



Morecambe Offshore Windfarm: Generation Assets Environmental Statement

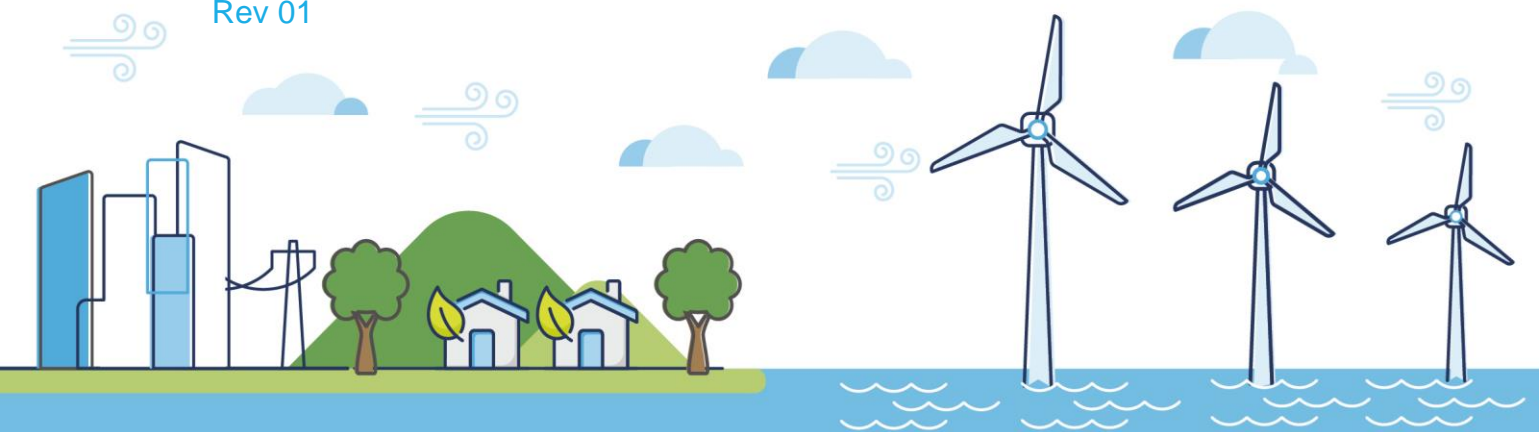
Volume 5

Non-Technical Summary

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Glossary of Acronyms

CBD	Convention on Biological Diversity
CRNRA	Cumulative Regional Navigation Risk Assessment
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
EC	European Commission
EIA	Environmental Impact Assessment
EnBW	Energie Baden-Württemberg AG
EPP	Evidence Plan Process
EPS	European Protected Species
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
FLOWW	Fisheries Liaison with Offshore Wind and Wet Renewables
HAT	Highest Astronomical Tide
LAT	Lowest Astronomical Tide
MCZ	Marine Conservation Zone
MMMP	Marine Mammal Mitigation Protocol
MPS	Marine Policy Statement
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRA	Navigational Risk Assessment
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OSP	Offshore substation platform
OSPAR Convention	Convention for the Protection of the Marine Environment of the North-East Atlantic
OWL	Offshore Windfarm Ltd
PATP	Port Access and Transport Plan
PDE	Project Design Envelope
PEI	Preliminary Environmental Information
PEIR	Preliminary Environmental Information Report
PEMP	Project Environmental Management Plan
PINS	Planning Inspectorate
SAC	Special Area of Conservation
SLVIA	Seascape, Landscape and Visual Impact Assessment

SoCC	Statement of Community Consultation
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
WSI	Written Scheme of Investigation
WTG	Wind turbine generator

Glossary of Unit Terms

GW	Gigawatt
km	kilometre
km ²	kilometre squared
MW	Megawatt

Glossary of Terminology

Applicant	Morecambe Offshore Windfarm Ltd.
Generation Assets (the Project)	Generation Assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect offshore substations.
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The Transmission Assets for the Morgan Offshore Wind Project Generation Assets and the Morecambe Offshore Windfarm. This includes the OSPs ¹ , interconnector cables, the Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400kV cables and associated grid connection infrastructure such as circuit breaker infrastructure. Also referred to in this document as the Transmission Assets, for ease of reading.
Offshore export cables	The cables which bring electricity from the OSP(s) to the landfall.
Offshore substation platform	A fixed structure located within the windfarm site, containing electrical equipment to aggregate the power from the WTGs and convert it into a more suitable form for export to shore.
Platform link cable (interconnector cable)	An electrical cable which links one or more OSPs.
Technical stakeholders	Technical consultees are considered to be organisations with detailed knowledge or experience of the area within which the Project is located and/or receptors which are considered in the Environmental Impact Assessment (EIA) and the Habitats Regulations Assessment (HRA). Examples of technical stakeholders include Marine Management Organisation, local authorities, Natural England and Royal Society for the Protection of Birds (RSPB).
Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables will be present.
Wind turbine generator (WTG)	A fixed structure located within the windfarm site that converts the kinetic energy of wind into electrical energy.

¹ At the time of writing the Environmental Statement (ES), a decision had been taken that the offshore substation platforms (OSPs) would remain solely within the Generation Assets application and would not be included within the Development Consent Order (DCO) application for the Transmission Assets. This decision post-dated the Preliminary Environmental Information Report (PEIR) that was prepared for the Transmission Assets. The OSPs are still included in the description of the Transmission Assets for the purposes of this ES as the Cumulative Effects Assessment (CEA) carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR.



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1 Introduction

1.1 About this document

1. This document is the Non-Technical Summary (NTS) of the Environmental Statement (ES) for Morecambe Offshore Windfarm Generation Assets (the Project). It provides a summary of the Project, the site selection process, engineering design development and the key findings of the Environmental Impact Assessment (EIA) process.
2. The Project is a Nationally Significant Infrastructure Project (NSIP). Consent to construct, operate and maintain the Project is therefore being requested from the Secretary of State for the Department for Energy Security and Net Zero (DESNZ), through the Development Consent Order (DCO) process, under the Planning Act 2008. The purpose of the EIA process is to allow stakeholders to develop an informed view of the development, as required by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations 2017). The ES provides the environmental information which has been gathered and an assessment of the potential significant environmental effects of the Project, during its construction, operation and maintenance, and decommissioning phases and any mitigation, if required.
3. The Project relates only to the Generation Assets of the Morecambe Offshore Windfarm, including wind turbine generators (WTGs), inter-array cables, Offshore Substation Platforms (OSP(s)) and possible platform link cables to connect OSPs.
4. A separate DCO application under the Planning Act 2008 is being made for the Transmission Assets associated with both the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project (another proposed windfarm to be located in the Irish Sea). In line with the Government's drive for coordination of offshore wind generation connections and transmission networks, the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project have a common onshore connection point to the National Grid electricity transmission network at Penwortham in Lancashire, and are working collaboratively to design, consent and deliver the Transmission Assets for both projects.

1.2 Project background

5. The Project is a proposed offshore windfarm located in the Eastern Irish Sea. It has a nominal generating capacity of around 480 megawatts (MW) and would produce renewable power for over 500,000 homes in the United Kingdom (UK). The Project was selected as part of The Crown Estate's Offshore Wind Round 4 leasing process. The windfarm site comprises an area

of around 87km² and is located approximately 30km off the Lancashire coast, as shown in **Figure 1.1**.

6. The Project includes WTGs to generate renewable energy. Inter-array cables would connect to the WTGs and carry the electricity from the WTGs to one or two OSPs. The OSP(s) would convert the power from the WTGs to a suitable voltage for transmission to shore. As there may be up to two OSPs, these would be linked by platform link cables. The Generation Assets would be contained within the windfarm site as shown in **Figure 1.1**.

1.3 Who is developing the Project

7. The Applicant is Morecambe Offshore Windfarm Ltd (The Applicant), a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) and Flotation Energy Limited (Flotation Energy).
8. With 80 years of experience, Cobra is a historically significant Group in the development of industrial infrastructure and service provision, and one of the key players in the renewable energy sector in Spain and Latin America. The Group possesses the capacity and determination to develop, build, and operate industrial and energy infrastructures that demand a high level of service, grounded in excellence in integration, technological innovation, and financial robustness. Their unrivalled knowledge and understanding of floating offshore wind developments is a significant advantage in delivering a high quality and efficient projects, coupled with their commitment to environmental stewardship. Their experience as a major player in offshore wind is based on a 50MW project in operation and over 11.2GW under development.
9. Flotation Energy, headquartered in Edinburgh, Scotland, sits at the heart of the energy transition. It's determined to support the big switch to sustainable, clean and affordable energy through the application of innovative offshore wind technology. An ambitious offshore wind developer, Flotation Energy has a 13GW portfolio that covers both fixed and floating developments globally, with projects in the UK, Ireland, Taiwan, Japan and Australia. Whilst Flotation Energy develops projects independently, it also recognises the strategic value of partnership and collaboration to deliver proven, cost-effective solutions.
10. Royal HaskoningDHV has supported the Applicant in the production of the ES. Royal HaskoningDHV is one of the UK's leading offshore wind EIA and consent consultancies. Royal HaskoningDHV has provided environmental, development and consenting support on over 14GW of renewable energy projects across the UK.

