthConnect	April 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	It should be noted that cumulative impacts will be the responsibility of Green Volt to assess as the NorthConnect EIA process is now complete.	Cumulative impacts are presented in all EIA technical chapters, and summarised in Table 20.4 .

Consultee	Date / Document	Comment	Response / where addressed in the EIA Report
NorthConnect	April 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	With regards to Electromagnetic Field (EMF) impacts, if Green Volt are to use the NorthConnect cable corridor or be close to it, the cumulative impacts of EMF should be modelled and clearly considered within the EIA Report. This is to allow for the assessment of impacts on ecological receptors including benthic and fish ecology with potential knock-on implications for the fishing sector and navigation. Significant cumulative effects are not expected however, there is a need for transparency to be clearly demonstrated to stakeholders that EMF has been appropriately considered.	Appendix 9.2: Green Volt Project EMF Assessment is appended to Chapter 9: Benthic Ecology . EMF is considered in Chapter 9: Benthic Ecology, Chapter 10: Fish and Shellfish Ecology and Chapter 11: Marine Mammal Ecology .
RSPB	27 th January 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	We have serious concerns over the potential risks offshore wind projects pose to seabird populations both individually and cumulatively. We also have serious concerns about the potential for in-combination impacts with other offshore proposals. We believe the consented projects in the Moray Firth, those granted lease agreements under Scotwind, and sites identified in the draft Sectoral Marine Plan round for Offshore Wind for INTOG are all of relevance to be considered with this project.	Cumulative impacts on seabird populations are assessed in Chapter 12: Offshore and Intertidal Ornithology and summarised below in Table 20.4 ScotWind and INTOG sites granted lease agreements are included in Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment .
Royal Yachting Association	21 st December 2021 Representation to MS-LOT during consultation on Offshore Scoping Opinion	In terms of the proposed landfall sites, Peterhead is one of the termini of the planned SEGL 2 HVDC link [Eastern Green Link 2] from Peterhead to Drax in Yorkshire which may lead to a cumulative impact.	The planned Eastern Green Link 2 from Peterhead to Drax has been included in Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment .
AberdeenInternational Airport	21 st December 2021 Representation to MS-LOT during consultation on Offshore Scoping Opinion	Our position with regard to this proposal will only be confirmed once the turbine details are finalized and we have been consulted on a full planning application. At that time we will carry out a full safeguarding impact assessment and will consider our position in light of, inter alia, operation impact and cumulative effects.	Green Volt Offshore Windfarm Ltd. (the Applicant) will continue engagement with Aberdeen International Airport and will consult Aberdeen International Airport on the full planning application.

20.4 Assessment Methodology

10. The general methodology for TIA and CIA is presented in **Chapter 6: EIA Methodology**.
11. The approach to the impact assessment requires assigning each potential receptor a sensitivity and magnitude level to determine the significance of an impact on each receptor. This approach is applied to all potential impacts that are identified as part of the EIA process. Each potential impact has been assessed against the Offshore Development Area's construction, operation and maintenance (O&M) and decommissioning development phases.
12. Transboundary effects are defined as those effects upon the receiving environment of European Economic Area (EEA) states, whether occurring from the Project alone, or cumulatively with other projects in the wider area. Transboundary effects arise when impacts from the offshore infrastructure within one EEA state affects the environment of another EEA state(s).

