



TotalEnergies E&P North Sea UK Ltd

# Culzean Floating Offshore Wind Turbine Pilot Project Environmental Impact Assessment Report - Non-Technical Summary

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Aberdeen

The Capitol Building  
431 Union Street, Aberdeen  
AB11 6DA, UK

T +44 1224 219 955  
E [deborah.morgan@xodusgroup.com](mailto:deborah.morgan@xodusgroup.com)  
[www.xodusgroup.com](http://www.xodusgroup.com)



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## GLOSSARY

TERMINOLOGY	DESCRIPTION
<b>Carbon dioxide equivalent (CO<sub>2</sub>e)"</b>	"Carbon dioxide equivalent" or "CO <sub>2</sub> e" is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO <sub>2</sub> e signifies the amount of CO <sub>2</sub> which would have the equivalent global warming impact.
<b>Annex I Habitat</b>	Annex I of the Habitats Directive list the types of habitats where conservation requires the designation of special areas of conservation.
<b>Culzean Floating Offshore Wind Pilot Project (the 'Project')</b>	The entire Development including all offshore components and all project phases from pre-construction to decommissioning.
<b>Cumulative Effects</b>	Assessment of the effects of the Project cumulatively with other foreseeable projects (other developments), plans and activities.
<b>Diadromous fish</b>	Fish which migrate through fresh and salt water
<b>Environmental Impact Assessment (EIA)</b>	The procedure to predict, minimise, measure and, if necessary, correct and compensate the impacts produced by any human action.
<b>EIA Regulations</b>	The Marine Works (Environmental Impact Assessment) Regulations 2007 requires that certain types of projects with the potential to significantly affect the environment have an environmental impact assessment before a marine licence decision is made.
<b>Habitats Directive</b>	The Habitats Directive (Council Directive 92/43/EEC) was adopted in 1992 and aims to ensure that designated species (including mammals, reptiles, amphibians, fish invertebrates, and plants) and habitat types are maintained, or restored, to a favourable conservation status.
<b>Habitats Regulations Assessment (HRA)</b>	Under the Habitats Regulations, all competent authorities must consider whether any plan or project could affect a European site before it can be authorised or carried out. This includes considering whether it will have a 'Likely Significant Effect' (LSE) on a European site, and if so, they must carry out an 'Appropriate Assessment' (AA). This process is known as Habitats Regulations Appraisal (HRA)
<b>Innovation and Targeted Oil and Gas (INTOG)</b>	<p>The Initial Plan Framework (IPF) Sectoral Marine Plan for Offshore Wind for INTOG encompasses spatial opportunities and a strategic framework for future offshore wind developments within sustainable and suitable locations that will help deliver the wider United Kingdom (UK) and Scottish Government Net Zero targets.</p> <p>The 'IN' component of INTOG consists of small-scale innovative projects of 100 Megawatts (MW) or less. The aim of the 'TOG' component is to supplying renewable electricity directly to oil and gas infrastructure. The Culzean Floating Wind Pilot Project falls under the TOG component of INTOG.</p>
<b>Inter-related effects</b>	Assessment of the potential effects of multiple impacts affecting a single receptor, either within a single Project stage or across multiple Project stages.
<b>Marine Licence Application ('the Application')</b>	A Marine Licence is granted under the Marine and Coastal Access Act 2009 for projects between 12-200 Nautical Miles (nm) from shore, or the Marine (Scotland) Act 2010 for projects between Mean High-Water Springs (MHWS) out to 12 nm

TERMINOLOGY	DESCRIPTION
	from shore. The Application includes HRA-supporting documentation (where required), an application letter, Marine Licence application form and this Environmental Impact Assessment Report (EIAR).
<b>Maximum Design Scenario (MDS)</b>	The maximum range of design scenarios for all infrastructure.
<b>Net Zero</b>	Refers to a government commitment to ensure the UK reduces its greenhouse gas emissions by 100% from 1990 levels by 2050 and in Scotland, the same target is set for 2045. If met, this would mean the amount of greenhouse gas emissions produced by the UK would be equal to or less than the emissions removed by the UK from the environment.
<b>Ocean quahog</b>	Large bivalve mollusc that lives buried in sandy seabeds.
<b>Project Design Envelope (PDE)</b>	The maximum range of design parameters of all infrastructure assessed as part of the EIA.
<b>Project Effects</b>	Also known as baseline effects and include assessment of the direct and indirect effects from Project construction (including pre-construction), operation and maintenance and decommissioning stages.
<b>Receptor</b>	Any environmental or social aspect of the Project which may be impacted by Project activities.
<b>Study Area</b>	Receptor specific area used to characterise the baseline.
<b>Project Area</b>	The extent of the immediate area surrounding the floating Wind Turbine Generator (WTG) and cable route as characterised by the extent of the seabed environmental and habitat surveys. Also referred to as the Survey Area where specifically relating to survey activities.
<b>Survey Area</b>	The area surveyed during site-specific surveys. Also referred to as the Project Area.
<b>Floating Wind Turbine Generator (WTG)</b>	Device that converts the kinetic energy of wind into electrical energy. Can be functionally divided into four parts: wind turbine, tower and transition piece, floating foundation, and mooring system.

## ACRONYMS AND ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION
AD	Air Defence
AIS	Automatic Information Systems
ALARP	As Low As Reasonably Practicable
ATC	Air Traffic Control
CNS	Central North Sea
CPF	Central Processing Facility Platform
DAS	Digital Aerial Surveys
E&P	Exploration and Production
eDNA	Environmental Deoxyribonucleic Acid
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
FSA	Formal Safety Assessment
FSO	Floating Storage and Offloading
GHG	Greenhouse Gas
HCA	Helideck Certification Agency
HRA	Habitats Regulations Appraisal
ICES	International Council for the Exploration of the Sea
IEMA	Institute of Environmental Management and Assessment
INTOG	Innovation and Targeted Oil and Gas
IPF	Initial Plan Framework
LSE	Likely Significant Effect
km	kilometres
MD-LOT	Marine Directorate – Licensing Operations Team
MDS	Maximum Design Scenario
MoD	Ministry of Defence
MW	Megawatts
NID	Nature Inclusive Design
nm	Nautical Miles
NSTA	North Sea Transition Authority
NTS	Non-Technical Summary
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic

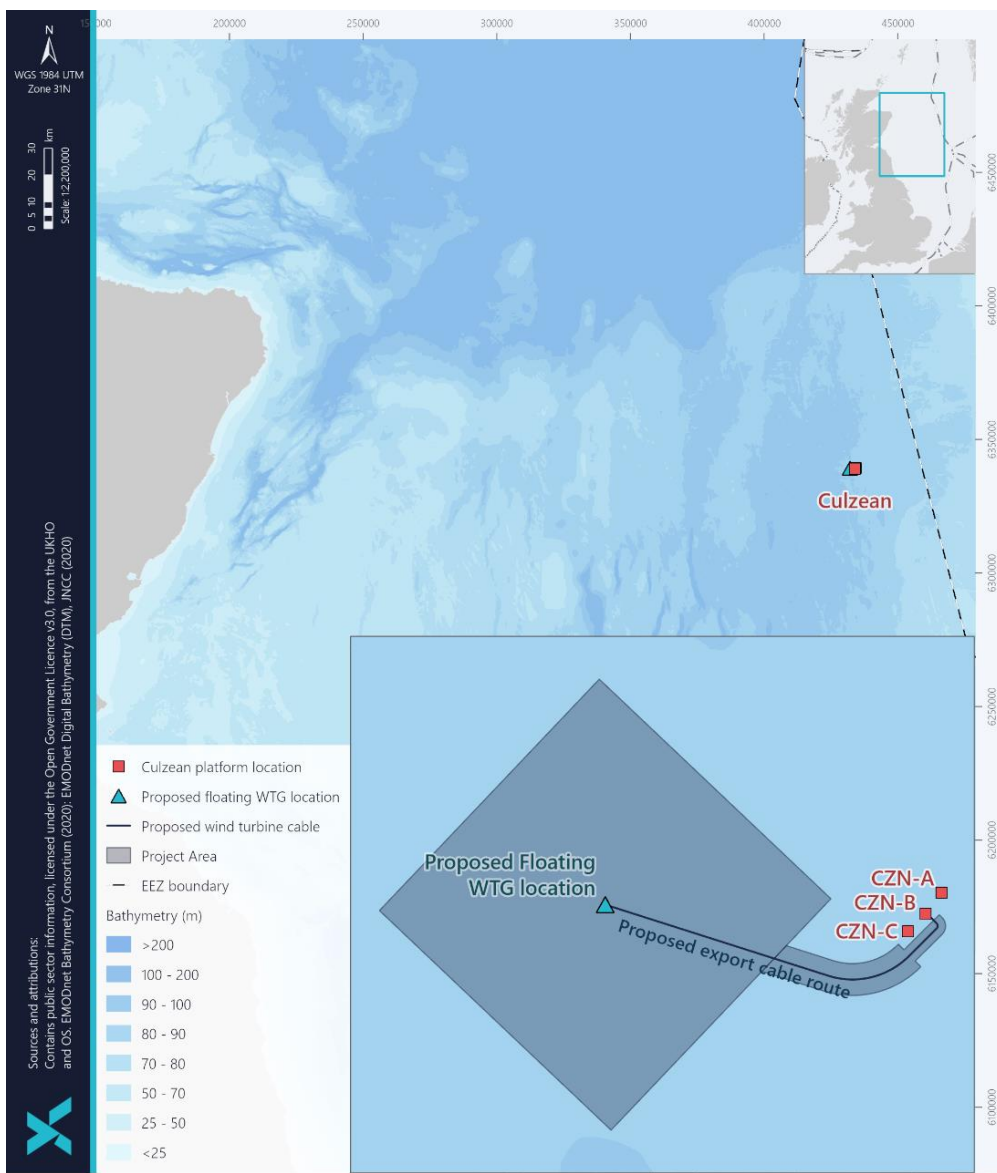
ACRONYM/ ABBREVIATION	DEFINITION
PDE	Project Design Envelope
PMF	Priority Marine Features
R&D	Research and Development
RIAA	Report to Inform Appropriate Assessment
SAR	Search and Rescue
SMP	Sectoral Marine Plan
SSC	Suspended Sediment Concentration
TEPNSUK	TotalEnergies Exploration and Production North Sea UK Limited
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
WTG	Wind Turbine Generator
ZoI	Zone of Influence