1.4 Consent and EIA process

11. The overall objective of the EIA process is to identify potential significant effects (noting these can be beneficial and adverse) resulting from a project. As relevant and where practicable, the EIA process identifies ways for adverse impacts to be avoided, minimised or mitigated.
12. As the Project has a planned capacity of over 100MW it is therefore considered a NSIP under the Planning Act 2008, as amended. Under the EIA Regulations 2017, an EIA must be undertaken in support of an application for Development Consent of an NSIP. The ES sets out the findings of the EIA, supporting the DCO Application.

1.5 Transmission Assets

13. The Morecambe Offshore Windfarm and Morgan Offshore Wind Project plan to submit a single DCO Application seeking consent for two coordinated, but electrically separate, sets of Transmission Assets (for example, where each windfarm will have its own transmission cables and onshore substation infrastructure). This project is known as the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. The Morgan Offshore Wind Project is being developed by Morgan Offshore Wind Limited, a joint venture between bp Alternative Energy Investments Ltd. (bp) and Energie Baden-Württemberg AG (EnBW). The Applicant is working alongside Morgan Offshore Wind Limited to jointly apply for the DCO for the Transmission Assets.
14. As such, a separate EIA process is being undertaken to support the DCO Application for the Transmission Assets. Accordingly, an EIA Scoping Report for the Transmission Assets was published in October 2022, and a subsequent Preliminary Environmental Information Report (PEIR) was published for statutory consultation in November 2023. An ES for the Transmission Assets is being produced as part of the DCO application process, with the Transmission Assets DCO application expected later in 2024. Whilst there will be separate DCO Applications for the Project and the Transmission Assets, a cumulative effects assessment has been undertaken for each project, which includes consideration of the effects of both the Generation Assets and the Transmission Assets.
15. The locality of the Project, the Morgan Offshore Wind Project Generation Assets, and the Transmission Assets PEIR boundary (within which the infrastructure for the Transmission Assets for both the Morgan and Morecambe windfarm projects would be located) are shown in **Figure 1.2**.

1.6 The ES structure

16. The ES for the Project comprises the following, submitted in Volume 5 of the DCO Application (**Table 1.1**):
 - ES chapters
 - Figures
 - Appendices
17. A Report to Inform Appropriate Assessment (RIAA) as part of the Habitat Regulation Assessment (HRA) process and a Marine Conservation Zone Assessment (MCZA) required under the Marine and Coastal Access Act (MCAA) (2009) are also provided alongside the ES (Report to Inform Appropriate Assessment (Document Reference 4.9) and Marine Conservation Zone Assessment Report (Document Reference 4.13)).

Table 1.1 The ES structure

Section	Chapter	Document Reference
Introductory chapters	Chapter 1 Introduction	5.1.1
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	Chapter 3 Policy and Legislation	5.1.3
	Chapter 4 Site Selection and Assessment of Alternatives	5.1.4
	Chapter 5 Project Description	5.1.5
	Chapter 6 EIA Methodology	5.1.6
Technical chapters	Chapter 7 Marine Geology, Oceanography and Physical Processes	5.1.7
	Chapter 8 Marine Sediment and Water Quality	5.1.8
	Chapter 9 Benthic Ecology	5.1.9
	Chapter 10 Fish and Shellfish Ecology	5.1.10
	Chapter 11 Marine Mammals	5.1.11
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	Chapter 15 Marine Archaeology and Cultural Heritage	5.1.15
	Chapter 16 Civil and Military Aviation and Radar	5.1.16
	Chapter 17 Infrastructure and Other Users	5.1.17
	Chapter 18 Seascape, Landscape and Visual Impact Assessment	5.1.18

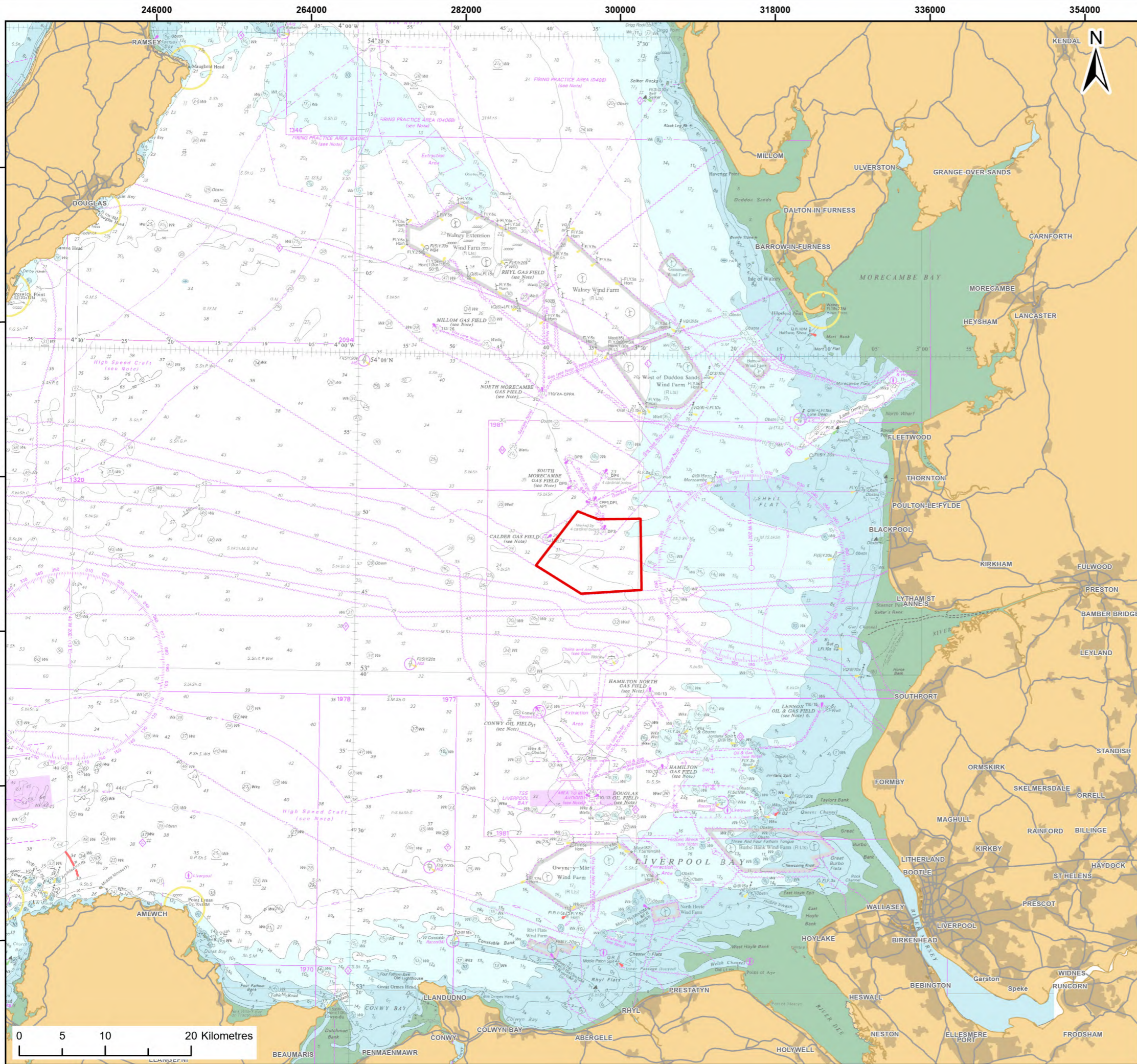
Section	Chapter	Document Reference
	Chapter 19 Human Health	5.1.19
	Chapter 20 Socio-economics, Tourism and Recreation	5.1.20
	Chapter 21 Climate Change	5.1.21
	Chapter 22 Traffic and Transport	5.1.22
Summary chapter	Chapter 23 Summary: Generation and Transmission Assets Assessment	5.1.23
Appendices	Appendix 6.1 CEA Project Long List	5.2.6.1
	Appendix 7.1 Offshore Geophysical Survey	5.2.7.1
	Appendix 9.1 Benthic Characterisation Survey	5.2.9.1
	Appendix 9.2 Marine Evidence-based Sensitivity Assessment	5.2.9.2
	Appendix 11.1 Underwater Noise Assessment	5.2.11.1
	Appendix 11.2 Marine Mammal Information and Survey Data	5.2.11.2
	Appendix 11.3 Marine Mammal Unexploded Ordnance Assessment	5.2.11.3
	Appendix 11.4 Marine Mammal CEA Project Screening	5.2.11.4
	Appendix 11.5 Marine Mammals Consultation Responses	5.2.11.5
	Appendix 12.1 Offshore Ornithology Technical Report	5.2.12.1
	Appendix 12.2 Aerial Survey Two Year Report March 2021 to February 2023	5.2.12.2
	Appendix 13.1 Commercial Fisheries Technical Report	5.2.13.1
	Appendix 14.1 Navigational Risk Assessment	5.2.14.1
	Appendix 14.2 Cumulative Regional Navigational Risk Assessment	5.2.14.2

