codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 8.1 Cumulative Effects Assessment


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Table of contents

List of tables

Abbreviations

Abbreviation	Term in full
CEA	Cumulative Effects Assessment
CWP	Codling Wind Park
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Fields
EPA	Environmental Protection Agency
EU	European Union
INNS	Invasive non-native species
MAC	Maritime Area Consent
NISA	North Irish Sea Array
O&M	Operations and maintenance
OECC	Offshore export cable corridor
ORESS	Offshore Renewable Energy Support Scheme
OWF	Offshore Wind Farm
PINS	Planning Inspectorate
SSC	Suspended Sediment Concentrations

Definitions

Glossary	Meaning
the Applicant	The developer, Codling Wind Park Limited (CWPL).
Codling Wind Park (CWP) Project	The proposed development as a whole is referred to as the Codling Wind Park (CWP) Project, comprising of the offshore infrastructure, the onshore infrastructure and any associated temporary works.
Codling Wind Park Limited (CWPL)	A joint venture between Fred. Olsen Seawind (FOS) and Électricité de France (EDF) Renewables, established to develop the CWP Project.
Environmental Impact Assessment (EIA)	A systematic means of assessing the likely significant effects of a proposed project, undertaken in accordance with the EIA Directive and the relevant Irish legislation.
Environmental Impact Assessment Report (EIAR)	The report prepared by the Applicant to describe the findings of the EIA for the CWP Project.
Maritime Area Consent (MAC)	A MAC provides State authorisation for a prospective developer to undertake a maritime usage and occupy a specified part of the maritime area. A MAC is required to be in place before planning consent can be sought.

APPENDIX 8.1 CUMULATIVE EFFECTS ASSESSMENT

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13–22 km off the east coast of Ireland, at County Wicklow.

2. The Environmental Impact Assessment Report (EIAR) for the CWP Project provides the decision-maker, stakeholders and all interested parties with the environmental information required to develop an informed view of any likely significant effects resulting from the CWP Project, as required by the European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the EIA Directive). These provisions are transposed into Irish legislation in Part X of the Planning and Development Act 2000, as amended, and in Part 10 of the Planning and Development Regulations 2001, as amended.

3. A fundamental component of the EIA is to consider and assess the potential for cumulative effects of the project with other projects, plans and activities (hereafter referred to as 'other development').

4. The Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022) defines cumulative effects as:

> *'The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.*
>
> *While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects.'*

5. This appendix presents the findings of the Cumulative Effects Assessment (CEA) for subtidal and intertidal ecology, which considers the residual effects presented in **Chapter 8 Subtidal and Intertidal Ecology**, alongside the potential effects of other proposed and reasonably foreseeable development. Cumulative effects are considered in this document across the construction and operations and maintenance (O&M) phases of the CWP Project.

6. The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project-alone impacts during the decommissioning phase of the CWP Project are assessed in **Chapter 8 Subtidal and Intertidal Ecology**. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.

2 CEA methodology

2.1 Guidance

7. This section summarises the approach to the assessment of cumulative effects for the CWP Project. Further details on the approach to the CEA is provided in **Appendix 5.1 Cumulative Effects Assessment Methodology**.

8. The principal guidance document that has informed the approach to the CEA is the Planning Inspectorate (PINS) for England 'Advice Note 17: Cumulative Effects Assessment' (PINS, 2019), which provides a four-stage process for the assessment of cumulative effects that has been applied here.

9. This guidance has been applied for a number of Offshore Windfarm (OWF) and non-OWF projects in the UK and is considered to provide developers with a structured approach to assessing cumulative effects. The guidance is also regularly applied in Ireland for large-scale projects, noting that there is no single, industry standard approach to CEA in Ireland, which often varies between projects.

10. In developing the CEA methodology, EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022) and Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission, 1999), have also been considered.

2.2 Consultation

11. **Table 1** provides a summary of stakeholder and regulator feedback received during the consultation process that is relevant to the CEA for subtidal and intertidal ecology.