# 1 INTRODUCTION

TotalEnergies Exploration and Production North Sea UK Limited (TEPNSUK) is applying for a Marine Licence (the Application') under the Marine and Coastal Access Act 2009 for the construction and operation of the Culzean Floating Offshore Wind Pilot Project ('the Project') in the Central North Sea (CNS). The Project will install one floating Wind Turbine Generator (WTG) with a generating capacity of 3 Megawatts (MW), to provide a basis for the electrification of TEPNSUK's portfolio of offshore oil and gas assets across the world. This will drive TEPNSUK's commitment to support the growth of cleaner energy production and to meet global net zero targets.

The Project will supply renewable energy to the Culzean development; a gas condensate oil and gas complex located 222 kilometres (km) east of Aberdeen in the United Kingdom Continental Shelf (UKCS) Block 22/25a (Figure 1).



The 'Project Area' is referred to throughout this Non-Technical Summary (NTS) and the Environmental Impact Assessment Report (EIAR) and can be defined as the immediate area surrounding the floating WTG and cable route and is also shown in Figure 1. The area has been characterised by the extent of the seabed environmental and habitat surveys undertaken to inform the impact assessment. The Project does not require a connection to shore and will be entirely within the United Kingdom (UK) offshore region.

Figure 1 Location of the Project





## 1.1 Environmental Impact Assessment Report

This NTS aims to summarise the findings of the EIAR, which has been prepared to support the Application for the Project. The structure of the EIAR is provided in Figure 2. Full technical details of the impact assessment process and the assessments summarised within this NTS can be found within the EIAR and associated appendices.

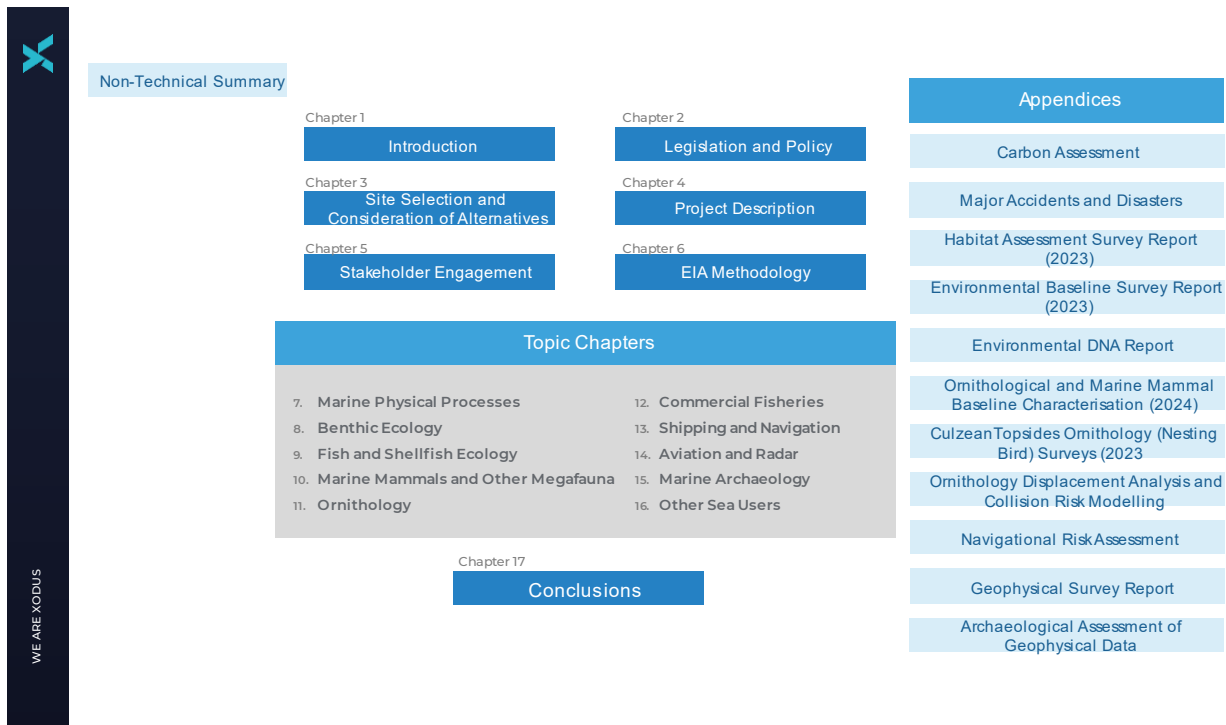


Figure 2 Structure of the EIAR

## 1.2 Habitats Regulations Appraisal

There is also a requirement to consider the potential impacts of plans and projects on European protected sites, under The Habitats Regulations. The Project has therefore also undertaken a Habitats Regulations Appraisal (HRA) screening exercise to consider the impact on the European protected sites and their conservation objectives around the protection of several species of birds, marine mammals and fish, and offshore protected Annex I seabed habitats. The information provided by this exercise enabled HRA Screening with respect to the Likely Significant Effects (LSE) the Project may have on European sites and the species and habitats protected therein. European sites were screened out where no potential for LSE is predicted from the Project on a European Site. Where it was not possible to conclude no potential for LSE from the Project, a subsequent assessment was undertaken to provide a more detailed assessment of adverse effects in the Report to Inform Appropriate Assessment (RIAA). The RIAA concludes that there are no adverse effects on the site integrity of the SPAs screened into this assessment. This combined HRA Screening and RIAA Report has been submitted along with the Marine Licence Application to the Competent Authority.



## 2 BACKGROUND AND PROJECT DESCRIPTION

### 2.1 Project Background

The Scottish Government is in the process of developing a Sectoral Marine Plan (SMP) for Innovation and Targeted Oil and Gas (INTOG), which outlines a strategic framework for future offshore wind deployment in sustainable and suitable locations, that will help deliver smaller projects to meet wider net zero commitments. To comply with the

spatial parameters set out at the leasing application stage, all INTOG projects were required to be within designated areas based on the framework requirements. The 'IN' component of INTOG consists of small-scale innovative projects of 100 MW or less. The aim of the 'TOG' component is to supply renewable electricity directly to oil and gas infrastructure. This Project falls under the TOG component of INTOG and is located within TOG area E-a as shown in Figure 3.

This planning process is specifically targeting oil and gas decarbonisation. It will provide unique opportunities to assist the oil and gas sector in meeting the net zero commitments of the North Sea Transition Authority (NSTA); which aims to encourage emissions reductions from both existing and new oil and gas developments.

