



**LLYR**

# LLYR FLOATING OFFSHORE WIND PROJECT

**Llŷr Floating Offshore Wind Farm  
Environmental Statement  
Volume 1: Chapter 1 – Introduction  
August 2024**

---

Prepared by: Llŷr Floating Wind Ltd



**FLOVENTIS  
ENERGY**

## Document Status

<u>Version</u>	<u>Authored by</u>	<u>Reviewed by</u>	<u>Approved by</u>	<u>Date</u>
FINAL	AECOM	AECOM	AECOM	August 2024

## Approval for Issue

Prepared by           AECOM  
Prepared for         Llŷr Floating Wind Limited  
Approved by         Jay Hilton-Miller

This report has been prepared by AECOM on behalf of Llŷr Floating Wind Ltd. Llŷr Floating Wind Ltd has made reasonable efforts to ensure that the content is accurate, up to date and complete for the purpose of the Environmental Statement. Llŷr Floating Wind Ltd shall have no liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.

## Acronyms and abbreviations

Acronym or Abbreviation	Definition	Acronym or Abbreviation	Definition
AfL	Agreement for Lease	MW	Megawatt
ATC	Automatic Traffic Count	NG ESO	National Grid Electricity System Operator
CEA	Cumulative Effects Assessment	nm	nautical miles
CEMP	Construction Environmental Management Plan	NRW	Natural Resources Wales
DBA	Desk Based Assessment	NRW MLT	Natural Resources Wales Marine Licencing Team
DIO	Defence Infrastructure Organisation	OTNR	Offshore Transmission Network Review
EIA	Environmental Impact Assessment	PCC	Pembrokeshire County Council
EPS	European Protected Species	PCNPA	Pembrokeshire Coast National Park Authority
ES	Environmental Statement	PEDW	Planning and Environment Decisions Wales
FCA	Flood Consequences Assessment	RIAA	Report to Inform Appropriate Assessment
GW	Gigawatt	SLVIA	Seascape and Landscape Visual Impact Assessment
HRA	Habitat Regulations Assessment	SSSI	Site of Special Scientific Interest
IAC	Inter-array cables	TEMPRO	Trip End Model Presentation Program
INNS	Invasive Non-Native Species	TJB	Transition Joint Bay
MCA	Maritime and Coastguard Agency	WFD	Water Framework Directive
MCZ	Marine Conservation Zone	WNMP	Welsh National Marine Plan

## Glossary of project terms

Glossary of Terms	Definition
British Energy Security Strategy	HM Government's plan to decarbonise the electricity system in Great Britain and Northern Ireland by 2035 to help achieve net zero and increase domestic energy production.
Cable Corridor	The route taken by the export cable from the array area to the substation and the point of connection with the grid.
Crown Estate	The collection of holdings belonging to the British monarch. This includes rights to lease the UK's seabed.
Cumulative Effects	The combined effects of Project Llŷr along with the effects of other projects in proximity to Project Llŷr that have been scoped into the inter project cumulative effects assessment.
Cumulative Impact Assessment	Impacts throughout the development and lifecycle of Project Llŷr including installation, operation, maintenance, and decommissioning phases.
Effect	The consequence of a given impact from a proposed project. This takes into account the magnitude of the impact against the sensitivity of the receptor.

Glossary of Terms	Definition
National Grid Electricity System Operator (NG ESO)	The electricity and grid system operator for the UK and Northern Ireland, managing the distribution of electricity and managing supply and demand.
Electricity Works Regulations 2017	Governs the need to conduct an EIA for proposed projects that generate electricity within England and Wales.
Environmental Impact Assessment (EIA)	A statutory process whereby the environmental impacts of a given proposed project are assessed against the legal requirements stated in the EIA Regulations.
European Protected Species	All listed species protected by Annex IV of the Habitat's Directive.
Flood Consequences Assessment (FCA)	An assessment of the proposed project's risk of present and future flooding from surface and subsurface water bodies and water courses under the Flood Risk Regulations 2009.
Habitat Regulations Assessment (HRA)	An assessment of a proposed project's impact on designated European sites up to 12nm from the coastline protected under the Conservation of Habitats and Species Regulations 2017.
Impact	An alteration in the environment and scoped in receptor as a result of the proposed project.
Marine Conservation Zone (MCZ) Assessment	An assessment of a proposed project's impact on designated Marine Conservation Zones under Section 126 of the Marine and Coastal Access Act, 2009.
Marine Works Regulations 2007	Governs the need to conduct an EIA and obtain a marine license for proposed offshore projects in English and Welsh waters.
Natural Resources Wales (NRW)	The Welsh Government body that regulates the development of proposed projects and assesses the EIA of each proposed project.
Net Zero	The UK's goal to decarbonise the economy by 2050.
Offshore Transmission Network Review (OTNR)	The UK government review of offshore transmission infrastructure capacity to meet the increased offshore wind electricity generation and achieve net zero targets.
Planning and Environment Decisions Wales (PEDW)	The Welsh Government body that manages planning casework and application
Site of Special Scientific Interest (SSSI)	Protected areas designated and protected by the Wildlife and Countryside Act 1981 which was subsequently amended in 2000.
Transition Joint Bay (TJB)	The link between the two separate export cables.
Water Framework Directive (WFD)	The Water Environment Regulations 2017 that sets environmental and water quality standards for UK water bodies.
Welsh National Marine Plan	The Welsh Government's long-term strategy to preserve marine habitats, species and coastal communities.
The Applicant	The developer of the Project, Llŷr Floating Wind Limited.
Array	All wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure within the Array Area, as defined, when considered collectively, excluding the offshore export cable(s).
Array Area	The area within which the wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure will be located.