13. Cumulative impacts are assessed through consideration of the extent of influence of changes or effects upon receptors within the Offshore Development Area arising from the Project alone and cumulatively with other planned projects.
14. In this TIA and CIA, the Applicant has taken into consideration the National Marine Plan, Sectoral Marine Plan for Offshore Wind and the Offshore Wind Policy Statement. The Applicant also notes the emerging INTOG Sectoral Marine Plan and the progressing North East Regional Marine Plan which will provide the underpinning policy upon which a determination will be based. The Applicant assessed TIA and CIA using the proposed project design parameters (opposed to “as-built” project parameters). This is largely precautionary and based on worst case.
15. The scope of the CIA has been established on a topic-by-topic basis with the relevant consultees as the EIA progresses, due to the differing geographic scales of each topic area not supporting a consistent scope for all assessments.
16. This **Offshore EIA Report** has considered potential offshore cumulative effects only. Offshore cumulative impacts may come from interactions with the following activities and industries:
 - aggregate extraction and dredging;
 - Carbon Capture and Storage (CCS);
 - commercial fisheries;
 - licensed disposal sites;
 - navigation and shipping;
 - oil and gas activities;
 - other offshore Windfarms;
 - potential port and harbour development;
 - sub-sea cables and pipelines; and
 - Unexploded Ordnance (UXO) clearance.
17. A separate **Onshore EIA Report** will provide an assessment of the Project’s onshore infrastructure. Where a technical topic is required to be assessed for both offshore and onshore, such as socioeconomics, a separate chapter is provided in the **Onshore EIA Report** for the Project’s onshore infrastructure. It is recognised that the onshore EIA assessment will be undertaken later than the submission of the **Offshore EIA Report**. To enable consideration of the on and offshore elements of the Project as a whole, an additional document has been prepared. This additional document is called the **Summary of Offshore and Onshore Environmental Impact Assessments** and provides a summary of the **Offshore EIA Report** and the predicted summary of the onshore EIA. It will be submitted to the Scottish Ministers along with the offshore application documents and will be available on the Green Volt website². If required, it will be updated upon completion of the **Onshore EIA Report**.
18. A comprehensive long list of projects to consider has been identified and agreed upon with MS-LOT which has been appended to this chapter (**Appendix 20.1: Long list of potential projects to be screened into cumulative impact assessment**).
19. The comprehensive long list of projects took account of the level of information available (data confidence) for projects where there is potential for cumulative impacts to occur (see **Table 20.2**).

² <https://greenvoltoffshorewind.com/>

Table 20.2 Data confidence for CIA projects

Data Confidence	Information available on project
Low	Projects that are not currently in the planning system but are likely to enter the planning system in the near future (e.g., AfL or projects at feasibility / early design stages);
Medium	Projects currently within the marine planning system at scoping stage or for which an application has been submitted but which are not yet consented;
High	Projects that are consented and are yet to be constructed or under construction; and
	Projects that are currently operational but that were not operational when baseline data was collected, or operational projects that have an ongoing impact.

20.5 Transboundary and Cumulative Impacts Summary

20. This section presents a summary of the potential impacts on transboundary and cumulative receptors screened in for each technical topic in within the **Offshore EIA Report**.
21. Projects in the operation and maintenance phase are considered as part of the cumulative impact baseline. Oil and Gas decommissioning plans have been considered separately in **Appendix 20.2: Decommissioning Plans for Consideration from Nearby Oil & Gas Facilities**.
22. In summary, Marine Mammals, Offshore and Intertidal Ornithology, Commercial Fisheries and Shipping and Navigation pose the greatest potential for significant cumulative effects. However, the assessments have determined that the Project will have:
 - no significant transboundary effects. A summary of the Project TIA is presented in **Table 20.3**; and
 - no significant cumulative effects. A summary of the Project CIA presented in **Table 20.4**.