Section	Chapter	Document Reference
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	Appendix 15.2 Seismic Data Review	5.2.15.2
	Appendix 15.3 Settings Assessment	5.2.15.3
	Appendix 16.1 Airspace Analysis and Radar Modelling	5.2.16.1
	Appendix 16.2 Blackpool Instrument Flight Procedure Safeguarding Report	5.2.16.2
	Appendix 16.3 Other Instrument Flight Procedure Assessments	5.2.16.3
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	Appendix 18.1 SLVIA Methodology	5.2.18.1
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	Appendix 20.1 Offshore Windfarm Economic Impact Assessment Methodology	5.2.20.1
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Section	Chapter	Document Reference
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	Appendix 15.3 Generation Assets Setting Assessment_Cultural Heritage Viewpoint 1 - 4	5.3.15.1 – 5.3.15.4
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	Chapter 19 Human Health Figures	5.3.19
	Chapter 20 Socio-economics, Tourism and Recreation Figures	5.3.20
	Chapter 23 Summary: Generation and Transmission Assets Assessment Figures	5.3.23

1.7 Consultation

18. The Applicant is committed to open and transparent communication with stakeholders and the wider public. The Project website www.morecambeandmorgan.com/morecambe provides information about the Project and is regularly updated.
19. Early consultation with local communities and consultees was a key part of the Project's development so that feedback on matters such as potential social and environmental impacts and opportunities and potential mitigation measures were considered in advance of the DCO Application being made. The first round of community consultation on the Project ran for six weeks, from the 2nd November to the 13th December 2022, and further community engagement events were established alongside the publication of Project preliminary assessment (the PEIR). The PEIR was made available for consultation from the 19th April to the 4th June 2023 in accordance with the Planning Act 2008 and the EIA Regulations 2017. Feedback from consultation on the PEIR has been taken into consideration and, where relevant, used to inform the design of the Project and the scope of the impact assessment presented in the ES.
20. Consultation with technical stakeholders (which include statutory bodies and environmental groups) has been facilitated through targeted discussion with relevant parties and through the Evidence Plan Process (EPP). The EPP is a consultation process with specialist stakeholders to discuss the approach to the EIA. It is structured with Expert Topic Groups (ETGs) where regular technical discussions take place to discuss and, where possible, agree the technical information required as part of the DCO Application. Targeted consultation processes have also been undertaken for specific stakeholders, such as fisheries groups, shipping and navigational stakeholders, aviation stakeholders and other marine users such as oil and gas operators and other offshore windfarm developers operating in the vicinity of the Project.
21. A Consultation Report submitted as part of the DCO Application (Document Reference 4.1) sets out how feedback from all consultations has shaped the design and assessment of the Project. The Consultation Report includes a summary of all consultation responses, including how this feedback was considered as the Application for DCO was drafted. It also details the consultation process, demonstrating how it was undertaken in accordance with the Statement of Community Consultation (SoCC) and how it met all legal requirements.



Legend:
 Morecambe Offshore Windfarm Site

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Report:
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

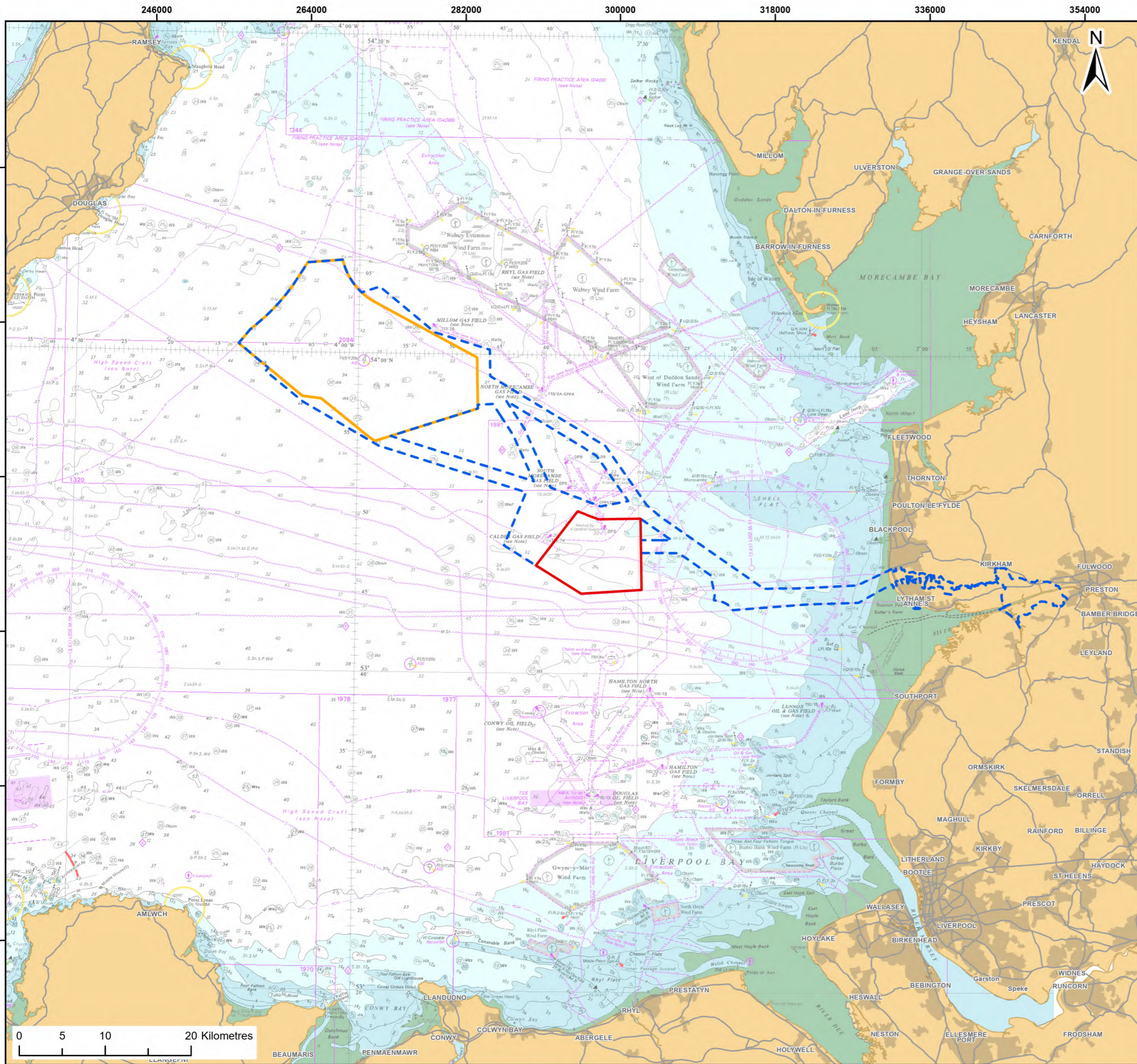
Title:
Morecambe Offshore Windfarm

Figure: 1.1 Drawing No: PC1165-RHD-ES-OF-DR-Z-0002

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Co-ordinate system: WGS 1984 UTM Zone 30N





- Legend:**
- Morecambe Offshore Windfarm Site
 - Morgan Offshore Wind Project Generation Assets
 - Morgan and Morecambe Offshore Wind Farms: Transmission Assets

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Report:
Morecambe Offshore Windfarm: Generation Assets
Environmental Statement

Title:
Morecambe Offshore Windfarm,
Morgan Offshore Wind Project Generation Assets and the
Morgan and Morecambe Offshore Wind Farms:
Transmission Assets

Figure: 1.2 **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0004

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P03	09/04/2024	JH	SB	A3	1:450,000

Co-ordinate system: WGS 1984 UTM Zone 30N



2 Need for the Project

22. There is a clear and urgent need for the development of the Project to help to meet the UK Government's aims for renewable energy capacity, and the target for offshore wind installation. The Project would contribute to the UK reaching its Net Zero by 2050 commitment. The Project would also make a significant contribution to achieving the aims of the British Energy Security Strategy (2022), which sets out an ambition to deliver up to 50GW of renewable energy by 2030.
23. The overarching objectives of the Project are to:
- **Decarbonisation:** Generate around 480MW of low carbon electricity from an offshore windfarm, in support of the Net-Zero by 2050 target and UK Government ambition to deliver 50GW of offshore wind by 2030
 - **Security of supply:** Provide significant electricity generation capacity within the UK to support commitments for offshore wind generation and security of supply
 - **Affordability:** Maximise generation capacity at low cost to the consumer from viable developable seabed within the constraints of available sites and grid infrastructure
 - **Coordination:** Coordinate and coexist with other activities, developers and operators to use previously developed seabed to deliver the Project and its skills, employment and investment benefits in the Local Economic Area²
24. The Project would provide secure, reliable and affordable renewable energy supply in the UK, powering over 500,000 homes, as well as providing decarbonisation alternatives to fossil fuel powered energy generation plants, as these are phased out. The Project would reduce carbon emissions associated with power generation and contribute to the economy, by providing substantial investment, as well as employment and new infrastructure during all phases of the Project.
25. The Project would continue efforts to drive technological and development costs down with the aim to provide cost effective energy to consumers and provide community benefits to help fight fuel poverty and contribute significantly to the UK's commitment to meeting the legally binding target of Net Zero emissions by 2050.