Glossary of Terms	Definition
Floventis Energy	A joint venture company between Cierco Ltd and SBM Offshore Ltd of which Llŷr Floating Wind Limited is a wholly owned subsidiary.
Landfall	The location where the offshore export cable(s) from the Array Area, as defined, are brought onshore and connected to the onshore export cables (as defined) via the transition joint bays.
Llŷr	The proposed Project, for which the Applicant is applying for Section 36 and Marine Licence consents. Including all offshore and onshore infrastructure and activities, and all project phases.
Marine Licence	A licence required under the Marine and Coastal Access Act 2009 for marine works which is administered by Natural Resources Wales (NRW) Marine Licensing Team on behalf of the Welsh Ministers.
Offshore Development Area	The footprint of the offshore infrastructure and associated temporary works, comprised of the Array Area and the Offshore Export Cable Corridor, as defined, that forms the offshore boundary for the S36 Consent and Marine Licence application.
Offshore Export Cable	The cable(s) that transmit electricity produced by the WTGs to landfall.
Offshore Export Cable Corridor (OfECC)	The area within which the offshore export cable circuit(s) will be located, from the Array Area to the Landfall.
Onshore Development Area	The footprint of the onshore infrastructure and associated temporary works, comprised of the Onshore Export Cable Corridor and the Onshore Substation, as defined, and including new access routes and visibility splays, that forms the onshore boundary for the planning application.
Onshore Export Cable(s)	The cable(s) that transmit electricity from the landfall to the onshore substation.
Onshore Export Cable Corridor (OnECC)	The area within which the onshore export cable circuit(s) will be located.
Proposed Project	All aspects of the Llŷr development (i.e. the onshore and offshore components).
Onshore Substation	Located within the Onshore Development Area, converts high voltage generated electricity into low voltage electricity that can be used for the grid and domestic consumption.
Section 36 consent	Consent to construct and operate an offshore generating station, under Section 36 (S.36) of the Electricity Act 1989. This includes deemed planning permission for onshore works.

**Contents**

**1. INTRODUCTION** ..... 7

1.1. The proposed Project..... 7

1.2. The Applicant ..... 10

1.3. Planning Legislation and Approach to Consenting ..... 10

1.4. The Environmental Statement ..... 13

1.5. Location of Information within the ES ..... 16

1.6. Other Supporting Documents ..... 22

1.7. Consultation ..... 23

1.8. References ..... 24

**List of Tables**

Table 1-1. A summary of the ES structure and contents ..... 14

Table 1-2. Requirements of the Marine Works (Environmental Impact Assessment (EIA)) Regulations 2007 (as amended) and location within this ES..... 16

Table 1-3. Requirements of the Electricity Works EIA Regulations and location within this ES..... 19

Table 1-4. A summary of the supporting documents forming part of the consent applications. .... 22

**List of Figures**

Figure 1-1 An overview of floating offshore wind (proposed Project) technology ..... 10

## 1. INTRODUCTION

1. This Environmental Statement (ES) has been commissioned by Llŷr Floating Wind Limited (the 'Applicant') to present the results of the Environmental Impact Assessment (EIA) for the Llŷr Floating Wind Project (hereafter referred to as 'the proposed Project' for both the onshore and offshore scope of the proposed Project).
2. The proposed Project is a floating offshore wind farm located approximately 54 km from Lundy Island and 35 kilometres (km) from the Pembrokeshire Welsh coastline, in the Celtic Sea and comprises all infrastructure required to generate and transmit electricity from the Proposed Development Array Area to the National Grid Connection point adjacent to Pembroke Power Station, the supporting infrastructure and the required temporary construction areas both offshore and onshore (**Volume 5: Figure 1-1, Site Location**). The proposed Project Onshore and Offshore Development Areas are presented in **Figure 1-1**.
3. The proposed Project is categorised as a Schedule 2 development under The Marine Works (Environmental Impact Assessment (EIA)) Regulations 2007 (as amended) and The Electricity Works (EIA) (England and Wales) Regulations 2017 (as amended). Due to the nature, scale and location of the proposed Project, it is considered to be 'EIA development', as confirmed by the Natural Resource Wales (NRW) Screening and Scoping Opinion (**Volume 6, Appendix 5A: EIA Scoping Opinion**) received in May 2022 and therefore an EIA is required to be undertaken to support the primary consent applications. Further information is included in **Chapter 02: Regulatory and Planning Policy** and **Chapter 04: Description of the Proposed Project**.
4. In accordance with the Marine Works (Environmental Impact Assessment (EIA)) Regulations 2007 (as amended) and the Electricity Works (EIA) (England and Wales) Regulations 2017 (as amended) this ES provides details of the proposed Project and the associated potential impacts on identified receptors. This ES also includes details of relevant legislation and policy and sets out mitigation measures that aim to avoid or reduce the potential significant effects identified.
5. This chapter introduces the proposed Project, summarises the consents and licences that are required for the proposed works, activity and infrastructure, and outlines the content of the Environmental Statement.

### 1.1. The proposed Project

#### 1.1.1. Context

6. As part of their commitments to tackling climate change, the UK and Welsh governments have set a legally binding target for England and Wales to become net-zero in all greenhouse gases by 2050. In addition, the UK Government has shown clear commitment to developing offshore wind at scale through the British Energy Security Strategy, identifying a target of delivering 50 gigawatts (GW) of wind generated electricity by 2030, which is enough to power every home in the UK (Prime Minister and Department for Business, Energy and Industrial Strategy, 2020). This will include a target of 5 GW from floating offshore wind (Department for Business, Energy and Industrial Strategy, 2022). The wider UK energy policy context is set out in **Chapter 02: Regulatory and Planning Policy Context**.
7. A study by the Offshore Renewable Energy Catapult (2020) has highlighted to Wales the benefits of developing floating offshore wind, demonstrating (through modelling) the advantages of developing larger projects, including cost reduction. Average wind speeds in

the Celtic Sea are high, meaning there is an opportunity to develop offshore wind, including floating offshore wind, in waters surrounding Wales and southwest England (Offshore Renewable Energy Catapult, 2020).

