Partners in UK offshore wind

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Review of Cumulative Effects Assessment and In-Combination Assessment

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Image of an offshore wind farm

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Glossary

Term	Meaning
Applicant	Morgan Offshore Wind Limited.
Cumulative effects assessment	Assessment of the likely effects arising from the Morgan Generation Assets Project alongside the likely effects of other development activities in the vicinity of the Morgan Generation Assets Project.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Effect	The consequence of an impact.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Morgan Generation Assets Project.
Impact	A change that is caused by an action.
In-combination effect	The combined effect of the Morgan Offshore Wind Project in-combination with the effects from a number of different projects on the same feature/receptor.
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a DCO to apply for a 'deemed' marine licence as part of the DCO process.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects.

Acronyms

Acronym	Description
CEA	Cumulative Effects Assessment
CRNRA	Cumulative Regional Navigational Risk Assessment
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EVMP	Environmental Vessel Management Plan
ISAA	Information to Support an Appropriate Assessment
MU	Management Unit
NSIP	Nationally Significant Infrastructure Project
SLVR	Seascape, Landscape and Visual Resources

Units

Unit	Description
km	Kilometre
MW	Megawatt

1 REVIEW OF CUMULATIVE EFFECTS ASSESSMENT AND IN-COMBINATION ASSESSMENT

1.1 Introduction

1.1.1.1 Morgan Offshore Wind Limited (hereafter referred to as 'the Applicant') submitted a Development Consent Order (DCO) application for the Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the 'Morgan Generation Assets') on 24 April 2024. The DCO application included an Environmental Statement, which presented the results of the Environmental Impact Assessment (EIA), encompassing a Cumulative Effects Assessment (CEA) (as presented within the topic specific chapters of Volume 2 of the Environmental Statement (APP-013 to APP-021, AS-010 and APP-023 to APP-027)). The DCO application also included the Information to Support an Appropriate Assessment (ISAA) which encompassed an in-combination assessment (APP-096, APP-097 and APP-098).

1.1.1.2 The CEA identified those projects, plans or activities with which the Morgan Generation Assets may interact to produce a cumulative effect. Information on other projects, plans or activities which was publicly available in January 2024 (up to three months before the application was submitted, as described in Volume 1, Chapter 5: Environmental impact assessment methodology (APP-012)) was considered in the CEA and in-combination assessment.

1.1.1.3 Since January 2024, new projects not previously considered in the CEA have entered the public domain, and new or updated assessment material has been published on projects that had been considered in the CEA. This document presents a review of the following:

1. New project information published up to 27 September 2024: for new projects (information for which was not available at the time of completing the CEA for the application), the Applicant has carried out CEA screening in line with Volume 3, Annex 5.1: Cumulative effects screening matrix (APP-031) and considered whether there is potential for additional cumulative effects to arise in order to inform whether these projects are screened into or out of the CEA review
2. Updated project information published up to 27 September 2024: for those projects already considered in the CEA submitted with the application, the Applicant has carried out a review to determine whether the updated information could change the conclusions of the assessment presented in the application.

1.1.1.4 This aligns with the CEA guidance published by the Planning Inspectorate in September 2024 which states that: 'Further assessment may be required during the examination stage for any newly identified 'other existing development and, or approved development' with potential to give rise to significant effects' (The Planning Inspectorate, 2024). If there is no potential for significant effects to arise, no further assessment is required.

1.1.1.5 This document considers the following projects for which new or updated information is available (see Table 1.1 for details of which projects were considered in the CEA presented in the application, and which are new since the submission of the application):

- Arklow Bank Wind Park Phase 2
- Cair Vie Onshore Wind Farm

- Codling Wind Park Offshore Wind Farm
- Llŷr Offshore Wind Project
- Microsoft Wales-Ireland telecommunications cable
- Morecambe Offshore Windfarm: Generation Assets
- North Irish Sea Array (NISA) Offshore Wind Farm
- Oran na Mara Tidal Energy
- Oriel Offshore Wind Farm.

1.2 Methodology

1.2.1 Background

1.2.1.1 This document has been prepared to supplement the CEA undertaken for the Morgan Generation Assets within the topic specific chapters in Volume 2 of the Environmental Statement (APP-013 to APP-021, AS-010 and APP-023 to APP-027) (hereafter referred to as 'the Morgan Generation Assets CEA').