² The smallest geographic area in which economic impacts are assessed

26. The Project directly aligns with the key drivers in current National Policy and supports the offshore wind targets in the UK which clearly establishes the need for the Project.

3 Site selection and assessment of alternatives

27. As part of the Round 4 leasing process The Crown Estate undertook extensive spatial analysis and stakeholder engagement to build a detailed evidence base to help identify areas of seabed around England and Wales that offered the least constrained (most technically favourable) areas for offshore wind development. The Applicant undertook an exercise to consider the technical and environmental constraints of the areas offered by The Crown Estate in the Round 4 leasing process. This involved detailed constraints analysis, informed by specialists comprising engineers, planners, legal and environmental consultants, whose expertise was drawn upon throughout the site selection process.
28. Analysis of constraints by the Applicant to identify potentially suitable offshore windfarm sites for development was undertaken, including consideration of:
- Physical parameters:
 - Bathymetry (water depths)
 - Wind capacity
 - Wave height
 - Seabed conditions
 - Location of possible onshore grid connection and marine port facilities
 - Environmental receptors and constraints:
 - Seabed ecology and species and habitats of conservation interest
 - Fish and shellfish species (spawning and nursery grounds)
 - Marine mammals (ranges and distributions)
 - Seabird density
 - Environmental designations
 - Shipping traffic
 - Commercial fisheries intensity
 - Relative visibility of coastal and marine areas from the land
 - Known offshore wreck sites
 - Military usage (exercise areas, danger areas and explosive disposal sites)

- Marine users (leisure and recreational boating activity)
 - Oil and gas infrastructure
 - Cumulative impacts with other activities and industries
29. Key design decisions to date that have been made by the Applicant as a result of the site selection, assessment process and stakeholder feedback, include:
- The windfarm site has been located outside of any environmentally designated site
 - The windfarm site boundary has been designed to co-exist with other marine users. This includes a reduction made to the western boundary since the PEIR as result of further data analysis and in response to consultation feedback, particularly regarding cumulative effects to shipping and navigation
 - The air gap between the sea level and the WTG blades has been increased from 22m to 25m above Highest Astronomical Tide (HAT) to reduce interaction with birds
 - A reduction in the maximum number and height of WTGs
30. As the ES considers a number of design options, the Project final design process would continue to evolve post-consent and be informed by the findings of the ES, further technical studies and consultation.

4 Policy and legislation

31. EIA is a requirement under the EIA Regulations 2017. Under these regulations, the Project is considered a Schedule 1 project, or an NSIP, and so an EIA is required.
32. Key features of the EIA process, as relevant to NSIPs, set out in the EIA Regulations 2017 include:
 - Scoping (setting out the scope for the EIA): Scoping allows the Applicant to request, in writing, the scope and the level of detail of the information to be provided in the ES. Prior to submitting the Scoping Request, non-statutory consultation can be undertaken with the consultation bodies, or others, to allow further refinement of the options and ensure a properly focused ES. A Scoping Opinion for the Project was provided by the Planning Inspectorate (PINS) on the 2nd August 2022, in response to an EIA Scoping Report submitted by The Applicant on the 23rd June 2022.
 - PEI: Preliminary environmental information can be provided to enable consultees (both specialist and non-specialist) to understand the likely significant environmental effects of a proposed development and help to inform their consultation responses during the pre-application stage. The PEIR provided PEI in relation to the Project, was published for statutory consultation in April 2023.
 - ES submission: Regulation 14 of the EIA Regulations 2017 sets out the information to include in the ES accompanying a DCO application. The ES should provide:
 - A clear description of the proposed development through all phases
 - A clear explanation of the processes followed to develop the ES
 - A description of the reasonable alternatives considered
 - Details of the forecasting methods for the assessment
 - An assessment of likely significant effects
 - Details of the mitigation required and any measures envisaged to prevent, reduce and, where possible, offset any significant adverse effects
33. This NTS provides a summary of the Project ES, considering feedback on the PEIR, supporting the DCO Application.

4.1 International environmental and nature conservation legislation and treaties

34. The approach to the EIA has considered international legislation and treaties, as follows
- The Convention on Biological Diversity (CBD), which is informed by the Bern and Bonn conventions³ and the establishment of the Natura 2000 network⁴ across Europe
 - The European Commission (EC) Directive 92/43/EEC, adopted in 1992 (known as the Habitats Directive), implemented the Bern and Bonn conventions and aims to conserve natural habitats of wild fauna and flora.
 - EC Directive 2009/147/EC on the conservation of wild birds (known as the Birds Directive) provides a framework for the conservation and management of wild birds in Europe
 - The Habitats and Birds Directives were transposed into UK legislation through the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (hereafter the 'Habitats Regulations'), together with the Wildlife and Countryside Act 1981. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (the EU Exit Regulations) made changes to the 2017 Habitats Regulations so that they continue to work (are operable) following the UK's exit from the European Union (EU) in 2020
 - The Ramsar Convention is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources
 - Marine Protected Areas of the North-East Atlantic are identified through the Convention for the Protection of the Marine Environment of the north-east Atlantic (OSPAR Convention), which focuses on the prevention and elimination of pollution from land-based sources, dumping or incineration, and offshore sources
35. These legislations are relevant to the Project as any potential for protected species and habitats to be affected by the Project must be considered.

³ The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) and The Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention)

⁴ Natura 2000 is an umbrella name for the network of protected sites that include Special Protection Area (SPA) and Special Areas of Conservation (SAC) sites designated across the European Union. From January 2021 the UK's Natura 2000 sites are known as The National Sites Network

4.2 National Policy Statements

36. There are three National Policy Statements (NPSs) which are relevant to the Project:
- EN-1 Overarching Energy: Which highlights that there should be a presumption in favour of granting consent for projects which fall within relevant NPSs and recognises that offshore wind is a key factor in meeting UK policy objectives
 - EN-3 Renewable Energy Infrastructure: Which covers nationally significant renewable energy infrastructure (including offshore windfarms in excess of 100MW)
 - EN-5 Electricity Networks (where relevant): Which covers the electrical infrastructure (including electricity cable systems and substations) in conjunction with EN-1
37. The ES outlines how the development complies with the requirements of these NPSs which were updated in 2023 and adopted in 2024. National Infrastructure Planning advice notes from the PINS and the National Planning Policy Framework (NPPF) are also relevant to the Project and have been considered, as required.

5 Project description

38. The ES uses a design envelope approach, in accordance with National Policy Statement EN-3, which recognises that: *“Owing to the complex nature of offshore windfarm development, many of the details of a proposed scheme may be unknown to the applicant at the time of the application, aspects may include:*
- *Precise location and configuration of turbines and associated development*
 - *Foundation type and size*
 - *The installation technique or hammer energy*
 - *The exact turbine blade tip height and rotor swept area*
 - *The cable type and precise cable or offshore transmission route*
 - *The exact locations of offshore and/or onshore substations”*
39. The Project Design Envelope (PDE) therefore provides maximum and minimum design parameters, where appropriate. Worst case scenarios for the Project were established using the PDE and used as the basis for assessment for the EIA, which allows for flexibility as the design is refined.
40. The design parameters described in this NTS represent the key components of the PDE for the Project (which is described in detail in the ES) and are derived from the range of designs, technologies and methodologies under consideration.
41. The Project windfarm site will contain all Generation Assets infrastructure. The windfarm site is approximately 87km² and is located approximately 30km to shore, at its closest distance. The water depth at the windfarm site ranges from 18m to 40m.
42. The Project is expected to include up to two OSPs and up to 35 WTGs (although the number may vary depending on the size of the WTGs selected). In addition, supporting subsea cables (platform link and inter-array) would be required to connect the WTGs and OSPs. The final size, number and capacity of the WTGs would be decided post-consent.
43. The WTG key design parameters are illustrated in **Plate 5.1** and fully set out in the ES (**Chapter 5 Project Description**; Document Reference 5.1.5).