8. The overall aim of the proposed Project is to deliver a cost effective demonstration of a new floating wind technology, providing validation of the technology proposition and establishing a pathway to series production. The proposed Project will demonstrate the progression of floating offshore wind technology to deployment at commercial scale and have an additional function to act as a pathfinder project to aid the establishment and development of UK offshore floating wind industrial capability in the Celtic Sea region. This will be in preparation for larger commercial opportunity for floating wind, not only within Wales and the UK, but the wider western European region.
9. The aims and potential benefits of the proposed Project are to:

- Accelerate the delivery of clean, green renewable electricity in the global transition to net zero;
- Engage and involve local people to facilitate a sustainable future;
- Demonstrate a full-scale floating offshore wind technology solution on a commercial scale with a turbine capacity greater than 12 MW in UK waters;
- Optimize the design of floating wind arrays to reduce the costs of large scale floating offshore wind developments within the UK;
- Contribute to the accelerated development of the UK floating offshore wind industry as a pathfinder project, piloting the development, installation and operation of floating offshore wind at a large scale in UK waters;
- Contribute to the learning of how floating wind interacts at a large scale with the natural environment and local interests, to better understand the benefits and challenges and to identify opportunities to enhance the local environment;
- Identify and maximise the potential opportunities and benefits to the local UK supply chain and employment; and
- Help de-risk floating wind investment at all levels of the supply chain.

10. In July 2021 the Crown Estate confirmed their intention, subject to a plan-level Habitats Regulations Assessment (HRA), to lease the floating wind demonstration site in the Celtic Sea to the Applicant (The Crown Estate, 2021). The plan-level HRA was completed in Q1 2024 with the Agreement for Lease (AfL) anticipated to be finalised in the summer of 2024.
11. The Applicant secured a grid connection offer for the proposed Project at the National Grid Pembroke Point of Connection, adjacent to Pembroke Power Station, for 2027. National Grid, the Electricity System Operator (ESO), will subsequently determine the connection timescales for the proposed Project's grid connection.
12. The Applicant has engaged with the other leaseholders in the Celtic Sea (Erebus and Whitecross projects) to set up a pre-2030 supply chain working group and establish

opportunities for collaboration across the three projects. Potential areas for consideration include (but are not limited to):

- Port infrastructure (e.g. crane mobilisation, mooring logistics, foundation wet-storage);
- Installation vessel sharing; and
- Operational and maintenance facilities (spares management, opportunities for vessel sharing).

13. The Crown Estate has announced an intention to provide leases for development of up to 4 GW of new floating wind capacity in the Celtic Sea and to work with the NG ESO and others to support a coordinated grid solution for floating wind projects in the area (The Crown Estate, 2021). This is in line with work currently underway through the Offshore Transmission Network Review (OTNR) to accelerate grid development and mitigate impacts on communities onshore. The Applicants project and grid connection is not within the remit of either the Crown Estate Round 5 leasing process or the NG ESO OTNR process and will proceed ahead of the finalisation and implementation of both initiatives.

#### 1.1.2. Design

14. The proposed Project will comprise of the following main components:
- Up to 10 wind turbines;
  - Floating offshore wind platforms and associated moorings;
  - Offshore inter-array cables and up to one subsea connection point per floating offshore wind array;
  - Up to two 55 km electricity export cables will connect offshore infrastructure to the Pembrokeshire coastline, each cable following the same route, to landfall at Freshwater West;
  - One transition joint bay (TJB) / riser at landfall to connect the offshore cable to the onshore cable;
  - Onshore cabling, and associated infrastructure between the landfall and the grid connection at the substation;
  - One onshore substation / control building near to the grid connection point; and
  - Other associate infrastructure, such as navigational buoys.
15. Consent requirements for the proposed Project are outlined in **Section 1.3**.
16. An overview of the proposed Project and example of floating offshore wind technology are presented in **Figure 1-1**.

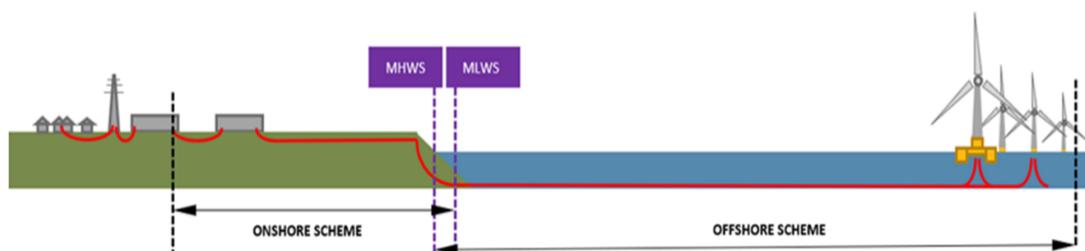


Figure 1-1 An overview of floating offshore wind (proposed Project) technology

17. The Crown Estate Lease Option area for the proposed Project covers an outline area of interest of 50 km<sup>2</sup>, which has been refined through the EIA and design process in consultation with stakeholders including the Crown Estate, the Defence Infrastructure Organisation (DIO), the Maritime and Coastguard Agency (MCA) and others. Refer to **Chapter 03: Alternatives** for further information about the site selection process and consideration of reasonable alternatives for the proposed Project.
18. Refer to **Chapter 04: Description of the Proposed Project** for further information about the proposed Project design for all aspects of the proposed Project listed above.

## 1.2. The Applicant

19. The Applicant is a subsidiary of Floventis Energy, a joint venture between the renewable energy project development company Cierco Ltd and SBM Offshore Ltd, a deep water energy company.

## 1.3. Planning Legislation and Approach to Consenting

20. AECOM Ltd was appointed by the Applicant to lead the production of the ES. Under regulations listed in **Section 1.3.1**, the proposed Project is considered a Schedule 2 development, requiring screening to determine if an EIA is required:
  - '1. Development to provide a generating station (other than a generating station of a description set out in paragraph 1 of Schedule 1) under Schedule 2 of The Electricity Works (EIA) (England and Wales) Regulations 2017'; and
  - '21. Installations for the harnessing of wind power for energy production (wind farms) under Schedule A2 of The Marine Works (EIA) Regulations 2007 (as amended)'.
21. As agreed through pre-application engagement with PEDW, an EIA is required due to the type, scale and location of the proposed Project in relation to sensitive areas. The EIA incorporates the results of many different assessments, including:
  - Flood Consequences Assessment (FCA) including Drainage Strategy (**Appendix 10A**);
  - Water Framework Directive Assessment (**Appendix 10C** and **Appendix 10D**);
  - Habitat Regulations Assessment Screening (**Appendix 8D**); and
  - Marine Conservation Zone Assessment (**Appendix 20A**).