1.2.1.2 The CEA methodology is described in full in Volume 1, Chapter 5: Environmental Impact Assessment methodology (APP-012). The methodology was developed in accordance with the Planning Inspectorate Advice Note Seventeen: Cumulative effects assessment relevant to Nationally Significant Infrastructure Projects (NSIPs) (Planning Inspectorate, 2019). The methodology and EIA are compliant with the latest CEA guidance published by the Planning Inspectorate in September 2024 (The Planning Inspectorate, 2024).

1.2.1.3 For a cumulative effect to occur, there must be an impact-receptor-pathway, which includes conceptual overlap, physical overlap and temporal overlap. The screening criteria used to identify an impact-receptor-pathway is described in Volume 1, Chapter 5: Environmental Impact Assessment methodology (APP-012) and Volume 3, Annex 5.1: Cumulative effects screening matrix (APP-031).

1.2.1.4 The Morgan Generation Assets CEA considers three scenarios:

- Scenario 1: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets
- Scenario 2: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets
- Scenario 3: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets plus other projects and plans.

1.2.1.5 This CEA review has been prepared for Scenario 3, which considers the Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets plus all other projects and plans screened into the CEA. A tiered approach has been adopted to Scenario 3. The tiered approach uses the following categorisations:

- Tier 1
  - Under construction
  - Permitted application
  - Submitted application

- Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an evidenced ongoing impact.

- Tier 2

- Scoping report has been submitted and is in the public domain.

- Tier 3

- Scoping report has not been submitted and is not in the public domain
- Identified in a relevant development plan
- Identified in other plans and programmes.

1.2.1.6 Since submission of the Morgan Generation Assets application, some of the projects considered in the CEA have moved from a lower tier to a higher tier, as described in paragraph 1.2.2.2.

1.2.1.7 This document presents a review of the CEA undertaken for the Morgan Generation Assets according to the stages described in sections 1.2.2 to 1.2.4.

1.2.2 Identification of new project information

1.2.2.1 An update to the CEA long list (presented within Volume 3, Annex 5.1: Cumulative effects screening matrix (APP-031)) has been completed based on information made publicly available on project or government websites. This update includes changes to existing projects on the long list as well as additional projects identified since January 2024 when the Morgan Generation Assets CEA was undertaken.

1.2.2.2 Each project that has been identified as having published substantial assessment material since the Morgan Generation Assets CEA was produced was taken forward to the screening stage below. Substantial assessment material includes:

- Projects which have progressed further along the consenting process meaning that they have moved from a lower tier to a higher tier
- Projects where the status of the project changed, for example from submitted to consented
- New projects not considered in the Morgan Generation Assets CEA which have been identified in the long list screening process
- Other new information has become available that could potentially lead to a change in the assessment conclusions of the Morgan Generation Assets CEA.

1.2.2.3 Minor updates to existing projects which did not constitute substantial assessment material (for example, updates to project names, project developers, completion of site investigation surveys where no new information was made available, etc.) have not been considered.

1.2.3 Topic screening of new project information

1.2.3.1 New or updated project information (identified in section 1.2.2) has been screened on a topic-by-topic basis to identify projects to be taken forward for the CEA review described in section 1.2.4.

1.2.3.2 The screening process for new projects is outlined in Figure 1.1 and described below:

- New projects are identified through review of the CEA long list

- Information was screened to identify whether there is spatial overlap between the project and the Morgan Generation Assets CEA study area for each topic (i.e. a physical effect-receptor pathway). The CEA study areas are defined as described in each topic chapter (APP-013 to APP-027). Projects beyond the CEA study areas were screened out of the CEA review
- The screening considered whether the new project information was relevant to the assessment for that topic, considering the criteria in Table 1.2 (and in accordance with the criteria set out in Volume 3, Annex 5.1: Cumulative effects screening matrix (APP-031)). Where a cumulative effect exists, projects were screened into the CEA review
- The screening considered whether the new project information could lead to an increase in the impacts assessed for each topic compared to that which has been assessed in the Morgan Generation Assets CEA
- Where is potential for a significant effect, the CEA is then reviewed considering the new project information.