Table 1 Consultation responses relevant to the CEA for subtidal and intertidal ecology

Consultee	Comment	How issues have been addressed
Topic specific meetings		
NPWS 27 February 2021	**Discussion on cumulative assessment** EIA guidance from 2017 suggests that only consented projects are to be considered in the assessment. It was advised that there was no formal observation from NPWS, however a min / max scenario where min is only those projects that are consented and max being inclusive of projects that could be consented in the time between assessment and works commencing was suggested.	A tiered approach to cumulative impact assessment has been adopted whereby projects in planning or consented or constructed have been considered in **Section 1.5** and in the EIAR. **Chapter 37 Cumulative Impact Assessment**.
NPWS 15 April 2021	Cumulative Impact Assessment projects agreed on provision projects are updated as far as possible prior to submission. Approach to Appropriate Assessment agreed.	Projects considered in the Cumulative Impact Assessments are provided in **Section 1.4**.

2.3 Identification of 'other development'

12. Stage 1 of the process involved establishing the longlist of other development with the potential to result in cumulative effects with the CWP Project. This included all projects that result in a comparative

effect that is not intrinsically considered as part of the existing environment and is not limited to other OWF projects.

13. The longlist of other development (presented in **Chapter 5**, **Appendix 5.1**) was then subject to additional screening criteria to establish a shortlist of other development for each topic. It should be noted that the approach to the CEA attempts to incorporate an appropriate level of pragmatism. Only projects which are well described and sufficiently advanced, with sufficient detail available with which to undertake a meaningful and robust assessment, have been screened into the CEA.

14. In accordance with PINS Advice Note 17, each development considered alongside the CWP Project as part of the CEA has been assigned to a tier, reflecting its current status in the planning and development process.

15. The purpose of the tiered approach is to give consideration to the level of certainty that a cumulative project will be built and therefore contribute to cumulative effects. For example, there can be greater certainty that other development that have been approved and are under construction are likely to contribute to cumulative effects, whereas other development at early phases of development (i.e. pre-planning) is less likely to proceed to construction and contribute to cumulative effects. Furthermore, sufficient detail about these projects is unlikely to be available with which to undertake a detailed cumulative assessment.

16. The proposed tiering structure is presented in **Table 2** and described in more detail in **Appendix 5.1 Cumulative Effects Assessment Methodology**. The tiers are listed in descending order of the level of detail likely to be available (and, correspondingly, certainty of effects arising).

Table 2 Tiered structure for other development considered for CEA (modified from PINS Advice Note 17 (PINS, 2019))

Tier	Description
Tier 1	• Under construction • Permitted applications, but not yet implemented • Offshore applications submitted six months or more in advance of the CWP Project planning application, but not yet determined • Onshore applications submitted six months or more in advance of the CWP Project planning application, but not yet determined.
Tier 2a	• Offshore projects in receipt of a MAC and an Offshore Renewable Energy Support Scheme (ORESS) contract.
Tier 2b	• Other offshore projects in receipt of a MAC • Offshore projects in the public domain where an EIA scoping report has been issued • Onshore projects in the public domain where an EIA scoping report has been issued.
Tier 3	• Projects in the public domain where an EIA scoping report has not been issued • Projects that have been identified in the relevant development plans and programmes, which set the framework for future development consents / approvals, where such development is reasonably likely to come forward.

3 CEA impact screening

17. The first step in the CEA for subtidal and intertidal ecology is the identification of which residual impacts assessed for the CWP Project alone have the potential for a cumulative impact with other development (described as 'impact screening'). This screening exercise is set out in **Table 3** below.

18. Only potential impacts assessed in **Chapter 8 Subtidal and Intertidal Ecology** as ['**Not Significant'**] or above are included in the CEA (i.e. those assessed as 'Negligible' are not taken forward as there is no potential for them to contribute to a cumulative effect).

19. In summary, **Table 3** shows that there is the potential for cumulative effects on subtidal and intertidal ecology as a result of all potential impacts assessed in **Chapter 8 Subtidal and Intertidal Ecology**, other than the Introduction of INNS (invasive non-native species) and Accidental Pollution Events which were assessed as Negligible in terms of magnitude of impact and the resulting effect was **Not Significant** as primary mitigation measures remove the potential route to impact.

Table 3 Potential impacts scoped into the assessment.