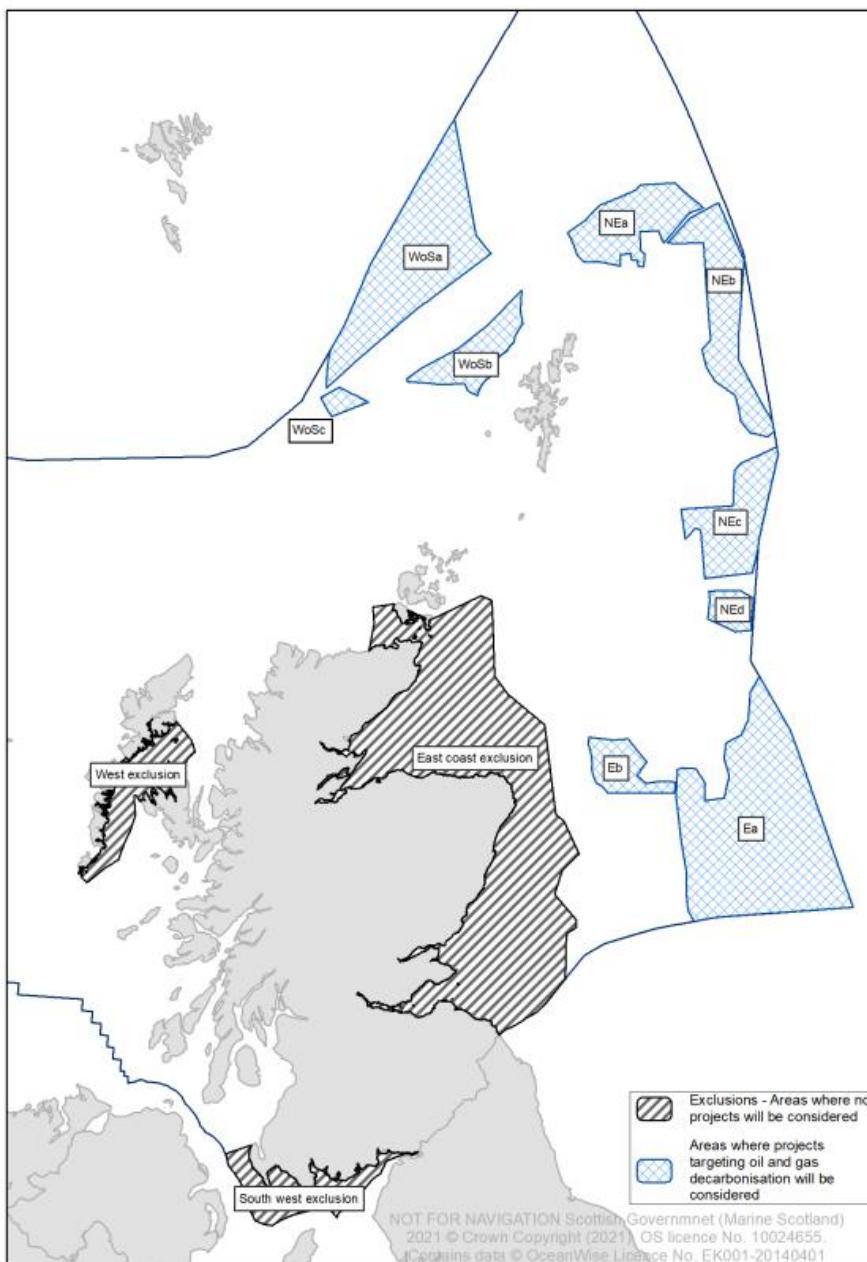


Figure 3 Target Oil and Gas Areas Decarbonisation options and Exclusions



## 2.2 Project Need and Benefit

The need for the Project and benefits of the Project are centred around two key areas:

- Climate change and emissions reduction:
  - There are various pieces of climate change and renewable energy legislation and policy that drive the need for the Project at an international and national level. For example, the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019 commits the Scottish Government to reaching net zero emissions of all greenhouse gases by 2045, five years ahead of the rest of the UK.
- Oil and Gas Decarbonisation:
  - The Project will test a new WTG design for dedicated use in for Oil and Gas asset power generation. This will provide the wider TotalEnergies portfolio with a ‘tried and tested’ route to establish electrification and will contribute to meeting various climate change and net zero emissions targets.

In parallel to this, the Project will also implement a scientific Research and Development (R&D) Programme. This will provide knowledge and experience on offshore wind turbine construction, integration, installation, operations and maintenance and vital information to inform Nature Inclusive Design (NID) initiatives and the impacts on biodiversity. An overview of the research initiatives to be included in the Programme is provided in Figure 4. These include:

- Undertaking Environmental DNA (eDNA) based monitoring which looks at DNA within samples collected at the Project Area to understand key species which may be present;
- Monitoring nearby bird and marine mammal activity;
- Monitoring water quality; and
- Monitoring noise in the water column.

## 2.3 Consideration of Alternatives

Multiple sites and alternatives have been considered throughout the development of the Project. The ‘do nothing’ option was discarded for several reasons, including the requirement to utilise clean energy fuel. Four initial sites were investigated, two of which in Norwegian waters were immediately discounted. The remaining options were the Alwyn North and the Culzean platforms in the North Sea. The Alwyn lifespan was deemed unsuitable for this Project. Ultimately Culzean was found to be the best option for the Project as the most advanced digital facility and the final location was based on a study for the tie-in of the Project to the Culzean Field which considered key factors:

- Environmental impact of the potential Project seabed footprint;
- Logistics, in particular helicopter approaches and tanker vessel operations,
- Future seismic survey(s) requirements and future development(s);
- Platform approach (crossings); and
- Potential collision risk with the Culzean platform (e.g. drift of the floating WTG in case of a broken anchor).

Detailed engineering work and discussions have been ongoing throughout the Environmental Impact Assessment (EIA) process and environmental, geophysical and geotechnical surveys were undertaken in 2023 to further help refine the engineering requirements and define the detailed design.

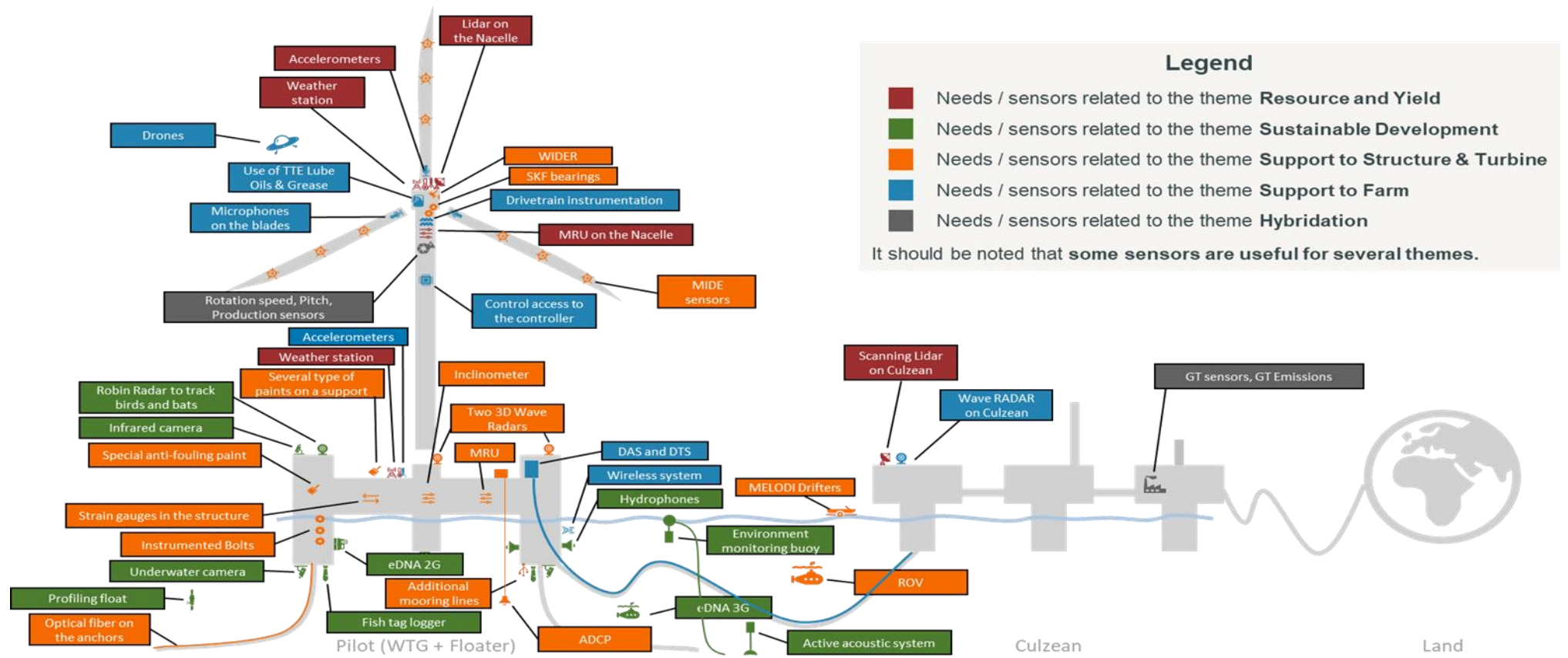


Figure 4 The Culzean R&D Programme

## 2.4 The Project

The floating WTG will be located approximately 2 km west of the Culzean facilities with an approximately 2.5 km long export cable connected to the Culzean Central Processing Platform (CPF), as shown in Figure 1. The Project consists of the following key components:

- One WTG;
- One floating substructure;
- Up to six mooring lines;
- Up to six anchors;
- One approximately 2.5 km long export cable; and
- Associated seabed scour and cable protection (if required).

### 2.4.1 Construction and Installation

It is anticipated that the pre-construction and construction of the Project will take place in Autumn 2025 and will take up to a month.

The mooring system and anchors will be pre-installed prior to the floating WTG arriving at the Project Area. The WTG will be installed on the substructure (Figure 5) at the quayside and will be transported by sea from a harbour based on the east coast of Scotland. Upon the arrival of the floating assembly at the Project Area, the substructure will be manoeuvred into the correct location using tugboats whilst the mooring lines are connected to the floating substructure.

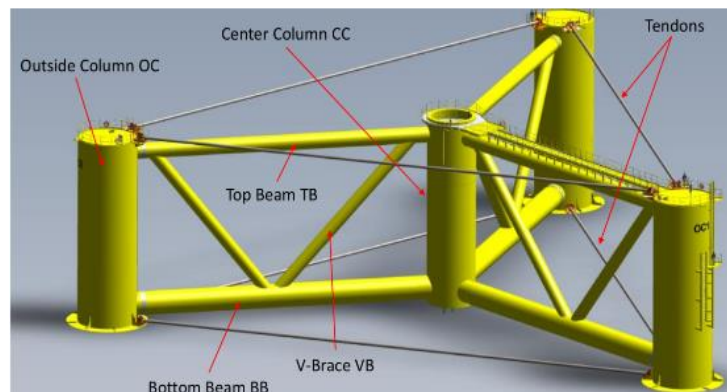


Figure 5 Floating substructure design.

Installation of the export cable will take place once the floating substructure and WTG have been installed. The cable will be pulled into the floating structure, secured and deployed into the water column in a 'dynamic cable' arrangement (Figure 6) with buoyancy and weights placed where required. The second end of the cable will then be deployed and pulled and secured at the Culzean Platform. The cable infrastructure will be laid and buried where possible, and where this is not possible, cable protection (rock protection) will be used.

To minimise disruption to navigation by users of the sea, safety zones are expected to be established around areas that have relevant activities taking place at a given time. The floating WTG is being treated as a supplementary unit under the Health and Safety Executive (HSE) Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995 and as such, TEPNSUK are applying for a 500 m safety exclusion zone centred around the WTG for the duration of installation, operations and maintenance activities.

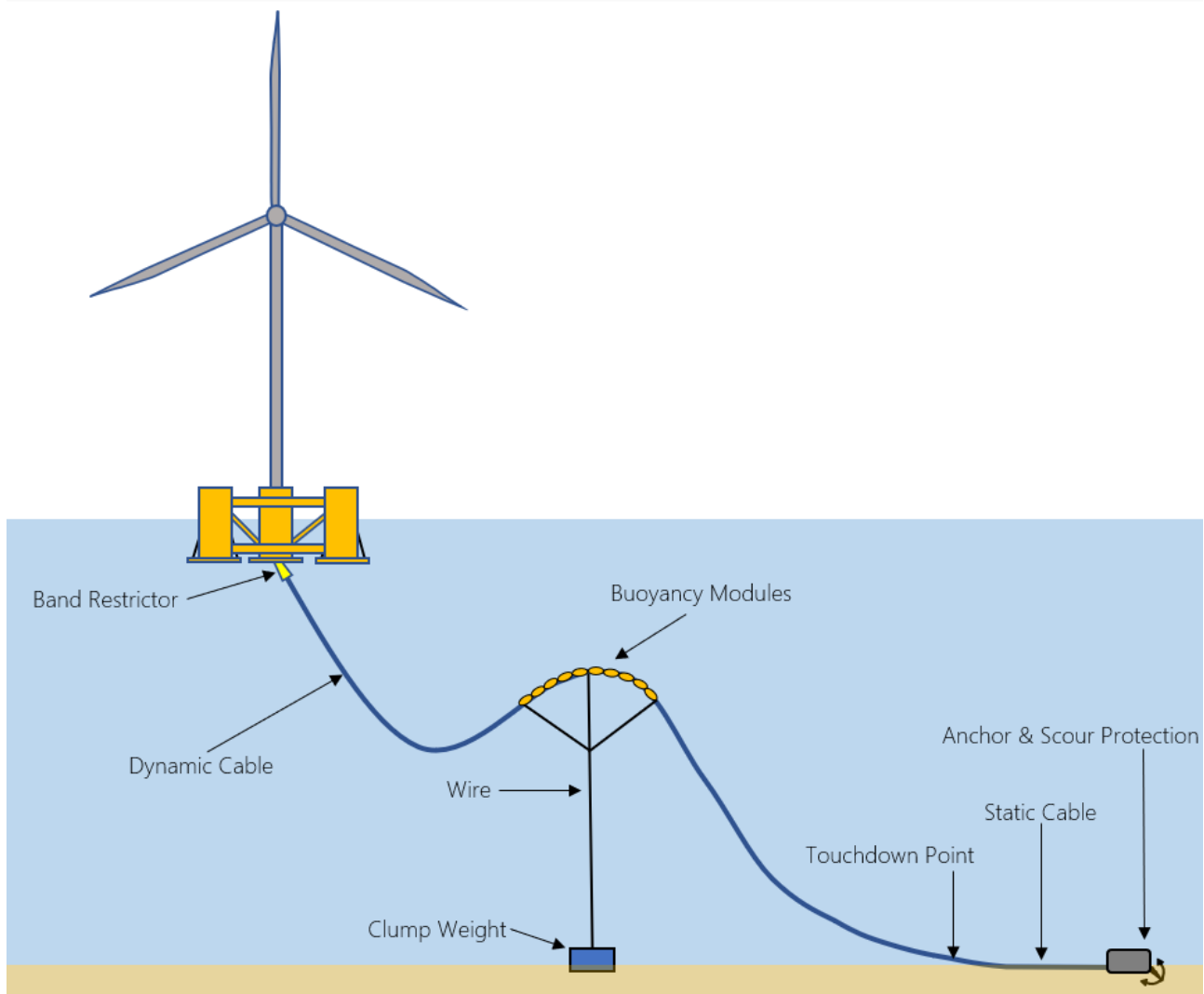


Figure 6 Example dynamic cable arrangement

## 2.4.2 Operation and maintenance

Once commissioned, the Project is expected to remain in operation for up to 10 years. During the operational period, the following maintenance may be required:

- Routine maintenance: activities that are carried out on a regular basis based on manufacturer recommendations and good industry practice, for example inspections, testing investigation of minor faults;
- Unscheduled maintenance: activities that may be required to carry out repairs or remedial works to return the asset to serviceable condition possibly requiring tow back to shore; and
- Major component replacement / repair: Faults that could trigger repairs requiring large component replacements and extensive remedial works, likely requiring tow back to shore.

## 2.4.3 Decommissioning

The current requirement for decommissioning is the return to a clear seabed, whilst recognising that this will be subject to technical and environmental assessments and consultation closer to the time of decommissioning. Decommissioning activities will comply with all relevant legislation and best practice at the time of decommissioning.

