

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Environmental Statement

Non-technical summary

Planning Inspectorate Reference Number: EN010136

Document Number: MRCNS-J3303-RPS-10038

Document Reference: F1

APFP Regulations: 5(2)(a)

April 2024

F01



Image of an offshore wind farm

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Application	RPS	Morgan Offshore Wind Ltd.	Morgan Offshore Wind Ltd.	April 2024

Prepared by:

RPS

Prepared for:

Morgan Offshore Wind Ltd.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Contents

1	NON-TECHNICAL SUMMARY	1
1.1	Introduction	1
1.1.1	The Morgan Offshore Wind Project.....	1
1.2	About the Applicant	1
1.3	Introduction to the Morgan Generation Assets and site location.....	2
1.4	Need for the Morgan Generation Assets.....	4
1.4.1	Climate change and renewable energy	4
1.5	Policy and legislative context.....	5
1.5.1	Introduction.....	5
1.5.2	Consenting regime and application process	5
1.5.3	Habitats Regulations	7
1.6	Consultation and engagement.....	7
1.7	Approach to Environmental Impact Assessment.....	10
1.7.1	Introduction.....	10
1.7.2	What is EIA and its approach?	10
1.7.3	Scoping	10
1.7.4	Preliminary Environmental Information Report	10
1.7.5	EIA Methodology	11
1.7.6	Transboundary effects.....	13
1.8	Project description	13
1.8.1	Overview	13
1.8.2	Key elements of the Morgan Generation Assets	13
1.8.3	Morgan Generation Assets Infrastructure	15
1.8.4	Operations and maintenance phase	17
1.8.5	Decommissioning phase	17
1.9	Site selection and alternatives.....	17
1.9.1	Overview	17
1.9.2	Stage 1: Identification of the Morgan Array Area	17
1.9.3	Stage 2: Generation and Transmission Assets split following the Holistic Network Design Review outcome	18
1.9.4	Stage 3: Pre-application engagement with stakeholders and communities	18
1.9.5	Stage 4: Refinement of the Morgan Potential Array Area to the Morgan Array Area for application submission	19
1.10	Potential environmental effects	20
1.10.1	Overview	20
1.10.2	Physical processes.....	21
1.10.3	Benthic subtidal ecology.....	23
1.10.4	Fish and shellfish ecology	25
1.10.5	Marine mammals.....	28
1.10.6	Offshore ornithology.....	31
1.10.7	Commercial fisheries.....	33
1.10.8	Shipping and navigation.....	36
1.10.9	Marine archaeology and cultural heritage	40
1.10.10	Other sea users.....	43
1.10.11	Seascape, Landscape and Visual Impact Assessment	45
1.10.12	Aviation and radar	48
1.10.13	Climate change	51
1.10.14	Socio-economics	53
1.10.15	Human health	56
1.10.16	Inter-related effects	58
1.11	References	60

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Tables

Table 1.1: Matrix used for the assessment of the significance of the effect..... 12

Figures

Figure 1.1: Location of the Morgan Generation Assets 3
Figure 1.2: Overview of the Planning Act 2008 Application Process..... 6
Figure 1.3: Overview of the Morgan Generation Assets infrastructure..... 14
Figure 1.4: Schematic of foundation design types..... 16

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Glossary

Term	Meaning
Applicant	Morgan Offshore Wind Limited.
Candidate Special Area of Conservation (cSAC)	SACs that were submitted to the European Commission before the end of the Transition Period following the UK's exit from the European Union (EU), but not yet formally designated. See also Special Area of Conservation (SAC).
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Morgan Offshore Wind Project: Generation Assets.
European Protected Species (EPS)	European Protected Species (such as bats, great crested newts, otters and dormice) receive full protection under The Conservation of Species and Habitats Regulations 2010.
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a DCO to apply for 'deemed marine licences' as part of the DCO process.
Marine spatial planning	A public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process.
Maximum Design Scenario (MDS)	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.
Morgan Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, scour protection, cable protection and offshore substation platforms (OSPs) forming part of the Morgan Offshore Wind Project: Generation Assets will be located.
Morgan Offshore Wind Project: Generation Assets	This is the name given to the Morgan Generation Assets project as a whole (includes all infrastructure and activities associated with the project construction, operations and maintenance, and decommissioning).
Morgan Offshore Wind Project: Generation Assets PEIR	The Preliminary Environmental Information Report (PEIR) that was publicised and consulted on for the Morgan Offshore Wind Project: Generation Assets to enable consultees to understand the likely environmental effects of the Morgan Generation Assets.
Morgan Offshore Wind Project: Generation Assets Scoping Report	The Morgan Scoping Report that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan Offshore Wind Project: Generation Assets.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the Offshore Substation Platforms (OSPs), interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker infrastructure (as defined in the Morgan and Morecambe Offshore Wind Farms: Transmission Assets PEIR).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Term	Meaning
Morgan Potential Array Area	The area that was presented in the Morgan Generation Assets PEIR within which the wind turbines, foundations, inter-array cables, interconnector cables and offshore substation platforms (OSPs) forming the Morgan Generation Assets were located. This area was the boundary consulted on during statutory consultation and subsequently refined for the application for Development Consent.
Nationally Significant Infrastructure Project (NSIP)	Large scale development including power generating stations which require development consent under the Planning Act 2008. An offshore wind farm project with a capacity of more than 100 MW in England constitutes an NSIP.
Offshore Wind Leasing Round 4	The Crown Estate auction process which allocated developers preferred bidder status on areas of the seabed within English and Welsh waters and which ends when the Agreements for Lease (AfLs) are signed.
Special Area of Conservation (SAC)	A site designation specified in the Conservation of Habitats and Species Regulations 2017. Each site is designated for one or more of the habitats and species listed in the Regulations. The legislation requires a management plan to be prepared and implemented for each SAC to ensure the favourable conservation status of the habitats or species for which it was designated. In combination with SPAs and Ramsar sites, these sites contribute to the national site network.
Special Protection Area (SPA)	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly occurring migratory species. SPAs contribute to the national site network.
The Planning Inspectorate	The executive agency of the Department for Communities and Local Government responsible for operating the planning process for NSIPs.
The Secretary of State for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Morgan Offshore Wind Project: Generation Assets.

Acronyms

Acronym	Description
AfL	Agreement for Lease
AHEF	Archaeology and Heritage Engagement Forum
ANMP	Aids to Navigation Management Plan
BEIS	Department for Business, Energy and Industrial Strategy
CAA	Civil Aviation Authority
CAS	Controlled Airspace
CCS	Carbon Capture and Storage
CEA	Cumulative Effects Assessment
cSAC	Candidate Special Area of Conservation
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
dML	Deemed Marine Licence
eDNA	Environmental Deoxyribonucleic Acid

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Acronym	Description
CMS	Construction Method Statement
CRNRA	Cumulative Regional Navigation Risk Assessment
EEA	European Economic Area
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EU	European Union
EWG	Expert Working Group
FLCP	Fisheries Liaison and Co-Existence Plan
GHG	Greenhouse Gas
GVA	Gross Value Added
HMRI	Helicopter Main Route Indicators
HND	Holistic Network Design
HVAC	High Voltage Alternating Current
INNS	Invasive Non-Native Species
ISAA	Information to Support the Appropriate Assessment
LAT	Lowest Astronomical Tide
MCA	Marine Character Areas
MDS	Maximum Design Scenario
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MOD	Ministry of Defence
MP	Members of Parliament
MU	Management Unit
NGESO	National Grid Electricity System Operator
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OSP	Offshore Substation Platform
OTNR	Offshore Transmission Network Review
OWIC	Offshore Wind Industry Council
PEIR	Preliminary Environmental Information Report
PEXA	Practice and Exercise Areas
PAD	Protocol for Archaeological Discoveries
PRoW	Public Rights of Way
pSPA	Potential Special Protection Area
PSR	Primary Surveillance Radar

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Acronym	Description
PVA	Population Viability Analysis
REWS	Radar Early Warning Systems
SAC	Special Area of Conservation
SCI	Site of Community Importance
SLVIA	Seascape, Landscape and Visual Impact Assessment
SNCB	Statutory Nature Conservation Body
SoCC	Statement of Community Consultation
SPA	Special Protection Area
SSC	Suspended Sediment Concentrations
SSZ	Seascape Sensitivity Zone
TCE	The Crown Estate
UKHO	UK Hydrographic Office
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation

Units

Unit	Description
%	Percentage
GW	GigaWatt
m	Metres
km	Kilometres
km ²	Square kilometres
MW	Megawatt
nm	Nautical miles
kg	Kilograms
tCO ₂ e	Tonnes of carbon dioxide equivalent

1 Non-Technical Summary

1.1 Introduction

1.1.1 The Morgan Offshore Wind Project

Overview

1.1.1.1 Morgan Offshore Wind Limited is a joint venture between two leading energy companies bp Alternative Energy Investments (hereafter referred to as bp) and Energie Baden-Württemberg AG (hereafter referred to as EnBW)). The Morgan Offshore Wind Project: Generation Assets (hereafter Morgan Generation Assets) is a proposed offshore wind farm located in the east Irish Sea. The infrastructure within the Morgan Array Area (Figure 1.1), including the wind turbines, foundations, inter-array cables, OSPs, scour protection, cable protection and interconnector cables, is referred to as the Morgan Generation Assets. This Non-Technical Summary (NTS) supports the Morgan Generation Assets application for a Development Consent Order (DCO) to The Planning Inspectorate, to be decided by the Secretary of State for the Department for Energy Security and Net Zero (DESNZ).

Purpose of this document

1.1.1.2 This document is a NTS of the Environmental Statement. This NTS forms part of the documents submitted by the Applicant in support of the application for development consent for the Morgan Generation Assets, as required under the Planning Act 2008 (the 2008 Act).

1.1.1.3 This NTS has been written in a non-technical language and summarises information contained within the Environmental Statement. It is intended to act as a standalone document that provides an overview of the Morgan Generation Assets and the likely significant effects of the Morgan Generation Assets.

1.2 About the Applicant

1.2.1.1 The Applicant is a joint venture between two leading energy companies (bp and EnBW). These two companies are working together as partners to deliver offshore wind projects in the UK:

- bp has set out an ambition to be a net-zero company by 2050 or sooner, and to help the world get to net zero. bp has set out a strategy for delivering this ambition. bp is focused on delivering its transformation into an integrated energy company, helping to provide the energy the world needs today, and investing in the energy transition
- EnBW is one of the largest energy supply companies in Germany and supplies electricity, gas, water and energy solutions and energy industry services to around 5.5 million customers with a workforce of more than 27,000 employees. EnBW aims to strengthen its position as a sustainable and innovative infrastructure partner for customers, citizens and local authorities to an even greater extent.

1.3 Introduction to the Morgan Generation Assets and site location

- 1.3.1.1 The Applicant entered into an Agreement for Lease (AfL) for the seabed from The Crown Estate (TCE) for the Morgan Generation Assets in early 2023. The AfL for the Morgan Array Area (i.e. the area within which the offshore wind turbines will be located) covers approximately 280 km² and is located approximately 22.22 km (12 nm) from the Isle of Man coastline, 37.13 km (20.1 nm) from the northwest coast of England and 58.5 km (31.6 nm) from the Welsh coastline (Anglesey). The Morgan Array Area is located in English offshore waters (beyond 12 nm from the English coast) (Figure 1.1).
- 1.3.1.2 Four bidding areas under Offshore Wind Leasing Round 4 were released by TCE in September 2019. The Northern Wales and Irish Sea bidding area was one of these areas. In addition to the Morgan Offshore Wind Project, two other projects from this leasing round were awarded an AfL in the Northern Wales and Irish Sea bidding area; the Mona Offshore Wind Project (also being developed by a joint venture of bp and EnBW) and Morecambe Offshore Windfarm, being developed by Morecambe Offshore Windfarm Ltd. (a joint venture between Cobra Instalaciones y Servicios, S.A. and Flotation Energy Ltd). Both the Morgan Offshore Wind Project and Morecambe Offshore Windfarm have been scoped into the Pathways to 2030 workstream under the Offshore Transmission Network Review (OTNR). The output of this process concluded that the Morgan Offshore Wind Project and Morecambe Offshore Windfarm should work collaboratively in connecting the wind farms to the National Grid at Penwortham in Lancashire. As such, offshore export cables (cables that bring the electricity from the Morgan Array Area to shore) and related works located within and between the Morgan Array Area and landfall are the subject of a separate application for development consent. They are not within the scope of the Morgan Generation Assets DCO application.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

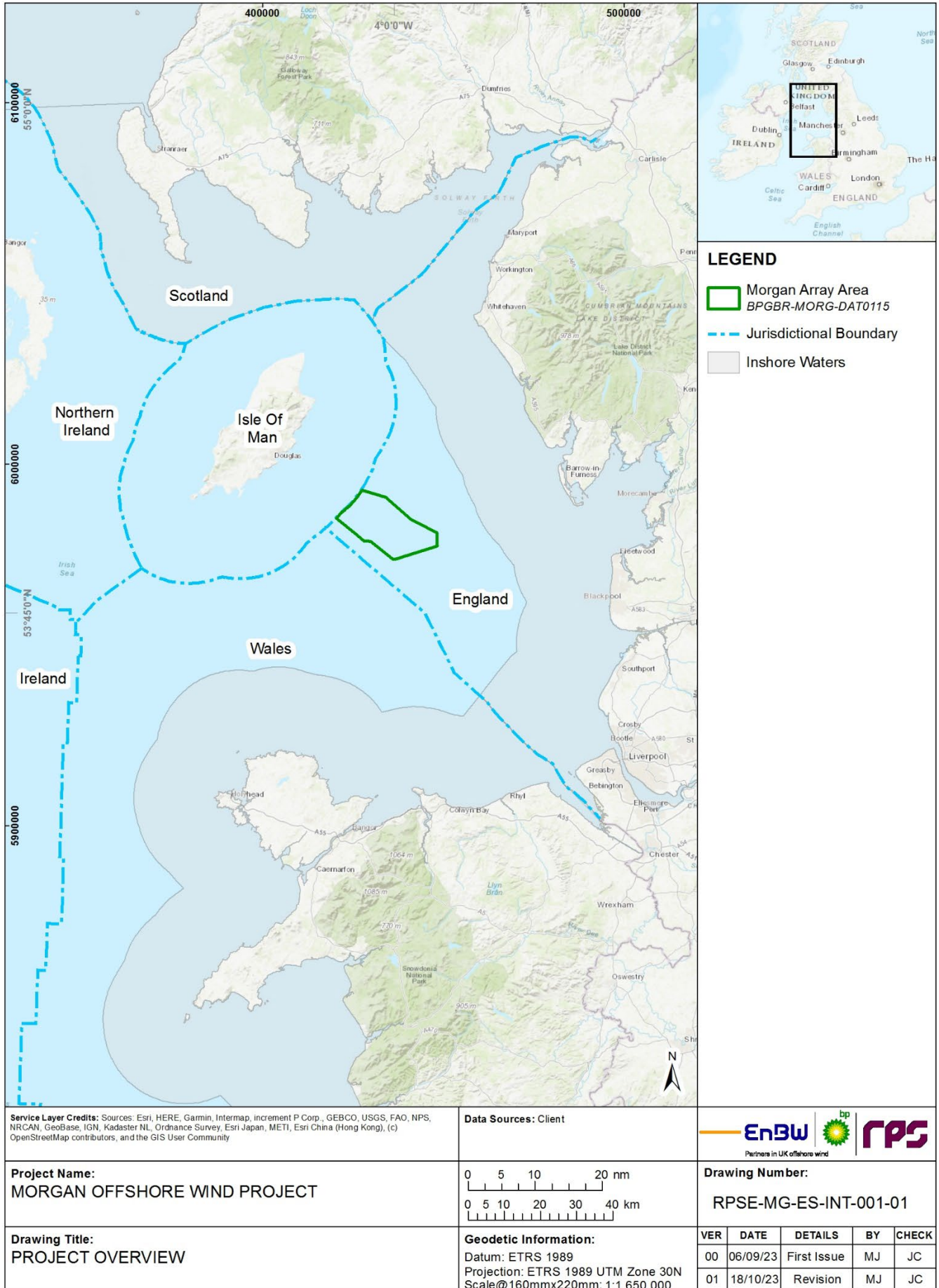


Figure 1.1: Location of the Morgan Generation Assets

1.4 Need for the Morgan Generation Assets

1.4.1 Climate change and renewable energy

- 1.4.1.1 The UK government has an ambition to generate 50 GW of clean, renewable energy from offshore wind by 2030. The Department for BEIS (now DESNZ) released information and figures in December 2022 that show that the UK had 13.1 GW of installed offshore wind capacity in the UK. There is some way to go to meet the target. The Morgan Generation Assets therefore has an important role to play – both in helping the UK to achieve its net zero ambitions and, specifically, in reaching its offshore wind generation goals.
- 1.4.1.2 The UK’s ambition is to lead the world in combatting climate change, reducing our reliance on fossil fuels and embracing a future where renewable energy powers our homes and businesses. At the centre of this drive is a commitment to reducing UK greenhouse gas (GHG) emissions and reaching net zero. Under the Climate Change Act 2008, the UK committed to a net reduction in GHG emissions of 80% by 2050 against the 1990 baseline in line with the commitments of the Kyoto Protocol.
- 1.4.1.3 In June 2019, secondary legislation (the Climate Change Act 2008 (2050 Target Amendment) Order 2019) was passed that extended that target to at least 100% against the 1990 baseline. In order for the UK to meet these ambitions it needs to work with developers to support proposals to produce clean, renewable energy within the UK. As the Morgan Generation Assets is planned to be operational by 2030 it would significantly contribute to meeting these ambitions.
- 1.4.1.4 On 07 April 2022, the UK Government published its British Energy Security Strategy (BEIS and Prime Minister’s Office, 2022). The strategy builds on the UK net zero target, placing a heavy reliance on a renewable and low carbon energy supply with a view to *‘bring clean, affordable, secure power to the people for generations to come...’*. The strategy plans to accelerate delivery of offshore wind by developing an Offshore Wind Acceleration Task Force to work on reducing the consenting and delivery times for offshore wind projects and fast tracking priority projects. Specifically, the strategy states an ambition to deliver up to 50 GW of offshore wind by 2030, an increase on previous targets of 40 GW. The Morgan Generation Assets would bring clean, affordable, secure power to millions of homes and be a key project to deliver 50 GW of offshore wind by 2030.
- 1.4.1.5 In July 2022, the UK Government published the Pathway to 2030 Holistic Network Design (HND) documents, which set out the approach to connecting 50 GW of offshore wind to the UK electricity network (National Grid ESO, 2022). The Morgan Generation Assets was identified with the Pathway to 2030 HND. A key output of the HND review process was the conclusion that the Morgan Generation Assets and the Morecambe Offshore Windfarm should work collaboratively in connecting their two wind farms to the National Grid electricity transmission network at Penwortham in Lancashire. Although the projects are being developed by separate companies, which means it is not feasible for all aspects of both projects to be consented under a single application, the Applicant intends to deliver a coordinated grid connection with the Morecambe Offshore Windfarm (including the sharing of offshore and onshore export cable corridors and a grid connection location at Penwortham).