Impact	Potential for cumulative effect	Rationale
Construction		
Temporary habitat disturbance	Yes	Potential cumulative impact exists Screened in
Temporary increase in SSC	Yes	Potential cumulative impact exists Screened in
Remobilisation of contaminated sediments	Yes	Potential cumulative impact exists Screened in
Introduction of INNS	No	No potential for cumulative impacts as primary mitigation measures minimise the route to impact, meaning the magnitude of impact was assessed as Negligible for all receptors and the resulting effect was **Not Significant**. Therefore, there is no potential for cumulative impacts from the introduction of INNS.
Accidental pollution	No	No potential for cumulative impacts as primary mitigation measures minimise the route to impact, meaning the magnitude of impact was assessed as Negligible for all receptors and the resulting effect was **Not Significant**. Therefore, there is no potential for cumulative impacts from Accidental Pollution Events.
Operation		
Long-term habitat loss	Yes	Potential cumulative impact exists Screened in
Habitat creation (increase in hard substrate)	Yes	Potential cumulative impact exists Screened in

Impact	Potential for cumulative effect	Rationale
Temporary habitat disturbance	Yes	Potential cumulative impact exists Screened in
Presence of Electromagnetic Fields (EMF) and / or temperature changes	Yes	Potential cumulative impact exists Screened in
Introduction of INNS	No	No potential for cumulative impacts as primary mitigation measures minimise the route to impact, meaning the magnitude of the effect of this impact was assessed as Negligible for all receptors and the resulting effect was **Not Significant**. Therefore, there is no potential for cumulative impacts from the introduction of INNS.
Accidental pollution	No	No potential for cumulative impacts as primary mitigation measures minimise the route to impact, meaning the magnitude of the effect of this impact was assessed as Negligible for all receptors and the resulting effect was **Not Significant**. Therefore, there is no potential for cumulative impacts from Accidental Pollution Events.
Decommissioning		
Temporary habitat disturbance	The detail and scope of the decommissioning works for the CWP Project will be determined by the relevant legislation and guidance at the time of decommissioning. Project alone impacts during the decommissioning phase of the CWP Project are assessed in Chapter 8 Subtidal and Intertidal Ecology. It is anticipated that the impacts will be no greater than those identified for the construction phase, and therefore no separate assessment of cumulative impacts during the decommissioning phase is presented within this CEA.	
Temporary increase in SSC		
Remobilisation of contaminated sediments		
Long-term habitat loss		
Introduction of INNS		
Accidental pollution		

4 CEA 'other development' screening

20. The second step in the CEA for subtidal and intertidal ecology is the identification of the other development that may result in cumulative effects for inclusion in the CEA (described as 'project screening'). This information is set out in **Table 4** below, together with a consideration of the relevant details of each development, including the tier (see **Table 2**), proximity to the CWP Project development area and a rationale for including or excluding a development from the assessment.

21. The other development included in the table below are taken from the longlist of other development (presented in **Appendix 5.1**). Information gathering for the other development screened in at Stage 2

of the CEA, along with a greater understanding of the potential effects of the CWP Project, has enabled further refinement of the shortlist.

22. In summary, the following other development will be assessed for potential cumulative effects with the CWP Project in relation to subtidal and intertidal ecology:

- Arklow Bank OWF Phase 2;
- Arklow Bank Wind Park off coast of County Wicklow;
- Banba Wind Ltd., Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin;
- Braymore Point;
- Codling Wind Park Ltd. Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin;
- Dublin Array OWF;
- Dublin City Council, environmental survey for proposed Point Bridge and Tom Clarke Widening Project;
- Dublin Port Company – dredge disposal;
- Dublin Port Capital Dredging Project;
- (Dublin Port Company) MP2 Project;
- Dublin Port Company Site Investigations;
- Hibernian Wind Power – Kilmichael Point;
- Iarnród Éireann, geotechnical and geophysical site investigation;
- Lir Offshore Array Ltd., Site Investigations for the proposed Lir Offshore Array, off Counties Louth, Meath and Dublin;
- Kish Offshore Wind Limited and Bray Offshore Wind Limited, capital and maintenance dredging;
- Maintenance dredging River Boyne, Dogheda;
- MaresConnect Electricity Interconnector Site Investigation;
- Microsoft Ireland Ltd, geophysical and site investigation surveys, Portmarnock;
- Microsoft Ireland Ltd, geophysical and site investigation surveys, Dublin Port;
- MP2 Project: (Jetty development);
- North Irish Sea Array (NISA) Site Investigations;
- North Irish Sea Array OWF;
- Rockabill Cable Systems Ltd;
- Statkraft North Irish Sea Array (NISA) Site Investigations for Export Cable Route;
- Sunrise Wind Ltd., Site Investigations for the proposed Sunrise Offshore Wind Farm, off Counties Dublin and Wicklow;
- Sure Partners Arklow Bank Wind Park Phase 2 Site Investigations;
- Sure Partners Site Investigations at Arklow Bank;
- Wicklow Port Dredging;
- Wicklow Sea Wind Ltd., Site Investigations for the proposed Wicklow Project offshore wind farm, off County Wicklow; and
- Irish Mussel Seed Company Aquaculture.