1.2.3.3 The screening process for updated projects is outlined in Figure 1.2 and described below:

- Updated projects are identified through review of the CEA long list
- The screening considered whether the updated project information was relevant to the assessment for that topic, considering the criteria in Table 1.2 (and in accordance with the criteria set out in Volume 3, Annex 5.1: Cumulative effects screening matrix (APP-031))
- The updated information was reviewed to determine if this could result in any change to the cumulative maximum design scenario for each impact compared to that assessed in the Morgan Generation Assets CEA. Projects which have no potential to result in any change were screened out of the CEA review
- Where a change was identified, the screening considered whether the change could lead to an increase in the impacts assessed for each topic compared to that assessed in the Morgan Generation Assets CEA. Where there is potential for an increase in potential effects, a sensitivity analysis was carried out to consider if the updated information could alter the conclusions of the CEA and in-combination assessment presented in the application.

1.2.3.4 The projects that have been reviewed for potential cumulative effects are listed in Table 1.1.

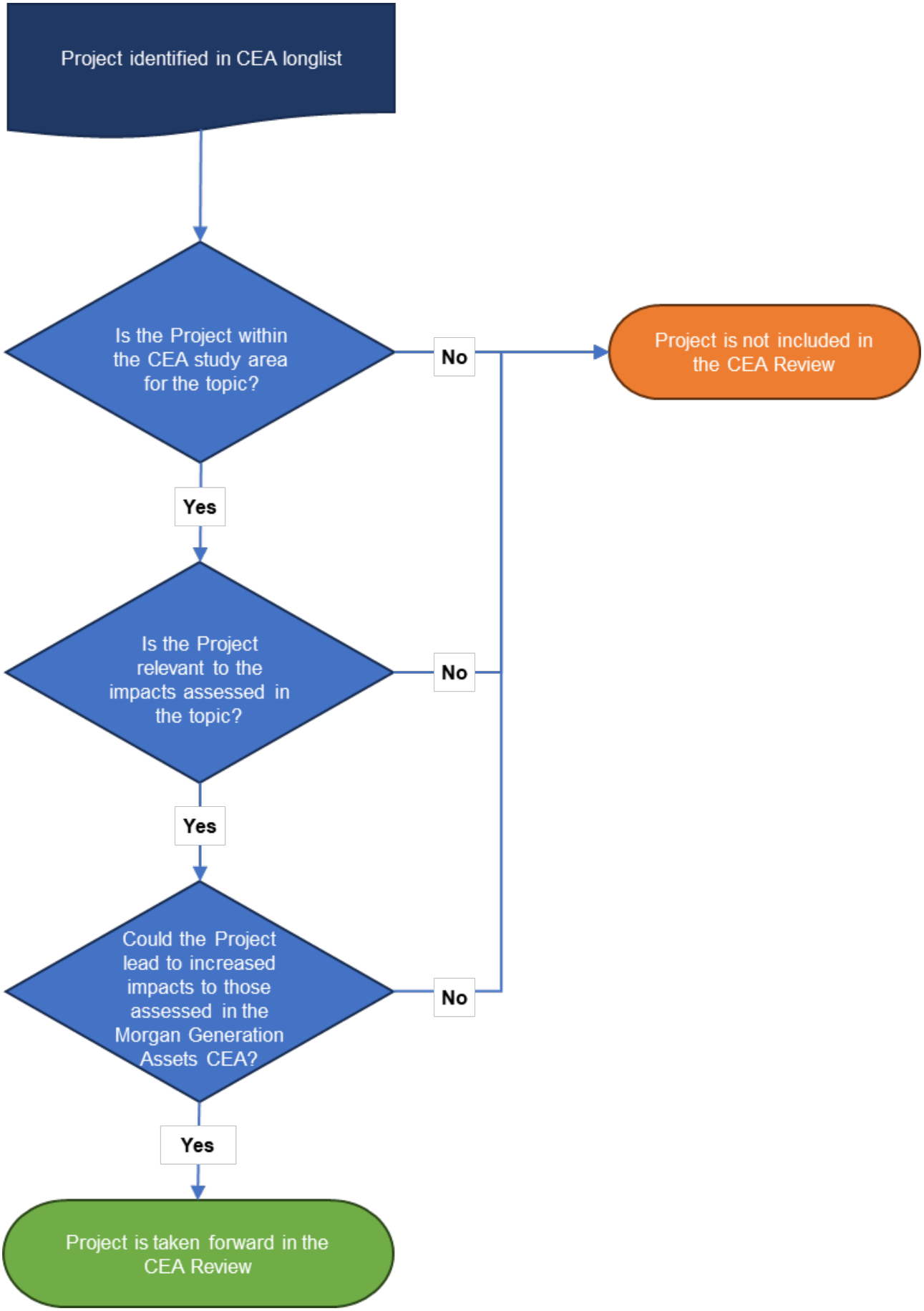

Figure 1.1: Flow chart for CEA screening process (New projects).

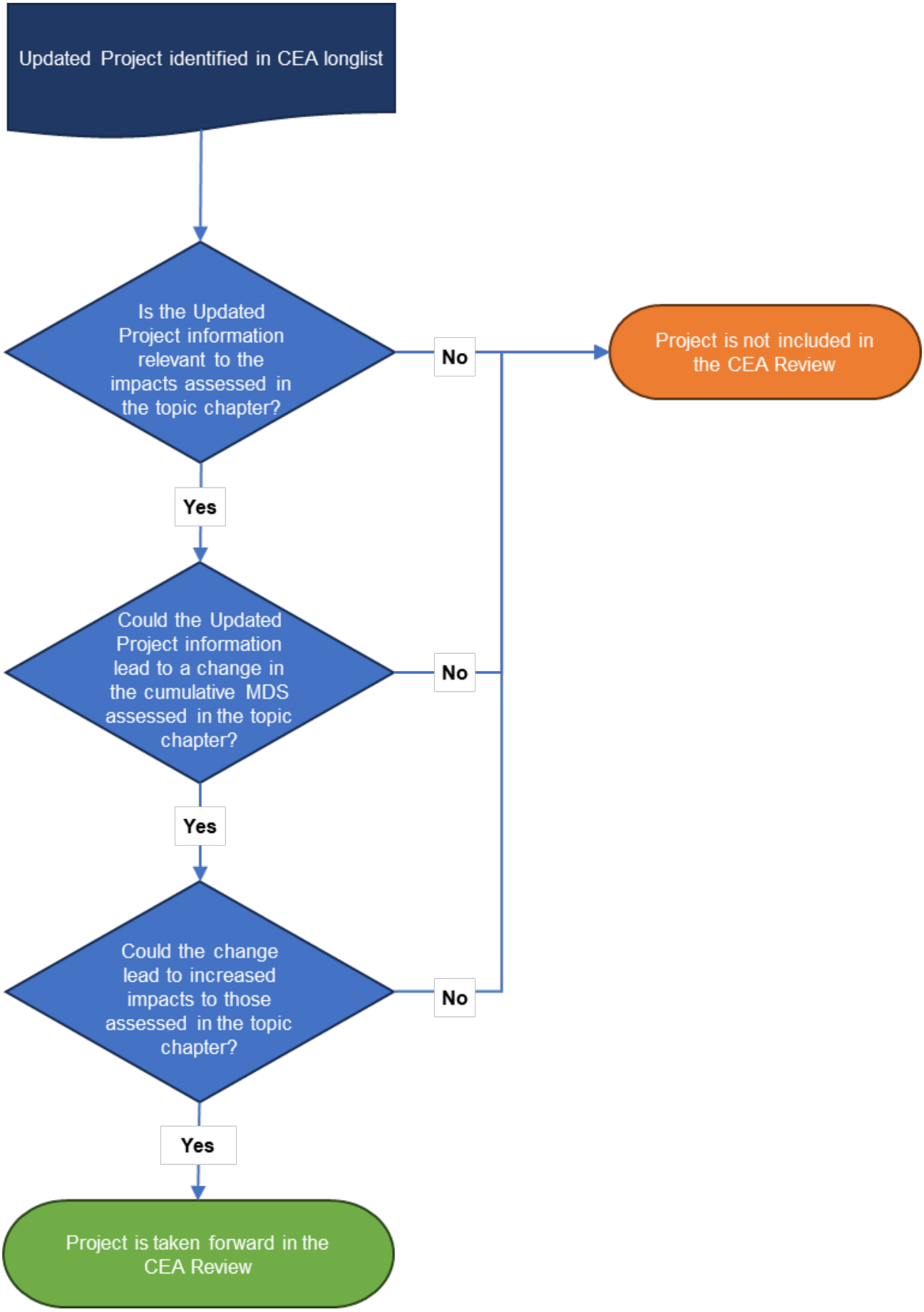

Figure 1.2: Flow chart for CEA screening process (Updated projects).