1.5 Policy and legislative context

1.5.1 Introduction

- 1.5.1.1 This section provides a summary of the policy and legislative context for the Morgan Generation Assets, with reference to the consenting process, including details of the Planning Act 2008 and associated planning policy.
- 1.5.1.2 Policy and legislation specific to individual environmental topics and Environmental Impact Assessment (EIA) are set out within each topic chapter of the Environmental Statement. This includes (as applicable) National Policy Statements (NPSs).

1.5.2 Consenting regime and application process

- 1.5.2.1 The Morgan Generation Assets require consent under the Planning Act 2008 as it is an offshore wind farm project with a capacity of more than 100 MW and therefore constitutes a Nationally Significant Infrastructure Project (NSIP). A marine licence is required before carrying out any licensable marine activities under the Marine and Coastal Access Act 2009 and the Planning Act 2008 allows 'deemed marine licences' to be applied for as part of the DCO process. The deemed Marine Licence(s) (dML) sought for the Morgan Generation Assets will cover works related to the offshore wind farm generation infrastructure (wind turbines, Offshore Substation Platforms (OSPs), associated foundations, inter-array cables and interconnector cables).
- 1.5.2.2 An EIA is required for the assessment of the effects of certain projects on the environment under European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the EIA Directive). The EIA Directive is transposed into English law for NSIPs by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. These regulations set out the requirements for EIA.
- 1.5.2.3 The results of the EIA process are presented in an Environmental Statement. The Environmental Statement ensures that the decision maker has enough information on the likely significant effects on the environment arising from a project. The approach to EIA for the Morgan Generation Assets is set out in further sections.
- 1.5.2.4 The Planning Act 2008 defines the key stages in the application process for NSIPs. These stages are summarised below in Figure 1.2.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

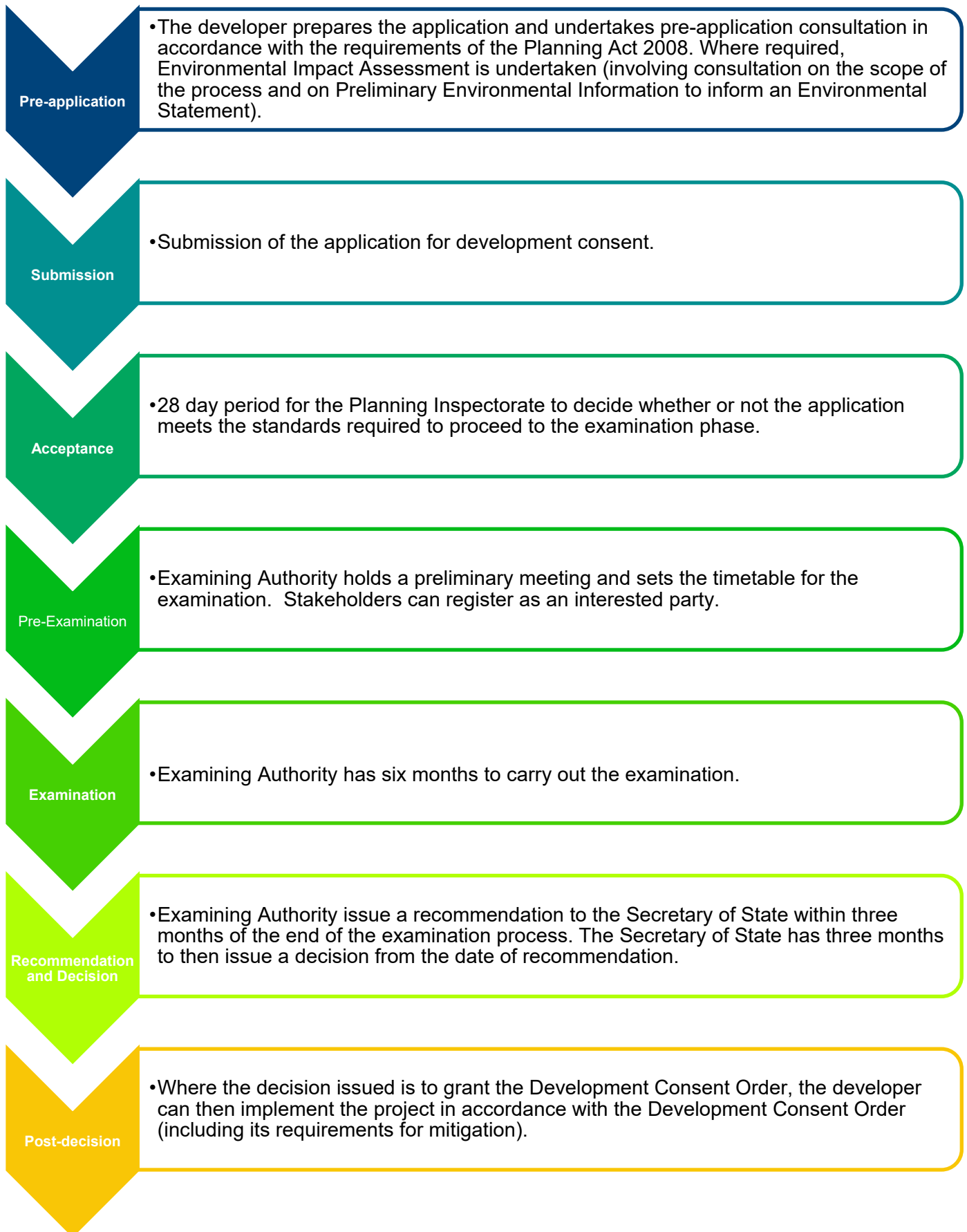


Figure 1.2: Overview of the Planning Act 2008 Application Process.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.5.3 Habitats Regulations

- 1.5.3.1 The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 require the assessment of significant effects on internationally important nature conservation sites where these may arise as a result of a project.
- 1.5.3.2 These internationally important sites include Special Areas of Conservation (SACs), or Candidate Special Areas of Conservation (cSAC), Special Protection Areas (SPAs) or potential SPAs (pSPAs), Sites of Community Importance (SCI) and Ramsar sites. These have been traditionally referred to as European Sites or Natura 2000 sites. Following the UK's departure from the EU they are now referred to as the National Site Network.
- 1.5.3.3 The assessment is to be undertaken by the 'competent authority', which in the case of the Morgan Generation Assets is the Secretary of State for DESNZ for the application for consent for infrastructure applied for under the DCO.
- 1.5.3.4 In order to carry out the Habitat Regulations Assessment (HRA), the competent authority requires a report to be submitted alongside the application for development consent that provides the information required to undertake the Appropriate Assessment. The Information to Support Appropriate Assessment (ISAA) (Document References E1.1 to E1.3) is provided alongside the Environmental Statement.

1.6 Consultation and engagement

- 1.6.1.1 As the Morgan Generation Assets project sits entirely at sea, there are no defined relevant local authorities under the Planning Act 2008, nor is there a requirement to prepare a Statement of Community Consultation. Notwithstanding this, comprehensive consultation and engagement with stakeholders have formed an integral part of the development of the Morgan Generation Assets. The following section provides a high level summary of the consultation and engagement activities that have been undertaken as part of the Morgan Generation Assets. Further detail on all public consultations can be found in the Consultation report (Document Reference E3).
- **EIA Scoping June to July 2022:** The EIA Scoping Report outlined details of the proposed approach to EIA and was submitted to The Planning Inspectorate in June 2022. The Applicant received a response from the Secretary of State for BEIS in the form of the Scoping Opinion in July 2022 (The Planning Inspectorate, 2022). The Preliminary Environmental Information Report (PEIR) and the Environmental Statement have been directly informed by the Scoping Opinion. The Applicant has also engaged with relevant stakeholders on the development of these documents through the Evidence Plan Process, Engagement Forums and wider technical engagement.
 - **Non-statutory Public Consultation 2 November to 13 December 2022:** The Applicant carried out the first phase of non-statutory public consultation in the autumn/winter of 2022. During the consultation period, several promotional activities and events took place:
 - To promote the consultation, a postcard was sent to over 36,000 addresses, and an email was sent to local stakeholders (including Members of Parliament (MPs), local planning authorities, local elected leaders, community councils, and interest groups such as associations, universities, government agencies and environmental groups). The email was also distributed to local seldom-heard groups. A media release was issued to local media and advertisements

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- were taken out in the Isle of Man Courier, Blackpool Gazette, Lancashire Evening Post and Daily Post.
- A consultation website was launched to provide a platform to share consultation material, and five events, six pop-up events and a webinar were held. At all events, members of the public were able to view the latest information and speak directly with members of the Morgan Generation Assets team to ask any questions or raise concerns. Anyone with an interest in the project was able to have their say and complete a feedback form
 - At the end of the consultation, feedback was collated and considered to inform the development of the Morgan Generation Assets. All feedback is comprehensively presented within the Consultation report (Document Reference E3), which is submitted as part of this application.
 - **Statement of Community Consultation (15 February to 14 March 2022 and 9 March to 6 April 2023):** The Applicant prepared a voluntary Statement of Community Consultation (SoCC) in line with the principles of the Planning Act 2008 in spring 2023 (this was voluntary as these provisions of the act do not apply to an application that has not terrestrial attributes). This set out how local communities, including those who would be potentially affected visually by the Morgan Generation Assets, would be consulted. A second round of consultation was undertaken on an updated draft SoCC to reflect some minor changes to the programme. The Applicant consulted on both draft SoCCs with the local authorities and other relevant bodies relevant to the Morgan Generation Assets' location. Further details of these consultations can be found in the Consultation report (Document Reference E3)
 - **Statutory Public Consultation 19 April to 4 June 2023:** Statutory consultation was undertaken in accordance with the Planning Act 2008 during the spring of 2023. The Consultation report (Document Reference E3) details all aspects of the consultation and how it was delivered as per sections 42, 47, 48 and 49 of the Planning Act 2008:
 - The statutory consultation was carried out on a draft Environmental Statement in the form of a PEIR in accordance with the published SoCC. This consultation was aimed at anyone with an interest in the project but specifically in line with the principles of the Planning Act 2008 – statutory stakeholders including local authorities, communities, and those with an interest in the Morgan Generation Assets
 - The consultation was widely promoted via various means – postcards were sent to over 58,000 addresses on mainland England and 45,000 addresses on the Isle of Man. A direct email was distributed to stakeholders (including MPs, local planning authorities, prescribed consultees, local elected leaders, parish councils, seldom heard groups and interest groups such as associations, government agencies, and environmental groups). A press release was issued to local media and advertisements were placed in local newspapers and online
 - All consultation materials could be found on the consultation website along with the feedback form and interactive feedback map. Documents were also placed in deposit locations across the area
 - Seven exhibitions, five pop-up events, and a webinar were held. At all events, members of the public were able to view the latest information and speak directly with members of the Morgan Generation Assets team to ask any

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

questions or raise concerns. Anyone with an interest in the project was able to have their say and give their feedback

- At the end of the consultation, feedback was collated and considered to inform the development of the project. All feedback is comprehensively presented within the Consultation report (Document Reference E3), which is submitted as part of this application.

- **Additional Consultation Autumn/Winter 2023/2024:** Further consultation was undertaken with specific consultees where a need to do so was identified. Details of this additional consultation can also be found in the Consultation report (Document Reference E3)

- **Expert Working Groups (EWGs)** have been established to discuss topic-specific issues with relevant stakeholders. EWG meetings have been held at key stages in the EIA process or when new information has become available for each topic, to provide the opportunity for stakeholders to provide feedback and advice to inform the proposals at an early stage. Details of EWG meetings can be found in the Technical engagement plan (Document Reference E4). EWGs have been established for the following topics:

- Physical processes, benthic ecology, and fish and shellfish ecology
- Marine mammals
- Offshore ornithology.

1.6.1.2 In addition to the EWGs, a number of engagement forums for consultation with stakeholders have been set up:

- Marine archaeology (in the form of the offshore Archaeology and Heritage Engagement Forum (AHEF))
- Shipping and navigation (in the form of the Marine Navigation Engagement Forum (MNEF)).

1.6.1.3 Technical engagement has also taken place with stakeholders relating to the following topics:

- Commercial fisheries
- Shipping and navigation
- Aviation and radar
- Other sea users
- Seascape, landscape and visual resources
- Socio-economics.

1.6.1.4 Full details of discussions held are set out in the Technical engagement plan (Document Reference E4).

1.6.1.5 The Applicant recognises the importance of ongoing engagement with all stakeholders and will continue to liaise with interested groups, the community and elected representatives as the proposal moves through the planning process.

1.7 Approach to Environmental Impact Assessment

1.7.1 Introduction

1.7.1.1 This section summarises the EIA methodology that has been employed for the Morgan Generation Assets in the preparation of the technical assessments. The EIA for the Morgan Generation Assets describes the likely effects on the environment arising from the construction, operations and maintenance, and decommissioning of the Morgan Generation Assets. Where likely significant effects are predicted, it identifies mitigation to reduce the magnitude of impacts (where practicable).

1.7.2 What is EIA and its approach?

1.7.2.1 EIA is the formal process of identifying and assessing the positive (beneficial) and negative (adverse) effects of a proposed development on the environment and determining if these are likely to be significant. Where adverse impacts are identified which lead to significant effects, mitigation measures are introduced to reduce the magnitude of impacts and seek to avoid significant effects. The EIA is then reported in an Environmental Statement.

1.7.2.2 The approach to determining the scope of the EIA to be included in an application for a DCO can be broadly summarised as consisting of three main elements that take place prior to the submission of the application for the DCO:

- **Scoping:** To determine the issues to be addressed during the EIA process
- **Consultation:** Pre-application consultation in accordance with the Planning Act 2008 (including production of a PEIR which forms the basis of statutory consultation)
- **Environmental Statement preparation:** Reporting on the EIA process, updating the information provided in the PEIR and continuing with design iteration and consultation.

1.7.3 Scoping

1.7.3.1 The purpose of the EIA Scoping Report is to provide information on the Morgan Generation Assets and to allow for engagement with stakeholders on the key topics to be addressed in the EIA. In addition, scoping can be used to present the baseline data sources and assessment methodologies to be used to inform the EIA. Through scoping, the key environmental issues are identified at an early stage in the application process, which allows the EIA to prioritise aspects of the environment likely to experience significant effects because of a proposed development.

1.7.3.2 As set out above, the Applicant submitted a Scoping Report setting out the scope and methodology of the EIA. Feedback in the form of the Scoping Opinion was received from The Planning Inspectorate, taking into account representations from relevant stakeholders. This formed the basis of the EIA for the Morgan Generation Assets by identifying and confirming which environmental topics required assessment, their scope and their assessment methodology.

1.7.4 Preliminary Environmental Information Report

1.7.4.1 Following the receipt of the Scoping Opinion, the PEIR (with supplementary reports, plans and drawings) was published as part of the statutory consultation process. The PEIR set out the preliminary findings of the EIA at the time. This provided stakeholders

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

with the opportunity to review and comment on the proposed Morgan Generation Assets development. As part of this consultation, five consultation events were held at which members of the public and other consultees could attend to meet members of the project team, as well as six smaller ‘pop-up’ events and one virtual event delivered as an online webinar. All PEIR documents were available on the Morgan Generation Assets consultation website. Feedback received from stakeholders during the consultation period and throughout the pre-application phase was then used to inform the Environmental Statement, where appropriate.

1.7.5 EIA Methodology

1.7.5.1 The Morgan Generation Assets has the potential to create a range of effects with regard to the physical, biological and human environment. For each environmental topic considered as part of the EIA process (e.g. marine mammals, shipping and navigation etc.), the following information has been provided in the Environmental Statement:

- Identification of the study area for the topic-specific assessments
- Relevant legislation and policy considered
- Consultation and engagement carried out and how stakeholder feedback has been considered
- A description of the existing environment and identification of receptors. Receptors are defined as the physical or biological resource or human user group that could be affected by the Morgan Generation Assets. These receptors are identified through available data and baseline studies that have been reviewed
- A description of the future environment (without the Morgan Generation Assets)
- The methodology and criteria used for the assessment
- Key project parameters considered for the assessment (i.e. identification of the Maximum Design Scenario (MDS))
- Identification of suitable mitigation measures to reduce or offset environmental effects (where required)
- Identification and assessment of the likely significant effects on receptors.

Approach to assessment

1.7.5.2 For the purposes of the Environmental Statement, the term ‘impact’ is defined as a change that is caused by an action. For example, the laying of an inter-array cable (action) is likely to result in seabed disturbance (impact). Impacts can be defined as direct, indirect, secondary, cumulative and inter-related. They can be either positive/beneficial or adverse, although the relationship between them is not always straightforward and relies on available evidence and professional judgement.

1.7.5.3 The term ‘effect’ is defined as the consequence of an impact. For example, the laying of an inter-array cable (action) results in seabed disturbance (impact), with the potential to disturb benthic habitats and species (effect).