Table 20.3 An overview of the transboundary impacts and effects

Topic	Notable Considerations	Transboundary Effects	Impact Assessment
Chapter 7: Marine Geology, Oceanography and Physical Processes	Small-scale nature of the impacts from the Project. The closest maritime boundary is with Norway at approximately 130 km from the boundary of the Windfarm Site. There will be no impact to the hydrodynamic and sedimentary regime	Screened out	
Chapter 8: Marine Sediment and Water Quality	Small-scale nature of the impacts from the Project. The closest maritime boundary is with Norway at approximately 130 km from the boundary of the Windfarm Site. There will be no impact to the hydrodynamic and sedimentary regime	Screened out	
Chapter 9: Benthic Ecology	Small-scale nature of the impacts from the Project. The closest maritime boundary is with Norway at approximately 130 km from the boundary of the Windfarm Site.	Screened out	
Chapter 10: Fish and Shellfish Ecology	Fish and shellfish species assessed are independent of national geographical boundaries. The impact assessment has been undertaken taking into account the distribution of fish stocks and populations irrespective of national jurisdictions. As a result, it is considered that a specific assessment of transboundary impacts is unnecessary.	Screened out	
Chapter 11: Marine Mammal Ecology	Highly mobile nature of marine mammals included within this assessment means that there is the potential for transboundary impacts. Relevant marine mammal populations (management units) include: <ul style="list-style-type: none"> • Belgium • Denmark • France • Germany • Ireland • Netherlands • Norway • Sweden A substantial level of marine development being undertaken, and being planned, by other countries (including Belgium, the Netherlands, Germany and Denmark) in the North Sea. The construction of 10 United Kingdom (UK) offshore wind farms could potentially overlap with the construction the project. Disturbance to the minke whale population in the Southern Trench Marine Protected Area	Potential transboundary effects assessed: <ul style="list-style-type: none"> • Disturbance from underwater noise during offshore wind farm piling works associated with construction • Disturbance from underwater noise during offshore wind farm construction works separate to piling (e.g. vessel movement, seabed preparation, cable and mooring installation) • Disturbance from other underwater noise sources (e.g. geophysical surveys for other offshore wind farms, aggregate extraction and dredging, oil and gas installation works, oil and gas seismic surveys, installation of pipelines, and UXO clearance) • Cumulative barrier effects from underwater noise or physical 	No effects above negligible or minor adverse identified – no significant impact

Topic	Notable Considerations	Transboundary Effects	Impact Assessment
		<p>presence during construction and operation</p> <ul style="list-style-type: none"> • Cumulative increased collision risk with vessels during construction and operation • Cumulative entanglement during operation • Cumulative changes to prey resources during construction 	
Chapter 12: Offshore and Intertidal Ornithology	<p>Transboundary impacts are possible due to the wide foraging and migratory ranges of typical bird species in the North Sea. Potential for collisions and displacement of birds with transboundary populations with those offshore renewable energy projects present. Likely temporal overlap within the operational phases of offshore renewable energy projects, however these unconsented projects are yet to release their data to allow complete TIA. During the breeding season, it is highly unlikely that even key receptors with large mean-maximum foraging ranges such as gannet will travel beyond UK waters. Therefore, developments outside of UK and Scottish waters will not contribute significantly to any transboundary effects. During the non-breeding season, key receptors tend to travel more widely and may come into contact with developments elsewhere in European waters. Given this larger spatial scale, any potential transboundary effects would be in relation to much larger populations than those considered at the UK-scale. The inclusion of non-UK offshore wind farms is considered very unlikely to alter the conclusions of the existing cumulative assessment, and highly likely to reduce estimated impacts at population levels if calculated at larger spatial scales.</p>	<p>The potential transboundary effects considered are:</p> <ul style="list-style-type: none"> • disturbance from construction activities; • disturbance from operation and maintenance activities; • barrier effects; • displacement from presence of wind turbines and; • collisions with wind turbines. 	<p>No significant effect</p>
Chapter 13: Commercial Fisheries	<p>Transboundary impacts are limited to potential displacement of fishing effort from the Offshore Development Area into non-UK Exclusive Economic Zones. As a result there are no transboundary impacts.</p>	<p>Screened out</p>	
Chapter 14: Shipping and Navigation	<p>None</p>	<p>Potential transboundary effects assessed:</p> <ul style="list-style-type: none"> • Vessel Displacement • Third Party to Third Party Vessel Collision • Third party to Project Vessel Collision 	<p>Effects deemed to be broadly acceptable or tolerable with mitigation.</p>