22. A summary of the ES structure and contents is provided in **Section 1.4.2** and **Table 1-1**.
  23. This ES covers marine and terrestrial environments and is being submitted to support the primary consent applications listed below. Further detail is provided in **Section 1.3.1** and **Section 1.3.2** respectively. Secondary consents are discussed in **Section 1.3.3**.
  24. The following primary consents are required for the proposed Project:
    - Section 36 (s.36) consent to construct and operate an offshore generating station, under the Electricity Act 1989. This would include deemed planning permission for onshore works. Given that deemed planning permission is being sought, a separate planning application under the Town and Country Planning Act 1990 is not required. The s.36 application will be considered by PEDW, administering consent on behalf of the Welsh Ministers; and
    - A Marine Licence consented under Part 4 of the Marine and Coastal Access Act 2009 to carry out certain activities in the marine environment, including construction works on the seabed, depositing substances or articles and dredging. The NRW MLT administers marine licences on behalf of the Welsh Ministers.
  25. The UK left the European Union on the 31 January 2020. However, at the time of writing, all legal obligations regarding compliance with environmental permitting and legislation continue to apply. This document is therefore produced in compliance with all existing and relevant EU and UK environmental legislation.
- 1.3.1. Section 36 Consent with Deemed Planning Permission*
26. S.36 (10) of the Electricity Act 1989 provides that the Welsh Ministers are the appropriate authority in respect of applications for s.36 consent for generating stations between 1 MW and 350 MW.
  27. S.36 applications are administered by PEDW on behalf of the Welsh Ministers and, following an appropriate consultation period (and hearings if necessary), the Inspector will submit their report to the Welsh Ministers for determination. Planning permission can be deemed to be granted with a s.36 consent under Section 90(2) of the Town and Country Planning Act 1990 (as amended by s.21 of the Growth and Infrastructure Act 2013).
  28. PEDW confirmed on 25 November 2021 that the Welsh Ministers are satisfied that:
    - NRW will undertake an assessment of any significant effect on the environment under the Marine Works (EIA) Regulations 2007;
    - This assessment will be sufficient to meet the requirements of the EIA Directive; and
    - NRW will make this assessment available for the purposes of determining the applications under s.36 of the Electricity Act 1989.
  29. Under powers provided by Regulation 39 (2) of the Electricity Works (EIA) (England and Wales) Regulations 2017 Regulations, the Welsh Ministers have decided there is no need to assess the environmental effects of the proposed Project under the Electricity Works (EIA) Regulations 2017. Paragraphs (3) to (10) of Regulation 39 of these regulations will now apply to the determination of the s.36 application(s). In other words, whilst two separate consent applications are required, the two are inextricably linked. It is NRW who will effectively assess the potential significant effects using the Environmental Statement and no decision can be

made on the s.36 application until NRW has concluded the determination of the Marine Licence application.

30. The onshore works are in the Local Planning Authority areas of Pembrokeshire County Council (PCC) and Pembrokeshire Coast National Park Authority (PCNPA) (**Volume 5: Figure 1-2, Jurisdiction Boundaries**). Therefore, PCC and PCNPA are statutory consultees on both applications. The Welsh National Marine Plan WNMP (Welsh Government, 2019) is the main decision-making document for the application for a Marine Licence, although other national and local planning documents would be considered material in decision making. The WNMP recognises the importance of marine renewable energy such as the proposed Project in helping Wales to achieve the legal targets as set within the Environment (Wales) Act 2016 (Welsh Government, 2016). Specifically, policies: ELC\_01a: Low carbon energy (supporting wind' of the WNMP which states:

*'Proposals for offshore wind energy generation will be supported where they contribute to the objectives of the WNMP'*

31. And further, policy ELC\_01 b states:

*'In order to understand future opportunities for offshore wind development, including floating technologies, the WNMP supports strategic planning for the sector'.*

32. The WNMP recognises that the Welsh Government is working with others to progress testing and demonstration zones for wave and floating wind energy, to enhance and further develop knowledge and understanding of the risks, opportunities, and capabilities. With the demonstration zone off Pembrokeshire providing a good opportunity for developers to deploy, refine and demonstrate their technologies prior to expanding the projects into wider commercial scale resource areas. Further details are covered in **Chapter 02: Regulatory and Planning Policy Context**.

### 1.3.2. Marine Licence

33. The NRW Marine Licencing Team (NRW MLT) administers Marine Licences under the Marine and Coastal Access Act 2009 for licensable marine activities within Welsh inshore and offshore waters.
34. Prior to April 2019, NRW MLT administered marine licences for projects within Welsh inshore waters out to 12 nautical miles (nm) only. The Wales Act 2017 transferred functions for marine licensing beyond 12 nm to the median line, from the Marine Management Organisation to Welsh Ministers. Subsequently, PEDW delegated this function to NRW MLT on the behalf of Welsh Ministers.

### 1.3.3. Secondary Consents

35. In addition to the primary consents discussed above, the following secondary consents and approvals may be required for the proposed Project:
- Declaration, pursuant to Section 36A of the Electricity Act, to extinguish public rights of navigation where the floating offshore wind structures are located;
  - Safety Zone application as set out in the Energy Act 2004 and under the amendments to The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007 introduced by The Electricity

(Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) (Amendment) (Wales) Regulations 2019;

- A Marine Works Licence from the Port of Milford Haven for any works on, under or over tidal waters within the Haven.
- European Protected Species (EPS) Derogation Licence issued under the Conservation of Habitats and Species Regulations 2017 to undertake works that may affect EPS administered by NRW; and
- Site of Special Scientific Interest (SSSI) Consent / Assent for works that may affect a SSSI, administered by NRW.

#### **1.4. The Environmental Statement**

##### *1.4.1. Purpose of the Environmental Statement*

36. This ES assesses the impact of the proposed Project on the environmental and social receptors identified in the Scoping Report. It considers comments on the Scoping Report from statutory consultees related to the technical chapters in these impact assessments.
37. Once the impact of the proposed Project has been assessed, the ES identifies appropriate mitigation measure for those impacts deemed to have a significant effect on assessed receptors. This process is elaborated upon in **Section 1.4.2.**
38. Consequently, the ES aims to provide the regulatory authority (NRW) the necessary detail to make appropriate consenting decisions for the further development of the proposed Project.