1.7.5.4 The ‘significance’ of each effect is determined by considering the magnitude of the impact alongside the importance, or sensitivity, of the receptor/receptor group, in accordance with the defined significance criteria. Unless set out otherwise within a chapter, a matrix approach has been adopted as a guide (Table 1.1). The magnitude of an impact considers the spatial extent, duration, frequency and reversibility of the

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

impact from the construction, operations and maintenance or decommissioning phases of the Morgan Generation Assets. The sensitivity of a receptor considers the vulnerability, recoverability and value/importance of each receptor. Professional judgement is used to define the magnitude of impact and receptor sensitivity. The matrix is then used, together with professional judgement, to evaluate the significance of effect.

Table 1.1: Matrix used for the assessment of the significance of the effect.

Sensitivity of Receptor	Magnitude of Impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	Negligible or Minor	Minor	Moderate	Moderate or Major
High	Minor	Minor or Moderate	Moderate or Major	Major
Very High	Minor	Moderate or Major	Major	Major

Cumulative effects

1.7.5.5 The EIA process has also considered the potential for cumulative effects to arise from the Morgan Generation Assets alongside other proposed developments. Cumulative effects are those which occur on the environment as result of the interaction between the Morgan Generation Assets and other proposed developments, where the effect is greater than if the Morgan Generation Assets was considered in isolation. For example, the cumulative effect of vessel traffic generated during construction of the Morgan Generation Assets and another nearby development on the local shipping routes.

1.7.5.6 The assessment of cumulative effects for the Morgan Generation Assets was undertaken using a four stage process, which can be summarised as follows:

- Stage 1: identification of a 'long list' of other proposed developments based on the area around the Morgan Generation Assets that may be affected for each environmental topic
- Stage 2: preparation of a 'shortlist' of other proposed developments, which was defined by reviewing the long list against inclusion/exclusion criteria
- Stage 3: collection of environmental information (if available) relating to other proposed developments in the shortlist
- Stage 4: determining if significant cumulative effects were likely to arise from the Morgan Generation Assets alongside other proposed developments in the shortlist.

1.7.5.7 The shortlisting process identified a number of other proposed developments within the area around the Morgan Generation Assets that may give rise to potential cumulative effects.

Inter-related effects

1.7.5.8 Inter-related effects between the environmental topics covered in the Environmental Statement have also been evaluated as part of the EIA process. Inter-related effects occur where the combined effect of one or more environmental topics on a single receptor (or a group of receptors) is greater than if the environmental topics were

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

considered in isolation. For example, the combined effects of suspended sediment concentrations and underwater sound changes during construction of the Morgan Generation Assets on marine mammals.

1.7.6 Transboundary effects

1.7.6.1 The EIA process has also considered the potential for transboundary effects. Transboundary effects arise when impacts from a project within one state affect the environment of another state(s). A screening assessment was carried out of the potential for transboundary impacts to occur on the environment or interests of other states as a result of the Morgan Generation Assets (Transboundary Impacts Screening, Document Reference F3.5.2). Transboundary effects have been considered in each topic chapter of the Environmental Statement, where applicable.

1.8 Project description

1.8.1 Overview

1.8.1.1 This section provides an outline description of the design of the Morgan Generation Assets infrastructure, as well as activities associated with the construction, operations and maintenance, and decommissioning of the Morgan Generation Assets.

1.8.1.2 It is important to note that the Morgan Generation Assets is in the early stages of the development process, therefore the project description has been designed to include flexibility to allow for further project refinement during detailed design, post-consent. Offshore wind is a continually evolving industry with a constant focus on cost reduction and efficiency, therefore improvements in technology and construction methodologies occur frequently and flexibility is required to allow for the adoption of new technology and methods.

1.8.1.3 Taking into account the above considerations, the EIA process has considered a Maximum Design Scenario (MDS) approach, also known as the 'Rochdale Envelope'. The MDS approach allows the EIA process to be conducted on the basis of a realistic 'worst case' scenario (i.e. the maximum project design parameters) which is selected from different design and construction scenarios.

1.8.2 Key elements of the Morgan Generation Assets

1.8.2.1 The key components of the Morgan Generation Assets infrastructure are shown in Figure 1.3. The key components of the Morgan Generation Assets include the following:

- Offshore wind turbines
- Offshore Substation Platforms (OSPs)
- Foundations (for wind turbines and OSPs)
- Scour protection
- Cable protection
- Inter-array cables linking the individual wind turbines to each other and the OSPs
- Offshore interconnector cable(s) linking the OSPs.

1.8.2.2 Construction of the Morgan Generation Assets is intended to commence in 2026, and the project is intended to be fully operational by 2030 in order to provide an important contribution to the UK Government's renewable energy targets.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

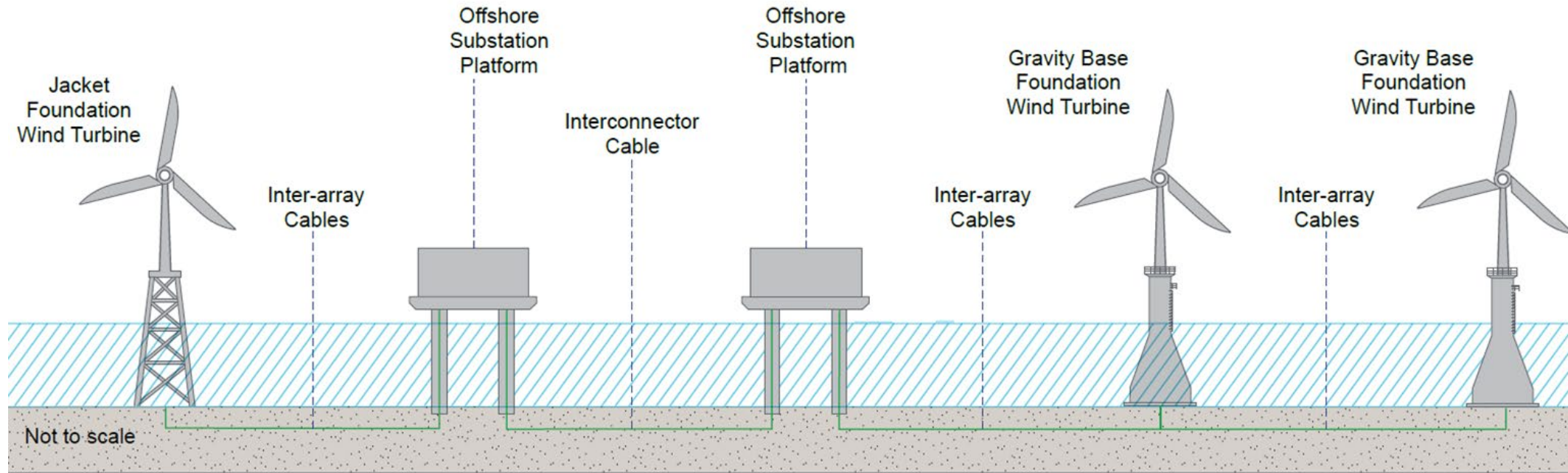


Figure 1.3: Overview of the Morgan Generation Assets infrastructure.

1.8.3 Morgan Generation Assets Infrastructure

Wind turbines

1.8.3.1 The Morgan Generation Assets will consist of up to 96 wind turbines (the final number will be determined during the post-consent detailed design phase) and will follow the traditional design with a horizontal rotor axis with three blades. Depending on the type and size of the chosen wind turbine the maximum blade tip height above the Lowest Astronomical Tide (LAT) will range between 293 m to 364 m, and the minimum height of lowest blade tip above LAT will be 34 m. The maximum rotor diameter will range between 250 m to 320 m.

1.8.3.2 Wind turbines are generally constructed by installing the foundation structure followed by installation of the tower. The nacelle containing the generator is next and then the three turbine blades are installed. All wind turbine components are lifted in place from a transport vessel/barge.

Offshore Substation Platforms

1.8.3.3 The OSPs will contain the equipment required to transform electricity generated by the wind turbines to a higher voltage. They may also house secondary equipment and facilities for operating, maintaining and controlling the OSP. They are likely to have one or more decks, a helicopter platform, cranes and communication antenna.

1.8.3.4 Up to four separate OSPs will be required, and the exact locations will be determined during the post-consent detailed design phase. Locations will take into account the seabed conditions and the most efficient cable routing amongst other considerations. OSPs are generally constructed by installing the foundation structure, then the substation components are lifted from a transport vessel/barge onto the foundation.

Foundations for wind turbines and OSPs

1.8.3.5 The wind turbines and OSPs will be attached to the seabed by foundation structures. The Applicant requires flexibility in foundation choice to accommodate ground conditions within the Morgan Array Area. The foundation types that are being considered are shown in Figure 1.4 below.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

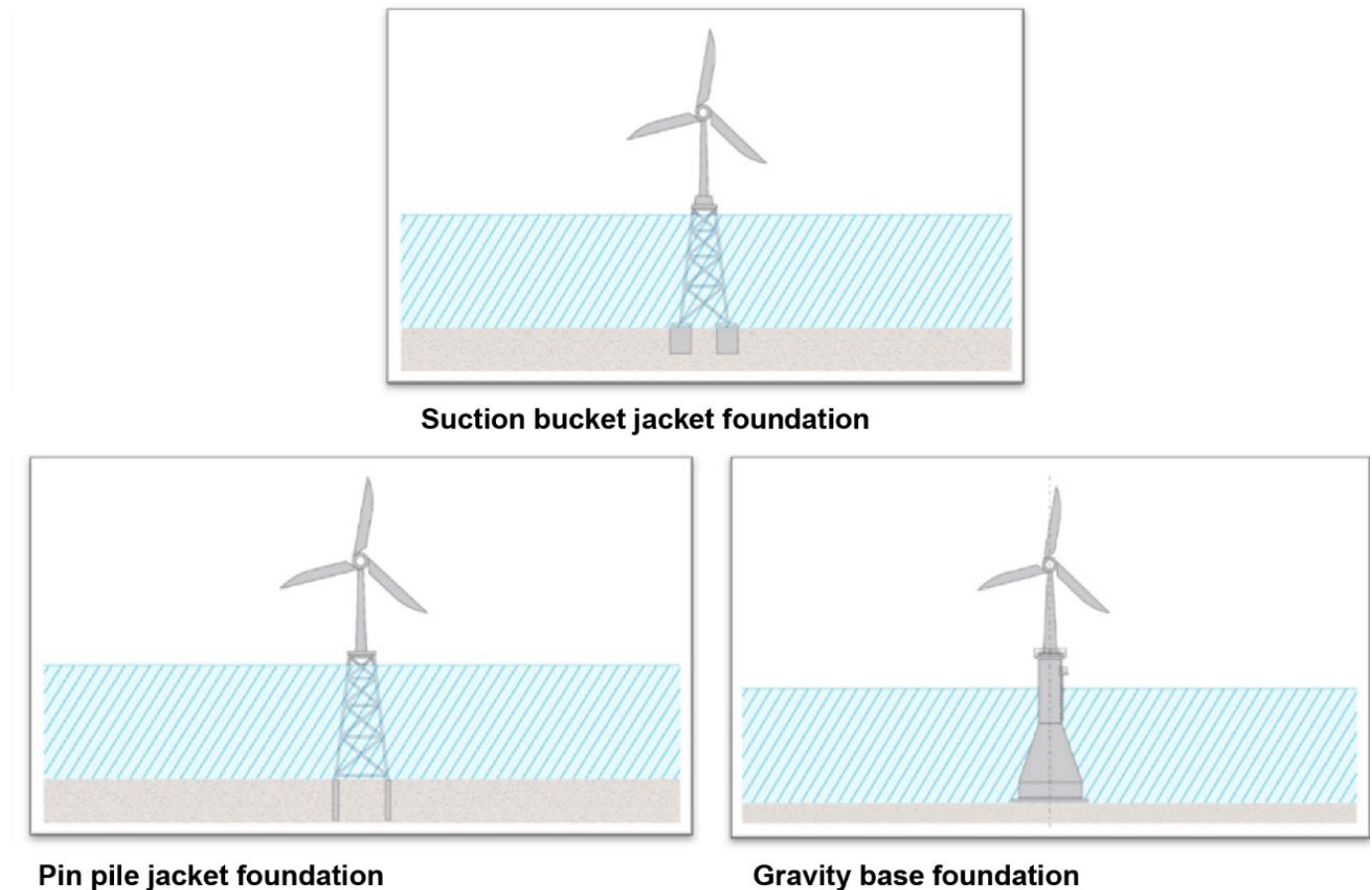


Figure 1.4: Schematic of foundation design types.

Inter-array cables

- 1.8.3.6 The inter-array cables carry the electrical current produced by the wind turbines to an OSP. A small number of wind turbines will typically be grouped together on the same cable ‘string’ connecting those wind turbines to the OSP. The maximum length of the inter-array cables is 390 km.
- 1.8.3.7 These inter-array cables will be buried below the seabed wherever possible and protected with a hard-protective layer (such as rock or concrete mattresses) where adequate burial is not practicable.

Offshore interconnector cables

- 1.8.3.8 The Morgan Generation Assets will require interconnector cables to connect the OSPs to one another in order to provide redundancy in the case of cable failure. The maximum length of interconnector cables is 60 km.

Pre-construction site investigation surveys

- 1.8.3.9 In addition to the survey work carried out to date, pre-construction site investigation surveys will be undertaken to provide detailed information on seabed conditions and to identify the presence/absence of any potential obstructions or hazards. Pre-construction site investigation surveys are likely to include geophysical and geotechnical surveys which will be conducted within the Morgan Array Area.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.8.4 Operations and maintenance phase

1.8.4.1 The overall operations and maintenance strategy will be finalised once the technical specifications of the Morgan Generation Assets are known, including wind turbine type and final layout. A single port or multiple ports in the northwest of England and/or North Wales could be used to support primary elements of operations and maintenance. The operations and maintenance requirements for the Morgan Generation Assets have been set out within an outline Offshore operations and maintenance plan (Document Reference J9) which has been submitted alongside the application for consent.

1.8.5 Decommissioning phase

1.8.5.1 The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment. This section summarises the assumptions that have been made regarding decommissioning in order to undertake an EIA on the decommissioning phase of the Morgan Generation Assets.

1.8.5.2 The Energy Act 2004 requires that a decommissioning programme must be submitted to the Secretary of State for DESNZ prior to the construction of the Morgan Generation Assets and is typically prepared post-consent. The Decommissioning programme (and associated assumptions regarding the decommissioning of the Morgan Generation Assets) will be updated during the Morgan Generation Assets lifetime to take account of changes in regulations, good practice and new technologies.

1.8.5.3 Wind turbines will be removed, and any piled foundations would likely be cut below the seabed at a level that means they will not create a hazard for fishing or shipping.

1.8.5.4 Inter-array and interconnector cables may be removed and disposed of onshore. At this time, it is difficult to foresee what techniques will be used to remove cables during decommissioning. However, it is not unlikely that equipment similar to that which is used to install the cables could be used to reverse the burial process.

1.9 Site selection and alternatives

1.9.1 Overview

1.9.1.1 This section summarises the site selection process for the Morgan Generation Assets and the alternatives considered. A full description of the site selection process is provided in Volume 1, Chapter 4: Site selection and consideration of alternatives of the Environmental Statement (Document Reference F1.4).

1.9.2 Stage 1: Identification of the Morgan Array Area

1.9.2.1 TCE launched the Offshore Wind Leasing Round 4 process in September 2019. The Northern Wales and Irish Sea Bidding Area was one of four Bidding Areas identified by TCE through the Offshore Wind Leasing Round 4 process. The Morgan Array Area was identified from within the Northern Wales and Irish Sea Bidding Area.

1.9.2.2 The Applicant selected the Northern Wales and Irish Sea Bidding Area (Bidding Area 4) as the preferred region based on the lower number of identified known constraints in comparison to the other Bidding Areas available. In order to identify potential project locations within Bidding Area 4, an extensive constraints analysis exercise was undertaken by TCE and the Applicant. This included a high level review of environmental and physical constraints to identify a study area where more detailed analysis could be carried out.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.9.2.3 The Morgan Generation Assets extent was limited by the following:
- To the northeast by the need to maintain 7.5 km from existing offshore wind farms (Walney and Walney Extensions)
 - To the south by the need to maintain 5 km separation from the Mona AfL area
 - To the west, by the extent of the Northern Wales and Irish Sea bidding area and the Isle of Man territorial waters
 - To the east by the presence of existing oil and gas infrastructure associated with the Millom West, North Morecambe and Dalton fields
 - To the east a project decision was taken at bid stage to maintain a 10 km offset from the Liverpool Bay SPA.

1.9.3 Stage 2: Generation and Transmission Assets split following the Holistic Network Design Review outcome

1.9.3.1 In its 2020 report to parliament, the Climate Change Committee called for government to develop a strategy to coordinate interconnectors and offshore networks for wind farms and their connections to the onshore network and bring forward any legislation necessary to enable coordination. Following this, the UK government announced the Offshore Transmission Network Review (OTNR).

1.9.3.2 The output of the OTNR was the HND an integrated approach for connecting new offshore wind infrastructure to the grid cohesively. The Morgan Offshore Wind Project was scoped into the HND as a Pathway to 2030 Project. The recommended design for the Northwest Region is a combination of collaborative developer-led solutions and single radial connections.

1.9.3.3 Following the inclusion of the Morgan Offshore Wind Project within the HND as a Pathway to 2030 Project, Morgan Generation Assets and Transmission Assets were detached from a consenting perspective and are now being administered under different DCOs and Marine Licences.

1.9.4 Stage 3: Pre-application engagement with stakeholders and communities

1.9.4.1 Stakeholder engagement and public consultation is recognised as vitally important for shaping the approach to development. A detailed description of the consultation process undertaken is provided in the Consultation report (Document Reference C3) and Technical engagement plan (Document Reference E4). Engagement has been undertaken with a wide range of stakeholders to refine the process, design and wider spatial constraints and considerations.