Table 4 Summary of other development screened into the CEA for subtidal and intertidal ecology

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes /No)	Rationale
Arklow Bank OWF Phase 2 (CEA-0004)	9.788	9.9	2b	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.
Arklow Bank Wind Park off coast of County Wicklow – Site Investigation(s) (CEA-2752; CEA-2753)	9	17	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Banba Wind Ltd., Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin (CEA-2746)	0	0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Braymore Point – Site Investigations (CEA-2742)	53	27	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Codling Wind Park Ltd. Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin (CEA-2748)	0	0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Dublin Array OWF (CEA-0037)	2.781	2	2a	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.
Dublin Port Capital Dredging Project(s) (CEA-0206 - CEA-0210)	31.5	0.5	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes /No)	Rationale
Dublin Port Company Site Investigations (CEA-2727)	29	0.2	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Hibernian Wind Power – Kilmichael Point – Site Investigations (CEA-2756)	25	34.5	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Lir Offshore Array Ltd., Site Investigations for the proposed Lir Offshore Array, off Counties Louth, Meath and Dublin (CEA2745)	48	37	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Maintenance dredging River Boyne, Dogheda (CEA-2712)	67	36	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
MaresConnect Electricity Interconnector Site Investigation(s) (CEA-2749)	30	9.5	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
(Dublin Port Company) MP2 Project (CEA- CEA-1323)	31.6	0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
MP2 Project: Jetty development (CEA-1328on/off)	32.1	4	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP -– screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes /No)	Rationale
North Irish Sea Array (NISA) Site Investigations (CEA-2738)	40	22.5	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
North Irish Sea Array OWF (CEA-0094)	40.78	23	2a	Yes	Potential cumulative impact exists as development will have all the same impacts as CWP – screened in.
Rockabill Cable Systems Ltd – site investigations (CEA-2732)	42	17	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Statkraft North Irish Sea Array (NISA) Site Investigations for Export Cable Route (CEA-2751)	45	27	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Sunrise Wind Ltd., Site Investigations for the proposed Sunrise Offshore Wind Farm, off Counties Dublin and Wicklow (CEA-2744)	0	2	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Sure Partners Arklow Bank Wind Park Phase 2 Site Investigations (CEA-2753)	9	17	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Sure Partners Site Investigations at Arklow Bank (CEA-2736)	9	17	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Wicklow Sea Wind Ltd., Site Investigations for the proposed Wicklow Project offshore wind farm, off County Wicklow (CEA-2747)	2	11.9	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

Development	Distance from the array site (km)	Distance from the export cable corridor	Tier	Included in the CEA (Yes /No)	Rationale
Irish Mussel Seed Company – Aquaculture	35	43.7	1	Yes	Potential cumulative impact exists as development will have some of the same impacts as CWP – screened in.
Dublin City Council, Environmental survey and ground investigation (CEA-2996)	1.5	34	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Kish Offshore Wind Limited & Bray Offshore Wind Limited, Port and harbour activities (including capital and maintenance dredging) and port development. (CEA-2979)	23	1	3	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Microsoft Ireland Operations Ltd, geophysical and site investigation surveys, Portmarnock (CEA-2991)	34	8	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Microsoft Ireland Operations Ltd, geophysical and site investigation surveys, Dublin Port (CEA-2989)	30	0	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.
Iarnród Éireann, Geotechnical and Geophysical site investigation survey (CEA-2993)	2	28	1	Yes	Potential cumulative impact exists as development will have similar impacts as CWP – screened in.

5 Assessment of cumulative effects

23. The subtidal and intertidal habitats assessed for the CWP Project alone are also present in the vicinity of the projects screened in in **Section 1.4**, with the exception of mixed sediment habitats which is only present within the Arklow Bank Phase 2, Dublin Array and North Irish Sea Array projects.

5.1 Construction

5.1.1 Construction phase cumulative Impact 1: Temporary habitat disturbance

24. When considering this impact for the CWP Project alone it relates to seabed preparation activities, jack up and anchoring operations, and cable installation. The impact of temporary habitat disturbance is confined to the boundaries of the CWP Project and as such only habitats within the boundaries have the potential be impacted. Only a small proportion (4–7%) of subtidal and intertidal habitats within the offshore development area had the potential to be impacted and it was concluded to be of an imperceptible to slight significance for all benthic subtidal and intertidal habitats which is **Not Significant**.