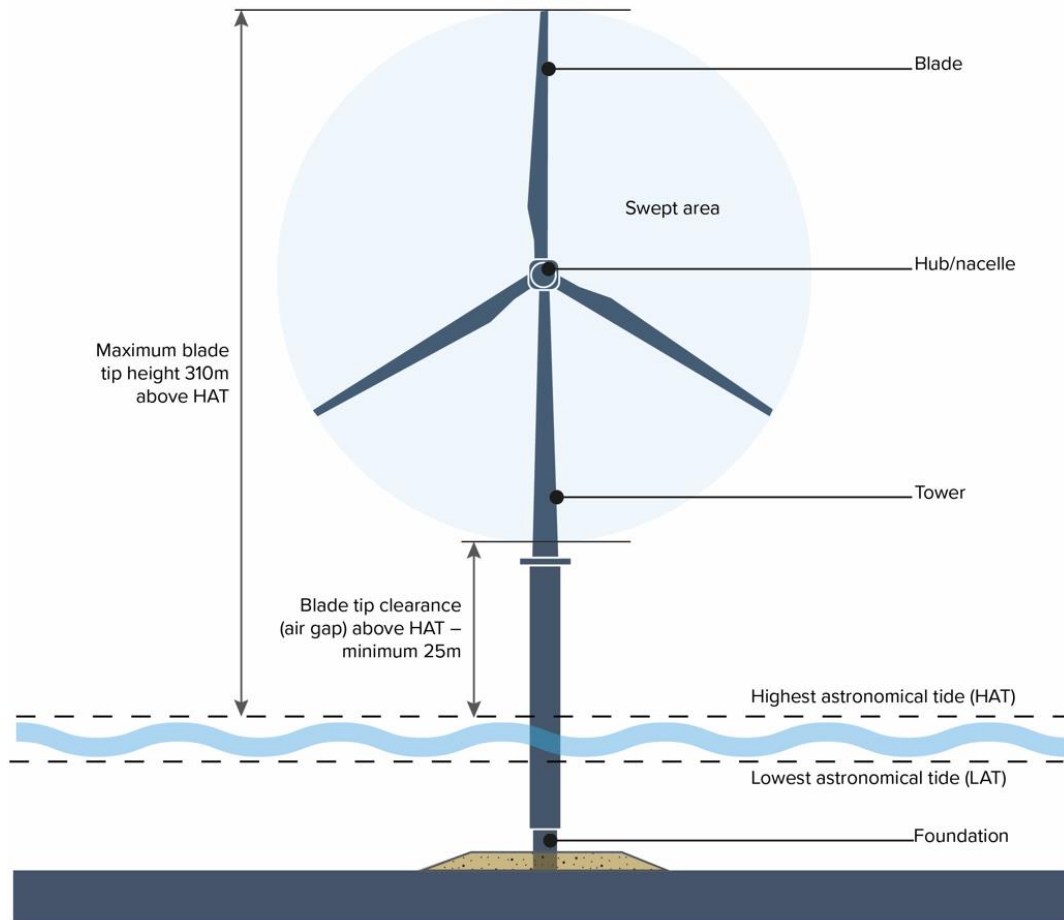


Plate 5.1 WTG schematic

44. WTGs and OSP(s) would be fixed to the seabed with foundation structures. There are a number of WTG and OSP foundation types being considered, with these illustrated in **Plate 5.2**. Seabed preparation and levelling may be required for the installation of all foundations with the diameter of seabed levelling reaching up to a maximum of 85m per foundation.

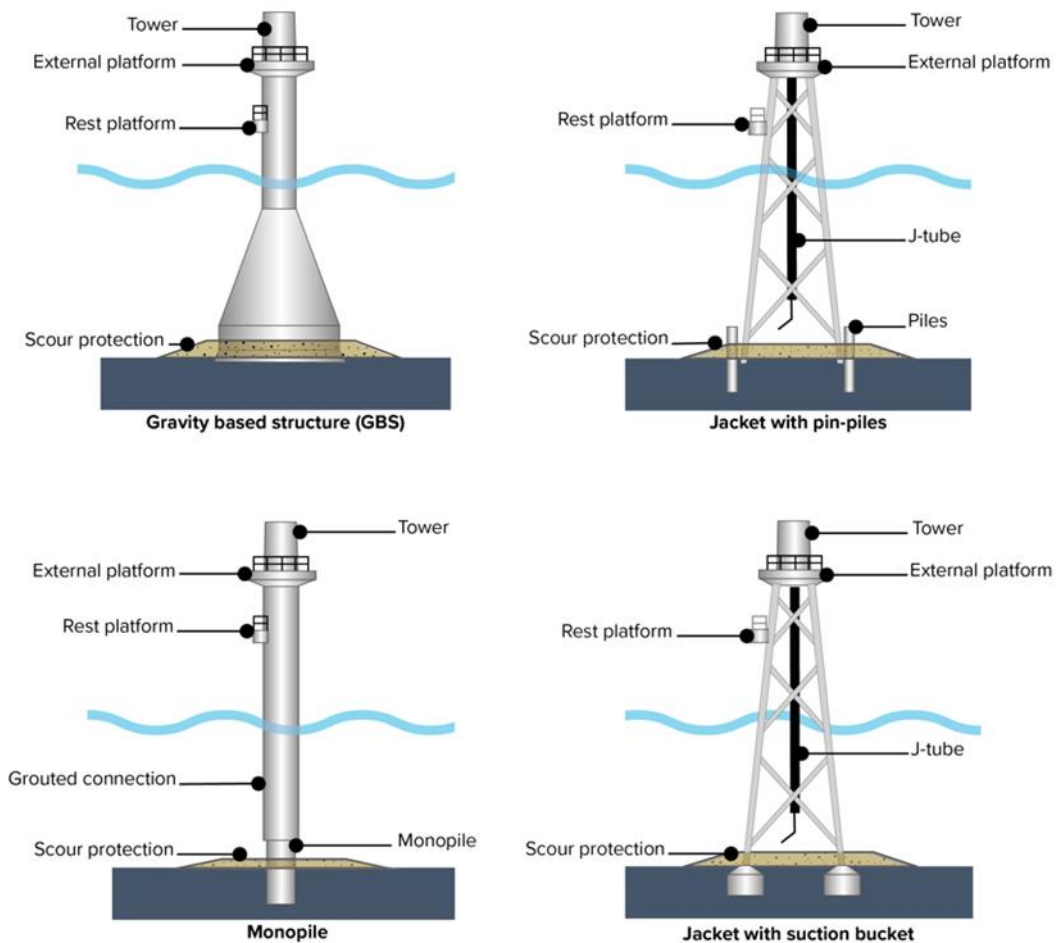


Plate 5.2 WTG/OSP foundation options

45. A number of factors influence the choice of foundation, and the parameters of each foundation type, such as ground conditions, wave, wind, tidal conditions, wind turbine selection, supply chain approach and constraints, as well as commercial consideration.
46. Cables would link the WTGs to the OSP(s), the requirement for which would depend on the windfarm layout and OSP design.
47. The layout of WTGs and OSP(s) across the windfarm site, as well as required lighting and navigational markings, would be agreed following the DCO Application.
48. The anticipated construction, operational and maintenance, and decommissioning activities are further described in the ES (**Chapter 5 Project Description**).

6 Topics considered in the environmental impact assessment

49. The ES covers a comprehensive range of environmental topics for which impacts on receptors have been assessed. Many of these technical assessments are related to each other and these inter-relationships are highlighted within the ES chapters.
50. The ES presents assessments for all of the topics and potential impacts that were specified within the PINS Scoping Opinion (received in August 2022). Each of those topics have been summarised as part of this NTS, in the sections that follow.
51. All ES chapters provide an overview of the existing environment, followed by an assessment of the potential effects and associated mitigation, where identified, for the construction, operation and maintenance, and decommissioning phases of the Project. Effects have been identified and assessed for the Project alone, as well as cumulative effects, which consider the Project alongside other proposed plans, projects and activities.

6.1 Marine geology, oceanography and physical processes

52. The assessment considered potential effects on the waves, tidal currents and the movement of sediment, both in the water column and along the seabed. Protected sites, features and habitats within the relevant study area have been identified and the assessment considered these as well as the wider physical processes that may affect marine species.
53. The baseline environment was characterised using data from a geophysical survey of the Project windfarm site, and from a ground truthing survey, where samples of sediment were taken. The windfarm site ranges in depths from 18m to 40m below Lowest Astronomical Tide (LAT) and is broadly characterised by sand. This was supported by a review of existing knowledge about this part of the Irish Sea, a desk-top assessment, analysis of tidal data and numerical physical processes modelling undertaken to inform the EIAs for the Awel y Môr Offshore Wind Farm, Mona Offshore Wind Project and Morgan Offshore Wind Project Generation Assets (also located in the east Irish Sea and which have similar characteristics to the Project windfarm site). Potential effects have been assessed using an evidence-based approach, utilising this range of available datasets.
54. During the construction of the Project, there is the potential for foundation and cable installation activities to disturb sediment, resulting in changes in suspended sediment and/or seabed levels. Sediment disturbed during

construction would be relatively localised. Coarser sediments would rapidly settle back onto the seabed, with larger-scale settlement for finer sediments. Given the lack of coarser sediments found at the windfarm site, the majority of sediment is expected to be suspended in the water column, but for a short time only (hours to days). Suspended sediments in the water column are predicted to return to baseline conditions within days and not be detectable above background levels beyond a few kilometres. The largest extent of sediment transport has been identified as the extent of a spring tide (10km).