1.9.4.2 Consultation on the refinements has been undertaken through the informal and formal pre-application stages of the Applicant's proposed development:

- The Applicant met with a range of stakeholders to discuss their consultation responses in the Scoping Opinion ahead of formal consultation on the PEIR in 2023, which was based on the Morgan Generation Assets AfL Area
- The Applicant did not undertake any refinement of the Morgan AfL Area between Scoping and PEIR. Both non-statutory and statutory consultation was therefore conducted on the Morgan Generation Assets AfL Area ('the Morgan Potential Array Area')
- Following statutory consultation, the Applicant collated Section 47 and Section 42 consultation responses and considered the refinements and changes to the

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

project design suggested. Where necessary, stakeholders were consulted further prior to application submission. The proposed refinements to the Morgan Potential Array Area and layout principles were presented including an explanation of how the changes could help to minimise any potential impacts to key receptor groups. Details of this consultation are provided in the Consultation Report (Document Reference C3).

1.9.5 **Stage 4: Refinement of the Morgan Potential Array Area to the Morgan Array Area for application submission**

- 1.9.5.1 Refinements to the Morgan Potential Array Area related to minimising interaction with other sea users, existing offshore wind farms, and power cables, with key refinements made to minimise risks to shipping and navigation, were undertaken between PEIR and application submission. These include:
- A refinement of the Morgan Potential Array Area, reducing it from approximately 322.2 km² to 280 km²
 - A reduction in the maximum number of turbines from 107 to 96.
- 1.9.5.2 The final boundaries for the Morgan Generation Assets application can be seen in detail within the plans that accompany the application for development consent. The final boundaries are considered to balance environmental and technical constraints, whilst taking into account feedback from stakeholders wherever feasible.
- 1.9.5.3 The site selection process has aimed to identify a site that is environmentally acceptable, deliverable and consentable, whilst also enabling the benefits in the long term of the lowest energy cost to be passed to the consumer.
- 1.9.5.4 The process has taken account of environmental, physical, technical, commercial, and social considerations and opportunities as well as engineering requirements. Each stage of the site selection process forms part of an iterative design process undertaken to identify the most suitable locations and configuration for the Morgan Generation Assets infrastructure.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.10 Potential environmental effects

1.10.1 Overview

1.10.1.1 The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. The Applicant has undertaken an assessment of the potential effects of the Morgan Generation Assets on a number of topics following feedback received during statutory consultation, the findings of the site-specific surveys and the project design refinements.

1.10.1.2 The potential environmental effects are described in section 1.10.2 to 1.10.14.15 for the following topics:

- Physical processes
- Benthic subtidal ecology
- Fish and shellfish ecology
- Marine mammals
- Offshore ornithology
- Commercial fisheries
- Shipping and navigation
- Marine archaeology and cultural heritage
- Other sea users
- Seascape, landscape and visual
- Aviation and radar
- Climate change
- Socio-economics
- Human health
- Inter-related effects.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.10.2 Physical processes

Introduction

1.10.2.1 Physical processes refer to the coastal and marine processes and their relationship with the physical environment which includes tidal currents, wave climate and sediment transport regime.

Approach and assessment methodology

1.10.2.2 The physical processes of the Morgan Generation Assets were numerically modelled using datasets collected from a series of site-specific surveys, including geophysical and metocean data. This was coupled with a detailed desktop review of existing studies and datasets.

Baseline environment

1.10.2.3 The seafloor morphology of the Morgan Array Area includes several distinct features such as sandwaves, megaripples, sediment waveforms and outcrops. Several glacial features were observed, particularly in the west and central areas of the Morgan Array Area. Generally, the composition of these features is expected to be highly variable, but gravels and boulders are expected to be very common. These features highlight that the seabed substrate would be derived from glacial origins and would be termed moraines which are comprised of glacial till. Seabed levels across the Morgan Array Area range from depths of 32 m to 54 m relative to Mean Sea Level (MSL) with a deeper corridor travelling across the Morgan Array Area from the southwest to the northeast. Shallower depths are observed in the north and the south of the Morgan Array Area.

1.10.2.4 The wave climate in the Morgan Array Area is described as dominant short period, southwesterly waves. Across the Morgan Array Area, the tidal current floods to the east-northeast and ebbs to the west-southwest. Relatively strong flows are present during spring tides, however, within the Morgan Array Area, the residual current speeds are several orders of magnitude smaller than those along the coastline. Sediment transport rates are highest during spring tides.

Mitigation measures adopted as part of the Morgan Generation Assets

1.10.2.1 The Morgan Generation Assets has committed to several measures to reduce the impact on physical processes including but not limited to:

- Adherence to an Offshore Construction method statement (CMS), which will include:
 - cable burial as a preference and cable protection where burial is not possible
 - details of scour protection management, to be used around offshore structures and foundations to reduce scour as much as is practical
 - material arising from drilling and/or sandwave clearance will be deposited in close proximity to the works and within the licenced disposal area
 - details to minimise sandwave clearance volumes.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Assessment of effects

- 1.10.2.2 A number of potential impacts on the physical processes receptors, due to the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets, were identified. These include:
- Increase in suspended sediment concentrations (SSCs) due to construction, operations and maintenance and/or decommissioning related activities, and the potential impact to physical features
 - Impacts to the tidal regime due to the presence of infrastructure
 - Impacts to the wave regime due to the presence of infrastructure
 - Impacts to sediment transport and sediment transport pathways due to the presence of infrastructure and associated potential impacts to physical features and bathymetry
 - Impacts to temperature and salinity stratification due to the presence of infrastructure.
- 1.10.2.3 Increased SSCs may arise due to seabed preparation involving sandwave clearance, the installation of the wind turbines and OSP foundations, and cable installation. Sediment plumes produced during construction are considered localised and not to persist beyond the physical processes study area. Sedimentation increase is not considered to be sufficient or significant enough to influence bathymetry of key receptors such as sandbanks, mudflats and sandflats. The effects during the decommissioning phase would be of lesser magnitude than both the construction phase and the operations and maintenance phase, with scour and cable protection remaining in situ. Increases in SSCs may occur during decommissioning when cables are removed and if suction caisson foundations are removed. Similarly, a small proportion of sediment may be released during the removal of ballast material from gravity base foundations.
- 1.10.2.4 The presence of infrastructure may lead to changes in impacts to the tidal regime, wave regime, sediment transport and associated sediment transport pathways and physical features. However, the impacts on receptors, such as sandbanks, were deemed to be of **negligible significance** which is not significant in EIA terms. These minor changes in hydrodynamics occur in close proximity to the location of the wind turbines and do not extend beyond the physical processes study area. The limited magnitude of changes observed would not alter the hydrography of sandbanks. Overall, for all receptors, the effect will be of **negligible significance** which is not significant in EIA terms.
- 1.10.2.5 A cumulative effects assessment was carried out for the following three scenarios:
- Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets
 - Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets
 - Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and all other relevant tiered projects (tiers 1, 2 and 3).
- 1.10.2.6 All cumulative impacts assessed were deemed to be of **negligible significance** which is not significant in EIA terms.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.10.2.7 No physical processes mitigation in addition to the measures adopted as part of the Morgan Generation Assets (e.g. scour protection) is considered necessary because the predicted impacts in the absence of mitigation are not significant in EIA terms.

1.10.2.8 **No significant transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to physical processes.

1.10.3 Benthic subtidal ecology

Introduction

1.10.3.1 Benthic ecology refers to the communities of animals and plants which live on or in the seabed and the relationships that they have with each other and with the physical environment.

Approach and assessment methodology

1.10.3.2 The subtidal benthic ecology of the Morgan Generation Assets was characterised via a series of site-specific surveys using grab sampling, underwater video and Environmental Deoxyribonucleic Acid (eDNA).

Baseline environment

1.10.3.3 The site specific surveys indicated that the seabed within the Morgan Array Area supports a variety of plant and animal communities that are typical of this area. Key habitats recorded included mixed sediment supporting a range of species such as catworms, sea urchins and amphipods, as well as coarse sediment habitats characterised by marine worms. Sandy mud and fine sand habitats were also identified in this area and were characterised by brittlestars, bristle worms, sea urchins and bivalves. Overlying these sediment based communities were plant and animal assemblages comprised of larger, more mobile species, such as hermit crab, common starfish and brittlestars.

Mitigation measures adopted as part of the Morgan Generation Assets

1.10.3.4 The Morgan Generation Assets has committed to several measures to reduce the impact on benthic subtidal ecology including but not limited to:

- Adherence to an Offshore CMS, which will include
 - cable burial as a preference and cable protection where burial is not possible
 - details of scour protection management, to be used around offshore structures and foundations to reduce scour as much as is practical
 - a requirement that material arising from drilling and/or sandwave clearance will be deposited in close proximity to the works and within the licenced disposal area
 - details to minimise sandwave clearance volumes.
- Adherence to an Offshore Environmental management plan (EMP), which will include:
 - A biosecurity risk assessment and invasive and non-native species (INNS) management plan to minimise the potential for the introduction and spread of INNS

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- A marine pollution contingency plan which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.

Assessment of effects

- 1.10.3.5 A number of potential impacts on benthic subtidal communities/species, associated with the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets, were identified. These include:
- Temporary habitat loss/disturbance
 - Increased suspended sediment concentrations and deposition
 - Disturbance/remobilisation of sediment bound-contaminants
 - Long term habitat loss/habitat alteration
 - Introduction of artificial structures
 - Increased risk of introduction or spread of INNS
 - Removal of hard substrate
 - Changes in physical processes
 - Electromagnetic fields
 - Heat from subsea cabling.
- 1.10.3.6 With the measures adopted as part of the Morgan Generation Assets in place, these potential impacts result in effects of either **negligible** or **minor adverse** significance (i.e. not significant in EIA terms).
- 1.10.3.7 Temporary habitat loss/disturbance and long term habitat loss/habitat alteration were deemed to be of **minor adverse significance** (not significant in EIA terms) to benthic receptors, as the proportion of habitat disturbed and/or lost is predicted to be small in the context of available habitats in the Morgan Array Area and wider area.
- 1.10.3.8 Temporary increases in suspended sediment concentrations and associated deposition were also deemed to be of **minor adverse significance** (not significant in EIA terms) due to the short term nature of the impact and as the seabed plants and animals in this area have a low sensitivity to this type of impact.
- 1.10.3.9 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets in relation to benthic subtidal ecology. All cumulative effects assessed were deemed to be of **negligible** or **minor adverse significance**, which is not significant in EIA terms.
- 1.10.3.10 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets in relation to benthic subtidal ecology. All cumulative effects assessed were deemed to be of **negligible** or **minor adverse significance**, which is not significant in EIA terms.
- 1.10.3.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to benthic subtidal ecology. Cumulative effects from other projects and activities such as aggregate extraction and other offshore renewable developments were assessed and predicted to result in effects of **negligible** or **minor adverse significance** (not significant in EIA terms)

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

upon subtidal benthic communities within a 50 km buffer of the Morgan Generation Assets. Effects of **moderate adverse significance** were predicted from temporary habitat disturbance/loss, however, this would only be applicable in the short term and would not extend beyond the construction phase. On the basis that the sediments and associated benthic communities are predicted to recover over time, no mitigation is required to reduce the significance of the effects. The overall significance of the effects in the medium to long term is of **minor adverse significance**, which is not significant in EIA terms.

- 1.10.3.12 **No significant transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to benthic subtidal ecology.

1.10.4 Fish and shellfish ecology

Introduction

- 1.10.4.1 Fish and shellfish ecology refers to the communities of animals (various commercially and ecologically important fish, crustacean, and mollusc species) which live in the water column or on and in the seabed, including diadromous fish which move between marine and freshwater environments for spawning activity, and the relationships these organisms have with each other and the physical environment.

Approach and assessment methodology

- 1.10.4.2 The fish and shellfish ecology of the Morgan Generation Assets was characterised primarily through desktop review due to the large amount of data publicly available. Additionally, data opportunistically collected from seabed characterisation surveys were incorporated to help increase the scope of the review and to provide empirical evidence to support characterisation of habitat for substrate-specific species, such as herring and sandeel.

Baseline environment

- 1.10.4.3 The desktop review and site-specific survey results showed the presence of a range of fish, shellfish, and shark and ray species with spawning, nursery or feeding grounds in the vicinity of the Morgan Generation Assets, and in the wider fish and shellfish ecology study area. Species of particular ecological interest include herring, which are a commercially important species with high and low intensity spawning grounds to the west of the Morgan Generation Assets. Sandeel, which are a key prey species for many other marine predators, were also noted as having important populations and spawning grounds in this area. Further, cod were noted as species of importance within the area, with mapped high intensity spawning grounds spanning the east Irish Sea, encompassing the Morgan Array Area.
- 1.10.4.4 Consultation with stakeholders highlighted the importance of queen and king scallop to commercial fishing activities. Information from vessel position data and outputs from fisheries stakeholder consultation were incorporated to show the distribution of key fishing and spawning grounds for these species, with overlap with the Morgan Generation Assets noted. Basking shark and angel shark populations were also examined, with the potential for these passing through or occurring within the Morgan Array Area highlighted. The likelihood of angel shark being present within the area is low, with the most abundant local populations identified off the coast of North Wales, and only intermittently present. Whilst basking shark are known to migrate through the

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

wider fish and shellfish ecology study area, none were recorded from the digital aerial surveys commissioned across the Morgan Generation Assets.

Mitigation measures adopted as part of the Morgan Generation Assets

1.10.4.5 The Morgan Generation Assets has committed to several measures to reduce the impact on fish and shellfish ecology including but not limited to:

- Adherence to a Marine mammal mitigation protocol (MMMP), an outline version of which was submitted with the application (Document Reference J17) that requires implementation of an initiation stage of a piling soft start and ramp-up, sets a maximum separation limit of 15 km and a minimum separation limit of 1.4 km for concurrent piling as well as the limit on maximum hammer energy to be used during piling. Furthermore, the MMMP requires implementation of a mitigation hierarchy with regard to UXO clearance
- Adherence to an Offshore CMS which will include cable burial where possible and cable protection, and will require material arising from drilling and/or sandwave clearance to be deposited in close proximity to the works
- Adherence to an Offshore EMP including a Marine pollution contingency plan which will include planning for accidental spills, address all potential contaminant releases and include actions to minimise INNS, including a biosecurity plan to limit spread and introduction of INNS. The Offshore EMP shall be issued to all project vessel operators, requiring them to:
 - not deliberately approach basking sharks and other marine megafauna
 - keep vessel speed to a minimum where deemed to be appropriate
 - avoid abrupt changes in course or speed should basking sharks or other marine megafauna approach the vessel, where appropriate and possible, taking into account all technical considerations
- Adherence to an Underwater sound management strategy (Document Reference J13) that includes consideration of Noise Abatement Systems (NAS) as part of the mitigation options to mitigate for the likelihood of temporary or permanent auditory injury or behavioural impacts to fish and marine mammals.

Assessment of effects

1.10.4.6 A number of potential impacts on fish and shellfish species associated with the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets were identified. These include:

- Temporary habitat loss or disturbance
- Underwater sound impacts
- Increased suspended sediment concentrations and associated sediment deposition
- Long term habitat loss
- Electromagnetic fields from subsea electrical cabling
- Introduction and colonisation of artificial structures
- Disturbance/remobilisation of sediment-bound contaminants
- Injury to basking shark due to increased risk of collision with vessels.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.4.7 Temporary and long term habitat loss/disturbance were both deemed to be of **minor adverse significance** (not significant in EIA terms) to fish and shellfish receptors, as the proportion of habitat lost within the Morgan Array Area was predicted to be small in the context of other similar available habitats in the wider fish and shellfish ecology study area. All other impacts were considered to be **not significant**, with the exception of underwater sound impacts.
- 1.10.4.8 The project alone assessment predicts potentially **significant effects** to herring as a result of underwater sound generated by piling during the construction phase within the herring spawning period of late September for three to four weeks. Mitigation is implemented through the Underwater sound management strategy (Document Reference J13) which is secured in the deemed marine licence. This strategy establishes a process of investigating options to manage underwater sound levels in consultation with the licensing authority and Statutory Nature Conservation Bodies (SNCBs), and agreeing which mitigation measures will be implemented to reduce impacts such that there will be **no residual significant effect**. An Outline Underwater sound management strategy (Document Reference J13) is provided with the Application.
- 1.10.4.9 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to fish and shellfish ecology. All cumulative effects assessed, except for underwater sound impacts to herring, were deemed to be of **minor adverse significance**, which is not significant in EIA terms. Cumulative effects of **moderate adverse significance** were predicted for herring from underwater sound impacts resulting from piling at the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets during the herring spawning period of late September for three to four weeks, which is significant in EIA terms.
- 1.10.4.10 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to fish and shellfish ecology. All cumulative effects assessed, except for underwater sound impacts to herring, were deemed to be of **minor adverse significance**, which is not significant in EIA terms. Cumulative effects of **moderate adverse significance** were predicted for herring from underwater sound impacts resulting from piling at the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Windfarm: Generation Assets during the herring spawning period, which is significant in EIA terms.
- 1.10.4.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to fish and shellfish ecology. Cumulative effects from nearby offshore wind farm construction, dredging and disposal activities, and other relevant projects were assessed within a 50 km radius of the Morgan Generation Assets for direct impacts, and a 100 km radius for underwater sound. These nearby projects were examined and predicted to result in cumulative effects of **negligible to minor adverse significance** (not significant in EIA terms) on fish and shellfish species within the defined 50 km study area. For underwater sound, cumulative effects of **moderate adverse significance** were predicted from the Morgan Generation Assets alongside other projects/plans on herring and cod during their respective spawning seasons through the impact of underwater sound from piling. Mitigation proposed for the project alone, based upon post-consent development of an Underwater sound management strategy (Document Reference J13), will also reduce any cumulative effect based upon reducing the magnitude of sound generated by the

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Morgan Generation Assets. The Underwater sound management strategy is secured as a condition of the dML within the draft DCO (Document Reference C1).

- 1.10.4.12 Contribution to any cumulative effect from underwater sound during piling (and other relevant activities) by the Morgan Generation Assets will therefore be **not significant**. The assessment of cumulative effects from other plans and projects is based upon the respective MDSs presented in the Environmental Statements for Tier 1 projects or PEIR for Tier 2 projects. The assessment does not consider any further mitigation or reduced/refined project design envelopes for other Tier 1 and/or Tier 2 projects that may be implemented post-consent. However, it is understood that if other projects are consented, it is reasonable to assume that they will each implement appropriate measures such that any significant effect is reduced to a non-significant level. Although this assessment cannot conclude based upon this assumption, a significant cumulative impact is considered unlikely for this reason. **No residual significant** cumulative effects are expected to occur.