25. The proportion of habitat with the potential to be impacted by temporary habitat disturbance by the CWP Project is expected to be representative of the other Tier 1, Tier 2a, Tier 2b and Tier 3 developments occurring in the area (noting that there is insufficient data available for the Tier 3 project to undertake a meaningful assessment), particularly the other offshore wind farm projects within Tier 2a and Tier 2b, and it is likely the impact arising from activities from each of the other projects assessed will also be confined to the boundaries of each project. Were each of the other projects to impact c. 7% of the habitat within their project boundaries with temporary habitat disturbance this would account for c. 0.2% of the benthic habitats within the cumulative impact screening area. Furthermore, the habitats disturbed by the other relevant port projects are likely to be impacting habitats that are already heavily disturbed and as such have benthic communities adapted to temporary habitat disturbance, such as the habitats found within the River Liffey (**Chapter 8, Subtidal and Intertidal Ecology**).

26. The impact is short term and occurs over a relatively small spatial extent, while the recoverability of all receptors to this impact is assessed as high, which means full recovery is expected within two years of the impact (Tyler-Walters et al., 2023), **Chapter 8, Subtidal and Intertidal Ecology**). As such, the impact is considered negligible in the context of the wider availability of these subtidal and intertidal habitats.

27. Therefore, it is concluded that the magnitude of the impact will not be meaningfully increased by the surrounding developments and that the cumulative effect of temporary habitat disturbance. As such, it is concluded that for the CWP Project and Tier 1 projects, the effect of temporary habitat disturbance will be **Not Significant.** The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

5.1.2 Cumulative impact 2: Temporary increase in suspended sediment concentrations (SSC)

28. This impact relates to seabed preparation for foundations and cables, jack up and anchoring operations, and cable installation. Temporary increases in SSC have the potential to impact subtidal and intertidal habitats within and out with the CWP Project boundaries. The representative scenario is based upon the dredging / disposal and trenching works that will take place as part of the CWP Project. The greatest predicted impacts can be summarised as follows:

Dredging and dredge disposal

29. Suspended sediment plumes created during dredge disposal operations are predicted to enhance SSC levels in the near field (i.e. to the point of release) and far field (i.e. up to circa 10 km) from the point of release).

30. The predicted transport of sediment plumes and subsequent deposition during dredge disposal activities within the CWP Project can be summarised as follows:

Modelled representative scenarios of dredge disposal activities within the array site indicated the predominant direction of travel for SSC plumes is eastward (away from shore). In one scenario, a maximum transient increase in SSC of 150 mg/L was predicted to travel a maximum of 4 km over c.10 days resulting in a cumulative sediment deposition thickness of c. 6 cm. In another a maximum increase of 100 mg/L was predicted to travel up to 6 km over c. 15 days resulting in a cumulative sediment deposition thickness of c. 3 cm. Modelled representative scenarios of dredge disposal activities within the offshore export cable corridor (OECC) predicted: a maximum transient increase in SSC of 80 mg/L, travelling 4 km westward resulting in a cumulative sediment deposition thickness of c. 2 cm, near the disposal location. In a final scenario, a maximum increase in SSC of 50 mg/L, travelling a maximum of 5 km south eastward resulting in a cumulative sediment deposition thickness of c. 4 cm, near the disposal location.

Trenching

31. A consequence of cable installation will be the liberation of sediment into suspension within the water column, just above the seabed. Jetting results in greater sediment suspension, introducing the potential for distribution of greater volumes of material over a larger spatial area than other cable laying techniques which may be employed during construction and thus is assessed as the representative scenario. This method involves fluidising the material to form a narrow trench into which the cable is laid.

32. Based upon the representative scenario, the predicted transport of sediment plumes generated during cable installation activities across the array site indicates the finest sediments will potentially be transported eastward up to 10 km at an increase of 20 mg/L, resulting in a cumulative sediment deposition thickness of < 1 cm, near the release location. Maximum SSC values of up to 40 mg/L were predicted to be transported up to 4 km eastward, resulting in a cumulative sediment deposition thickness of c. 1 cm, near the release location. However, these plumes are transient, rapidly decreasing as sand-sized sediments deposit to the bed and finer sediments are dispersed.