Topic	Notable Considerations	Transboundary Effects	Impact Assessment
		<ul style="list-style-type: none"> Vessel to Structure Allision Reduction of Emergency Response Capability 	
Chapter 15: Offshore Archaeology and Cultural Heritage	Small-scale nature of the impacts from the Project. The closest maritime boundary is with Norway at approximately 130 km from the boundary of the Green Volt Offshore Windfarm array area. There will be no impact to the hydrodynamic and sedimentary regime	Screened out	
Chapter 16: Aviation and Radar	Given the distance from other countries' airspace or infrastructure it is considered that there is no pathway for transboundary impact	Screened out	
Chapter 17: Infrastructure and Other Marine Users	The single existing international asset project considered for transboundary impacts associated with this technical chapter is the Peterhead to Egersund telecommunication cable (not in use)	Potential transboundary effects assessed: <ul style="list-style-type: none"> Disturbance of existing subsea cables and pipelines 	No effects above minor adverse identified – no significant impact
Chapter 18: Climate Change	The impact of greenhouse gas (GHG) emissions is inherently cumulative, and no specific cumulative assessment is required to be undertaken.	Screened out	
Chapter 19: Socioeconomics, Tourism and Recreation	None	Screened out	

Table 20.4 An overview of the cumulative impacts and effects

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
Chapter 7: Marine Geology, Oceanography and Physical Processes	Small-scale nature of the impacts from the Project. There will be no impact to the hydrodynamic and sedimentary regime. Low sensitivity of geomorphological features. Lack of information available at this time for Salamander Floating Offshore Windfarm.	Screened out		
Chapter 8: Marine Sediment and Water Quality	Impacts occur at discrete locations, are temporary in nature and are negligible or low in magnitude. Contaminant concentrations are considered to be within background levels found in the northern North Sea. This effect is limited to the presence of the Offshore Windfarm Site structures only.	Screened out		
Chapter 9: Benthic Ecology	Impacts occur at discrete locations, are temporary in nature and are negligible or low in magnitude. Potential introduction of Marine Invasive Non-Native Species (MINNS).	<ul style="list-style-type: none"> Scotland's National Marine Plan Acorn Carbon Capture and Storage Site North Buchan Ness Disposal Site NorthConnect High Voltage Direct Current (HVDC) Link Eastern Green Link 2 Sea Wall Repair and Extension – Alexandra Parade 	Potential cumulative effects assessed: <ul style="list-style-type: none"> Potential introduction of MINNS (Construction, O&M, Decommissioning) EMF (O&M) 	No effects above minor adverse identified – no significant impact
Chapter 10: Fish and Shellfish Ecology	No impacts are assessed to give rise to cumulative impacts. The Project impact with the greatest range is Temporary Threshold Shift due to piling, at 4.5 km (see Table 10.36 in Chapter 10: Fish and Shellfish Ecology). The nearest project that may use minimal pile driving is Salamander floating Windfarm (if piling is used on this Project it will likely be for offshore substation(s) only, as floating wind turbines are not piled). The nearest fixed-foundation that could possibly overlap construction phase with the Project is Moray West Offshore Windfarm, located 127.5 km away.	Screened out		
Chapter 11: Marine Mammal Ecology	Highly mobile nature of marine mammals included within this assessment means that there is the potential for cumulative impacts. Considered all	Due to the large distances marine mammals travel, a large number of projects were considered in CIA for marine mammals. See	Potential cumulative effects assessed:	No effects above negligible or minor