A Decommissioning Programme will be prepared based on industry best practices and submitted to Scottish Ministers for approval ahead of construction. It will be reviewed and updated every five years throughout the offshore Project's life cycle.

## 2.5 Consultation

TEPNSUK have undertaken a range of stakeholder engagement since the early stages of the Project. The key stakeholder engagement and consultation activities are shown in Figure 7. Throughout the Scoping and EIA process, stakeholder concerns have been key to refining the Project design and have been included within TEPNSUK's mitigation approaches.

### Pre-application advice:

- TEPNSUK began engaging to discuss the proposed licensing route for the Project through a series of meetings in Summer 2022 with the Scottish Ministers and NatureScot.

### EIA Scoping:

- A Scoping Report was submitted to the Scottish Ministers, on 14<sup>th</sup> April 2023, who then circulated the report to relevant consultees. The Scoping Opinion was received on 20<sup>th</sup> July 2023 which detailed a summary of the key issues raised by Scottish Ministers and consultees on the proposed scope of the EIA. This enabled TEPNSUK to refine and inform the EIA approach and take into account any stakeholder concerns.

### Pre-Application Consultation with statutory and non-statutory consultees:

- Consultation has occurred throughout the EIA and HRA process in the form of topic-specific meetings and dedicated workshops to discuss Commercial Fisheries, Shipping and Navigation and Ornithology. Feedback gained during these meetings has been integral to the preparation of the assessments presented within the EIAR and HRA.

Figure 7 Key stakeholder engagement and consultation activities

## 3 EIA METHODOLOGY

The principal aim of an EIA is to ensure that the authority granting consent (the 'regulatory authority') for a particular project makes its decision in full knowledge of any potential significant effects on the environment. EIA is a means of drawing together, in a systematic way, an assessment of a project's potential environmental impacts (e.g. underwater noise) and the resultant effects on environmental receptors (e.g. disturbance to fish and marine mammals). This helps to ensure that the significance of the predicted effects, and the scope for reducing any negative effects, is properly understood by the public and the regulatory authority before it makes its decision.

### 3.1 EIA process

The key steps are as follows and are outlined in Figure 8:

- **Baseline characterisation** to describe the relevant characteristics of the receiving environment.
- **Description of the Project Design Envelope (PDE)** to set out the range of project design parameters used to determine the worst-case scenario impact that is assessed.
- **Assessment of potential effects** to identify and assess potentially significant effects that could arise from the Project, including both cumulative and inter-related effects.
- **Identification of embedded mitigation** - measures that are built into the Project to reduce impacts and resultant effects;
- **Identification of secondary mitigation** (where required) - additional measures required for the Project to further reduce environmental effects to 'not significant' levels.
- **Assessment of residual effects** once all proposed embedded and additional mitigations are considered.
- **Identification of relevant monitoring studies** to monitor the predicted impacts of the Project as appropriate for each receptor.
- **Publication of EIAR and NTS** and subsequent consultation with Marine Directorate – Licensing Operations Team (MD-LOT), their statutory consultees, and other relevant stakeholders and the public on the findings of the EIA.



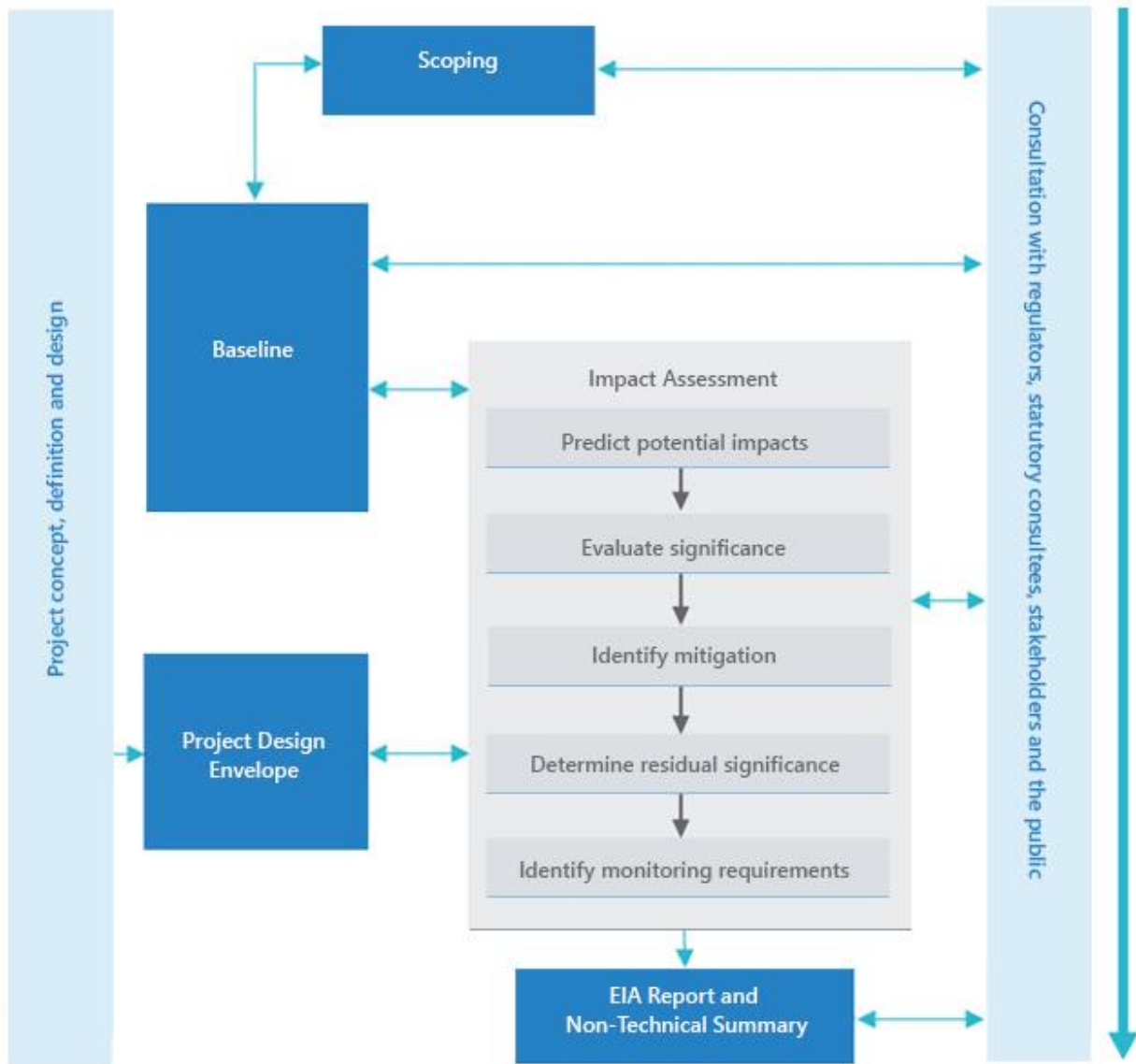


Figure 8 The EIA process

## 3.2 Assessing impact significance

The assessment of how significant an impact on the environment and society can be is very subjective. However, to make this assessment as objective as possible and consistent across different topics, a defined methodology is followed, with some variation in the process between different topics and as required by receptor-specific guidance.

For all EIA topics assessed, the potential for an impact was assessed based on 'worst-case' parameters contained within the PDE. These worst-case parameters were discussed with consultees throughout the EIA process where appropriate. These parameters differ between topics e.g., the Project design with the greatest potential to impact birds may not be the same as the Project design with the greatest potential to impact marine mammals (Figure 9).

For each Project impact, the assessment identifies a receptor's sensitivity to that effect and implements a systematic approach to understand the consequence and significance of the effect associated with the impact under consideration. The process considers the following:

- Identification of receptor and impact;
- The **sensitivity** of a receptor, taking into account their tolerance to change, recoverability, adaptability and value;
- The **magnitude** of the impact, accounting for the spatial extent, duration, frequency, intensity and likelihood of the impact; and
- The **consequence** of the effect on the receptor, considering both the sensitivity of receptor and magnitude of impact.



Figure 9 Marine mammal receptors

## 4 IMPACT ASSESSMENT

Following receipt of the Scoping Opinion, Water and Sediment Quality, Seascape and Landscape, Air Quality and Airborne Noise, and Socioeconomics were scoped out of further consideration in the EIA. The following sections of this NTS present the results of the topic specific assessments that have been scoped in for assessment following receipt of the Scoping Opinion.