33. The predicted transport of sediment plumes generated during cable installation activities across the OECC were for a maximum increase in SSC of 50 mg/L being transported for up to 7 km eastward resulting in a cumulative sediment deposition thickness of c. 2 cm, near the release location and southward and a maximum increase in SSC of 80 mg/L being transported for < 1 km eastward resulting in a cumulative sediment deposition thickness of < 1 cm, near the release location.

34. Therefore, the maximum thickness of the deposit on the seabed away from the trenching activities were predicted to be c. 2 cm; deposited sediments would be reworked and rapidly integrated into the prevailing sediment transport regime, and thus would have negligible impact on the prevailing

environment. Consequently, enhanced SSC and the predicted deposition thickness would not be discernible above natural variation observed during storm events, with SSCs predicted, in the representative scenario, to reduce to baseline levels within c. 15 days following trenching operations.

35. Background levels of SSC are considered to be between 5–15 mg/L within the CWP Project.

36. All habitat types within the study area are considered to have the potential to be impacted by increased SSC.

37. When this impact was assessed for the CWP Project alone, only a very small proportion of the subtidal and intertidal habitats had the potential to be impacted (when assuming an even distribution of impact across the habitats) and the magnitude of this impact for all subtidal and intertidal receptors were assessed as negligible or low. The impact was assessed as imperceptible to slight for all benthic habitat receptors, which is **Not Significant**.

38. Sediment plume modelling for the CWP Project alone suggests that only subtidal and intertidal sediment habitats have the potential to be impacted by increases in SSC. As such, should other wind farm projects such as the Tier 2b Arklow Bank and Tier 2a Dublin Array have the potential to impact reef habitats within the cumulative effects screening area, there is no potential for cumulative impacts on these habitats from impacts from CWP Project. Furthermore, the types of rocky reef habitat that occur in Wicklow Reef SAC and Rockabill to Dalkey Island SAC have high tolerance and recoverability to increases in SSC and sediment deposition (up to 5cm) (Stamp et al., 2023; Stamp, 2016).

39. Of the relevant projects, three are offshore wind farm developments, and five are dredging programmes. Therefore, the impacts are likely to be relatively similar to those predicted for the CWP Project. It was concluded that the sediment thickness will be less than 1 cm within the immediate vicinity followed by rapid natural dispersal and sediment movement to reduce to background levels within 15 days. As it is highly unlikely that the impacts from all projects will be occurring simultaneously, the short duration of increased levels of SSC, and rapid redistribution of sediments ensures there will not be change in magnitude of the predicted impact from the cumulative impact of other developments.

40. The other projects include 18 site investigation projects, Dublin Port Company MP2 Project, MP2: Jetty development, Grand Canal Storm Water Outfall Extension and New Terminal Building, and Irish Mussel Seed, all of which sit within Tier 1, will impact a much smaller area due to the nature of the projects and do not involve dredge disposal. While activities will have the likelihood of increasing SSC, the combination of smaller areas and highly dynamic marine environments ensures there will not be a change in the magnitude of the predicted impact.

41. Therefore, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments and the cumulative effect. As such, it is concluded that for the CWP Project and Tier 1 projects the effect of increased SSC will be N**ot Significant**. The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 project of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

5.1.3 Cumulative impact 3: Remobilisation of contaminated sediments

42. Remobilisation of contaminated sediments can occur when such sediments are disturbed and enter the water column and are transported and redeposited elsewhere. As such, the area over which this may apply, and the subtidal and intertidal habitat receptors, are considered analogous to that described above for temporary increase in SSC.

43. In the CWP baseline site specific survey, contaminated sediment results showed low levels of chemical contaminants at stations sampled within the offshore development area. The majority of contaminant levels at sampled stations were below the Irish Lower AL and Cefas AL1 (**Appendix 8.3 Benthic Baseline Report**).

44. When this impact was assessed for the CWP Project alone, only a very small proportion of the subtidal and intertidal habitats had the potential to be impacted (when assuming an even distribution of impact across the habitats) and the magnitude of this impact for all subtidal and intertidal receptors were assessed as negligible or low. The impact was assessed as imperceptible to slight for all benthic habitat receptors, which is **Not Significant**.

45. Contaminated sediment levels in and around other relevant Tier 2a and Tier 2b offshore wind farm projects are likely to be of the same low levels as found at the CWP Project, although higher levels may exist in the coastal project areas as the main source of contaminants to the Irish Sea are largely from riverine discharges (Cefas, 2005).