No transboundary effects were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to fish and shellfish ecology.

1.10.5 Marine mammals

Introduction

- 1.10.5.1 The marine mammals chapter considers species of whales, dolphins and porpoises as well as seal species found in the vicinity of the Morgan Array Area, in terms of their distribution, abundance and density.

Approach and assessment methodology

- 1.10.5.2 The baseline environment was informed by a combination of site-specific surveys and a detailed desktop review of existing studies and datasets. The digital aerial surveys covered the Morgan Array Area plus a 10 km to 13.3 km buffer, as agreed with the marine mammal EWG.

Baseline environment

- 1.10.5.3 The site-specific surveys indicated that the key species found in the vicinity of the Morgan Array Area include bottlenose dolphin, harbour porpoise, Risso's dolphin, grey seal and harbour seal. Other species known to occur regularly in the region include short-beaked common dolphin and minke whale.
- 1.10.5.4 Harbour porpoise occur throughout the marine mammal study area and are present year-round in the Irish Sea with seasonal peaks around Anglesey during winter months. Short-beaked common dolphin and Risso's dolphin are largely restricted to the south of the Irish Sea and, although both species have been sighted throughout the year, data suggest higher occupancy during warmer months with animals moving offshore as the temperature drops. Sightings of bottlenose dolphin are highest in coastal waters of Cardigan Bay, particularly during the summer; as winter approaches animals are thought to move northwards and are regularly sighted around Manx waters during this time. Minke whale is the most common baleen whale species in UK waters and can be found throughout the Irish Sea, with higher numbers recorded during summer and autumn, aligning with peaks in herring stocks. Grey seal is distributed extensively throughout the south Irish Sea and pupping season occurs between August and November. Harbour seal is concentrated along the northeast coast of Ireland, east coast of Northern Ireland and the Firth of Clyde and pups are born in June

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

and July. The numbers of both species of seal are relatively low in the vicinity of the Morgan Array Area compared to other parts of the Irish Sea.

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.5.5 The Applicant has committed to the development of and adherence to a MMMP, an outline version of which was submitted with the application (Document Reference J17), that requires implementation of an initiation stage of a piling soft start and ramp-up, sets a maximum separation limit of 15 km and a minimum separation limit of 1.4 km for concurrent piling, as well as a limit on maximum hammer energy to be used during piling.
- 1.10.5.6 The Morgan Generation Assets has committed to the development of an Underwater sound management strategy, an outline version of which was submitted with the application (Document Reference J13). The Underwater sound management strategy (Document Reference J13) establishes a process of investigating options to manage underwater sound levels, in consultation with the licensing authority and SNCBs, and agreeing mitigation measures that will be implemented to reduce the magnitude of impacts such that there will be no residual significant effect from the project. The Underwater sound management strategy will be developed and agreed with stakeholders post-consent. The MMMP forms an annex to the Underwater sound management strategy, both of which are secured in the deemed marine licences within the draft DCO.

Assessment of effects

- 1.10.5.7 A number of potential impacts on marine mammals, associated with the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets, were identified. These include:
- Injury and disturbance from elevated underwater sound during piling
 - Injury and disturbance from elevated underwater sound during Unexploded Ordnance (UXO) clearance
 - Injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other (non-piling) sound producing activities
 - Increased likelihood of injury due to collision with vessels
 - Injury and disturbance from elevated underwater sound generated from site investigation survey sources
 - Underwater sound from wind turbine operation
 - Changes in fish and shellfish communities affecting prey availability.
- 1.10.5.8 Injury and disturbance from elevated underwater sound during piling was deemed to be of **minor adverse significance** (not significant in EIA terms) to marine mammals in the regional marine mammal study area from the Morgan Generation Assets alone. The underwater sound modelling predicted ranges of impact which had the potential to result in injury and disturbance to a small number of animals. For the assessment of injury, with measures adopted as part of the Morgan Generation Assets in place in the form of an Outline MMMP (Document Reference J17), the impact would result in a very small risk of injury, as animals would be deterred beyond the predicted injury range. For the assessment of disturbance, it was considered that whilst a small number of animals could experience mild disturbance, this was unlikely to lead to population level effects. In addition, population modelling was carried out to explore the potential

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

of disturbance during piling to affect the population trajectory over time for harbour porpoise, bottlenose dolphin, minke whale and grey seal, which corroborated the assessment conclusion that the impact is unlikely to lead to population level effects.

- 1.10.5.9 For harbour porpoise only, a significant impact was concluded from elevated underwater sound during UXO clearance where standard mitigation measures may not be sufficient to reduce the risk of injury. Adopting a precautionary approach, the assessment considered detonation of a range of UXO sizes up to an absolute maximum of 907 kg. The most likely (common) size is considered to be 130 kg. The Morgan Generation Assets will, where practically possible and safe to do so, use alternative clearance methods, such as low order techniques. Where alternative clearance methods can be employed, it is considered that there would be **no significant effect** on any marine mammal species. Alternative clearance methods include low order techniques such as low order deflagration, which result in a much lower amplitude of peak sound pressure than high order detonations. Therefore ranges of effect are much smaller for alternative clearance methods (i.e. low order techniques). At the time of preparing the Application, there was limited information on the type and size of UXOs within the Morgan Array Area. A more detailed evaluation will therefore be undertaken post-consent as part of the Underwater sound management strategy (Document Reference J13). The Underwater sound management strategy will present relevant further mitigation options in order to manage underwater sound levels so as to reduce the magnitude of impacts for the project alone. At this point mitigation measures will be refined to ensure no residual risk of injury.
- 1.10.5.10 Increased likelihood of injury due to collision with vessels was deemed to be of **minor adverse significance** (not significant in EIA terms). An increase in vessel movements could lead to an increase in interactions between marine mammals and vessels, resulting in fatal and non-fatal injuries. Vessels travelling at 14 knots or faster are those most likely to cause death or serious injury to marine mammals. Largely, vessels involved in the construction phase are likely to be travelling slower than this, and all vessels will be required to follow the provisions set out in the EMP. With adherence to the Offshore EMP, which includes measures to minimise disturbance to marine mammals and rafting birds from transiting vessels, in combination with the likelihood that animals will be deterred by the sound of moving vessels, the risk of collision is reduced.
- 1.10.5.11 The assessment also concluded effects of **minor adverse significance** (not significant in EIA terms) for the following potential impacts: injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other (non-piling) sound producing activities; injury and disturbance from elevated underwater sound generated from site investigation survey sources; underwater sound from wind turbine operation; and changes in fish and shellfish communities affecting prey availability.
- 1.10.5.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to marine mammals. The cumulative assessment considered: injury and disturbance from elevated underwater sound during piling, injury and disturbance from elevated underwater sound generated from site investigation survey sources, injury and disturbance from elevated underwater sound during UXO clearance, injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities, increased risk of injury due to collision with vessels, and changes in fish and shellfish communities affecting prey availability. All cumulative

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.

- 1.10.5.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to marine mammals. The cumulative assessment considered those impacts listed above (paragraph 1.10.5.12). All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.5.14 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to marine mammals within the cumulative marine mammal study area. The cumulative assessment considered those impacts listed above (paragraph 1.10.5.12). Overall, for most impacts, it was concluded that there will be **no significant cumulative effects** on any marine mammal species. The exceptions were for behavioural disturbance during piling for bottlenose dolphin within the Irish Sea Management Unit (MU), and potential injury from UXO clearance for harbour porpoise.
- 1.10.5.15 The cumulative impact of piling at projects across the Irish Sea could result in potential reductions to reproductive success to some bottlenose dolphin individuals in the Irish Sea MU population. This is because disturbance in offshore areas during piling could lead to a longer duration over which individuals may be displaced from key feeding areas and therefore there may be a further reduction in the size of a declining MU population. The assessment of cumulative impact of UXO clearance concluded that individual harbour porpoise may potentially be exposed to sound levels that could elicit permanent auditory injury. As the project alone assessment determined there is the potential for a significant effect in EIA terms from UXO clearance, it is acknowledged this may contribute to a cumulative impact alongside other UXO clearance activities within the cumulative marine mammal study area. The Morgan Generation Assets has committed to the development of an Underwater sound management strategy (Document Reference J13) to investigate options to reduce any potential residual effects from the project alone, thereby reducing potential cumulative significant impacts to a non-significant level.
- 1.10.5.16 **No transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to marine mammals.

1.10.6 Offshore ornithology

Introduction

- 1.10.6.1 Seabirds refers to species that depend on the marine environment for survival at some point in their life cycle. In addition to true seabirds, seaducks, divers and grebes are also considered due to their additional reliance on marine areas, especially in the non-breeding season. Consideration is also given to non-seabird species that may interact with the Morgan Generation Assets during migratory flights.

Approach and assessment methodology

- 1.10.6.2 Information on seabirds within the Morgan Generation Assets offshore ornithology study area was collected through a detailed desktop review of existing studies and datasets, as well as site-specific surveys (digital aerial surveys).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.10.6.3 In order to inform the assessment, 24 months of site-specific surveys were undertaken between April 2021 and March 2023. The site-specific surveys characterised the distribution and number of seabirds within the Morgan Generation Assets offshore ornithology study area.

1.10.6.4 Displacement analyses followed the displacement matrix approach and collision risk modelling was undertaken using the Stochastic Collision Risk Model developed by Marine Scotland, for relevant species. Population Viability Analysis (PVA), which is the process of determining the probability that a population will persist over a specified time period, was undertaken using the Seabird PVA Tool developed by Natural England, where necessary based on defined criteria.

Baseline environment

1.10.6.5 The site-specific digital aerial surveys indicated that the Morgan Array Area supported a seabird assemblage that is typical of the Irish Sea, and dominated by guillemot, razorbill, kittiwake, Manx shearwater and gannet.

Mitigation measures adopted as part of the Morgan Generation Assets

1.10.6.6 The Morgan Generation Assets has committed to the development of an Offshore EMP which will include measures to reduce disturbance to rafting birds from transiting vessels.

Assessment of effects

1.10.6.7 A number of potential impacts on seabird species, associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets were identified. These include:

- Increased disturbance and displacement from airborne sound, underwater sound, and presence of vessels and infrastructure
- Indirect impacts from underwater sound affecting prey species
- Temporary habitat loss/disturbance and increased Suspended Sediment Concentrations (SSCs)
- Collision risk
- Combined displacement and collision risk
- Barrier to movement.

1.10.6.8 Disturbance of birds and displacement of birds from their preferred areas from sound and presence of vessels and infrastructure was deemed to be of **negligible adverse significance** (not significant in EIA terms), due to the short term nature of the impact during the construction and decommissioning phases.

1.10.6.9 Indirect impacts from sound affecting prey species of birds were deemed to be of **negligible adverse significance** (not significant in EIA terms) on ornithological receptors due to the short term nature of the impact. Similarly, temporary habitat loss/disturbance and increased SSCs were deemed to be of **negligible adverse significance** (not significant in EIA terms).

1.10.6.10 **No significant effects** of collision were predicted on seabirds and migratory waterbirds and seabirds within the Morgan Array Area, and the barrier effect was deemed to be of **negligible adverse significance** which is not significant in EIA terms. Furthermore, the combined impact of collision risk and disturbance and displacement

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

from airborne sound, underwater sound, and presence of vessels and infrastructure was considered to be of **minor adverse significance** (not significant in EIA terms).

- 1.10.6.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to offshore ornithology. All cumulative effects assessed were deemed to be of **negligible significance** (where a cumulative impact pathway existed), which is not significant in EIA terms.
- 1.10.6.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to offshore ornithology. All cumulative effects assessed were deemed to be of **negligible or minor significance**, which is not significant in EIA terms.
- 1.10.6.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to offshore ornithology. Cumulative effects from other offshore renewable developments were assessed and predicted to result in effects of **negligible or minor adverse significance** (not significant in EIA terms) upon regional populations (i.e. Biologically Defined Minimum Population Scales) (Scenario 3).
- 1.10.6.14 **No transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to offshore ornithology.

1.10.7 Commercial fisheries

Introduction

- 1.10.7.1 Commercial fisheries are defined as any form of fishing activity where the catch is sold for taxable profit.

Approach and assessment methodology

- 1.10.7.2 The commercial fisheries baseline was characterised via a review of publicly available data, site-specific surveys and consultation with fisheries stakeholders.

Baseline environment

- 1.10.7.3 Within the region, landings are dominated by dredge vessels, and shellfish are the most important species group in terms of landed weight and value. Within the Morgan Array Area there are queen scallop grounds, which are of particular importance to dredge vessels from the west coast of Scotland. These vessels, as well as vessels from the Isle of Man and nomadic vessels from Ireland and Northern Ireland, also engage in the king scallop fishery in the region. English static gear vessels targeting whelk and crab in the Morgan Array Area operate out of Fleetwood and Whitehaven. Beam trawl vessels from Belgium and the south coast of England are also occasionally present within the vicinity targeting flatfish, such as sole and plaice. Vessels from Ireland and Northern Ireland, deploying pelagic trawls and seine nets that target herring, are active across the commercial fisheries study area. Nephrops grounds off the coast of Cumbria are of particular importance to vessels that deploy demersal trawls and otter trawls, which are predominantly from England and Northern Ireland.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Mitigation measures adopted as part of the Morgan Generation Assets

1.10.7.4 The Morgan Generation Assets has committed to several measures to reduce the impact on commercial fisheries receptors including but not limited to:

- Adherence to an Offshore CMS, which will include:
 - A Cable Burial Risk Assessment (CBRA) where cable protection shall be designed to minimise snagging hazards as far as possible
 - Details of cable protection management and scour protection management
 - Outline of cable burial depth, cable protection and monitoring of inter-array and interconnector cables to reduce snagging risk
- Infrastructure spacing at a minimum of 1,400 m apart in order to provide additional space for continued fishing and transit by commercial fisheries between and around the Morgan Array Area
- Adherence to a Design plan with roughly north to south alignment of wind turbine rows and two lines of orientation for navigation and Search and Rescue (SAR) access, and includes implementation of a Scallop Mitigation Zone (SMZ) over an area of core scallop grounds within the Morgan Array Area
- Adherence to a Fisheries liaison and co-existence plan (FLCP), in accordance with the Outline FLCP (Document Reference J10)
- Notification of construction, maintenance and decommissioning activities via Notice to Mariners, giving appropriate advance warning to fishing fleets
- Adherence to an Aids to navigation management plan (ANMP) to ensure adequate navigational markers (including lighting), in accordance with the most recent relevant industry guidance
- Adherence to an Offshore EMP including a Marine pollution contingency plan
- ‘As-laid’ co-ordinates of the inter-array cable route shall be recorded and submitted to the UK Hydrographic Office (UKHO) and KIS-ORCA Service. ‘As-laid’ cables shall be marked on Admiralty Charts and fisherman’s awareness charts (paper and electronic format).

Assessment of effects

1.10.7.5 A number of potential impacts on commercial fisheries groups, associated with the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets, were identified. These include:

- Loss or restricted access to fishing grounds
- Displacement of fishing activity
- Interference with fishing activity
- Temporary increase in steaming distances
- Loss or damage to fishing gear due to snagging
- Potential impacts on commercially important fish stocks
- Supply chain opportunities for local fishing vessels.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.7.6 Loss or restricted access to fishing grounds is an impact that is of particular importance for Scottish west coast vessels and Isle of Man vessels, who rely on queen scallop and king scallop grounds within and around the Morgan Array Area. During construction, the loss or restricted access to fishing grounds is assessed as an effect no greater than **minor adverse significance** (not significant in EIA terms) on all commercial fisheries receptor groups, due to the temporary and intermittent nature of the works. During the operations and maintenance phase, an effect of **minor adverse significance** is also predicted on the Scottish west coast scallop vessels and Isle of Man vessels receptor groups, which is not significant in EIA terms. To mitigate the potential for Morgan Generation Assets infrastructure to severely restrict fishing and to promote co-existence, the Applicant has made a commitment to maintaining an area free of wind turbines and OSPs over an area of core scallop grounds within the Morgan Array Area, termed the Scallop Mitigation Zone. Project-specific consultation has established that scallop and static gear vessels tow and deploy their gear in a north to south alignment within the Morgan Array Area, which is the only orientation possible due to tides in the region. The Applicant has also committed to positioning wind turbine rows in a roughly north to south alignment, to allow for continued fishing within the Morgan Array Area (secured within the Outline FLCP).
- 1.10.7.7 The construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets may lead to displacement of fishing activity into other areas, as a result of loss or restricted access to fishing grounds. This displacement can create potential adverse effects on existing fisheries in the areas that vessels are displaced into.
- 1.10.7.8 During construction, the displacement of vessels into other areas, and the potential adverse impacts on existing fisheries in the areas that vessels are displaced into, is assessed as an effect of no greater than **negligible adverse significance** (not significant in EIA terms) for all commercial fisheries receptor groups. This is due to the use of rolling advisory clearance distances (to avoid the entire Morgan Array Area being closed to fishing vessels during the construction phase), and the temporary and intermittent nature of the works during the construction phase.
- 1.10.7.9 During the operations and maintenance phase, different fisheries operators have the potential to be impacted in different ways depending on the target species, gears used and areas fished. The Scottish west coast scallop vessels, for example, have limited spatial tolerance due to significant dependence upon the commercial fisheries study area for queen scallop dredging.
- 1.10.7.10 A number of measures have been committed to reduce displacement during the operations and maintenance phase. This includes the minimum spacing between wind turbines and rows of wind turbines being at a distance of 1,400 m. During project-specific consultation, information was provided by commercial fisheries stakeholders with regard to their preference of minimum spacing between wind turbines that would allow for continued fishing within the Morgan Array Area. Differences in preference of wind turbine spacing by different fisheries operators are in part attributable to different attitudes to risk, as well as different operating requirements associated with gear width when actively fishing. Further measures to minimise displacement include the commitment to minimum and target cable burial depths, roughly north to south alignment of array infrastructure and a SMZ that covers areas of core scallop grounds located within the western section of the Morgan Area Array. The Applicant has made these commitments to mitigate the potential for displacement as a result of the Morgan Generation Assets and to promote co-existence and co-location. These commitments are outlined and secured within the Outline FLCP.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.7.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to commercial fisheries. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.7.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to commercial fisheries. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.7.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to commercial fisheries. The main cumulative impact identified arising from the Morgan Generations Assets alongside other plans and projects for commercial fisheries focused on loss or restricted access to fishing grounds arising from the operations and maintenance phase. The cumulative effect of loss or restricted access to fishing grounds on Scottish west coast scallop vessels and Isle of Man scallop vessels, as a result of other plans/projects, is of minor adverse significance, which is not significant in EIA terms.
- 1.10.7.14 Transboundary effects outside UK waters are limited to the potential displacement of effort from the Morgan Generation Assets into non-UK waters and potential effects on commercially important fish and shellfish resources which could occur in non-UK waters. These effects are anticipated to be **not significant**.