### 4.1 Physical Environment

#### 4.1.1 Marine Physical Processes

The Study Area specific to Marine Physical Processes where impacts are most likely, has been defined by a 5 km radius around the WTG. The bedrock geology comprises multiple geological units within the shallow geology, largely comprising Quaternary geological deposits varying presence and thicknesses across the Project Area. Above this, surface sediments are mostly classified as muddy sand. The completed geophysical surveys identified the presence of infrequent boulders across the Project Area, which were all present on the surface, and none detected below the seabed surface. The seabed is relatively featureless, although evidence of rippling on the seabed indicates bottom currents. The location of the Project offshore means that there is no interaction with the coast. Additionally, there are no protected sites designated for geological or geomorphology features within the Study Area.

Potential impacts associated with all phases of the Project, were identified. These included:

- Loss or alteration of seabed morphology;
- Increase in suspended sediments; and
- Introduction of scour.

Due to the small-scale of the Project and with embedded mitigation measures in place to lessen the impact on the seabed such as the application of scour protection, these impacts will result in effects of negligible and not significant consequence. Any potential impacts to Marine Physical Process properties from the Project will be highly localised and temporary, as such, transboundary impacts were scoped out of the EIA. The Study Area does not overlap with any other projects and therefore no cumulative effects will occur. Additionally, no significant inter-related effects were established on other receptors. Given these conclusions, no additional mitigation is required, as no significant effects were identified.

### 4.2 Biological Environment

#### 4.2.1 Benthic Ecology

Benthic Ecology encompasses the species, habitats and communities located on the seabed within the Study Area, which is defined by a 5 km radius around the WTG. The main benthic habitat classification type present in the Study Area is 'Deep Circalittoral Sand.' The primary sensitive receptors identified in the Study Area include:

- '*Seapens and burrowing megafauna*' habitat (Figure 10); and

- Ocean quahog species.

Both are designated under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) and are Scottish Priority Marine Features (PMFs). There are no protected sites designated for benthic features within 18 km of the WTG.



Figure 10 OSPAR threatened and declining habitat 'Seapens and burrowing megafauna'

Several potential impacts on Benthic Ecology associated with all phases of the Project, were identified. These included:

- Temporary habitat disturbance;
- Temporary increase in suspended sediment and sediment deposition;
- Long-term loss and/or damage to benthic habitats and species;
- Disturbance of contaminated sediments;
- Colonisation of hard structures; and
- Removal of artificial hard structures during decommissioning.

Due to the small-scale of the Project and with embedded mitigation measures in place, the assessment concluded that these impacts will not result in significant effects on benthic ecology receptors and as such, no additional mitigation is required. Any potential impacts from the Project will be localised and temporary, as such transboundary impacts were scoped out of the EIA. Additionally, no significant cumulative or inter-related effects were identified on Benthic Ecology receptors.

Effects on Annex I Benthic Habitats as qualifying features of European Sites protected under the Habitat Regulations have also been considered within a separate Habitats Regulations Appraisal (HRA) Report, submitted alongside the Application. The HRA Screening process, undertaken in consultation with NatureScot and MD-LOT, concluded there was no potential for LSE on these features and therefore no further assessment was required under the HRA process.

### 4.3 Fish and Shellfish Ecology

Fish and Shellfish found within the Study Area (defined as the International Council for the Exploration of the Sea (ICES) Rectangle 43F1) include marine finfish (pelagic (Figure 11) and demersal fish), shellfish and elasmobranchs (e.g. sharks, rays and skates).

Potential spawning grounds for cod, lemon sole, mackerel, Norway lobster, Norway pout, and sandeel overlap the Project Area. Additionally, potential nursery grounds for cod, anglerfish, blue whiting, ling, herring, mackerel plaice, sandeel and Spurdog were identified in the Project Area. The habitats surveys undertaken in the Project Area identified five species and two families of conservation importance including evidence of a Norway lobster burrow and a possible sandy ray. eDNA surveys also identified large reads of the cod family, including Norway pout and haddock, and of the ling fish family.

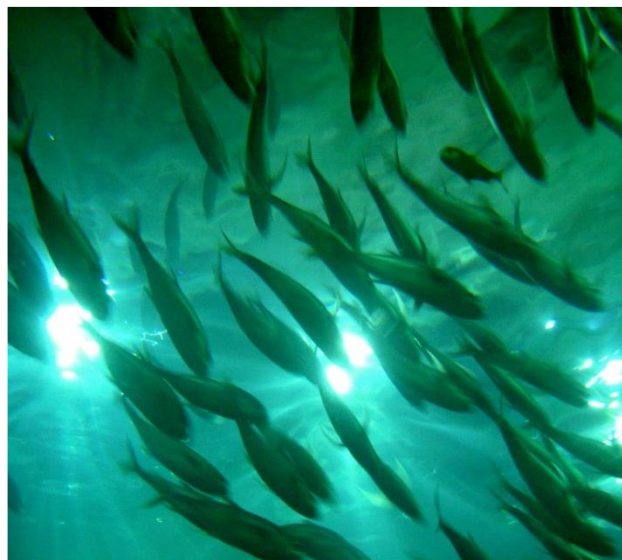


Figure 11 Pelagic fish shoal

Of the species identified within the Study Area, two are listed on the OSPAR List of Threatened and/or Declining Species and Habitats: cod and spurdog. Ten species are listed as Scottish PMFs: these are sandeel, cod, whiting, herring, Norway pout, blue whiting, ling, anglerfish, mackerel and Spurdog. Additionally, one species is listed on the International Union for Conservation of Nature (IUCN) Red List as Threatened, the sandy ray.

Potential impacts on Fish and Shellfish Ecology, all phases of the Project, were identified. These included:

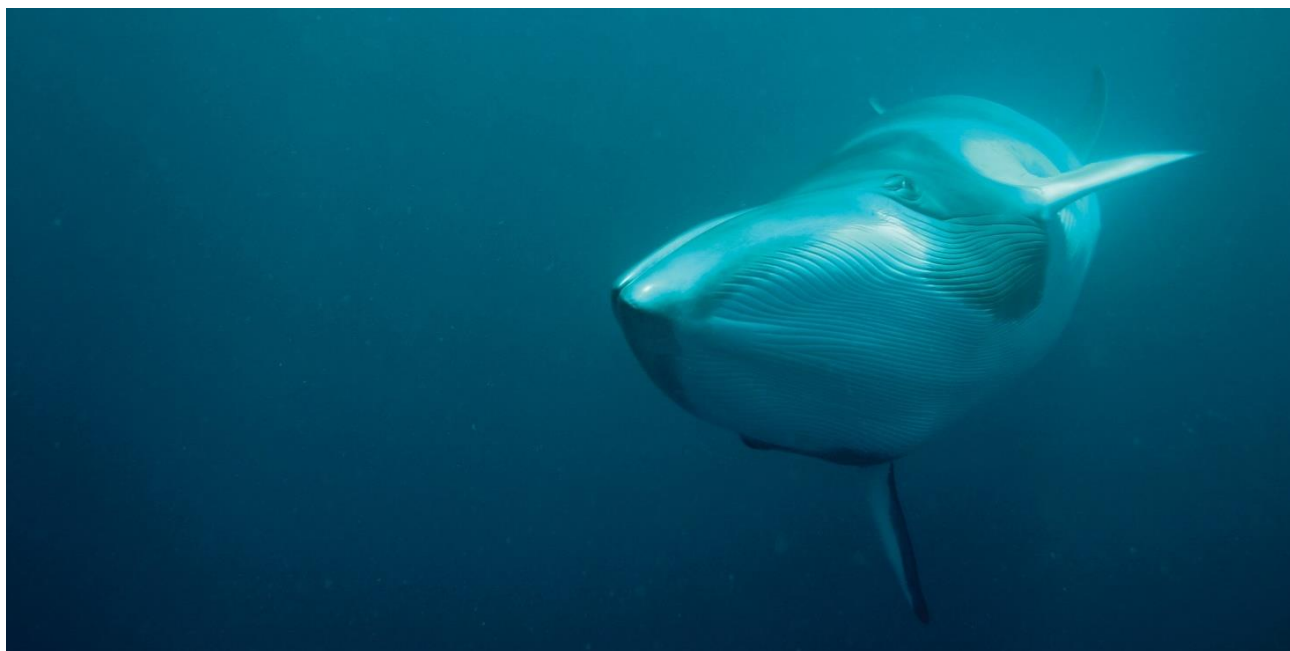
- Disturbance or damage to sensitive species due to underwater sound;
- Habitat loss or disturbance during the installation of the export cable, mooring lines and the anchors;
- Temporary increases in Suspended Sediment Concentration (SSC) and potential sedimentation and smothering of fish and shellfish; and
- Impact to habitats or species as a result of pollution or accidental discharge.