46. The other projects include 18 site investigation projects, Dublin Port Company MP2 Project, MP2: Jetty development, Grand Canal Storm Water Outfall Extension and New Terminal Building, and Irish Mussel Seed, all of which sit within Tier 1, will impact a much smaller area due to the nature of the projects and do not involve dredge disposal. While activities will have the likelihood of increasing SSC, and deposition, the likely increase in remobilisation of contaminated sediments, given the requirements to mitigate where elevated levels of contamination are present, combined with smaller areas and highly dynamic marine environments ensures there will not be a change in the magnitude of the predicted impact.

47. Given the low levels of sediment deposition expected to occur as a result of temporary habitat disturbance and the low levels of contaminated sediments present in the Irish Sea, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments.

48. Therefore, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments. As such, it is concluded that for the CWP Project and Tier 1 projects that the effect of the remobilisation of contaminated sediments will be **Not Significant.** The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 project of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

5.2 Operation and maintenance

5.2.1 Cumulative impact 1: Long-term habitat loss

49. This impact relates to the impact from the installation of structures in the seabed such as OSS and WTG monopile foundations, including scour and cable protection. The impact of long-term habitat loss is confined to the boundaries of the CWP Project and as such only habitats within the boundaries have the potential to be impacted. When this impact was assessed for the CWP Project alone, only a very small proportion (0.4%) of subtidal and intertidal habitats within the offshore development area, had the potential to be impacted and the magnitude of impact was assessed as negligible for all relevant habitats. The impact of long-term habitat loss was concluded to be slight for all benthic subtidal and intertidal habitats which is **Not Significant**.

50. The proportion of habitats with the potential to be impacted by long-term habitat loss by the CWP Project is expected to be representative of the other developments occurring in the area, in particular Tier 2a and Tier 2b offshore wind projects, and the impact arising from activities from each of the other projects assessed will also be confined to the boundaries of that project. As such, the impact is considered negligible in the context of the wider availability of these subtidal and intertidal habitats.

51. The other projects include 18 site investigation projects, Dublin Port Company MP2 Project, MP2: Jetty development, Grand Canal Storm Water Outfall Extension and New Terminal Building, and Irish Mussel Seed, all of which sit within Tier 1, will impact a much smaller area due to the nature of the projects and do not involve meaningful habitat loss with regards the habitats found within the offshore area in which the CWP project is proposed. As such, there will not be a change in the magnitude of the predicted impact.

52. Therefore, it is concluded that the magnitude of the impact will not be increased by the surrounding developments. As such, it is concluded that for the CWP Project and Tier 1 projects the effect of long-term habitat loss will be **Not Significant**. The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 project of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

5.2.2 Cumulative impact 2: Habitat creation (increase in hard substrate)

53. The habitat areas within the CWP Project and other relevant projects, which are adversely affected by long-term habitat loss, are likely to be positively impacted by habitat creation through the colonisation on the hard substrates introduced. As such, only habitats within the boundaries of each project have the potential to be positively impacted by habitat creation.

54. The impact assessment for this impact for CWP Project activities alone are the same as those of long-term habitat loss in terms of Sensitivity and Magnitude and therefore for Significance, though the impact is positive. The impact from the other relevant projects will also be the same as that of their long-term habitat loss impact.

55. Therefore, it is concluded that the magnitude of the impact will not be increased by the surrounding developments. As such, it is concluded that for the CWP Project and Tier 1 projects the effect of habitat creation will be **Not Significant**. The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 project of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

5.2.3 Cumulative impact 3: Temporary habitat disturbance

56. When considering this impact for the CWP Project alone it relates to maintenance and repair activities required during the operation and maintenance phase. The impact of temporary habitat disturbance is confined to the boundaries of the CWP Project and as such only habitats within the boundaries have the potential be impacted.

57. It is anticipated that the level of temporary habitat disturbance caused by the maintenance and repair activities during operation and maintenance activities will be no greater than that generated by the installation during construction. Given this, the potential effects of this impact on the subtidal and intertidal habitats will be less than, or equal to, those of temporary habitat disturbance during construction which have been assessed as not significant.

58. Only a small proportion (4–7%) of subtidal and intertidal habitats within the offshore development area had the potential to be impacted and therefore it was concluded to be of an imperceptible to slight significance for all benthic subtidal and intertidal habitats which is **Not Significant**.