1.2.4 Review of the cumulative effects assessment

1.2.4.1 A review of the CEA has been undertaken on a topic-by-topic basis and is presented in section 1.4. The assessment presented within Volume 2, Chapter 12: Climate change (APP-016) is inherently cumulative, in accordance with IEMA (2022), and therefore this topic was not included in the CEA review.

1.2.4.2 A summary of the projects that new information has become available for since the Morgan Generation Assets application was submitted and that have the potential to result in a change to the Morgan Generation Assets CEA are presented in Table 1.1.

Table 1.1: Projects reviewed for potential cumulative effects, with status at application and at Deadline 2 (D2), and programme details.

Project	Capacity/ scale/ description	Status at application	Status at Deadline 2	Tier at D2	Construction period	Operation period	Distance to Morgan Array Area (km)
Arklow Bank Wind Park Phase 2	Offshore wind farm. Maximum capacity of up to 800 MW.	Considered in the CEA as a Tier 2 project.	Submitted but not yet determined, Tier updated from Tier 2 to Tier 1 - application submitted June 2024 (SSE Renewables, 2024). Project description updated and additional data available.	1	2026-2030	From 2030	107.6
Cair Vie Onshore Wind Farm	Wind farm with up to five turbines and associated infrastructure. Output of approximately 20 to 28 MW	Not considered in the CEA.	New project, pre-application.	2	2026	From 2027	33.8
Codling Wind Park Offshore Wind Farm	Offshore wind farm. Maximum capacity of up to 800 MW.	Considered in the CEA as a Tier 2 project.	Submitted but not yet determined, Tier updated from Tier 2 to Tier 1 - application submitted September 2024. Project description updated and additional data available.	1	2026-2029	From 2030	141.2
Llŷr Offshore Wind Project	Offshore wind farm. Capacity of up to 100 MW.	Considered in the CEA as a Tier 2 project.	Application submitted but not yet determined, Tier updated from Tier 2 to Tier 1 – Application submitted August 2024 (Llŷr Floating Wind Ltd., 2024). Project description updated and	1	2027-2028	From Q4 2028	295.0

Project	Capacity/ scale/ description	Status at application	Status at Deadline 2	Tier at D2	Construction period	Operation period	Distance to Morgan Array Area (km)
			additional data available.				
Microsoft Wales-Ireland telecommunications cable	There is limited public information available on the project, however the Applicant has been made aware of it through the written submission by Microsoft Ireland Operations Limited on the Mona Offshore Wind Project, which is publicly available.	Not considered in the CEA.	New project, pre-application. Additional information provided through applications for site investigation surveys to Natural Resources Wales (NRW) and the Irish Government (Natural Resources Wales 2024a and 2024b and Maritime Area Regulatory Authority, 2024).	3	From 2026	Unknown	Unknown
Morecambe Offshore Windfarm: Generation Assets	Offshore wind farm generation assets. The following key changes were made to the project between the publication of the PEIR and the submission of the application (Morecambe Offshore Windfarm Ltd, 2024): • Reduction in site area • Increase in minimum wind turbine rotor clearance from 22 m to 25 m above Highest Astronomical Tide (HAT) • Reduction in maximum blade tip height • Reduction in maximum number of wind turbines from 40 to 35.	Considered in the CEA as a Tier 2 project.	Submitted but not yet determined, Tier updated from Tier 2 to Tier 1 - application submitted May 2024 (Morecambe Offshore Windfarm Ltd, 2024). Project description updated and additional data available.	1	2026-2029	From 2030	11.2