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
	<p>plans located in the marine mammal Management Unit (MU) population reference area (defined for individual species in the assessment sections):</p> <ul style="list-style-type: none"> • Harbour porpoise <i>Phocoena phocoena</i>: North Sea MU; • Bottlenose dolphin <i>Tursiops truncatus</i>: Greater North Sea and Coastal East Scotland MUs; • White-beaked dolphin <i>Lagenorhynchus albirostris</i>: Celtic and Greater North Seas (CGNS) MU; • Atlantic white-sided dolphin <i>Lagenorhynchus acutus</i>: CGNS MU; • Risso's dolphin <i>Grampus griseus</i>: CGNS MU; • Minke whale <i>Balaenoptera acutorostrata</i>: CGNS MU; • Humpback whale <i>Megaptera novaeangliae</i>; • Grey seal <i>Halichoerus grypus</i>: East Scotland (EaS) and Moray Firth (MoF) MUs; and • Harbour seal <i>Phoca vitulina</i>: EaS and MoF MUs. <p>Screened out noise from operational and decommissioning offshore wind farms (including maintenance activities). Shipping and navigation, and commercial fishery activities are considered part of the baseline environment and so have been screened out of CIA.</p>	<p>Appendix 11.1 Cumulative Impact Assessment Screening for the complete list of:</p> <ul style="list-style-type: none"> • UK offshore wind farm • Offshore wind farm in other European countries • Wave and tidal marine renewable developments • Aggregate and dredging projects • Licensed disposal sites • Oil and gas projects • Gas storage projects • Offshore mining projects • Carbon capture projects • UXO clearance projects <p><u>Screened in projects:</u></p> <ul style="list-style-type: none"> • Aspen (floating) Offshore Windfarm • Beech North (floating) Offshore Windfarm • Beech South (floating) Offshore Windfarm • Berwick Bank Offshore Windfarm • Dieppe - Le Treport Offshore Windfarm • Dogger Bank South (East and West) Offshore Windfarm • Dolphyn Project - pre-commercial (floating) Offshore Windfarm • Dudgeon Extension Offshore Windfarm • Dunkerque Offshore Windfarm • East Anglia ONE North Offshore Windfarm • East Anglia THREE Offshore Windfarm • East Anglia TWO Offshore Windfarm • East Orford Ness Dredging • EEC 5 South Dredging • EEC 5 South Dredging • Goodwin Sands Dredging • Greenwich Light East Dredging • Hewett Depleted Gas subsea cable • Hornsea Project Four Offshore Windfarm • Hornsea Project Three Offshore Windfarm • Inch Cape Offshore Windfarm 	<ul style="list-style-type: none"> • CIA for Disturbance Due to Underwater Noise During Construction of the Project • Cumulative Barrier Effects from Underwater Noise or Physical Presence during Construction and Operation • Cumulative Increased Collision Risk with Vessels during Construction and Operation • Cumulative Entanglement during Operation • Cumulative Changes to Prey Resources during Construction or Operation 	<p>adverse identified – no significant impact</p>

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
		<ul style="list-style-type: none"> • Lowestoft Extension Dredging • Median Deep Dredging • Norfolk Boreas Offshore Windfarm • Norfolk Vanguard Offshore Windfarm • Off Great Yarmouth Dredging • Ossian Offshore Windfarm • Outer Dowsing Offshore Windfarm • Pentland Floating Demo (formerly Dounreay Tri) Offshore Windfarm • Rosebank Field Development oil and gas production license • Salamander Floating Offshore Windfarm • Seagreen Offshore Windfarm • Sheringham Shoal Extension Offshore Windfarm • Sofia (formerly Dogger Bank Teesside B) Offshore Windfarm • Stora Middelgrund Offshore Windfarm • Teal West Development oil and gas production license • Thor Offshore Windfarm • West Bassurelle Extension Dredging • West Wight Dredging 		
<p>Chapter 12: Offshore and Intertidal Ornithology</p>	<p>Cumulative impacts are possible due to the wide foraging and migratory ranges of typical bird species in the North Sea. Impacts are highly localised nature of the impacts (i.e., they occur entirely within the Project boundary only). Potential for cumulative collisions and displacement with offshore developments. Due to the considerable rate of offshore development, there will likely be a temporal overlap within the construction and operational phases of offshore renewable energy projects. Management measures proposed by the Project will also be in place for other projects reducing the risk of occurring. It is possible that long distance migrants or seabirds that have a maximum foraging range of <100 km may encounter more than one Offshore</p>	<p>Due to the large distances birds travel, a significant number of projects were considered in CIA. See Chapter 12: Offshore and Intertidal Ornithology for the complete list.</p> <p>Screened in projects include:</p> <ul style="list-style-type: none"> • Aberdeen Offshore Windfarm • Beatrice Offshore Windfarm • Bellrock Offshore Windfarm • Broadshore Offshore Windfarm • Berwick Bank Offshore Windfarm • Blyth Demonstration Sites (1 & 2) • Caledonia Offshore Windfarm • CampionWind • Cluaran Deas Ear Offshore Windfarm • Cluaran Ear-Thuan Offshore Windfarm 	<p>Potential cumulative effects assessed:</p> <ul style="list-style-type: none"> • Cumulative disturbance and displacement: operational phase (for gannet, guillemot, razorbill, puffin and kittiwake) • Cumulative collision risk (for gannet, kittiwake, herring gull, great black-backed gull) • Cumulative combined operational displacement and collision risk (for gannet, kittiwake) 	<p>No effects above negligible or minor adverse identified – no significant impact</p>