55. Overall, effects on waves, currents and the movement of sediment are predicted to be of a small scale and have localised and temporary effects. Hence, they are categorised as, at most, negligible adverse effects and insignificant in EIA terms. This applies to the Project in isolation, and considering other plans, projects and activities in the area.

6.2 Marine sediment and water quality

56. The marine sediment quality environment within the windfarm site has been characterised using site-specific survey data and supplemented, where possible, by publicly available information.
57. During site-specific surveys sediment samples were taken, which were then analysed for levels of potential contamination. The results of the analysis showed that concentrations of contaminants within the sediments were low when compared with standard sediment quality thresholds.
58. The subsequent impact assessment determined that during the construction, operation and maintenance, and decommissioning phases, significant effects on water quality would not occur. This applies to both the Project in isolation and considering other plans, projects and activities in the area.

6.3 Benthic ecology

59. Site-specific seabed surveys were undertaken to provide a detailed understanding of the habitats and species on the seabed (benthic ecology). The survey results were then used to produce habitat maps to inform the assessment. This data was supplemented, where available, by information available in the public domain.
60. The seabed across the windfarm site is dominated by sands, with the corresponding benthic communities being typical of these sandy sediment habitats in the wider Irish Sea area.
61. Potential impacts to benthic communities during the construction, operation and maintenance, and decommissioning phases, include temporary disturbance and/or loss of habitats, an increase in suspended sediments and sediment deposition, underwater noise and the potential introduction of

invasive non-native species. The majority of impacts would be temporary in nature and localised to the Project boundaries and the immediate surrounding area (and insignificant). Permanent habitat loss is also assessed as insignificant, given the localised nature of the effects (limited to the physical footprint of infrastructure) and the wider availability of the same habitats in the region.

62. Species and habitats of conservation importance were found to be sufficiently distant from the windfarm site so that any potential impacts would be unlikely.
63. Effects on benthic ecology, considered alongside other plans and projects, were assessed to be negligible or minor adverse, and insignificant in EIA terms, due to the small scale of impact to the seabed in the windfarm site, relative to the extent of similar habitats in the wider area.

6.4 Fish and shellfish ecology

64. Fisheries landings datasets, in combination with other public and long-term datasets, were used to characterise and describe the fish and shellfish resource within the region, including consideration of spawning grounds, nursery grounds and migratory fish.
65. A range of activities during the construction, operation and maintenance, and decommissioning phases have the potential to impact fish and shellfish, including activities that cause disturbance to the seabed, habitat loss and underwater noise. The assessment of effects of underwater noise was informed through a Project specific underwater noise modelling study.
66. The impacts would be generally localised in nature, being restricted to the windfarm site and immediate surrounding area. Noise effects were found to have a larger footprint. However, given the location of the Project there would be minimal contribution to noise effects on sensitive herring spawning areas, and while the Project is located in an area of cod spawning, the spawning grounds are extensive and the effects of the Project would be minimal. In addition, given the Project location, there is sufficient separation between the noise source and designated sites to avoid impacts upon protected fish species.
67. The assessment found that there would be some negligible to minor adverse effects resulting from the Project, which are insignificant in EIA terms. This applies to the Project in isolation, and considering other plans, projects and activities in the area.

6.5 Marine mammals

68. Characterisation of the existing environment for marine mammals has been undertaken using site-specific surveys, existing data from other offshore

windfarms and other available information and studies across the region. The site-specific high resolution digital aerial surveys recorded the presence of marine mammals over a period of 24 months. Overall, sources identified harbour porpoise, bottlenose dolphin, common dolphin, Risso's dolphin, white-beaked dolphin, minke whale, grey seal and harbour seal as the key marine mammal species for the purposes of assessment. The windfarm site is situated away from areas protected for marine mammals.

69. Activities during the construction, operation and maintenance, and decommissioning phases of the Project have the potential to impact marine mammals. The impacts that have been assessed include underwater noise from construction activities and operation and maintenance works. These impacts can result in a range of potential effects, including physical injury, disturbance, behavioural effects, barrier effects (i.e. preventing movement of animals), changes to prey availability and disturbance at seal haul out sites. Other potential impacts assessed include increased collision risk with vessels and changes in water quality.
70. Modelling was undertaken to support the assessment of underwater noise effects on marine mammals, as well as an analysis of the numbers of marine mammals in the study areas for each species.
71. The impact assessment concluded that negligible to minor adverse and insignificant effects to marine mammals would occur with the implementation of mitigation measures during foundation piling activities. These measures would be further defined in a Marine Mammal Mitigation Protocol (MMMP), which is provided in draft (Document Reference 6.5) within the DCO Application. Best practice measures to mitigate collision risk are also included in the Outline Project Environmental Management Plan (PEMP) (Document Reference 6.2), which is also provided in outline within the DCO Application.
72. No significant effects for the Project alone were identified following mitigation.
73. When considering other activities and noise sources in the wider area, including other offshore windfarms, a conservative assessment based on the worst-case scenario for piling at the Project and other offshore windfarms, as well as noise sources from other activities and industries, was undertaken. The assessment, using population modelling where relevant, identified no significant effects on any species. However, given the potential number of noisy activities that may take place at the same time from different projects, the MMMP identifies mitigation measure options that could reduce cumulative effects, if required, once full construction timescales for all projects are better developed. This would also allow the Project to use available new technology for mitigation, where appropriate.

6.6 Offshore ornithology

74. Characterisation of the existing environment for offshore ornithology (seabirds) has been undertaken, based on site-specific survey data and existing information and literature. A study area around the windfarm site was surveyed, using high resolution digital aerial surveys, over a period of 24 months. Data from these surveys have been used to estimate the abundance and community of birds using the study area.
75. The potential effects on seabirds have been minimised through the Project design and site selection process. The Project is located outside of areas designated for their importance to seabird populations and the air gap between turbine blades and the sea level has been increased above the minimum requirements for shipping and navigation safety to further reduce seabird collision risk.
76. The impacts that could potentially occur to seabirds during the construction and decommissioning stages of the Project include disturbance and displacement, and indirect effects on habitats and prey species. The operational WTGs and maintenance activities may cause disturbance, displacement and barrier effects, collision risk and indirect impacts on habitats and prey species.
77. During the construction and decommissioning phases of the Project alone, no effects have been assessed to be greater than minor adverse significance for any seabird. This includes the more sensitive species screened into detailed assessment for disturbance, displacement and barrier effects during these phases, i.e. common scoter, guillemot, razorbill and red-throated diver.
78. During the operation and maintenance phase of the Project, effects due to disturbance, displacement and barrier effects on the more sensitive species screened into detailed assessment (common scoter, gannet, guillemot, razorbill, Manx shearwater and red-throated diver) would not result in effects of more than minor adverse and are not considered significant in EIA terms.
79. The risk posed to seabirds from collisions with Project WTGs is assessed as no greater than minor adverse, and insignificant for all species recorded in flight at the windfarm site. This includes the species screened into detailed assessment (gannet, kittiwake, common gull, herring gull, lesser black-backed gull and great black-backed gull).
80. There is the potential for cumulative effects (assessment with other activities, plans and projects, including relevant existing offshore windfarms) for displacement and collision risk during the operation and maintenance phase. The risk to seabirds from cumulative displacement and collision is assessed as no greater than minor adverse significance for all species, with the exception of great black-backed gull (for which the collision risk is moderate

adverse and significant in EIA terms). However, it is noted that the contribution made by the Project to this cumulative effect on great black-backed gull would be small.

6.7 Commercial fisheries

81. Commercial fishing activity has been characterised using landings statistics, vessel monitoring and surveillance data, and consultation with the fishing industry.
82. The key fleets considered in the assessment were identified as the UK (and Isle of Man) and Irish scallop dredgers; UK (and Isle of Man) potters targeting shellfish (primarily whelk offshore, but also lobster and brown crab); UK and Belgian beam trawlers targeting sole, plaice and other demersal fish (fish species that live close to the sea bed), with localised inshore trawling targeting brown shrimp and UK inshore vessels under 10m in length targeting a variety of demersal species (e.g. bass) using nets and hooked gear.
83. Based on analysis of landings and spatial data, and the location of the windfarm site, fishing activity in the windfarm site includes larger vessels potting for whelk and to a lesser extent dredging for scallops, with the potential for occasional beam trawl activity.
84. The assessment identified moderate adverse (significant) effects for the UK potting fleet in relation to reduction in access and displacement impacts to the UK and Isle of Man potting fleets during the construction and decommissioning phases. Additional mitigation, following Fisheries Liaison with Offshore Wind and Wet Renewables (FLOWW) group guidance, including justifiable, evidence-based, disturbance payments (UK fleet only), has been identified, and included in the Outline Fisheries Liaison and Co-Existence Plan submitted with the DCO Application (Document Reference 6.3), to reduce the effect to minor adverse and insignificant in EIA terms.
85. During the operation and maintenance phase, the commercial fisheries assessment found all Project alone effects to all fleets to be minor adverse, or lower, and insignificant in EIA terms.
86. The cumulative impact assessment found moderate adverse (significant) effects for the UK and Isle of Man potting and dredge fleets, related to reduction in access, displacement impacts and disruption to scallop resource during construction of the Project, along with other projects. While the Project contributes to only a small degree (considering its location, the cumulative scenarios and the large number of other plans, projects and activities assessed) the Applicant has committed to fisheries activity monitoring and is open to participation in a regional fisheries working group as required.