Project	Capacity/ scale/ description	Status at application	Status at Deadline 2	Tier at D2	Construction period	Operation period	Distance to Morgan Array Area (km)
North Irish Sea Array (NISA) Offshore Wind Farm	Offshore wind farm with a proposed capacity of 500 MW.	Considered in the CEA as a Tier 2 project.	Submitted but not yet determined, Tier updated from Tier 2 to Tier 1 - application submitted June 2024 (North Irish Sea Array Windfarm Limited, 2024). Project description updated and additional data available.	1	2027-2029	From 2030	107.6
Oran na Mara Tidal Energy	Offshore tidal energy project with a capacity of up to 10 MW.	Considered in the CEA as a Tier 3 project.	Tier level updated from Tier 3 to Tier 2.	2	Unknown*	Unknown*	235.7
Oriel Offshore Wind Farm	Offshore wind farm with a capacity of 375 MW.	Considered in the CEA as a Tier 2 project.	Submitted but not yet determined, Tier updated from Tier 2 to Tier 1 - application submitted March 2024 (Oriel Windfarm Limited, 2024). Project description updated and additional data available.	1	2026-2028	From 2029	119.4

*Project will be developed incrementally, with turbines and associated offshore and onshore infrastructure installed gradually in phases dependent on environmental monitoring data (Intertek, 2023).

1.3 Screening for the Morgan Generation Assets cumulative effects review

1.3.1.1 Table 1.3 and Table 1.4 provide the results of the screening exercise carried out to determine if a project is taken forward into the CEA review, as per the process described in Figure 1.1 and Figure 1.2.

1.3.1.2 This screening exercise was carried out based on the level of detail available as well as the potential for interactions with the Morgan Generation Assets on a conceptual, physical and temporal basis, following the methodology set out in Volume 3, Annex 5.1 Cumulative effects screening matrix (APP-031), adapted for this CEA review, and the criteria in Table 1.2 below. The projects which have been screened in have been carried forward into the CEA review presented in section 1.4.

Table 1.2: Screening criteria (based on Volume 3, Annex 5.1 Cumulative effects screening matrix (APP-031)).

Code	Screening criteria
a	Included as part of the topic baseline with no anticipated impacts **Not relevant to CEA review**
b	Part of the baseline but has an ongoing impact **Not relevant to CEA review**
c	Potential cumulative effect exists, or change to cumulative effect previous assessed **Screened into the CEA review**
d	No conceptual or physical effect-receptor pathway **Screened out of the CEA review**
e	Low data availability **Screened out of the CEA review**
f	No temporal overlap **Screened out of the CEA review**
g	Project has been withdrawn from development or operation **Screened out of the CEA review**
h	Updated project information does not result in the potential for a change to cumulative effect previously assessed, or additional cumulative effects **Screened out of the CEA review**

1.3.1.3 Justification for all projects screened out of the CEA review in accordance with these criteria is provided in Appendix A.

Table 1.3: Screening of new project information that may affect cumulative effects assessment and in-combination assessment for the Morgan Generation Assets Environmental Statement and ISAA.

Topic	Summary of Morgan Generation Assets CEA and in-combination assessment conclusions for Scenario 3 as presented within the Environmental Statement/ISAA	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Physical processes (Volume 2, Chapter 1 (APP-013))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
Benthic subtidal ecology (Volume 2, Chapter 2 (APP-020))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
Fish and shellfish ecology (Volume 2, Chapter 3 (APP-021))	There will be potentially significant cumulative effects from the Morgan Generation Assets alongside other projects and plans to herring and cod during their respective spawning seasons through the impact of underwater sound from piling (moderate adverse significance). No residual significant cumulative effects are expected to occur.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)