##### *1.4.2. Structure of the Environmental Statement*

39. This ES is divided into four volumes and a separate Non-Technical Summary:
  - **Non-Technical Summary** – Standalone document that provides a concise description of the proposed Project, alternatives considered, baseline, assessment methodology, potential environmental effects and mitigation measures identified using non-technical language;
  - **Volume 1, The Proposed Project** – Details of the proposed Project, legislative and policy context, alternatives considered, overall approach and methodology followed in the EIA and how stakeholder engagement activities have informed the development of the proposed Project;
  - **Volume 2, Terrestrial Environment** – The potential effects of the proposed Project throughout all project stages on identified terrestrial receptors and suggested mitigation measures to avoid or reduce any identified significant effects;
  - **Volume 3, Marine Environment** – The potential effects of the proposed Project throughout all project stages on identified marine receptors and suggested mitigation measures to avoid or reduce any identified significant effects; and
  - **Volume 4, Project-wide Effects** – An assessment of the potential impacts of the proposed Project on climate, major accidents and disasters, and the combined and cumulative effects with other known development, and summary of residual effects considering the identified mitigation measures.
40. The contents of each volume of ES are summarised in **Table 1-1.**

Table 1-1. A summary of the ES structure and contents

Document Reference	Title	Lead Author
<b>Non-Technical Summary</b>		
<b>Volume 1 – The Proposed Project</b>		
Chapter 01	Introduction	Tim Newton, AEOM
Chapter 02	Regulatory and Planning Policy Context	Esme Portsmouth, AECOM
Chapter 03	Alternatives	Tim Newton, AECOM
Chapter 04	Description of the Proposed Project	The Applicant
Chapter 05	EIA Approach and Methodology	Tim Newton, AECOM
Chapter 06	Consultations and Stakeholder Engagement	Jon Harvey, AECOM
<b>Volume 2 – Terrestrial Environment</b>		
Chapter 07	Landscape and Visual	John Devenny, AECOM
Chapter 08	Ecology and Biodiversity	Hannah Mitchell, AECOM
Chapter 09	Historical Environment and Cultural Heritage	Andy Mayes, AECOM
Chapter 10	Water Environment	Tim Jones, AECOM
Chapter 11	Geology and Hydrogeology	Phil Hough, AECOM
Chapter 12	Agriculture and Soils	Alastair Field, Reading Agricultural Consultants
Chapter 13	Traffic and Transport	Jen Searle, AECOM
Chapter 14	Air Quality	Danny Duce, AECOM
Chapter 15	Noise and Vibration	Eddie Robinson, AECOM
Chapter 16	Socio-economics, Recreation and Tourism	Bob Perkins, ECOM
<b>Volume 3 – Marine Environment</b>		
Chapter 17	Marine Physical Processes	David Lambkin, APBmer
Chapter 18	Marine Water and Sediment Quality	Tim Jones, AECOM
Chapter 19	Benthic Ecology	Jackie Hill, AECOM
Chapter 20	Fish and Shellfish Ecology	Jackie Hill, AECOM
Chapter 21	Marine Mammals	Catriona Gall, HiDef
Chapter 22	Ornithology	Ruth Peters-Grundy, HiDef
Chapter 23	Seascape, Landscape and Visual	John Devenny, AECOM
Chapter 24	Marine Archaeology	Michael Walsh, Coracle
Chapter 25	Shipping and Navigation	Sam Westwood, Anatec
Chapter 26	Commercial Fisheries	Sarah MacNab, NiMa
Chapter 27	Aviation and Radar	Michael Sutton, Pager Power
Chapter 28	Other Sea Users	Robyn Jones, AECOM
<b>Volume 4 – Project-wide Effects</b>		
Chapter 29	Climate Change	Jessica Playle, AECOM
Chapter 30	Major Accidents and Disasters	Neil Stephenson, AECOM
Chapter 31	Inter-related Effects Assessment	Tim Newton, AECOM
Chapter 32	Residual Effects	Tim Newton, AECOM
<b>Volume 5 – Figures</b>		
ES Figures		Maisie Lemon Smith, AECOM
<b>Volume 6 – Appendices</b>		
1A	Statement of Competence	Megan Ford, AECOM

Document Reference	Title	Lead Author
3A	Offshore Cable Route Assessment	Vaughan Finch, AECOM
3B	Offshore Geological Desk Study	Vaughan Finch, AECOM
3C	Landfall Assessment	Vaughan Finch, AECOM
4A	Outline Construction Environmental Management Plan (CEMP)	Tegan Helbrow, AECOM
4B	Outline Invasive Non-Native Species (INNS) Plan	Hannah Mitchell, AECOM
4C	Calculation Log	Charlotte Kiernan, AECOM
4E	Red Line Boundary Coordinates Tables	Charlotte Kiernan, AECOM
5A	Cumulative Effects Assessment (CEA) Approach and Methodology	Natasha Aragao, AECOM
5B	EIA Scoping Opinion	James Rigby, AECOM
5C	EIA Scoping Opinion Responses	James Rigby, AECOM
6A	Technical Engagement Log	Kimberley O'Hare, AECOM
7A	LVIA Methodology	John Devenny, AECOM
7B	Landscape and Visual Assessment Tables	John Devenny, AECOM
7C	Cumulative Landscape and Visual Assessment Tables	John Devenny, AECOM
8A	Chough Survey Report	Hannah Mitchell, AECOM
8B	Preliminary Ecological Appraisal - Terrestrial	Hannah Mitchell, AECOM
8C	Bat Activity Survey Report	Hannah Mitchell, AECOM
8D	Habitat Regulations Assessment (HRA) Screening Report	Alison Curtis, AECOM
8E	HRA Report to Inform Appropriate Assessment (RIAA)	Alison Curtis, AECOM
8F	Green Infrastructure Report	Lisbeth Nash, AECOM
9A	Heritage Desk Based Assessment	Andy Mayes, AECOM
10A	Flood Consequences Assessment (FCA) including Drainage Strategy	Tim Biedulski, AECOM
10B	Water Features Survey Report	Tim Jones, AECOM
10C	Onshore Water Framework Directive (WFD) Assessment	Tim Jones, AECOM
10D	Offshore WFD Assessment	Tim Jones, AECOM
11A	Phase 1 Desk Study Report	Phil Hough, AECOM
11B	Land Contamination Method Tables	Phil Hough, AECOM
11C	Areas of Contamination, Site Rating and Impact Assessment	Phil Hough, AECOM
11D	Assessment of Effects and Significance	Phil Hough, AECOM
13A	Automatic Traffic Count (ATC) Survey Sheets	Jen Searle, AECOM
13B	Raw Accident Data from Pembrokeshire County Council	Jen Searle, AECOM
13C	Trip End Model Presentation Program (TEMPRO) Output	Jen Searle, AECOM
13D	Project Erebus Traffic and Transport ES Chapter	Jen Searle, AECOM
13E	Project Erebus Outline Construction Traffic Management Plan	Jen Searle, AECOM
13F	Personal Injury Collision Data	Jen Searle, AECOM
15A	Human Hearing and Acoustic Terminology	Eddie Robinson, AECOM
15B	Noise Modelling	Eddie Robinson, AECOM
17A	Geophysical Survey Report	Produced by Ocean Ecology
17B	2024 Multi Beam Echo Sounder (MBES) Survey Report	Produced by Ocean Ecology
19A	Nearshore 2023 Benthic Survey Report	Richard Gibbs, AECOM
19B	Offshore 2023 Benthic Survey Report	Richard Gibbs, AECOM
19C	Electromagnetic Field Report	Produced by Vekta