6.8 Shipping and navigation

87. Shipping and navigation considers transport (of people or goods both commercially or for recreational purposes) and vessels associated with extraction activities (for example, fishing, aggregates and oil and gas). In order to assess potential effects on shipping and navigation, existing vessel traffic and navigational features in the vicinity of the windfarm site have been analysed and recorded using marine data sets and targeted marine vessel traffic surveys.
88. Analysis shows that service vessels associated with existing oil and gas infrastructure and offshore windfarms account for a large proportion of vessel movements within the study area. Vessels passing through the windfarm site/study area are predominantly ferries and service vessels and commercial cargo. Tanker routes are of low frequency in the windfarm site. Four principal operators were identified in the eastern Irish Sea: The Isle of Man Steam Packet Company (IoMSPC); Seatruck; Stena Line and P&O.
89. Offshore windfarms can impact vessel routing by creating an obstruction in otherwise navigable waters that requires deviation of vessel routes. A Navigation Risk Assessment (NRA) has been undertaken considering navigational safety, that has informed the EIA.
90. An assessment of the impacts on ferry routing as a result of the presence of the Project, identified interaction with the Liverpool to Douglas ferry route and the Liverpool to Belfast ferry route, but only one of the Liverpool to Belfast routes would require a small additional transit distance (an additional distance of 1.6nm on a 114nm passage) as a result. Limited interactions with adverse weather routes were also identified for the Project alone.
91. An assessment of the effects on small craft routing determined that there would be sufficient spacing between WTGs to facilitate safe navigation for fishing and recreational craft. However, where vessels do not choose to passage through the windfarm array area, there may be some effects due to the displacement of vessels into adjacent channels.
92. An assessment of the effects of the Project on the likelihood of collision and allision (the striking of a vessel against a fixed object) for all vessels identified a limited increase. However, mitigation has been identified to reduce the risk to as low as reasonably possible.
93. An assessment of the effects of the Project on search and rescue activities, communications, ship-based radar, radar early warning systems and positioning systems determined that impacts were negligible to minor and insignificant in EIA terms.

94. Overall, due to the positioning and size of the windfarm site, Project alone effects are insignificant. Given that the key concern from stakeholders was identified as a result of multiple projects in the region, a joint Cumulative Regional Navigation Risk Assessment (CRNRA) was undertaken to assess the effects of the Project, along with other relevant cumulative projects, including the other Irish Sea Round 4 windfarms (Mona Offshore Wind Project, Morgan Offshore Wind Project Generation Assets and the Morgan and Morecambe Offshore Wind Farms Transmission Assets) on shipping and navigation. The assessment identified additional effects but given the site boundary changes made by all projects since PEIR submission, no significant effects on navigational safety were concluded. Following the submission of a Scoping Report for the Moir Vannin Offshore Wind Farm (proposed to be located in Isle of Man waters), an addendum was made to the CRNRA. Significant navigational risks presented in the CRNRA addendum inclusive of Moir Vannin are not considered applicable to the Project assessment as these are outside the influence of the Project.
95. Significant cumulative effects to some ferry routes in terms of deviations (in adverse weather conditions), have been identified, however the contribution made by the Project is considered low and no additional mitigations required by the Project are identified. However, engagement with ferry operators on residual operational impacts is planned to continue as the Project progresses.

6.9 Offshore archaeology and cultural heritage

96. Characterisation of the existing environment for offshore archaeology and cultural heritage has been undertaken based on both pre-existing and site-specific geophysical survey data. This has considered the historical landscape and seabed features of archaeological interest, such as wrecks of either maritime or aviation origin.
97. A number of seabed features have been identified within the windfarm site that are of low and medium archaeological potential and exclusion zones would be used as required. There is also potential for further archaeological material to be present (potential heritage assets) which have not been identified by surveys undertaken to date, such as isolated finds of material, or wrecks or aircraft crash sites potentially buried and concealed within or beneath marine seabed sediments.
98. It is not possible to avoid heritage assets that have not yet been discovered (potential heritage assets), and as such, the significance of effect is major adverse and significant without proposed mitigation. To minimise this potential effect, further archaeological assessment and surveys would be undertaken. This would reduce as far as possible any potential for unintended impacts during construction, with the significance of effect reduced to minor adverse (insignificant in EIA terms). An Outline Written Scheme of Investigation (WSI)

is submitted as part of the DCO Application, setting out the methodology for all proposed mitigation.

99. An assessment to identify potential historical assets onshore which could be affected by the presence (visually) of the Project has also been undertaken. This included consideration of the Seascape, Landscape and Visual Impact Assessment (SLVIA) results, but highlighted insignificant effects.

6.10 Civil and military aviation and radar

100. Characterisation of the existing environment, regarding civil and military aviation and radar, has been undertaken through a desk-based assessment. Potential impacts include physical obstruction to aircraft, increased air traffic in the area related to windfarm activities, and interference on radars, caused by rotating WTG blades.
101. Potentially affected aviation receptors include civil and military aerodromes and radar facilities, as well as offshore fixed-wing and helicopter flights, such as military low flying operations, safety and rescue operations and helicopter support for the oil and gas industry. Before mitigation, there is a potential for significant effects during construction and operation due to the creation of aviation obstacles, and during the operation and maintenance phase due to WTGs causing permanent interference on civil and military radar. Also identified, prior to any mitigation, are potentially significant effects due to the overlap of the windfarm site with identified instrument flight procedures for a number of airports/aerodromes and effects on helicopter access to oil and gas platforms.
102. A range of mitigation measures related to civil and military aviation and radar are embedded in the Project design to reduce potential aviation effects and a number of additional mitigations have also been identified and discussed with impacted operators. Consultation has been advanced with operators to discuss the implementation of technical mitigation and commercial agreements as required, which would be further progressed as the Project develops. These are secured by requirements in the draft DCO. It is expected with additional mitigation in place effects would be insignificant in EIA terms.

6.11 Infrastructure and other users

103. The infrastructure and other users assessment considers activities associated with other marine users and industries, such as the offshore oil and gas industry, other operational offshore windfarms telecommunications and power cables, including interconnectors, marine aggregate extraction areas, marine disposal sites, Ministry of Defence operations and marine recreation. It covers a wide geographic scope to ensure that all activities with the potential to interact with the Project are identified.

104. The site selection process identified the windfarm site through analysis of technical resources and constraints, with further analysis of constraints undertaken by the Applicant to reduce impacts on marine users. As such, the potential effects of the Project associated with the potential to interfere with other activities in this region of the Irish Sea would be largely avoided, or would be minor and insignificant (including consideration of other plans, projects and activities).
105. However, given the location of the windfarm site overlapping with the South Morecambe and Calder gas fields, potential significant effects on existing oil and gas helicopter operations could occur without mitigation. The windfarm site boundary changes made since the PEIR have increased the distance to active oil and gas platforms with no impact identified to search and rescue operations. Restrictions to helicopter access, particularly at night, causing logistical impacts for some oil and gas platforms have been identified as significant without mitigation. The Applicant is actively engaged with oil and gas operators around the windfarm site, with a commitment to coexistence agreements (or protective provisions in the DCO) to mitigate operational helicopter access restrictions at oil and gas platforms to reduce impacts to be insignificant in EIA terms.

6.12 Seascape, Landscape and Visual Impact Assessment (SLVIA)

106. A desk-based review of literature, datasets and surveys has been undertaken to inform the SLVIA. Baseline surveys were also undertaken, consisting of viewpoint photography, to collect baseline data on landscape character and visual amenity associated with views of the Project. The study area included the English counties of Cumbria, Lancashire and Merseyside; a southern terrestrial area, including the Welsh counties of Flintshire, Denbighshire, Conwy, Gwynedd and the Isle of Anglesey; and a western offshore area, defined by the waters of the Irish Sea and the Isle of Man.
107. The assessment identified that, for much of the study area, views of the Project would be either distant or heavily influenced by the existing offshore windfarms (Burbo Bank, Burbo Bank Extension, North Hoyle, Rhyl Flats and Gwynt y Môr, West of Duddon Sands, Ormonde and Walney offshore windfarms).
108. Significant visual effects identified would be contained within the areas of the Fylde and Sefton coasts, where people have a high sensitivity to changes in the sea views, which are considered to be a fundamental part of the appeal of the coast and settlements at Blackpool, Lytham St Anne's and Southport. Although there would be localised significant effects on views from this section of coast, these visual effects would not result in significant effects on the

perceived landscape character, which is extensively urbanised, and its urban/settled character would not be changed as a result of the Project.