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
	<p>Windfarm. Many proposed developments lack sufficient data to complete a CIA.</p>	<ul style="list-style-type: none"> • Dogger Bank C Offshore Windfarm • Dogger Bank Creyke Beck A Offshore Windfarm • Dogger Bank Creyke Beck B Offshore Windfarm • Dudgeon Extension Project Offshore Windfarm • Dudgeon Offshore Windfarm • East Anglia One North Offshore Windfarm • East Anglia One Offshore Windfarm • East Anglia Three Offshore Windfarm • East Anglia Two Offshore Windfarm • Five Estuaries Offshore Windfarm • Floating Energy Alliance (ScotWind NE8) • Galloper Offshore Windfarm • Greater Gabbard Offshore Windfarm • Gunfleet Sands Offshore Windfarm • Hornsea Four Offshore Windfarm • Hornsea Project One Offshore Windfarm • Hornsea Project Two Offshore Windfarm • Hornsea Three Offshore Windfarm • Humber Gateway Offshore Windfarm • Hywind Scotland Pilot Park • Inch Cape Offshore Windfarm • Kentish Flats Offshore Windfarm • Kincardine Offshore Windfarm • Lincs, Lynn and Inner Dowsing Offshore Windfarm • London Array Offshore Windfarm • MarramWind Offshore Windfarm • Marubeni, SSE Renewables and CIP (ScotWind) • Methil Offshore Wind Demonstration Zone • Moray East Offshore Windfarm • Moray West Offshore Windfarm • Morven Offshore Windfarm • Neart na Gaoithe Offshore Windfarm • Norfolk Boreas Offshore Windfarm • Norfolk Vanguard Offshore Windfarm 	<ul style="list-style-type: none"> • Cumulative barrier effects 	

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
		<ul style="list-style-type: none"> • North Falls Offshore Windfarm • Outer Dowsing Offshore Windfarm • Pentland Floating Offshore Windfarm • Race Bank Offshore Windfarm • Rampion 2 Offshore Windfarm • Rampion Offshore Windfarm • Salamander Offshore Windfarm • Scroby Sands Offshore Windfarm • Seagreen Offshore Windfarm • Sheringham Shoal Extension Project Offshore Windfarm • Sheringham Shoal Offshore Windfarm • Sofia Offshore Windfarm • Stromar Offshore Windfarm • Teesside Offshore Windfarm • Thanet Offshore Windfarm • Triton Knoll Offshore Windfarm • Vattenfall / Fred Olsen Seawind (ScotWind) • West of Orkney Offshore Windfarm • Westernmost Rough Offshore Windfarm 		
<p>Chapter 13: Commercial Fisheries</p>	<p>Commercial fisheries work in a number of locations, with some fleets having larger operational ranges than others. The potential for cumulative impacts to occur depends on the operating practices of local fishing vessels, and the location and range of existing fishing grounds, in relation to other projects/developments</p>	<ul style="list-style-type: none"> • Moray West Offshore Windfarm • NorthConnect HVDC Link • Salamander Floating Offshore Windfarm • Eastern Green Link 2 	<p>Potential cumulative effects assessed for all phases:</p> <ul style="list-style-type: none"> • Reduction in access to, or exclusion from established fishing grounds • Displacement of fishing vessels leading to gear conflict and increased 	<p>No effects above negligible and minor adverse identified – no significant impact</p>