Document Reference	Title	Lead Author
19D	2024 Drop Down Video (DDV) Survey	Produced by Ocean Ecology
19E	2024 Habitat Assessment Report	Produced by Ocean Ecology
20A	Marine Conservation Zone (MCZ) Assessment	Alison Curtis, AECOM
21A	Marine Mammals Baseline Technical Report	Catriona Gall, HiDef
21B	Marine Mammals Noise Modelling	Peter Ward, Award Environmental Consultants
21C	Marine Mammals Noise Assessment	Ruth Peters-Grundy, HiDef
22A	Ornithological Baseline Technical Report	Ruth Peters-Grundy, HiDef
22B	Ornithology Colony Apportioning	Ruth Peters-Grundy, HiDef
22C	Ornithological Collision Risk Modelling Report	Ruth Peters-Grundy, HiDef
22D	Ornithological Displacement Report	Ruth Peters-Grundy, HiDef
22E	Ornithological Project Alone and Cumulative Impact Scenarios	Ruth Peters-Grundy, HiDef
22F	Ornithological Population Modelling Report	Ruth Peters-Grundy, HiDef
23A	Seascape and Landscape Visual Impact Assessment (SLVIA) Methodology	John Devenny, AECOM
23B	Preliminary Assessment	John Devenny, AECOM
23C	SLVIA Assessment Tables	John Devenny, AECOM
23D	Night-time Visual Assessment	John Devenny, AECOM
23E	Cumulative SLVIA Tables	John Devenny, AECOM
24A	Marine Archaeology Desk Based Assessment (DBA)	Darren Glazier, Coracle
24B	Marine Archaeology Landfall Survey	Darren Glazier, Coracle
24C	Marine Archaeology Technical Report	Darren Glazier, Coracle
25A	Navigational Risk Assessment	Sam Westwood, Anatec
26A	Commercial Fisheries Baseline Report	Sarah, MacNab, NiMa
27A	Aviation and Radar Technical Study	Michael Sutton, Pager Power
30A	Environmental Risk Register	Nick Stayt, AECOM
32A	Mitigation Register	James Rigby, AECOM

**1.5. Location of Information within the ES**

41. Schedule 4 of the Electricity Works EIA Regulations and Schedule 3 of the Marine Works EIA Regulations identify information for inclusion in Environmental Statements. **Table 1-2** and **Table 1-3** signpost relevant requirements in the Marine Works and Electricity Works EIA Regulations to the location within the ES.

*Table 1-2. Requirements of the Marine Works (Environmental Impact Assessment (EIA)) Regulations 2007 (as amended) and location within this ES*

Requirement	Location within this ES
1. A description of the development or project and of the regulated activity, including in particular: (a) the location, size and nature of the development or project and regulated activity;	Chapter 01: Introduction Chapter 04: Description of the Proposed Project.

Requirement	Location within this ES
(b) the quantity and nature and source of the materials to be used in the course of the project and the regulated activity;	Chapter 04: Description of the Proposed Project.
(c) the quantity, nature and source of any items or materials to be deposited in the sea in the course of the project and the regulated activity; and	Chapter 04: Description of the Proposed Project.
(d) the working methods to be used in the course of the project and the regulated activity.	Chapter 04: Description of the Proposed Project.
<p>2. A description of the aspects of the environment likely to be significantly affected by the project and the regulated activity, including—</p> <p>(a) human beings, fauna and flora;</p>	<p>Chapter 08: Ecology and Biodiversity Chapter 16: Socio-economics, Recreation and Tourism Chapter 19: Benthic Ecology Chapter 20: Fish and Shellfish Chapter 21: Marine Mammals Chapter 22: Ornithology Chapter 25: Shipping and Navigation Chapter 26: Commercial Fisheries Chapter 27: Aviation and Radar Chapter 28: Other Sea Users.</p>
(b) soil, water, air, climate, and the landscape;	<p>Chapter 07: Seascape, Landscape and Visual Chapter 10: Water Environment Chapter 11: Geology and Hydrogeology Chapter 12: Agriculture and Soils Chapter 14: Air Quality Chapter 18: Physical Environment Chapter 29: Climate Change.</p>
(c) material assets and the cultural heritage; and	<p>Chapter 09: Historic Environment and Cultural Heritage Chapter 24: Marine Archaeology.</p>
(d) the interaction between any two or more of the things mentioned in the preceding sub-paragraphs.	<p>Chapters 07 – 30 Chapter 31: Inter-related Effects Assessment.</p>
<p>3. (1) A description, complying with sub-paragraph (2), of the likely significant effects of the project and the regulated activity on the environment resulting from—</p> <p>(a) the nature of the activities to be carried out and the manner in which they are to be carried out;</p>	<p>Chapter 04: Description of the Proposed Project Chapters 07 – 30 in the 'Appraisal of Potential Impacts' section Chapter 31: Inter-related Effects Assessment.</p>
(b) the use of natural resources;	<p>Chapter 04: Description of the Proposed Project Chapter 08: Ecology and Biodiversity Chapter 10: Water Environment Chapter 11: Geology and Hydrogeology Chapter 12: Agriculture and Soils Chapter 18: Physical Environment Chapter 19: Benthic Ecology</p>