109. Measures are embedded as part of the Project to avoid, minimise or reduce any significant environmental effects on seascape, landscape and visual receptors, as far as possible. The reduction in the windfarm site and maximum height of WTGs since the PEIR has also narrowed the spread (east to west) and the apparent scale of the Project. The siting (and spread) of the Project, at a comparatively long distance offshore, forms the key designed-in measure which minimises potential for significant effects experienced in coastal views.
110. The Project has also been assessed as potentially contributing to some visual effects together with other projects, experienced from parts of the Fylde and Sefton coasts. The effect derives primarily from the introduction of a new windfarm grouping in the southern Irish Sea, resulting from the Project, Mona Offshore Wind Project and Morgan Offshore Wind Project Generation Assets. This would result in the loss of open sea views, and the effect of multiple WTG arrays across the sea skyline, albeit at long distance. These effects however, due to the distance of Mona and Morgan offshore would rarely be perceived.

6.13 Human health

111. An assessment of activities which may affect people's physical or mental health during the construction, operation and maintenance, and decommissioning of the Project was undertaken. The health assessment looked at the potential effects for both the general population and for vulnerable groups.
112. The characterisation of the baseline environment with regard to human health was established with reference to relevant legislation and guidance. The study area comprised the local authority areas along the closest adjacent coast, that is Wyre, Fylde and West Lancashire Councils (within the Lancashire County Council area), Blackpool Council and Sefton Metropolitan Borough Council.
113. Local, regional, national and international population trends were used in the assessment, however, as the population is remote from the windfarm site, the only onshore activities would be associated with the port(s) that would service the Project. At this stage, the Applicant is unable to confirm which port(s) would be used for each of the Project phases. As such, an assessment of the human health implications relating to port(s) has not been conducted in detail, and the need for any separate health impact assessment would be reviewed post-consent, upon selection of the port(s). It is likely that port related activities for the Project would fall within permitted port operations and insignificant effects are expected.
114. Potential pathways for the Project to adversely or positively affect human health receptors have been considered through the assessment, with

consideration of impacts on leisure and lifestyles, employment and education, environmental conditions, community identity and society. This included impacts to transport links that were considered alongside the shipping and navigation cumulative assessment, with insignificant impacts to human health identified.

115. The assessment identified that effects would be negligible to minor adverse and negligible to moderate beneficial. Beneficial effects are expected whilst the windfarm is operational, relating to the positive impacts on climate change, and the public health improvements derived from access to clean and secure energy. Beneficial health effects due to socio-economic factors (income and employment) and workforce upskilling are also expected to be realised during all Project phases.

6.14 Socio-economics, tourism and recreation

116. The socio-economic, tourism and recreation assessment drew on a range of publicly available statistics for the local study area (including Liverpool, Halton, Sefton, Wirral, Copeland, South Lakeland, Barrow-in-Furness, Blackpool, Fylde, Lancaster, West Lancashire, Wyre, Cheshire West and Chester, Denbighshire, and Flintshire) and for the UK as a whole. No site surveys were required, as publicly available statistics were used to define the existing environment and conduct the assessment.
117. The receptors relating to this topic are the economic activity for the local area and for the UK, the tourism sector, including tourism and recreation receptors within the local area, and local community assets such as housing, schools and health facilities.
118. The assessment shows that potential beneficial effects would arise from the increase in expenditure and the resulting boost for the economy, and the creation of employment, particularly during the construction phase. At this stage, because the port(s) used to service the Project are not confirmed and the local study area is broad, beneficial effects are shown to be negligible, and insignificant, although it is expected that the benefit would increase once the local area is refined. The Applicant has also produced an Outline Skills and Employment Plan (Document Reference 6.11) that will be further developed to maximise benefits.
119. Insignificant adverse effects on the tourism economy, recreational activities or community assets were identified. No significant effects on wider economic receptors were identified in relation to commercial fishing and shipping, including cumulative effects with other projects in the Irish Sea.

6.15 Climate change

120. The climate change assessment considers the effects of the Project on the global climate, as well as the Project's vulnerability and resilience of the Project to climate change.
121. The assessment involves a greenhouse gas estimation, to determine the potential emissions of the Project. Results determined that the construction phase of the Project would incur the highest levels of greenhouse gas emissions, and that beneficial effects on climate change from the operational period are predicted. There would be significant greenhouse gas savings, when compared to energy produced from non-renewable sources, saving approximately 36 million tonnes CO₂ equivalent in the operational phase. The Project would support the UK's transition to a low to zero-carbon energy generation mix and meeting the UK's net zero targets.

6.16 Traffic and transport

122. Due to commercial processes, the Applicant was not able to confirm which port(s) would be used for each of the Project phases during the EIA process and therefore no detailed assessment of traffic and transport effects associated with the port activities can be presented at this stage. However, an Outline Port Access and Transport Plan (PATP) (Document Reference 6.7) is submitted in support of the DCO Application. This captures a framework to consider impacts, and any required measures, on the road network, should the need for a further assessment be established.

6.17 Generation and Transmission Assets summary

123. Given the functional link between the Project and the separate Transmission Assets DCO Application, a cumulative assessment has been undertaken within the technical chapters of the ES considering both the Project (Generation Assets) and the Transmission Assets combined. The assessment considered the results (onshore and offshore) of the Transmission Assets PEIR, specifically considering cumulative effects that may arise as a result of impact interactions as well as potential additive effects between the projects. The combined assessment found that, while there are a number of potential additive effects, there would be limited impact interaction and overall, no effects were identified beyond the assessments made for each project alone.
124. Chapter 23 Summary: Generation and Transmission Assets Assessment (Document Reference 5.1.23) also provides the results of the PEIR assessment of onshore effects of the Transmission Assets as (while there is no pathway for combined effects with the Project) they are associated with the Morecambe Offshore Windfarm as a whole. It is considered these onshore effects, while provided for information, would not be influenced by the Project.

6.18 Conclusions

125. The site selection and early design processes have been used to avoid or minimise effects. For the majority of topics, the assessments concluded that with mitigation, where required, the Project would not result in significant effects, alone or cumulatively with other activities, plans and projects. In a number of areas, the mitigations identified would be discussed and refined further with stakeholders, for example, with oil and gas operators, radar and aviation operators and ferry operators, as the final designs are developed. Mitigation measures are set out in full in the Schedule of Mitigation (Document Reference 5.5) and secured in the draft DCO (Document Reference 3.1).
126. Potential significant effects, following mitigation, have been identified for the following topics:
- Offshore ornithology (adverse cumulative effect)
 - Commercial fisheries (adverse cumulative effects)
 - Seascape and landscape (adverse Project alone visual effects)
 - Human health (beneficial Project alone and cumulative effects)
 - Shipping and navigation (adverse cumulative effects)
127. The assessment of the risk to ornithological receptors from collisions during WTG operation identified one species (great black-backed gull) where there would be a potential significant effect considering the Project alongside other plans and projects. However, the contribution of the Project is considered small and not material, with an annual mortality of less than two birds, compared to the total quantifiable annual mortality from all other projects at around 115 birds.
128. The commercial fisheries assessment found significant cumulative effects during construction (noting only a small contribution from the Project) for the UK and Isle of Man potting fleet, related to reduction in access and/or displacement impacts, and the UK and Isle of Man dredge fleet, due to a reduction in access as well as disruption to the scallop resource. Additional Project mitigation as part of a fisheries liaison and coexistence plan is to be further developed following FLOWW group guidance, including justifiable, evidence-based, disturbance payments, and is expected to reduce effects from the Project. The Applicant is also committed to monitoring fishing effort and is open to participating in a regional commercial fishery working group alongside other projects, given the cumulative effects identified across the region.
129. Potentially significant effects have been identified in relation to seascape, landscape and visual receptors along the nearest coastline adjacent to the

Project (Fylde and Sefton coastline), where sea views are considered as being a fundamental part of the appeal of the coast and settlements. However, whilst an effect may be significant, that does not necessarily mean that it would be unacceptable, particularly considering the existing offshore windfarms in the wider area and the distance the Project is from the coast.

130. Significant cumulative effects to ferry operations (route deviations in adverse weather) have been identified, however the contribution made by the Project is considered low and no additional mitigations required by the Project are identified. However, engagement with ferry operators on residual operational impacts is planned to continue as the Project progresses.
131. Significant positive effects are identified for human health, and positive effects are also identified in relation to socio economics and climate change. Positive effects are also being enhanced by the Applicant through the development of an Outline Skills and Employment Plan, which would be further developed as the Project progresses.
132. Overall effects have largely been avoided, minimised or mitigated as part of the Project design. As identified in the Planning Development Consent and Need Statement (Document Reference 4.8) the need for the Project is considered to outweigh residual adverse effects that arise from the Project.