Topic	Summary of Morgan Generation Assets CEA and in-combination assessment conclusions for Scenario 3 as presented within the Environmental Statement/ISAA	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Marine mammals (Volume 2, Chapter 4 (AS-010))	Overall, it is concluded that for most impacts there will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans, except as a result of behavioural disturbance during piling for bottlenose dolphin within the Irish Sea MU and potential injury from Unexploded Ordnance (UXO) clearance for harbour porpoise, which have a potential significant cumulative effect.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (h)	No (h)	Yes (c)	No (d)	Yes (c)
Offshore ornithology (Volume 2, Chapter 5 (APP-023))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (d)	Yes (c)	Yes (c)	Yes (c)	Yes (c)
Commercial fisheries (Volume 2, Chapter 6 (APP-024))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
Shipping and navigation (Volume 2, Chapter 7 (APP-025))	A cumulative regional navigational risk assessment (CRNRA) was undertaken, which adopted a regional (co-ordinated) approach to assessment for the Mona Offshore Wind Project, Morgan Generation Assets and Morecambe Offshore Windfarm: Generation Assets projects, as well as known Tier 1 projects, and measures put in place to mitigate for significant effects.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)

Topic	Summary of Morgan Generation Assets CEA and in-combination assessment conclusions for Scenario 3 as presented within the Environmental Statement/ISAA	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Marine archaeology and cultural heritage (Volume 2, Chapter 8 (APP-026))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
Other sea users (Volume 2, Chapter 9 (APP-027))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
Seascape, landscape and visual resources (Volume 2, Chapter 10 (APP-014))	Potential significant cumulative effects are assessed to arise to Isle of Man Landscape Character along the coast and for individuals on the Raad ny Foillan coastal path due to the addition of Morgan Generation Assets and existing offshore wind farms, and the consented Awel y Môr Offshore Wind Farm and the submitted Mona Offshore Wind Project.	No (d)	Yes (c)	No (d)	No (d)	No (h)	No (h)	No (d)	No (d)	No (d)
Aviation and radar (Volume 2, Chapter 11 (APP-015))	No significant cumulative effects from the Morgan Generation Assets alongside other projects/plans in relation to the potential impact: creation of obstacle to aircraft operations. Significant cumulative effects arising from the Morgan Generation Assets alongside other projects/plans due to wind turbines causing interference on aviation Primary Surveillance Radar (PSR) systems.	No (d)	Yes (c)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)

Topic	Summary of Morgan Generation Assets CEA and in-combination assessment conclusions for Scenario 3 as presented within the Environmental Statement/ISAA	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Socio-economics (Volume 2, Chapter 13 (APP-017))	There will be no significant adverse cumulative effects from the Morgan Generation Assets alongside other projects/plans. Significant beneficial cumulative effects (moderate beneficial) identified for potential impact on economic receptors including employment and gross value added.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
Human health (Volume 2, Chapter 14 (APP-018))	In relation to collision and allision risk when including the effects of the Mooir Vannin Offshore Wind Farm within the assessment, there would be a cumulative moderate adverse effect for human health. There will be a minor adverse and minor beneficial cumulative effect relating to community identity influences on population health and employment and income. Minor beneficial cumulative effect to climate change and public health and moderate beneficial effect on wider societal infrastructure and resources.	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)
HRA Stage 2 ISAA - Annex II diadromous fish (APP-097))	No adverse effect on the integrity of assessed sites from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
HRA Stage 2 ISAA - Annex II marine mammals (APP-097))	No adverse effect on the integrity of assessed sites from the Morgan Generation Assets alongside other projects/plans.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (h)	No (h)	Yes (c)	No (d)	Yes (c)

Topic	Summary of Morgan Generation Assets CEA and in-combination assessment conclusions for Scenario 3 as presented within the Environmental Statement/ISAA	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
HRA Stage 3 ISAA - Offshore ornithology (APP-098)	No adverse effect on the integrity of assessed sites from the Morgan Generation Assets alongside other projects/plans.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (d)	Yes (c)	Yes (c)	Yes (c)	Yes (c)

1.4 Review of the Morgan Generation Assets CEA

Table 1.4: Review of project updates that may affect cumulative effects assessment in the Morgan Generation Assets Environmental Statement.