1.10.8 Shipping and navigation

Introduction

- 1.10.8.1 The shipping and navigation chapter considers the potential impacts arising from the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets upon maritime safety and the activities of commercial shipping, ferries, ports/harbours, commercial fisheries, recreational cruising and other maritime operations.

Approach and assessment methodology

- 1.10.8.2 A shipping and navigation baseline was developed through a review of relevant publications, collection and analysis of historical vessel traffic and incident data, site-specific vessel traffic surveys and consultation with key stakeholders. A Navigation Risk Assessment (Document Reference F4.7.1) was carried out to inform the assessment.

Baseline environment

- 1.10.8.3 The Morgan Generation Assets are located in an area frequently utilised by a variety of different maritime users. Existing offshore wind farms, oil and gas and aggregate activities occur within the shipping and navigation study area. Key commercial shipping routes bound for the Port of Liverpool pass clear of the shipping and navigation study area, but smaller shipping routes to Douglas and Heysham cross through the Morgan Array Area. Regular ferry services between the UK, Isle of Man and the Republic of Ireland operate through or adjacent to the Morgan Array Area. Fishing by static and mobile gear takes place throughout the shipping and navigation study area. Offshore recreational cruising routes between the UK and the Isle of Man were also identified,

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

however, the numbers of vessels using them is low. Tug and service activities supporting existing offshore infrastructure is widespread.

- 1.10.8.4 Adverse weather, particularly from the prevailing southwest, was demonstrated to have an influence of vessel traffic patterns. Historical incident data demonstrated that relatively few navigational incidents had occurred within the shipping and navigation study area, with the majority analysed occurring in the approaches to Liverpool.

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.8.5 The Morgan Generation Assets has committed to several measures to reduce the impact on shipping and navigation receptors, including but not limited to:

- Adherence to a Design plan which will be agreed with the Marine Management Organisation (MMO), in consultation with the Maritime Coastguard Agency (MCA) and Trinity House
- Adherence to an ANMP to ensure adequate navigational markers (including lighting and a buoyed construction area), in accordance with the most recent relevant industry guidance
- Adherence to an Offshore CMS which includes details of cable monitoring to ensure under keel clearance is maintained and no more than a 5% reduction in water depth (referenced to Chart Datum) will occur as a result of cable protection at any point over cables without prior written approval from the Licensing Authority
- Notification of construction, maintenance and decommissioning activities through the use of Notice to Mariners
- Adherence to a Vessel traffic management plan, to ensure coordination of passage plans, setting out vessel standards and vessel health and safety requirements, and requiring continuous watch by multi-channel Very High Frequency (VHF), including Digital Selective Calling
- Adherence to an Emergency response and cooperation plan, which sets out details of periodic exercises to reduce the consequences of incidents
- Hydrographic surveys to reduce the risk of grounding or snagging of cables
- Adherence to a Navigation Monitoring Strategy setting out vessel traffic monitoring and post-construction monitoring to identify unanticipated project impacts.

Assessment of effects

- 1.10.8.6 A number of potential impacts on shipping and navigation, associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets, were identified. The impacts assessed include:

- Impacts to vessel routing
- Impacts to port operations
- Impacts to navigational safety
- Impacts to emergency response.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.8.7 Detailed and comprehensive assessments were undertaken which included analysis of vessel traffic surveys, risk modelling, full bridge navigation simulations and hazard workshops. With the measures adopted as part of the Morgan Generation Assets (e.g. aids to navigation and the use of guard vessels) in place, the majority of these impacts result in effects which are **not significant** in EIA terms, with the exception of the impacts on adverse weather routeing which was assessed as **potentially significant**. Through a structured navigation risk assessment, all hazards to marine navigation arising from the Morgan Generation Assets were assessed to be either **Broadly Acceptable or As Low As Reasonably Practicable**.
- 1.10.8.8 During adverse weather conditions, Stena Line vessels operating between Liverpool and Belfast, and Isle of Man Steam Packet Company vessels operating between Heysham and Douglas, navigate through the footprint of the Morgan Array Area. Given the orientation of the route to the prevailing conditions between the Morgan Array Area and the Walney offshore wind farms, vessels navigating this route were assessed to have insufficient sea room and likely to experience significant vessel motions which could damage cargo or injure passengers. Therefore, with the wind turbines in place, vessels would be required to deviate to the southwest of the Morgan Array Area in adverse weather to maintain safe and comfortable vessel motions. This has the potential to increase transit durations, cause delays and may lead to the cancellation of some services. To address these significant effects, the Applicant has committed to engaging with affected stakeholders. The Applicant will seek to continue this engagement beyond submission of the application and run in parallel with the application determination process.
- 1.10.8.9 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to shipping and navigation. The majority of cumulative effects assessed were deemed to be of **negligible to minor significance**, which is not significant in EIA terms. The impact on adverse weather routeing on the Stena Line route between Liverpool and Belfast, and the Isle of Man Steam Packet Company route between Heysham and Douglas was assessed as **potentially significant** as deviations would be required around the Morgan Array Area in adverse weather.
- 1.10.8.10 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to shipping and navigation. The majority of cumulative effects assessed were deemed to be of **negligible to minor significance**, which is not significant in EIA terms. The impact on adverse weather routeing on the Stena Line route between Liverpool and Belfast, and the Isle of Man Steam Packet Company route between Heysham and Douglas was assessed as **potentially significant** as deviations would be required around the Morgan Array Area in adverse weather.
- 1.10.8.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to shipping and navigation. A Cumulative Regional Navigation Risk Assessment (CRNRA) assessed the impacts and risks of the Morgan Generation Assets cumulatively with the Mona Offshore Wind Project, Morecambe Offshore Windfarm: Generation Assets and Awel y Môr Offshore Wind Farm. The assessment noted that whilst these projects would result in constrained routes between projects, all hazards were assessed to be either **Broadly Acceptable or As Low As Reasonably Practicable**.
- 1.10.8.12 On 18 October 2023, a scoping report was issued for the Mooir Vannin Offshore Wind Farm located in Isle of Man waters, to the northwest of the Morgan Array Area. Given

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

the timing of the release of the Scoping Report after the navigation simulations and hazard workshops, an addendum to the CRNRA was produced to consider the additional impacts and hazards that might result. On the basis of this addendum, several additional **significant cumulative effects** were identified for the Morgan Generation Assets alongside other projects.

- 1.10.8.13 Firstly, the cumulative impact on ferry routeing as a result of the presence of the Morgan Generation Assets alongside other projects including the Moir Vannin Offshore Wind Farm was assessed. Routes operated by Stena Line between Liverpool and Belfast east of the Isle of Man and small commercial operators operating between northwest England and the Isle of Man would experience frequent deviations to pass around the Morgan Array Area and Moir Vannin Offshore Wind Farm which might make these passages unviable in the future. Following the identification of significant effects on commercial operators including strategic routes and lifeline ferries within the PEIR, the Applicant has made substantial commitments to reduce these effects, including a reduction to the Morgan Array Area and additional control measures. Similar commitments made by the Mona Offshore Wind Project and Morecambe Generation Assets have further contributed to a reduction in this impact. No mitigation is proposed by the Applicant. It is noted that Moir Vannin Offshore Wind Farm Limited have committed to undertaking a shipping and navigation assessment in compliance with industry good practice and it is assumed that the potential cumulative impacts will be addressed by the Moir Vannin Offshore Wind Farm through the planning process.
- 1.10.8.14 Secondly, impacts on adverse weather routeing of Isle of Man Steam Packet and Stena Line routes as a result of the presence of the Morgan Generation Assets alongside other projects including the Moir Vannin Offshore Wind Farm were assessed as **significant**. During adverse weather, significant deviations of ferry routes were judged to be required around the array areas. These would result in increased transit durations, delays and cancellations due to insufficient contingency in existing schedules. Following the identification of significant effects on adverse weather routeing within the PEIR, the Applicant has made substantial commitments to reduce these effects, including a reduction to the Morgan Array Area and additional control measures. Similar commitments made by the Mona Offshore Wind Project and Morecambe Generation Assets have further contributed to a reduction in this impact. The Applicant has committed to engaging with affected stakeholders. The Applicant will seek to continue this engagement beyond submission of the application and in parallel with the application determination process.
- 1.10.8.15 Thirdly, whilst the CRNRA noted that all risks were reduced to **As Low As Reasonably Practicable**, the addendum including the Moir Vannin Offshore Wind Farm identified unacceptable risks of collision for passages between the Morgan Array Area and Moir Vannin Offshore Wind Farm. The width of this passage and the expected density of traffic and therefore meeting situations would not meet required passing distances set by operators on these routes. Following the identification of significant effects on collision risk within the PEIR, the Applicant has made substantial commitments to reduce these effects, including a reduction to the Morgan Array Area and additional control measures. Similar commitments made by the Mona Offshore Wind Project and Morecambe Generation Assets have further contributed to a reduction in this impact. No mitigation is proposed by the Applicant. It is noted that Moir Vannin Offshore Wind Farm Limited has committed to undertaking a shipping and navigation assessment in compliance with industry good practice and it is assumed that the potential cumulative impacts will be addressed, as required, by the Moir Vannin Offshore Wind Farm through the planning process.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.8.16 Fourthly, a **significant impact** on the risk of allision (contact between a moving vessel and a stationary one) was identified. As for the risk of collision, this risk was identified for passages between the Morgan Array Area and Moir Vannin Offshore Wind Farm and is a result of the width of the route and the likelihood of adverse weather. Following the identification of significant effects on allision risk within the PEIR, the Applicant has made substantial commitments to reduce these effects, including a reduction to the Morgan Array Area and additional control measures. Similar commitments made by the Mona Offshore Wind Project and Morecambe Generation Assets have further contributed to a reduction in this impact. No mitigation is proposed by the Applicant. It is noted that Moir Vannin Offshore Wind Farm Limited has committed to undertaking a shipping and navigation assessment in compliance with industry good practice and it is assumed that the potential cumulative impacts will be addressed, as required, by the Moir Vannin Offshore Wind Farm through the planning process.
- 1.10.8.17 A screening of transboundary impacts has been carried out and any potential for significant transboundary effects with regard to shipping and navigation from the Morgan Generation Assets upon the interests of other states has been assessed as part of the Environmental Statement. Each individual vessel may be internationally owned or operating between ports in different states. These impacts have been captured and assessed within the shipping and navigation chapter, Navigation Risk Assessment and CRNRA. **No additional transboundary impacts are therefore anticipated.**

1.10.9 Marine archaeology and cultural heritage

Introduction

- 1.10.9.1 Marine archaeology refers to the physical remains of the human past that survive within the marine environment. This includes maritime archaeology, such as shipwrecks, and submerged prehistoric archaeological material. Cultural heritage considers the potential impact on the setting of terrestrial designated historic assets arising from visual change.

Approach and assessment methodology

- 1.10.9.2 The existing marine archaeology conditions have been characterised through a review of desktop data including, but not limited to, data held by Historic England, the Isle of Man and the UK Hydrographic Office (UKHO), and studies alongside archaeological assessment of site-specific geophysical and geotechnical surveys.
- 1.10.9.3 The settings assessment has examined data from a number of sources, principally the Historic England and Manx National Heritage datasets which cover England and the Isle of Man. The locations of designated historic assets within the settings study area and within the Zone of Theoretical Visibility (ZTV) were identified.

Baseline environment

- 1.10.9.4 The site-specific geophysical survey data corroborates academic theories that the now submerged coastal areas of the east Irish Sea may have previously formed a partially terrestrial landscape during the Upper Palaeolithic and into the Mesolithic periods. Submergence to the modern coastline would have occurred towards the end of the Mesolithic periods (circa 6000 years before present). This partially terrestrial landscape would have allowed humans the opportunity to exploit the resources of the intertidal zone during this time and therefore there is the potential for the survival of archaeological material associated with these activities.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.9.5 The east Irish Sea is an area of historically high maritime traffic and 51 anomalies of potential archaeological interest were identified within the Marine archaeology study area (Morgan Array Area + 2 km buffer). Of these, five have been assessed to be of medium potential and five of high potential. The remaining 41 geophysical anomalies have been classified as low potential. The medium potential anomalies represent unidentified material ranging from debris to a potential wreck site. The high potential anomalies all correlate with positions of recorded wrecks in the UKHO database. The location of Morgan_0008 coincides with the *Limesfield*; Morgan_0017 coincides with the *Flying Meteor*; Morgan_0096 coincides with the *Ben Rein*; Morgan_0097 coincides with the *Hibernian*; and Morgan_0098 coincides with the *Lucy*. These anomalies primarily represent wrecks of 19th century shipping and transport vessels, with the exception of the *Ben Rein* and the *Limesfield* which were both sunk on 7th February 1918 by the same submarine, UB57.
- 1.10.9.6 The settings assessment has considered terrestrial designated historic assets, including World Heritage Sites (England), Registered Parks and Gardens (England), Scheduled Monuments (England), Ancient Monuments (Isle of Man), Listed Buildings (England), Registered Buildings (Isle of Man), Conservation Areas (Isle of Man and England), and Registered Battlefields (England).

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.9.7 The Morgan Generation Assets has committed to several measures to reduce the impact on marine archaeology receptors, including but not limited to:
- Adherence to Archaeological Exclusion Zones (AEZs) around those sites identified as having high and medium archaeological potential, as presented in the Offshore historic environment plan (Document Reference B7) and the Outline Offshore written scheme of investigation (WSI) and Protocol for archaeological discoveries (PAD) (Document Reference J14)
 - The Design plan will include final wind turbine locations to avoid any AEZs identified in pre-construction site investigation surveys or micro-siting requirements as set out in the Offshore WSI and PAD
 - Adherence to Temporary Archaeological Exclusion Zones (TAEZs) based on all available information including the stated positional accuracy, the recorded size of the target and the potential archaeological significance, as presented in the Offshore Historic environment plan (Document Reference B7) and the Outline Offshore WSI and PAD (Document Reference J14)
 - Adherence to an Offshore WSI including the establishment of a PAD.

Assessment of effects

- 1.10.9.8 A number of potential impacts on marine archaeology were identified:
- Sediment disturbance and deposition leading to indirect impacts on marine archaeology receptors
 - Direct damage to marine archaeology receptors
 - Direct damage to deeply buried marine archaeology receptors
 - Alteration of sediment transport regimes leading to indirect impacts to marine archaeology
 - Effects on Historic Seascape Character

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- Potential for visual change leading to indirect impacts on cultural heritage receptors.
- 1.10.9.9 Direct impacts were deemed to be of **minor adverse significance** (not significant in EIA terms) to marine archaeology receptors in the Morgan marine archaeology study area, as the measures adopted as part of the Morgan Generation Assets, including the implementation and monitoring of AEZs around high and medium potential archaeological anomalies, will ensure that no project-related activities will be carried out in these zones.
- 1.10.9.10 Indirect impacts through sediment disturbance and deposition and the alteration of sediment transport regimes were also deemed to be of **minor adverse significance** as modelling concluded that changes to physical processes are limited to the immediate vicinity of the infrastructure and therefore the potential for the exposure and/or burial of marine archaeology receptors is minimal. Measures adopted as part of the Morgan Generation Assets include the provision of an Outline WSI and PAD (Document Reference J14) that will ensure both the operational awareness of all known marine archaeology receptors and that provisions are in place in the event of the discovery of as yet unknown marine archaeology during the lifetime of the Morgan Generation Assets.
- 1.10.9.11 It was considered that the HSC of the area can accommodate the introduction of the Morgan Generation Assets without significant alteration to the existing characteristics, due to the current utilisation by energy and other industries.
- 1.10.9.12 The cultural heritage assessment found that effects during the construction, operations and maintenance, and decommissioning of the structures within the Morgan Array Area would be of **negligible adverse** or **minor adverse** significance for a number of designated historic assets within the settings study area, which is not significant in EIA terms.
- 1.10.9.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to marine archaeology and cultural heritage. Cumulative effects from sediment disturbance and deposition during all phases and direct damage to marine archaeology receptors during all phases are predicted to be of **minor adverse significance** (not significant in EIA terms) upon marine archaeology receptors. Cumulative effects from alteration of sediment transport regimes during the operations and maintenance phase are predicted to be of **negligible significance** (not significant in EIA terms). **No cumulative effects** are predicted on terrestrial designated historic assets (not significant in EIA terms).
- 1.10.9.14 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to marine archaeology and cultural heritage. Cumulative effects from sediment disturbance and deposition during all phases and direct damage to marine archaeology receptors during all phases are predicted to be of **minor adverse significance** (not significant in EIA terms) upon marine archaeology receptors. Cumulative effects from alteration of sediment transport regimes during the operations and maintenance phase are predicted to be of **negligible significance** (not significant in EIA terms). Cumulative effects on designated historic assets are predicted to be of **negligible adverse significance** (not significant in EIA terms) during all phases.
- 1.10.9.15 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, on designated historic assets. Cumulative

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

effects on designated historic assets are predicted to be of **negligible adverse significance** (not significant in EIA terms) during the construction and decommissioning phases. In general, cumulative effects are predicted to be of **minor adverse significance** (not significant in EIA terms) for the majority of the historic assets assessed during the operations and maintenance phase. However, cumulative effects on four designated historic assets on the Isle of Man (comprising the Point of Ayre lighthouse, the Point of Ayre fog horn, the small lighthouse on the Point of Ayre Beach known as Winkie, and the Maughold lighthouse) during the operations and maintenance phase are predicted to be of **moderate adverse significance**, which is significant in EIA terms, as a result of the additional presence and proximity of the turbines of the Mooir Vannin Offshore Wind Farm.