Requirement	Location within this ES
	Chapter 20: Fish and Shellfish Chapter 21: Marine Mammals Chapter 22: Ornithology.
(c) the emission of pollutants;	Chapter 07: Seascape, Landscape and Visual Chapter 08: Ecology and Biodiversity Chapter 10: Water Environment Chapter 11: Geology and Hydrogeology Chapter 12: Agriculture and Soils Chapter 14: Air Quality Chapter 15: Noise and Vibration Chapter 18: Physical Environment Chapter 29: Climate Change.
(d) the creation of nuisances; and	Chapter 07: Seascape, Landscape and Visual Chapter 13: Traffic or Transport Chapter 15: Noise and Vibration Chapter 16: Socio-economics, Recreation and Tourism Chapter 26: Commercial Fisheries Chapter 27: Aviation and Radar Chapter 28: Other Sea Users.
(e) the elimination of waste.	Chapter 04: Description of the Proposed Project.
3. (2) The description should cover each of the following categories of effect—	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> section.
(a) direct and indirect effects;	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> sections.
(b) secondary effects;	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> sections.
(c) cumulative effects;	Chapters 07 – 30 in the <i>'Appraisal of Cumulative Effects'</i> section. Chapter 31: Inter-related Effects Assessment.
(d) short-term, medium-term and long-term effects;	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> section.
(e) permanent and temporary effects; and	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> section.
(f) positive and negative effects.	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> section.
4. The forecasting methods used by the Applicant to assess the main effects that the project and the regulated activity are likely to have on the environment.	Chapter 05: EIA Approach and Methodology Chapters 07 – 30 in the <i>'Assessment Methodology'</i> section.
5. A description of the measures envisaged to prevent, reduce and offset any significant adverse effects of the project and the regulated activity on the environment.	Chapters 07 – 30 in the <i>'Embedded and Good Practice Measures'</i> and <i>'Additional Mitigation and Enhancement Measures'</i> section.

Requirement	Location within this ES
6. An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant’s choice, taking into account the environmental effects of those alternatives and the project as proposed.	Chapter 03: Alternatives.
7. A non-technical summary of the information provided under paragraphs 1 to 6.	Project Llŷr Non-Technical Summary.
8. Any difficulties, such as technical deficiencies or lack of knowledge, encountered in compiling any information of a kind specified in paragraphs 1 to 6.	Chapters 07 – 30 in the ‘Assessment Assumptions and Limitations’ section.

Table 1-3. Requirements of the Electricity Works EIA Regulations and location within this ES

Requirement	Location within this ES
1. A description of the development, including in particular—	Chapter 04: Description of the Proposed Project.
(a) a description of the location of the development;	
(b) a description of the physical characteristics of the whole development, including where relevant, requisite demolition works and the land use requirements during the construction and operational phases;	Chapter 04: Description of the Proposed Project.
(c) a description of the main characteristics of the operational phase of the development (in particular, any production process), for example, energy demand and energy used, the nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;	Chapter 04: Description of the Proposed Project.
(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operational phases.	Chapter 04: Description of the Proposed Project Chapter 10: Water Environment Chapter 11: Geology and Hydrogeology Chapter 12: Agriculture and Soils Chapter 14: Air Quality Chapter 15: Noise and Vibration Chapter 18: Physical Environment Chapter 29: Climate Change.
2. A description of the reasonable alternatives (for example, in terms of development design, technology, location, size and scale) studied by the developer that are relevant to the development and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	Chapter 03: Alternatives. Appendix 3A: Cable Route Assessment

Requirement	Location within this ES
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution of the environment without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	Chapters 07 – 30 in the ‘Existing Baseline’ and ‘Future Baseline’ sections.
4. A description of the factors set out in regulation 7(2) likely to be significantly affected by the development.	Chapters 07 – 30 in the ‘Appraisal of Potential Impacts’ section.
5. – (1) A description of the likely significant effects of the development on the environment resulting from, amongst other things –  (a) the construction and existence of the development, including, where relevant, demolition works;	Chapters 07 – 30 in the ‘Appraisal of Potential Impacts’ section.
(b) the use of natural resources, in particular, land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;	Chapter 04: Description of the Proposed Project Chapter 08: Ecology and Biodiversity Chapter 10: Water Environment Chapter 11: Geology and Hydrogeology Chapter 12: Agriculture and Soils Chapter 18: Physical Environment Chapter 19: Benthic Ecology Chapter 20: Fish and Shellfish Chapter 21: Marine Mammals Chapter 22: Ornithology.
(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances and the disposal and recovery of waste;	Chapter 04: Description of the Proposed Project Chapter 07: Seascape, Landscape and Visual Chapter 10: Water Environment Chapter 11: Geology and Hydrogeology Chapter 12: Agriculture and Soils Chapter 14: Air Quality Chapter 15: Noise and Vibration Chapter 18: Physical Environment Chapter 29: Climate Change.
d) the risks to human health, cultural heritage or the environment (for example, due to accidents and disasters);	Chapter 04: Description of the Proposed Project Chapter 05: EIA Approach and Methodology Chapter 09: Historic Environment and Cultural Heritage Chapter 11: Geology and Hydrogeology Chapter 14: Air Quality Chapter 15: Noise and Vibration