Due to the small scale of the Project, the distance from the coast and with embedded mitigation measures in place to lessen the impact on the seabed, none of these impacts are deemed to result in significant effects and therefore no secondary mitigation is required. Any potential disturbance to Fish and Shellfish Ecology resulting from the Project would be highly localised and temporary, as such, transboundary impacts were scoped out of the EIA. Overall, it is concluded that there will be no significant inter-related or cumulative effects on Fish and Shellfish Ecology receptors.

An assessment under the Habitats Regulations of effects on European Sites designated for Diadromous Fish Features has also been considered within the Project's HRA Report. The HRA Screening process, undertaken in consultation with NatureScot and MD-LOT, concluded there was no potential for LSE on European Sites designated for these features and therefore, no further assessment was required under the HRA process.

## 4.4 Marine mammals and other megafauna

Marine Mammals and Other Megafauna refers to several species of cetaceans and pinnipeds occurring within the Study Area and basking shark, considered as a megafauna species. This includes harbour porpoise, bottlenose dolphin, Atlantic-white sided dolphin, minke whale (Figure 12) and two species of seals: grey seal and harbour seal. All species considered in the assessment are of conservation importance and are protected under UK legislation.



*Figure 12 Minke whale*

Potential impacts on Marine Mammals and Other Megafauna, associated with all Project phases, were identified:

- Noise-related impacts to marine mammals and other megafauna associated with construction and decommissioning noise, including the risk of injury and disturbance/displacement.

Since the initial planning and Scoping stage, anchor installation by pile driving has been removed from the PDE. Therefore, the potential activities resulting in underwater noise for the Project are limited to vessel activities, cable laying, and pre-construction surveys utilising positioning equipment. Due to the low levels of noise associated with these activities, and with the proposed mitigation measures in place, impacts are assessed as not resulting in significant effects, and as such, no secondary mitigation is required. Overall, it is concluded that there will be no significant inter-related, cumulative or transboundary effects on Marine Mammal and Other Megafauna receptors.

An assessment under the Habitats Regulations of effects on European Sites designated for Marine Mammals has also been considered within the Project's HRA Report. The HRA Screening process, undertaken in consultation with NatureScot and MD-LOT, concluded there was no potential for LSE on European Sites designated for these features and therefore, no further assessment was required under the HRA process.

## 4.4.1 Ornithology

The seas around Scotland support internationally important numbers of breeding and overwintering seabirds. Digital Aerial Surveys (DAS) showed that the Project Area is regularly used by seven species: fulmar, gannet, kittiwake (Figure 13), great black-backed gull, herring gull, common guillemot and razorbill. In the breeding season most seabirds in the Project Area are likely to be foraging birds from breeding colonies in eastern Scotland and for some species, possibly from north-east England also. These species occurred at very low or low densities, compared to densities reported from coastal waters off eastern Scotland. Outside the breeding season common guillemot and razorbill were sometimes present in reasonably high densities. In the breeding season most seabirds using the vicinity of the project site are likely to be foraging birds from breeding colonies in eastern Scotland and for some species, likely from north-east England.



Figure 13 Kittiwake

The potential impacts identified for Ornithological receptors included:

- Disturbance and displacement during construction and decommissioning (vessels, noise and lighting);
- Disturbance and displacement during operation and maintenance (WTG, vessels, noise and lighting); and,
- Collision risk to flying birds during WTG operation.

Kittiwake, common guillemot and razorbill are vulnerable to disturbance and displacement. Modelling undertaken showed no additional mortality due to displacement of kittiwake and razorbill in the breeding or non-breeding seasons, or of guillemot during the breeding season. It was modelled that on average there could be up to five guillemot deaths during the non-breeding season per year, however, given their winter population size is of more than a million birds, no significant effects from disturbance or displacement were established. Collision risk modelling was also undertaken for the four collision-vulnerable species including gannet, kittiwake, great black-backed gull and herring gull. The modelling predicted that on average the Project would result in well below one fatal collision per year for these species. As such, no significant effects from collision risk were established.

Given the scale of the Project and the distance to the coastline, this greatly reduces the potential for impacts on seabirds compared to larger scale offshore wind developments closer to the coast. The results of the modelling show no potential for the Project to materially contribute to a wider regional cumulative impact on any ornithology receptors. It is therefore concluded that cumulative effects are not significant. Additionally, there will be no significant inter-related or transboundary effects related to the Project, and as such, no secondary mitigation is required.

Effects on Ornithological Features as qualifying features of European Sites have also been considered by the HRA process. The HRA screening, undertaken in consultation with NatureScot and MD-LOT, concluded there may be potential for LSE for kittiwake during the breeding season and therefore further assessment has been undertaken as part of the RIAA. The RIAA concludes no adverse effect on site integrity for all European Sites with breeding kittiwake features considered either from the Project alone or in-combination with other Plans or Projects.

## 4.5 Human Environment

### 4.5.1 Commercial Fisheries

Commercial Fisheries is defined as an activity by licensed fishing vessels undertaken for legitimate capture and sale of finfish and shellfish in the marine environment.

Automatic Information Systems (AIS) data collected from vessels at sea, indicated very low fishing vessel activity within the Study Area. The Study Area for commercial fisheries lies within International Council for the Exploration of the Sea (ICES) Rectangle 43F1, located approximately 222 km east off the coast of Scotland. The key fleets identified were demersal (seabed) trawlers targeting Norway lobster.

Several potential impacts on Commercial Fisheries, associated with the construction / installation, operational and maintenance, and decommissioning phases of the Project, were identified. These included:

- Temporary loss of access to fishing grounds due to the presence of vessels and safety zones;
- Temporary displacement of fishing activity into other areas;
- Interference with fishing activity as a result of increased vessel traffic; and
- Safety issues for fishing gear interactions.

Due to the small scale of the Project and with embedded mitigation measures in place, such as procedures for dropped objects, cable burial, notice to mariners and use of a company Fisheries Liaison Officer (FLO), potential effects are not deemed to be significant and as such, no secondary mitigation is required. Overall, it is concluded that there will be no significant inter-related or cumulative effects on Commercial Fisheries receptors.



## 4.5.2 Shipping and Navigation

Key navigational features in the area include various oil and gas fields and associated infrastructure (including 500 m safety zones). From the 12 months of vessel traffic survey data recorded in 2022/23 within the Study Area, there was an average of eight vessels per day. The main vessel type within the Study Area during the survey period were oil and gas vessels (89%), with most of the oil and gas vessels visiting the Culzean platform complex (Figure 14).



Figure 14 The Culzean platform complex

Eleven main commercial routes were identified from the vessel traffic survey data. The highest use main commercial routes were between Aberdeen (UK) and various oil and gas fields such as Pierce, Culzean, Lomond, and Shearwater. The route between Aberdeen (UK) and the Pierce Oil Field recorded approximately two to three vessels per week, with the routes between Aberdeen (UK) and Culzean, Lomond, and Shearwater recording two vessels per week each.

A number of potential impacts on Shipping and Navigation associated with the construction, operation and maintenance, and decommissioning phases of the Project, were identified. These included:

- Vessel displacement;
- Third-party vessel collision risk;
- Third party to Project vessel collision risk;
- Allision risk, loss of station;
- Loss of station;
- Vessel interaction with export cable and mooring lines; and
- Reduction of emergency response capability.

All impacts assessed were determined to be As Low As Reasonably Practicable (ALARP) under the Formal Safety Assessment (FSA) and were broadly acceptable or tolerable with the embedded mitigation and therefore not significant. As such, no secondary mitigation is required. Overall, it is concluded that there will be no significant inter-related, cumulative or transboundary effects on Shipping and Navigation receptors related to the Project.