59. The proportion of habitat with the potential to be impacted by temporary habitat disturbance by the CWP Project is expected to be representative of the other Tier 1, Tier 2a, Tier 2b and Tier 3 developments occurring in the area (noting that there is insufficient data available for the Tier 3 project to undertake a meaningful assessment), particularly the other offshore wind farm projects within Tier 2a and Tier 2b, and it is likely the impact arising from activities from each of the other projects assessed will also be confined to the boundaries of each project. Were each of the other projects to impact c. 7% of the habitat within their project boundaries with temporary habitat disturbance this would account for c. 0.2% of the benthic habitats within the cumulative impact screening area. Furthermore, the habitats disturbed by the other relevant port projects are likely to be impacting habitats that are already heavily disturbed and as such have benthic communities adapted to temporary habitat disturbance, such as the habitats found within the River Liffey (**Chapter 8, Subtidal and Intertidal Ecology**).

60. The impact is short term and occurs over a relatively small spatial extent, while the recoverability of all receptors to this impact is assessed as high, which means full recovery is expected within two years of the impact (Tyler-Walters et al., 2023), **Chapter 8, Subtidal and Intertidal Ecology**). As such, the impact magnitude is considered negligible in the context of the wider availability of these subtidal and intertidal habitats.

61. Therefore, it is concluded that the magnitude of the impact will not be meaningfully increased by the surrounding developments and that the cumulative effect of temporary habitat disturbance. As such, it is concluded that for the CWP Project and Tier 1 projects, the effect of temporary habitat disturbance will be **Not Significant.** The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 projects of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

5.2.4 Cumulative impact 4: Presence of EMF and / or temperature changes

62. Transmission of electricity through subsea cables will lead to the generation of EMF and / or temperature changes. As described in the impact assessment for the CWP Project alone, there is a lack of evidence of the impacts of EMF on benthic invertebrate species and habitats while benthic fauna are considered sensitive only to acute increases in temperature and the sensitivity of the receptors were assessed as low.

63. There is approximately 145.8 km of OECC cable, 8.6 km of inter-connector cable and 139 km of inter-array cabling for the CWP Project, all of which has the potential to generate EMF and the magnitude of impact was assessed as low. This is likely to be representative of the other three Tier 2a and Tier 2b windfarm developments.

64. As the other projects, Dublin Port Capital Dredging Project, Dublin Port Company MP2 Project, MP2: Jetty development, Grand Canal Storm Water Outfall Extension and New Terminal building, and Irish Mussel Seed Company are not power-generating developments, there will be no associated EMF for any of these projects, and as such they will not contribute to the cumulative impact.

65. Cable burial or protection is an industry standard practice. For the CWP Project, EMF levels, specifically the magnetic field that is created by power transmitting cables, are already below the

background levels of the earth's magnetic field, and burial of the cables will reduce the received levels at the seabed considerably. Marine benthic fauna are considered sensitive to acute increases in temperature, though they can tolerate an increase of 2°C. Increases of 5°C can however have lethal effects, particularly in summer conditions (Tillin and Tyler-Walters, 2014). The burial depth for the export and inter array cables is 1.5–3 m and is therefore expected to be consistent with these predictions for the majority of the route. At this burial depth, temperature increases can be expected to remain between 0°C and 2°C in most circumstances, with no discernible increase in water temperature anticipated. As the other Tier 2a and 2b offshore wind projects will utilise these standard industry practices, there will be no significant contribution of EMF and / or temperature changes to the marine environment and therefore no change in magnitude.

66. Therefore, it is concluded that the magnitude of the impact will not be significantly increased by the surrounding developments. As such, it is concluded that for the CWP Project cumulatively with Tier 1 projects the effect of the presence of EMF and / or temperature changes will be **Not Significant.** The same conclusion is drawn for the CWP Project and Tier 1 projects combined with Tier 2a and Tier 2b projects. There are no Tier 3 project of relevance, or for which there is adequate information to undertake a meaningful assessment. As such, there are anticipated to be no significant cumulative effects with CWP cumulatively with Tier 3 projects; the same conclusion being drawn for Tier 1, Tier 2a, Tier 2b and Tier 3 combined.

6 CEA summary

67. This CEA, which supports **Chapter 8 Subtidal and Intertidal Ecology**, has assessed the potential cumulative effects on subtidal and intertidal ecology from the construction and operation and maintenance phases of the CWP Project alongside other development.

68. In summary, the CEA for subtidal and intertidal ecology does not identify any significant cumulative effects resulting from the CWP Project alongside other development.

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