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
			fishing pressure on adjacent grounds <ul style="list-style-type: none"> Physical presence of other offshore wind farm infrastructure leading to fishing gear snagging Project activities leading to additional steaming to alternative fishing grounds 	
Chapter 14: Shipping and Navigation	Cumulative deviations are anticipated such that there may be a cumulative increase in collision and allision risks with developments and other vessels. The hazards are localised to the area in the vicinity of each individual development.	<ul style="list-style-type: none"> Acorn Carbon Capture and Storage Site Broadshore Floating Offshore Windfarm Buchan Offshore Windfarm CampionWind Floating Offshore Windfarm Muir Mhòr Floating Offshore Windfarm MarramWind Floating Offshore Windfarm Salamander Floating Offshore Windfarm 	Potential cumulative effects assessed for all phases: <ul style="list-style-type: none"> Vessel Displacement. Increased Vessel to Vessel Collision Risk (third party to third party) Increased Vessel to Vessel Collision Risk (third party to Project vessel) Vessel to structure allision risk Reduction of emergency response capability. 	Effects deemed to be broadly acceptable or tolerable with mitigation.
Chapter 15: Offshore Archaeology and Cultural Heritage	Application of Archaeological Exclusion Zones identified through EIA. No cumulative impacts are anticipated during the construction phase as a result of hydrodynamic sediment or geological impacts. The setting of marine heritage assets is not considered to form a key part of their cultural significance. It is not possible to avoid heritage assets that have not yet been discovered. NorthConnect HVDC Link will be installed through the south-east section of the Offshore Development Area. Similarly, Scotland / England Green Link / Eastern Link 2 will be installed within the St. Fergus South Cable Corridor	<ul style="list-style-type: none"> NorthConnect HVDC Link Eastern Green Link 2 	Potential cumulative effects assessed for all phases: <ul style="list-style-type: none"> Direct (physical) impact to potential heritage assets 	The significance of direct cumulative physical effects to marine heritage assets was identified as minor adverse (not significant).

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
Chapter 16: Aviation and Radar	The closest existing wind turbine development, the Hywind Offshore Windfarm, is located 55 km to the southwest of the Project and no cumulative impacts are expected from this site due to its location and size (five turbines and approximately 4 km ²). All other Offshore Windfarm projects (constructed or scoped) are considered to be of sufficient distance from the development site that they would have no impact on the in-combination impacts from the Project. A number of ScotWind developments are planned, with the closest being located on the NE7 plan option area (which is seven kilometres to the north of the Offshore Windfarm Site).	Screened out		
Chapter 17: Infrastructure and Other Marine Users	<p>Potential cumulative impacts to vessels are discussed in Chapter 14: Shipping and Navigation.</p> <p>The potential cumulative impacts of the Project on infrastructure and other users have been assessed to be non-significant or able to be fully mitigated through consultation with the relevant parties (i.e. through the development of crossing and proximity agreements or similar) for construction, operation and decommissioning phases. All other parties (i.e. another offshore wind farm operator, cable or pipeline operator or oil and gas operator) that interact with the same receptor will also need to demonstrate no impact (i.e. through avoidance) or agree mitigation with the operators. Therefore, no project will have a direct impact on another user, and by extension it is considered that there will be no pathways for cumulative impact.</p>	Screened out		
Chapter 18: Climate Change	The impact of GHG emissions is inherently cumulative and no specific cumulative assessment is required to be undertaken.	Screened Out		
Chapter 19: Socioeconomics, Tourism and Recreation	Any planned renewable energy developments in the vicinity of the Project has the potential to impact direct employment, supply chain, demand for local good/services, interference with local activities. Salamander floating Offshore Windfarm and the	<ul style="list-style-type: none"> Acorn Carbon Capture and Storage Site Moray West Offshore Windfarm Salamander Floating Offshore Windfarm 	<p>Potential cumulative effects assessed for all phases:</p> <ul style="list-style-type: none"> Direct Employment Supply chain impacts 	No effects above negligible and minor adverse/beneficial identified – no significant impact

Topic	Notable Considerations	Projects Considered in CIA	Cumulative Effects	Cumulative Impact Assessment
	<p>Acorn Carbon Capture and Storage Site have overlapping construction periods. Decommissioning activities will likely draw on similar services and skills as the construction phase.</p>		<ul style="list-style-type: none"> • Increase in demand for local private services/goods • Impact on recreational • Activities (construction and decommissioning only) 	