### 4.5.3 Aviation

In aviation terms, the Project Area is situated in a relatively uncomplicated piece of airspace. The Project is outside the safeguarding area of any civil airports and outside the coverage of any civil Air Traffic Control (ATC) radars, military ATC/Air Defence (AD) radars or meteorological radars. The nearest Helicopter Main Route is located approximately 2 nm (3.7 km) north of the proposed WTG's location however, helicopter operations on this route will not be affected by its presence. The Project is just outside the 9 nm consultation zones of any offshore helicopter installations (Figure 15) operated by third parties, although there are several helicopter installations nearby; the Elgin, Shearwater and Franklin platforms, located just outside 9 nm (17 km) to the south and the Lomond platform located approximately 12 nm (22 km) to the northeast. As no offshore helicopter installations are within 9 nm of the proposed WTG, helicopter operations into offshore installations are not expected to be affected by the Project.



Figure 15 Helicopter taking off from an offshore installation

The nearest offshore helicopter installations to the proposed WTG and within the 9 nm consultation zone, are the TEPNSUK-operated Culzean platform complex and the Ailsa Floating Storage and Offloading (FSO) facility, which are 2 km and 5.5 km to the east of the WTG site, respectively. During the site selection process, interference with existing flight paths was highlighted as a safety differentiator for the Project location but was not deemed to present an obstruction or a safety risk to ongoing flights.

The following impacts were identified as requiring assessment in the EIAR:

- Potential impact on military low flying and UK Search and Rescue (SAR) helicopter operations due to presence of obstacles (WTG) during construction and decommissioning; and
- Potential impact on military low flying and UK SAR helicopter operations due to presence of obstacles (WTG) during operation.

The Project is not expected to affect any of the aviation receptors assessed with the exception that the WTG itself will create obstacles to military aircraft operating at low level and to SAR helicopters operating within the vicinity of the Project in the event of a rescue mission. However, any potential impact will be alleviated through embedded mitigation measures including engagement with the Helideck Certification Agency (HCA), Ministry of Defence (MoD) and Maritime and Coastguard Agency on the development of the specific WTG and export cable.

With embedded mitigation measures in place to lessen the impact Aviation, any potential effects will be of negligible consequence and not significant. No secondary mitigation is required as no significant effects are predicted. Overall, it is concluded that there will be no significant inter-related, cumulative or transboundary effects on Aviation receptors related to the Project.

## 4.5.4 Marine Archaeology

Marine Archaeology encapsulates the following aspects: known wrecks and obstructions, identified geophysical receptors, and the potential for further maritime and aviation archaeological receptors. Within the Marine Archaeology Study Area the following elements were identified from geophysical data:

- 55 anomalies of possible archaeological interest (Figure 16); and
- Two additional seabed features consisting of foul ground and an obstruction.

Potential impacts on Marine Archaeology, associated with all phases of the Project, were identified. These included:

- Loss or damage to known and unknown maritime and aviation receptors from direct impacts; and
- Indirect disturbance to maritime and aviation receptors caused by anchoring and mooring systems.

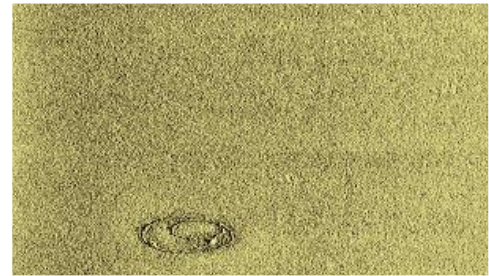


Figure 16 Archaeological anomaly

Due to the small scale of the Project and with embedded mitigation measures in place these impacts result in effects of either negligible or minor consequence and are therefore not significant. Transboundary impacts were scoped out of the EIAR for this chapter. No secondary mitigation is required as no significant effects are predicted. Overall, it is concluded that there will be no significant inter-related or cumulative effects on Marine Archaeology receptors related to the Project.

## 4.5.5 Other Sea Users

The potential impacts relating to Other Sea Users (e.g. Figure 17) in a 10 km buffer around the Project include:



Figure 17 Yacht in an offshore setting

- Obstruction of routine oil and gas operations due to the presence of safety zones and construction vessels;
- Obstruction of the ongoing decommissioning operation at the Scoter and Merganser Fields due to the presences of safety zones and construction vessels;
- Obstruction of subsea cable installation due to the presence of safety zones and construction vessels; and
- Disruption of telecommunications during the operation of the WTG due to the production of low levels of electromagnetic radiation.

Given the location and small-scale of the Project, and with embedded mitigation measures in place all potential effects to Other Sea Users have been classed as not significant and as such, no secondary mitigation is required. Overall, it is concluded that there will be no significant inter-related, cumulative or transboundary effects on Other Sea Users receptors related to the Project.

## 5 CARBON ASSESSMENT

The aim of the Project is to replace some of the electricity generated from gas via the Culzean platform gas turbines with electricity generated from renewable energy via a WTG (Figure 18) thereby reducing Greenhouse Gas (GHG) emissions from the platform. Power generation for the Culzean Field would therefore be partly from the gas turbines and partly from the WTG.



Figure 18 Wind Turbine Generator

The life cycle carbon emissions which will result from the Project have been determined in a Carbon Assessment which quantifies the total carbon dioxide equivalent (CO<sub>2</sub>e) GHG emissions attributed to each phase of the Project (construction, operation and maintenance and decommissioning).

The total CO<sub>2</sub>e emissions associated with the Project itself are estimated to be 27,302 CO<sub>2</sub>e as a worst-case (highest potential emissions) scenario. Most of these emissions are associated with vessel activity. These emissions can be offset as the WTG will generate electricity to replace some of the electricity generated from gas turbines at the Culzean platform. Under a

worst-case scenario, it is estimated that throughout the lifetime of the Project it will offset up to 33,536 t of CO<sub>2</sub>e emissions. This is a clear demonstration of progress towards the Project aim, i.e., realising a reduction in CO<sub>2</sub>e emissions associated with electricity generation at this scale. This floating wind pilot will deliver opportunities for industrialisation of larger projects, ultimately supporting TEPNSUK's commitment to support the growth of cleaner energy production and to meet global net zero targets.

## 6 ASSESSMENT OF MAJOR ACCIDENTS AND/OR DISASTERS

In line with the Institute of Environmental Management and Assessment (“IEMA”) ‘Major Accidents and Disasters in EIA: A Primer’ an assessment has been undertaken to better understand the likelihood of an occurrence and the Project susceptibility to potential major accidents and hazards. The following hazards were identified as having the potential to result in a major accident and/or disaster:

- Cable snagging (e.g. fishing gear snagging resulting in potential injury, fatalities, damage to assets and/or vessels);
- Third-party vessel or aviation collision;
- Climate hazards (e.g. increased frequency of extreme weather events);
- Electrical / system or process failures;
- External industrial hazards (i.e. major accidents at a nearby development e.g., Figure 19) and;
- Ground hazards – Unexploded Ordnance (UXO)

Following risk assessment, no risks were identified for the Project that could result in a major accident and/or disaster with the embedded mitigation and management plans in place. In EIA terms, the risks identified for the Project result in no significant effects on receptors, owing in principle to the scale and design of the Project, which will be built in line with the identified embedded mitigations and management plans to safeguard, in so far as practicable, against these risks.



*Figure 19 Offshore handling operations*

## 7 FURTHER INFORMATION

The Offshore EIAR has been submitted to MD-LOT to support the Application. Once the Application has been formally registered, Marine Directorate will undertake a consultation with stakeholders and invite public representation on the Application before reaching a decision. Hard copies can also be made available on request, these will be subject to a charge to cover printing costs (including postage and packaging). Copies of the short non-technical summary are available free of charge. Requests for hard copy Application documents can be made at: [tebuk.environment@totalenergies.com](mailto:tebuk.environment@totalenergies.com).

Electronic copies of this EIAR, including all figures, supporting studies, and accompanying documents, are available to view and download on the Project website at [www.totalenergies.co.uk/culzeanwindturbine](http://www.totalenergies.co.uk/culzeanwindturbine). Anyone having difficulty accessing the application documents through this website can contact ([tebuk.environment@totalenergies.com](mailto:tebuk.environment@totalenergies.com)) for assistance.

The Application documents are also available via the Marine Directorate website at <https://marine.gov.scot/marine-licence-applications>.

If you wish to comment on this EIAR or make representations to Marine Directorate, you must do so within the representation period specified in the relevant newspaper advert or in any consultation letter you receive. Please email Marine Directorate at the following address: [ms.marinerenewables@gov.scot](mailto:ms.marinerenewables@gov.scot), or write at:

Scottish Government  
Marine Directorate-Licensing Operations Team  
Marine Laboratory  
PO Box 101  
375 Victoria Road  
Aberdeen  
AB11 9DB