- 1.10.9.16 **No transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to marine archaeology and cultural heritage.

1.10.10 Other sea users

Introduction

- 1.10.10.1 Other sea users include recreational receptors (including receptors carrying out activities such as sailing and motor cruising, and recreational fishing), offshore energy receptors (including other offshore wind farms, oil and gas operations, cable operators, carbon capture and storage (CCS) and underground gas storage), aggregate extraction and disposal activities.

Approach and assessment methodology

- 1.10.10.2 The other sea users baseline was developed through a detailed desktop review of existing studies and datasets and consultation with key stakeholders. To establish the potential impact of the Morgan Generation Assets on Radar Early Warning Systems (REWS) installed on oil and gas platforms, a modelling assessment was undertaken.

Baseline environment

- 1.10.10.3 There are no licenced marine aggregate or open disposal sites, wreck diving sites or recreational bathing sites within the regional other sea users study area.
- 1.10.10.4 There is a low to moderate intensity recreational sailing and motor cruising in the northwest of the local other sea users study area, and few recreational vessels pass through the local other sea users study area compared with other areas in the east Irish Sea. Sea fishing trips operate from Conwy (North Wales), the Isle of Man and Fleetwood (Lancashire) amongst other ports along the coasts of the east Irish Sea.
- 1.10.10.5 No infrastructure associated with existing or proposed offshore wind farms is located within the local other sea users study area. The closest operational offshore wind farm to the Morgan Generation Assets is Walney Extension, located 8.1 km to the northeast from the Morgan Array Area.
- 1.10.10.6 There are no licenced oil and gas blocks overlapping with the local other sea users study area. The nearest exploration licence is 3.5 km from the Morgan Array Area, held by Spirit Energy Production UK Limited. Three blocks offered in the 33rd Oil and Gas Licensing Round overlap with the local other sea users study area (110/1, 110/2c and 113/26).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.10.10.7 There are no offshore oil and gas installations or pipelines within the local other sea users study area. The nearest offshore oil and gas platform is the Millom West platform, operated by Chrysaor Resources (Irish Sea) Limited (Harbour Energy), located 2.96 km from the Morgan Array Area. Consultation with Harbour Energy has confirmed that Millom West is planned to be decommissioned and vessel access will be required from 2024 to approximately 2030. The Millom East subsea structures are also planned to be decommissioned and vessel access will be required from 2027 to approximately 2032.
- 1.10.10.8 There are no CCS projects or underground gas storage projects within the local other sea users study area.
- 1.10.10.9 There is one operational power cable which intersects the local other sea users study area, the United Kingdom (UK)/Isle of Man (IoM) interconnector, between the Isle of Man and Blackpool, owned and operated by Manx Utilities. A section of the interconnector is located 830 m to the north of the Morgan Array Area.
- 1.10.10.10 Radar Early Warning Systems (REWS) are a type of early warning system used to prevent vessel collision with an offshore oil and gas platform. The system uses radar mounted on a platform to detect and track vessels and provide collision warning when vessels approach within a certain distance of the platform. There are four REWS which may be within line of sight of the Morgan Array Area.

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.10.11 Measures adopted as part of the Morgan Generation Assets include:
- Safety zones around each of the wind turbines and OSPs whilst construction/decommissioning works are ongoing and during periods of major maintenance
 - Notification of construction, maintenance and decommissioning activities through the use of Notice to Mariners
 - Site marking and marine charting
 - Adherence to an ANMP to ensure adequate navigational markers (including lighting and a buoyed construction area)
 - Continued communication with other offshore energy operators to promote and maximise cooperation between parties and minimise both spatial and temporal interactions between conflicting activities
 - Proximity agreements will be negotiated and agreed with relevant cable operators
 - Adherence to an Offshore CMS including details of cable monitoring to ensure under keel clearance is maintained and no more than a 5% reduction in water depth (referenced to Chart Datum) will occur as a result of cable protection at any point over cables without prior written approval from the Licensing Authority.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Assessment of effects

- 1.10.10.12 A number of potential impacts on other sea users, associated with the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets, were identified. The impacts assessed include:
- Displacement of recreational activities
 - Reduction or restriction of other offshore energy activities
 - Interference with the performance of REWS located on oil and gas platforms
 - Effect of rerouted traffic on REWS alarm rates.
- 1.10.10.13 With the mitigation measures adopted as part of the Morgan Generation Assets in place, these impacts result in effects which are of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.10.14 The displacement of recreational activities was deemed to be of minor adverse significance for all phases of the Morgan Generation Assets. This conclusion was reached based on the distance from the Morgan Array Area to the nearest coastline (the Isle of Man, 22.22 km) and accordingly the relatively low level of recreational activity within the Morgan Array Area. Notice to Mariners will be publicised regularly throughout all phases of the Morgan Generation Assets, advising of the location and nature of any works, ensuring that recreational activities can be planned accordingly.
- 1.10.10.15 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to other sea users. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.10.16 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to other sea users. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.10.17 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to other sea users. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.10.18 **No transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to other sea users.

1.10.11 Seascape, Landscape and Visual Impact Assessment

Introduction

- 1.10.11.1 The Seascape, Landscape and Visual Impact Assessment (SLVIA) considers the potential impact of the Morgan Generation Assets during the construction, operations and maintenance and decommissioning phases on seascape, landscape and visual amenity.
- 1.10.11.2 Seascape and landscape resources and receptors refer to areas of sea or land and their existing character and perceptual qualities. Visual receptors are people who experience views of the landscape and seascape who may be affected by the Morgan Generation Assets.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Approach and assessment methodology

- 1.10.11.3 The SLVIA study area for the Morgan Generation Assets is the area within a 50 km radius from the boundary of the Morgan Array Area. The seascape, landscape and visual baseline analysis involved a desktop exercise and consultation process. A Zone of Theoretical Visibility (ZTV) was generated comprising a map highlighting the likely extent (theoretical) of visibility of the Morgan Array Area within the SLVIA study area. This along with consultation informed the selection of representative viewpoints for assessment.
- 1.10.11.4 The representative viewpoints were selected to represent a broad range of locations and sensitive visual receptors across the SLVIA study area. Fieldwork was undertaken to verify the visual receptors and representative viewpoint locations and photography was captured in both summer and winter conditions.
- 1.10.11.5 A 60 km study area from the Morgan Array Area was also identified solely for the purpose of assessing effects on nationally and internationally designated landscapes.

Baseline environment

- 1.10.11.6 Seascape, landscape and visual resources comprises existing seascape and landscape (including character and the physical fabric of the seascape and landscape) and views attained by individuals from publicly accessible locations such as national trails, coastal settlements, Access Land, Public Rights of Way (PRoW) and transport routes, including national cycleway networks..
- 1.10.11.7 National landscape character areas in the Isle of Man and England, national Marine Character Areas (MCAs) and Seascape Sensitivity Zones (SSZs) within the SLVIA study area were identified.
- 1.10.11.8 Three nationally and internationally designated landscapes partly lie within the 60 km SLVIA study area. These include the Isle of Anglesey National Landscape and the Lake District National Park and English Lake District World Heritage Site.
- 1.10.11.9 Twenty-three representative viewpoints from publicly accessible locations were assessed. These represent a range of locations, distances and directions to the Morgan Generation Assets on land in England, Wales and the Isle of Man, with three of these viewpoints located at sea.

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.11.10 Measures adopted as part of the Morgan Generation Assets include:
- The nacelles, blades and towers will be painted light grey.

Assessment of effects

- 1.10.11.11 A number of potential impacts on SLVIA, associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets, were identified. The impacts assessed include:
- Potential impacts on seascape and marine character areas
 - Potential impacts on national landscape character areas
 - Potential impacts on the special qualities, themes and criteria of nationally and internationally designated landscapes
 - Potential visual impacts on the following receptors:

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- people using National Trails and long-distance paths
 - people using Countryside Rights of Way Act 2000 Access Land, or equivalent land with public access
 - people using National Cycle Routes and the National Cycleway Network
 - people at main coastal settlement seafronts/shorelines
 - people travelling along coastal roads
 - people travelling along coastal railways
 - people using main ferry routes
 - people using commercial shipping, recreational craft and fishing vessels
 - Visual impacts at representative viewpoints
 - Night-time effects on visual receptors.
- 1.10.11.12 Potential impacts will arise on seascape, landscape and visual resources during construction, operations and maintenance and decommissioning phases resulting from the wind turbines, OSPs and construction and service vessels/helicopters associated with the Morgan Generation Assets.
- 1.10.11.13 The Morgan Generation Assets would be located within the southwest part of English Marine Character Area (MCA) 38 Irish Sea South resulting in direct effects. The Morgan Generation Assets are predicted to result in very localised significant effects during construction and decommissioning within the Morgan Array Area. These effects would reduce with increasing distance from the Morgan Array Area. The Morgan Generation Assets would be located within an area partly characterised by commercial shipping and ferries, static sea infrastructure and by several operational offshore wind farms, including a cluster of existing offshore wind farms to the east-northeast of the Morgan Array Area (Northwest England cluster) and a cluster of existing offshore wind farms to the south of the Morgan Array Area (the North Wales cluster). Overall, the effect on MCA 38 Irish Sea South during construction and decommissioning is predicted to be minor to moderate adverse and not significant for the MCA as a whole.
- 1.10.11.14 During the operations and maintenance phase, localised **significant adverse effects** are predicted arise to the area of sea within MCA 38 occupied by the Morgan Array Area. **No significant effects are predicted** from the Morgan Generation Assets on MCA 38 (Irish Sea South), MCA A (Dreswick Point to Maughold Head Isle of Man southeast inshore waters) and SSZ 5 (North Wales and Anglesey Outer Offshore) when considered as a whole.
- 1.10.11.15 The Morgan Generation Assets would be located offshore and as a result, the baseline landscape of the SLVIA study area would not be directly affected. Indirect effects on landscape character would arise. These effects are predicted to be **not significant** due to the distance of the Morgan Generation Assets at over 20 km at the closest point to the coastline of the Isle of Man. **No significant effects are predicted** to arise on landscape character within England including the coastline of Cumbria and Lancashire.
- 1.10.11.16 The assessment considered the potential effects on the special qualities of the Lake District National Park and attributes of outstanding universal value of The English Lake District World Heritage Site. **No significant effects** are predicted during the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets on this nationally and internationally designated landscape in the SLVIA study area. The SLVIA concludes that the special qualities of this nationally designated landscape and the attributes of outstanding universal value of

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

the World Heritage Site would remain intact and the Morgan Generation Assets would not conflict with or compromise the reasons for the designations.

- 1.10.11.17 **Moderate and not significant adverse** visual effects are predicted to be experienced during the operations and maintenance phase by users of the Raad ny Foillan Coastal Path on the Isle of Man's east coast.
- 1.10.11.18 **Moderate and not significant adverse** visual effects (long term and reversible) are predicted during the operations and maintenance phase of the Morgan Generation Assets for individuals at the settlements of Douglas and Laxey, Isle of Man, where views of the Morgan Generation Assets are available at distances of 24 km and 24.9 km respectively. Visual effects arising during construction and decommissioning are predicted to be lower, temporary, short term in duration and **not significant**.
- 1.10.11.19 Users of ferries are predicted to experience **moderate to major adverse** effects during the operations and maintenance phase where the ferries pass within or adjacent to the Morgan Array Area. At other points along the route farther away from the Morgan Array Area the magnitude of visual impact and the significance of the effect are predicted to be lower **and not significant** in EIA terms. Similarly recreational sailors may experience **significant visual effects** in close proximity to the Morgan Generation Assets wind turbines. These effects are predicted to diminish with increasing distance from the Morgan Generation Assets.
- 1.10.11.20 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to SLVIA. The effect of the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets on the baseline landscape, seascape and visual amenity are predicted to be the same as that concluded for the Morgan Generation Assets.
- 1.10.11.21 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to SLVIA. The cumulative assessment concluded **moderate to major** and **potentially significant** cumulative effects on MCA 38 Irish Sea South.
- 1.10.11.22 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to SLVIA. **Potential significant** cumulative effects are assessed to arise to Isle of Man Landscape Character along the coast and for individuals on the Raad ny Foillan coastal path due to the addition of the Morgan Generation Assets with existing offshore wind farms, the consented Awel y Môr Offshore Wind Farm and the submitted Mona Offshore Wind Project.
- 1.10.11.23 **No significant transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to SLVIA.

1.10.12 Aviation and radar

Introduction

- 1.10.12.1 Aviation and radar relates to the potential interactions between the Morgan Generation Assets and relevant activities within the aviation and radar study area (e.g. low flying activities, helicopter operations, airports and aerodromes, aviation radar).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Approach and assessment methodology

1.10.12.2 Information on aviation and radar within the aviation and radar study area was collected through a detailed desktop review of existing studies and datasets. The following studies were carried out to support the assessment:

- Point-to-point radar line of sight analysis to give an indication of the theoretical likelihood of a wind turbine being detected by aviation radar systems
- Helicopter access assessment for offshore hydrocarbon platforms within 9 nm of the Morgan Array Area
- Instrument Flight Procedures (IFP) assessment in relation to relevant airport safeguarded areas.

Baseline environment

1.10.12.3 The aviation and radar study area covers all aviation radar systems that provide radar coverage over the Morgan Generation Assets, and which may detect the highest wind turbine blade tip height of 364 m above Lowest Astronomical Tide (LAT). It has been defined on the basis of the Civil Aviation Authority (CAA) Civil Aviation Publication (CAP) 764 Policy and Guidelines on Wind Turbines (CAA, 2016) consultation zones and criteria.

1.10.12.4 The Morgan Generation Assets would be located within a multi-layered area of lower, Class G uncontrolled airspace and higher, Class C and Class D Controlled Airspace (CAS). Above and surrounding the Morgan Generation Assets, the airspace is used by both military and civil registered aircraft. There are no aeronautical Military Practice and Exercise Areas (PEXAs) located within close proximity to the Morgan Generation Assets and consequently there will be no direct obstruction created to airborne activities conducted in PEXAs. No Helicopter Main Route Indicators (HMRIs) cross the Morgan Generation Assets and they are located at a sufficient distance not to be impacted by the operation of the Morgan Generation Assets.

1.10.12.5 Aviation and radar receptors relevant to the assessment include:

- Primary Surveillance Radar (PSR) systems. Within CAS, NATS is the main Air Traffic Service provider using PSR systems to provide coverage of UK airspace. There are 10 PSR sites located within the aviation and radar study area
- Ronaldsway (IoM) Airport is the main airport located on the IoM. The airport publishes a number of IFP which are required to be safeguarded by the airport authority to maintain safe flight operations
- RAF Valley is a military operated aerodrome and has a safeguarded Air Traffic Control Surveillance Minimum Altitude Chart (ATCSMAC)
- Walney Aerodrome. The published Minimum Sector Altitudes (MSAs) will be penetrated by the maximum blade tip height of wind turbines within the Morgan Array Area
- Military low flying aircraft
- Helicopters operating in Class G airspace in support of the offshore hydrocarbon industry conduct flights to helicopter platform equipped offshore facilities.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.12.6 Measures to be adopted as part of the Morgan Generation Assets to reduce aviation and radar impact are as follows.
- Adherence to a Design Plan, which will include two lines of orientation for navigation and Search and Rescue (SAR) access within the Morgan Array Area
 - Lighting as required and/or determined necessary for aviation safety
 - Information regarding construction should be passed to the Defence Geographic Centre in advance of the obstacle type(s) erection
 - Notification to the Defence Infrastructure Organisation Safeguarding (DIOS) of the date of the commencement of construction and operation, maximum height of construction equipment and infrastructure, and location of infrastructure
 - Appropriate information about the site construction and any associated lighting should be provided to the NATS Aeronautical Information Service (AIS).

Assessment of effects

- 1.10.12.7 The potential impacts on aviation and radar, associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets include:
- Creation of a physical obstacle to aircraft operations
 - Wind turbines causing interference on aviation PSR systems.
- 1.10.12.8 The creation of a physical obstacle to aircraft operations will take place during the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets due to the installation, operation or removal of physical objects. A range of adopted measures, in the form of adherence to a Design Plan, lighting for aviation safety, and appropriate notification to aviation stakeholders to minimise effects on aviation flight operations would apply to the Morgan Generation Assets. The effect across all phases of the project (where relevant) is deemed to be of **minor adverse significance** for military and low flying operations, **minor adverse significance** for helicopter operations and **minor adverse significance** following technical mitigation for IFP at Walney Aerodrome, RAF Valley and Ronaldsway (IoM) Airport, which is not significant in EIA terms.
- 1.10.12.9 For wind turbines causing interference on aviation PSR systems, the operational wind turbines in the Morgan Array Area would be theoretically detectable by the NATS Lowther Hill and St Anne's PSRs, and the Ronaldsway (IoM) Airport PSR system. Wind turbines detectable by a PSR system might degrade the system by creating false targets, reduce system sensitivity, create radar shadowing behind the wind turbines and saturate the radar receiver leading to clutter potentially concealing real aircraft targets. The effect is deemed to be of **minor adverse significance** after technical mitigation (such as radar blanking or an application for a Transponder Mandatory Zone), which is not significant in EIA terms.
- 1.10.12.10 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to aviation and radar. All cumulative effects assessed (where relevant) were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.12.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

and the Morecambe Offshore Windfarm: Generation Assets, in relation to aviation and radar. All cumulative effects assessed were deemed to be of **minor adverse significance** following technical mitigation (where relevant) which is not significant in EIA terms.