Requirement	Location within this ES
	Chapter 13: Traffic or Transport.
e) the cumulation of effects with other existing and approved developments, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected and the use of natural resources;	Chapters 07 – 30 in the <i>'Existing Baseline'</i> and <i>'Future Baseline'</i> sections Chapter 30: Combined Effects and Cumulative Effects Assessment.
f) the impact of the development on climate (for example, the nature and magnitude of greenhouse gas emissions) and the vulnerability of the development to climate change;	Chapter 29: Climate Change.
g) the technologies and the substances used.	Chapter 04: Description of the Proposed Project.
— (2) The description of the likely significant effects on the factors set out in regulation 7(2) must cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development, taking account of the environmental protection objectives established at European Union or domestic level that are relevant to the development, including in particular those established under the Habitats Directive or the Wild Birds Directive.	Chapters 07 – 30 in the <i>'Appraisal of Potential Impacts'</i> section Chapter 31: Inter-related Effects Assessment.
6. A description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example, technical difficulties or lack of knowledge) encountered in compiling the required information and the main uncertainties involved.	Chapter 05: EIA Approach and Methodology Chapters 07 – 30 in the <i>Assessment Methodology'</i> and <i>'Assessment Assumptions and Limitations'</i> section.
7.—(1) A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example, the preparation of a post-development analysis).	Chapters 07 – 30 in the <i>'Embedded and Good Practice Measures'</i> and <i>'Additional Mitigation and Enhancement Measures'</i> section.
— (2) The description must explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset and must cover both the construction and operational phases.	Chapter 32: Residual Effects.
8.— (1) A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and disasters that are relevant to the development.	Chapter 04: Description of the Proposed Project.
— (2) Relevant information available and obtained through risk assessments under requirements imposed in accordance with European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive and relevant	N/A

Requirement	Location within this ES
assessments undertaken under domestic legislation may be used for this purpose provided that the requirements of the EIA Directive are met.	
— (3) Where appropriate, the description must include measures envisaged to prevent or mitigate the significant adverse effects of accidents and disasters referred to in subparagraph (1) on the environment and details of the preparedness for and proposed response to such emergencies.	Chapters 07 – 30 in the ‘ <i>Embedded and Good Practice Measures</i> ’ and ‘ <i>Additional Mitigation and Enhancement Measures</i> ’ section. Chapter 04: Description of the Proposed Project.
(4) In this paragraph— “Nuclear Safety Directive” means Council Directive 2009/71/Euratom of 25th June 2009 establishing a Community framework for the nuclear safety of nuclear installations(1); “Seveso III Directive” means Directive 2012/18/EU of the European Parliament and of the Council of 4th July 2012 on the control of major-accident hazards involving dangerous substances(2).	N/A
9. A non-technical summary of the information provided under paragraphs 1 to 8.	Project Llŷr Non-Technical Summary
10. A reference list detailing the sources used for the descriptions and assessments included in the EIA report.	A reference list is provided at the end of all technical chapters in the ES (Chapters 07 – 30).

**1.6. Other Supporting Documents**

42. There are also a number of other documents which form part of the consent applications in addition to the ES, as detailed in **Table 1-4**. The ES may cross reference other documents within the consent applications and vice versa.

*Table 1-4. A summary of the supporting documents forming part of the consent applications.*

Document Title	Description
Planning, Design and Access Statement	Identifies the context and need for the proposed Project and includes an assessment of how the proposed Project accords with relevant national, regional and local planning policies. It also explains the design principles and concepts that have been applied to the development and demonstrates how the proposed Project context has influenced its design.
Consultation Report	Provides an overview of stakeholder engagement activities undertaken to inform the development of the proposed Project and how key issues have been addressed in the proposed Project.
Planning Drawings	Sets out the location and design of the proposed Project and its various constituent components in accordance with local validation requirements.
Application forms	Associated application forms required for the consent applications.
HRA Screening	In support of the Marine Licence and S.36 consent applications. Stage 1 of the HRA assessment, screening for the likely significant effects of the proposed Project on European sites.

Document Title	Description
HRA RIAA	In support of the Marine Licence and S.36 consent applications. Stage 2 of the HRA assessment an appropriate assessment on the potential for an adverse effect on site integrity on European sites by the proposed Project.

**1.7. Consultation**

- 43. A combined Screening and Scoping Report (Llŷr Floating Wind Limited, 2022) was prepared and submitted to PEDW and the Natural Resources Wales Marine Licensing Team (NRW MLT) in April 2022. This ES has been prepared in accordance with the approach set out in the Screening and Scoping Report and incorporates feedback from stakeholders received within **Appendix 5C: Scoping Opinion Responses** as well as throughout the development of the proposed Project.
- 44. Information regarding additional consultation undertaken for the proposed Project can be found in **Chapter 06: Consultations and Stakeholder Engagement**.

## 1.8. References

Department for Business, Energy and Industrial Strategy (BEIS), 2022. *British energy security strategy*. [Online]. Available at: <https://www.gov.uk/government/publications/british-energy-security-strategy> [Accessed: 5 May 2022].

BEIS, 2020. *The ten point plan for a green industrial revolution*. [Online]. Available at: <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution> [Accessed: 5 May 2022].

Llŷr Floating Wind Limited, 2022. *Project Llŷr Scoping Report*.

Offshore Renewable Energy Catapult, 2020. *Benefits of Floating Offshore Wind to Wales and the South West*. [Online]. Available at: <https://www.marineenergywales.co.uk/wp-content/uploads/2020/01/Benefits-of-Floating-Offshore-Wind-to-Wales-and-the-South-West.pdf> [Accessed: 5 May 2022].

The Crown Estate, 2021. *Celtic Sea Floating Wind Programme*. [Online]. Available at: <https://www.thecrownestate.co.uk/media/3982/celtic-sea-floating-wind-position-paper.pdf> [Accessed: 5 May 2022].

The Crown Estate, N/A. *Test and demonstration projects for floating wind*. [Online]. Available at: <https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/floating-offshore-wind/test-and-demonstration-projects-for-floating-wind/> [Accessed: 5 May 2022].

Wave Hub, 2020. *European Regional Development Fund*. [Online]. Available at: <https://www.wavehub.co.uk/pembrokeshire-wave-zone> [Accessed: 5 May 2022].

Welsh Government, 2019. *Welsh National Marine Plan*. [Online]. Available at: [https://gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document\\_0.pdf](https://gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document_0.pdf) [Accessed: 11 February 2022].