- 1.10.12.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to aviation and radar. The cumulative effect for the creation of a physical obstacle to aircraft operations is considered to be of **minor adverse significance** during all phases of the Morgan Generation Assets, which is not significant in EIA terms. The cumulative effect for wind turbines causing interference on aviation PSR systems is considered to be of **minor adverse significance** following technical mitigation during the operation and maintenance phase, which is not significant in EIA terms.
- 1.10.12.13 **No transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to aviation and radar.

1.10.13 Climate change

Introduction

- 1.10.13.1 Climate change refers to the long term shifts in temperatures and weather patterns that are fundamentally driven by human activities. Climate change in the context of the assessment undertaken can be considered in two parts:
- The effect of GHG emissions arising from the construction, operations and maintenance and decommissioning of the Morgan Generation Assets, which may contribute to climate change
 - The potential effects of the future climate on the Morgan Generation Assets.

Approach and assessment methodology

- 1.10.13.2 The GHG emissions arising from the Morgan Generation Assets are characterised by a series of desk-based assessments and articles using published data to determine the potential impact of the Morgan Generation Assets on climate change. The potential risks to the Morgan Generation Assets from a changing climate have also been assessed and reported, with the impact of the effects of climate change on the Morgan Generation Assets being established through a risk assessment process.

Baseline environment

- 1.10.13.3 The current baseline with regards to the assessment of GHGs arising from the Morgan Generation Assets is represented by the existing land use (seabed). The baseline consists of various subtidal habitats including subtidal sand and muddy sand sediments to subtidal coarse and mixed sediments with diverse benthic communities. The future baseline for existing land use (seabed) without the Morgan Generation Assets is expected to remain similar to the current baseline.
- 1.10.13.4 The current baseline with regards to the assessment of climate on the Morgan Generation Assets is represented by current climate observations within the local area. The future baseline has been informed by climate projections, showing worst case predictions of climate (including temperature, precipitation and wave height) over the Morgan Generation Assets' lifetime.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.13.5 Measures adopted as part of the Morgan Generation Assets to reduce the potential for impacts on climate change include:
- Application of anti-corrosion protective coatings
 - Integrated scour protection to offshore equipment
 - Wind turbine design to be fitted with automatic shutdowns/lockdowns with regards to spinning too fast
 - Where relevant, the OSP will house auxiliary equipment (e.g. appropriate cooling plant) to account for a range of temperature conditions
 - Regular inspections to be carried out to assess wind turbine condition
 - Regular inspections to be carried out to assess OSP condition where appropriate (i.e. following severe weather events).
- 1.10.13.6 These are considered to be industry standard design measures to ensure resilience of the Morgan Generation Assets.

Assessment of effects

- 1.10.13.7 A number of potential impacts relevant to climate change, associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets, were identified. These include:
- Impact of GHG emissions arising from the consumption of materials and activities required to facilitate operations and maintenance
 - Impact of GHG emissions arising from land use (seabed) change during the construction, operations and maintenance, and decommissioning phases
 - Impact of GHG emissions arising from the manufacturing and installation of the Morgan Generation Assets
 - Impact of GHG emissions from decommissioning works (plant and equipment, fuel and vessel use) and recovery or disposal of materials
 - Impact of estimated abatement of UK Grid emissions during the operations and maintenance phase
 - Impact of the effects of climate change on the Morgan Generation Assets.
- 1.10.13.8 The GHG emissions arising from the extraction of raw materials, manufacturing and transportation of materials during the construction phase were calculated to be approximately 1,927,897 tCO₂e, leading to an effect of **minor adverse significance** following mitigation, which is not significant in EIA terms.
- 1.10.13.9 The operations and maintenance phase emissions predominantly arise from transportation emissions required to maintain the Morgan Generation Assets. Additionally, the operations and maintenance phase of the Morgan Generation Assets would enable the displacement of fossil fuels. When considering the avoided emissions, in addition to operations and maintenance emissions, the operations and maintenance phase impact results in the order of approximately 2,305,986 tCO₂e savings by 2064. This would result in a **beneficial effect** which is significant in EIA terms.
- 1.10.13.10 Despite the GHG emissions resulting from the construction and decommissioning stages of the Morgan Generation Assets, the magnitude of avoided emissions resulting

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

from the operations and maintenance phase allows the Morgan Generation Assets to be in a position of net avoided emissions from the 10th year of operation (carbon payback period). Over the lifetime of the Morgan Generation Assets, it would result in 324,370 tCO_{2e} of avoided emissions.

- 1.10.13.11 The potential impacts of climate change on the Morgan Generation Assets were identified through consideration of various climate related risks that may have an adverse effect upon the Morgan Generation Assets. **No risks were assessed as having a significant effect** on the Morgan Generation Assets, due to the design measures included as part of industry good practice.
- 1.10.13.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to climate change. The cumulative effects assessed would have a net **beneficial** effect which would be significant in EIA terms.
- 1.10.13.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to climate change. The cumulative effects assessed would have a net **beneficial** effect which would be significant in EIA terms.
- 1.10.13.14 A separate cumulative effects assessment was not carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets together with other projects and plans, in relation to climate change. All developments that emit, avoid or sequester GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Cumulative effects due to other specific local development projects are not individually predicted but are taken into account when considering the impact of the Morgan Generation Assets by defining the atmospheric mass of GHGs as a high sensitivity receptor. The construction, operations and maintenance and decommissioning phase effects of the assessment of the Morgan Generation Assets takes account of cumulative changes in GHG emissions from other energy generation sources.
- 1.10.13.15 In relation to transboundary impacts, all developments which emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a transboundary impact on climate change. Consequently, transboundary effects due to other specific international development projects are not individually identified but would be taken into account when considering the impact of the Morgan Generation Assets by defining the atmospheric mass of GHGs as a high sensitivity receptor. Each country has its own policy and targets concerning carbon and climate change which are intended to limit GHG emissions to acceptable levels within that country's defined budget and international commitments.

1.10.14 Socio-economics

Introduction

- 1.10.14.1 This section provides a summary of the potential impact of the Morgan Generation Assets on socio-economics. The socio-economics assessment considers socio-economic receptors within the following categories:
- Economic: assessing the potential employment and Gross Value Added (GVA) impacts associated with the Morgan Generation Assets and the associated impacts on local employment opportunities

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- Social: assessing the potential impacts of the workforce associated with the Morgan Generation Assets on housing, accommodation and population (including local services)
- Tourism: assessing the potential indirect impacts associated with visual amenity, overnight accommodation and recreation on tourism
- Isle of Man interactions with lifeline ferry services: assessing potential socio-economic impacts on the Isle of Man associated with potential adverse effects on lifeline ferry services.

Approach and assessment methodology

- 1.10.14.2 Information on socio-economics within the economic, social, and tourism study areas was collected through a detailed desktop review of existing studies and datasets. No site-specific surveys were undertaken due to the availability of existing publicly accessible data to inform the assessment. Consultation has been undertaken with stakeholders across the identified economic, social and tourism study areas.

Baseline environment

- 1.10.14.3 The offshore wind sector is identified as a high priority industry within national, regional and local policies across the UK. This reflects the opportunities the sector provides for supporting economic development and growth, plus providing jobs and incomes for UK residents.
- 1.10.14.4 The tourism sector is an important sector within the relevant policy environments, providing jobs for local residents and contributing to economic output.
- 1.10.14.5 The Isle of Man economy can be characterised as a service dominated economy. The day-to-day operations of the service economy and public services are not dependent on the movement of freight and passengers, therefore a large proportion of the Isle of Man economy (90% of GDP, 71% of resident employment) has limited dependency on lifeline ferry services. The day-to-day operations of the retail and wholesale, construction, and manufacturing sectors are heavily reliant on the movement of freight. The visitor and leisure economy is highly reliant on the movement of passengers. These sectors are highly dependent on lifeline ferry services.

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.1.1.1 The Applicant has provided an outline Skills and employment plan (Document Reference J8). This document sets out the principles that will be secured for the Morgan Generation Assets which will be part of a full skills and employment plan for the whole Morgan Offshore Wind Project which will be secured via the Morgan and Morecambe Offshore Wind Farms: Transmission Assets DCO. This will secure the economic benefits associated with the Morgan Generation Assets in relation to skills and employment within the offshore wind sector.
- 1.10.14.6 This plan will detail how the Applicant will engage with local workers and training providers for anticipated associated employment opportunities. It will set out opportunities for engagement to enable local workers and training providers to prepare for anticipated employment opportunities associated with the whole Morgan Offshore Wind Project.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Assessment of effects

- 1.10.14.7 A number of potential impacts on socio-economics, associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets, were identified. The impacts assessed include:
- The potential impact on economic receptors including employment and GVA
 - The potential impact of increased employment opportunities
 - The potential impact on population, housing and accommodation
 - The potential impact on tourism
 - The potential socio-economic impacts on the Isle of Man associated with potential adverse effects on lifeline ferry services.
- 1.10.14.8 Taking into account the mitigation measures described above, the following significant effects are likely to occur with respect to socio-economics:
- The beneficial effect on economic receptors in northwest England including employment, GVA and job opportunities for local residents, is likely to be **not significant** in EIA terms. Potential effects in North Wales on employment and GVA have the potential to be of **moderate (beneficial) significance** during the operations and maintenance phase, which is significant in EIA terms.
 - The beneficial effect on social receptors in northwest England, including demand for housing, accommodation and local services, is likely to be **not significant** in EIA terms. Potential effects in North Wales on demand for housing, accommodation and local services have the potential to be of **moderate (beneficial) significance** during the construction phase, which is significant in EIA terms.
- 1.10.14.9 The assessment concludes that, during the construction, operations and maintenance, and decommissioning phases, potential adverse effects on tourism are likely to be **not significant** in EIA terms.
- 1.10.14.10 The assessment concludes that, during the construction, operations and maintenance, and decommissioning phases, the adverse effect on socio-economic conditions in the Isle of Man is likely to be **not significant** in EIA terms.
- 1.10.14.11 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to socio-economics. Potential effects in North Wales on employment and GVA have the potential to be of **moderate (beneficial) significance** during the operations and maintenance phase, which is significant in EIA terms. All other effects were not considered to be significant in EIA terms.
- 1.10.14.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to socio-economics. Potential effects in northwest England on employment and GVA have the potential to be of **moderate (beneficial) significance** during the construction phase, which is significant in EIA terms. Potential effects in North Wales on employment and GVA have the potential to be of **moderate (beneficial) significance** during all phases, which is significant in EIA terms. All other effects were not considered to be significant in EIA terms.
- 1.10.14.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

together with other projects and plans, in relation to socio-economics. The assessment determined that there would be the following **significant cumulative effects** with respect to socio-economics:

- Beneficial cumulative effect on economic receptors, including employment and GVA in North Wales, northwest England and the UK during construction of the Morgan Generation Assets
- Beneficial cumulative effect on economic receptors, including employment, GVA and employment opportunities in North Wales during all phases of the Morgan Generation Assets.

1.10.14.14 With respect to potential socio-economic impacts on the Isle of Man associated with potential adverse effects on lifeline ferry services, cumulative effects with other plans and projects were assessed and predicted as likely to result in **no significant cumulative effects** in EIA terms.

1.10.14.15 **No significant transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to socio-economics.

1.10.15 Human health

Introduction

1.10.15.1 The human health assessment considers how the Morgan Generation Assets affects different aspects of the environment that influence population health. This includes changes to the social, economic and bio-physical environment, as well as how the electricity generated by the Morgan Generation Assets is a resource that supports society.

Approach and assessment methodology

1.10.15.2 The health assessment is informed by the findings of other Environmental Statement chapters, including commercial fisheries, shipping and navigation, other sea users, seascape, landscape and visual resources, climate change and socio-economics. The health assessment has also been informed by a review of relevant public health evidence sources, including scientific literature, baseline data, health policy, local health priorities and health protection standards. The assessment follows guidance and good practice.

Baseline environment

1.10.15.3 An overall baseline health profile was gathered for the Isle of Man and northwest England using publicly available public health evidence. This data reflects slightly poorer health outcomes on the Isle of Man compared to England. For example, healthy life expectancy on the Isle of Man is similar for males but slightly lower for females compared to England. Mortality rates from all causes considered preventable are lower for the Isle of Man than in England. Public health data also indicates poorer health outcomes in the northwest region of England compared to England. Socio-economic conditions and other health determinants are typically worse in the northwest region of England compared to England. For example, there is a higher percentage of children in relative and absolute low-income families compared to the England average. The indicators confirm elevated sensitivity, particularly for vulnerable groups, on several measures.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Mitigation measures adopted as part of the Morgan Generation Assets

- 1.10.15.4 No mitigation specific to human health is proposed. The health assessment takes into account the mitigation discussed in other chapters of the Environmental Statement.

Assessment of effects

- 1.10.15.5 A number of potential impacts on human health associated with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets were identified. These include the potential health effects of changes to the following:
- Transport modes, access and connections
 - Community identity, culture, resilience and influence
 - Employment and income
 - Climate change
 - Wider societal infrastructure and resources.
- 1.10.15.6 With the measures adopted as part of the Morgan Generation Assets in place, the adverse effects of the Morgan Generation Assets are considered to be **not significant** for population health in EIA terms.
- 1.10.15.7 In terms of the potential health effects of changes to strategic routes and lifeline ferries to the Isle of Man, the Morgan Generation Assets may lead to an **adverse effect** which is **not significant** in EIA terms. This includes avoiding significant effects to medical and other health related deliveries to the Isle of Man.
- 1.10.15.8 Changes in offshore employment and income in relation to loss of or restricted access to commercial fishing grounds will have an **adverse effect** which is **not significant** for population health in EIA terms.
- 1.10.15.9 The contribution to energy security provide by the Morgan Generation Assets will have a **beneficial effect** for population health which is **significant** in EIA terms. This includes powering homes, public services, schools and places of work, all of which have positive effects on public health.
- 1.10.15.10 Overall, it is concluded that there will be **no significant adverse effects** arising from the Morgan Generation Assets during the construction, operations and maintenance or decommissioning phases. **Significant public health benefits** in relation to energy security are expected for population health in the operations and maintenance phase.
- 1.10.15.11 The cumulative effects assessment for human health is informed by conclusions set out in other chapters. A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, in relation to human health. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.15.12 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets, in relation to human health. All cumulative effects assessed were deemed to be of **minor adverse significance**, which is not significant in EIA terms.
- 1.10.15.13 A cumulative effects assessment was carried out for the Morgan Generation Assets alongside the Morgan and Morecambe Offshore Wind Farms: Transmission Assets

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

together with other projects and plans, in relation to human health. Overall, it is concluded that there will be the following **significant cumulative effects**:

- In relation to risk of a safety incident at sea (vessel-to-vessel or vessel-to-wind-turbine contact), there is a cumulative **adverse effect** which is **significant** in EIA terms due to the potential future presence of the proposed Moor Vannin Offshore Wind Farm. In practice it is not expected that the combination of wind farm designs that could give rise to this significant effect would actually be built. The Morgan Generation Assets, Mona Offshore Wind Project and Morecambe Offshore Windfarm: Generation Assets have already worked together to develop a design that avoid effects that are significant in EIA terms
- The combined contribution to energy security of multiple offshore wind farm projects will have a **beneficial effect** for population health, which is **significant** in EIA terms.

1.10.15.14 **No transboundary effects** were predicted to arise from the Morgan Generation Assets on the interests of other states with regard to human health.

1.10.16 Inter-related effects

Introduction

1.10.16.1 The EIA is required to identify, describe and assesses the potential inter-related effects of the Morgan Generation Assets. Inter-related effects refer to the potential for there to be multiple effects acting upon the same receptor. These occur either where a single effect acts upon a receptor over time to produce a potential additive effect or where a number of separate effects, such as underwater sound and collision risk, affect a single receptor, for example marine mammals. The inter-related effects assessment is presented in a separate chapter of the Environmental Statement.

Project lifetime effects

1.10.16.2 Inter-related effects can originate from impacts occurring on a receptor group over several phases of the Morgan Generation Assets. For example, a receptor group may experience impacts during the construction and decommissioning phases of the Morgan Generation Assets. These inter-related effects are collectively described as project lifetime effects.

1.10.16.3 For all receptor groups identified, the overall significance of any project lifetime effects was not judged to increase above the significance value assessed for individual effects in the topic-specific chapters.

Receptor-led effects

1.10.16.4 Inter-related effects may also occur where a receptor group experiences impacts across several different aspects of the environment. As an example, multiple effects on a given receptor such as benthic habitats (e.g. direct habitat loss or disturbance, sediment plumes, scour, jack-up vessel use etc.) may interact to produce a different or greater effect on this receptor than when the effects are considered in isolation. These inter-related effects are collectively described as receptor-led effects.

1.1.1.2 The overall significance of any receptor-led effects was not judged to increase above the significance value assessed for individual effects in the topic-specific chapters.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Summary

- 1.10.16.5 Based on one or a combination of the following factors: the low sensitivity of receptors; temporary and small scale nature of effects; availability of alternative habitats; and also factoring in proposed mitigation measures, the overall significance of any inter-related effects was not judged to increase above the significance value assessed for individual effects in the topic-specific chapters.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.11 References

Civil Aviation Authority (CAA) (2016) Civil Aviation Publication (CAP) 764 Policy and Guidelines on Wind Turbines. Available: [REDACTED] Accessed February 2024.

Department for Business, Energy and Industrial Strategy (BEIS) and Prime Minister's Office (2022) British Energy Security Strategy Available: <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>. Accessed February 2024.

National Grid ESO (2022) Pathway to 2030 Holistic Network Design. Available: [REDACTED] d. Accessed February 2024.

ONS (2023a) Business Register and Employment Survey. Available: [REDACTED] Accessed February 2024.

ONS (2023b) Regional gross value added (balanced) by industry: all ITL regions. Available: <https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry>. Accessed February 2024.

Orsted (2023) Moir Vannin Offshore Wind Farm. Scoping Report. Available: [REDACTED].

OWIC (2023) Offshore Wind Skills Intelligence Report. Available: [REDACTED]

The Planning Inspectorate (2022) Scoping Opinion: Proposed Morgan Offshore Wind Project. Available: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010136/EN010136-000057-EN010136_Morgan%20OWF%20Scoping%20Opinion.pdf. Accessed February 2024.