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
Benthic subtidal ecology (Volume 2, Chapter 2 (APP-020))	The proposed route of the **Microsoft Wales-Ireland telecommunications cable** is not currently known however based on information provided in the written submission by Microsoft Ireland Operations Limited for the Mona Offshore Wind Project there is potential for the cable to be located within the benthic subtidal ecology CEA study area for the Morgan Generation Assets. The cumulative effects assessed in section 2.11 of Volume 2, Chapter 2: Benthic subtidal ecology (APP-020) with potential to be influenced by the new project information include: • Temporary habitat loss/disturbance and long term habitat loss/habitat alteration: the Microsoft Wales-Ireland telecommunications cable project has the potential for temporary habitat loss/disturbance, long term habitat loss/habitat alteration and introduction of artificial structures during construction/decommissioning and operation. The Microsoft Wales-Ireland project is, however, a new project, and little is known about the project parameters, but as a cable project it is unlikely to result in significant additional cumulative impacts with the Morgan Generation Assets, as the footprint of the works is unlikely to be large and buried cables will have minimal long term effects. Therefore, there is **no change** from the original Morgan Generation Assets CEA, and the effects are of **minor adverse significance** during construction, operations and maintenance and decommissioning. • Increased risk of introduction and spread of invasive non-native species: the introduction and spread of invasive non-native species (INNS) during all phases may be facilitated by increased vessel traffic. As a new project, little is known about the project parameters for the Microsoft Wales-Ireland telecommunications cable, but as a cable project it is unlikely to give rise to significant marine traffic levels. Therefore, there is **no change** from the original Morgan Generation Assets CEA, and the effects are of **minor adverse significance** during construction, operations and maintenance and decommissioning. • Removal of hard substrate: In relation to the removal of hard substrate during the decommissioning phase, the Microsoft Wales-Ireland telecommunications cable is unlikely to result in significant impacts, whether any cable protection is allowed to remain in situ after decommissioning or not, due to an anticipated small footprint of introduced hard substrate. Therefore, there is **no change** from the original Morgan Generation Assets CEA, and the effects are of **minor adverse significance** during decommissioning.	No change to the conclusions of the Environmental Statement.
Fish and shellfish ecology (Volume 2, Chapter 3 (APP-021))	The proposed route of the **Microsoft Wales-Ireland telecommunications cable** is not currently known however based on the information provided in the written submission by Microsoft Ireland Operations Limited for the Mona Offshore Wind Project, there is potential for the cable to be located within the fish and shellfish ecology CEA study area. Construction is currently scheduled for quarter two or three of 2026. This overlaps with the construction of the Morgan Generation Assets and is therefore screened into the CEA review. The cumulative effects assessed in section	No change to the conclusions of the Environmental Statement.

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	3.11 of Volume 2, Chapter 3: Fish and Shellfish ecology (APP-021) with potential to be influenced by the new project information include: • Temporary subtidal habitat loss/disturbance: the project has the potential to cause temporary subtidal habitat loss during the construction phase. Very little information is publicly available concerning the Microsoft Wales-Ireland telecommunications cable due to this being a new project, but cable installation activities are likely to represent only a small footprint, and the impacts are known to be reversible. The project is unlikely to lead to significant cumulative effects alongside the Morgan Generation Assets. Therefore, there is **no change** from the original Morgan Generation Assets CEA, and the effects are considered to remain of **negligible to minor adverse significance** during construction. • Long term habitat loss and the introduction and colonisation of hard structures: the project has the potential for long term habitat loss and the introduction and colonisation of hard structures during the construction and operation and maintenance phases, through the potential introduction of cable protection measures. The Microsoft Wales-Ireland project is, however, a new project, and little is known about the project parameters, but as a cable project it is unlikely to result in significant additional cumulative impacts with the Morgan Generation Assets, as the footprint of the works is unlikely to be large. Therefore, there is **no change** from the original Morgan Generation Assets CEA, and the effects are of **negligible to minor adverse significance** during the construction and operation and maintenance phases. • Injury due to increased risk of collision with vessels (basking shark only): During the construction phase the project has potential to result in increased vessel traffic which may increase the risk of collision between basking sharks and construction vessels. Due to the scale of this project, however, compared with the Morgan Generation Assets, the number of additional vessels is expected to be comparatively low in an area of existing heavy vessel traffic, and therefore any cumulative effect would be limited. Therefore, there is **no change** from the original Morgan Generation Assets CEA, and the effects are of **minor adverse significance** during the construction phase.	
Marine mammals (Volume 2, Chapter 4 (AS-010))	Six projects that have been updated to Tier 1 (Table 1.1) are located within the Irish Sea and within the regional marine mammal study area. The cumulative effects that were assessed within Volume 2, Chapter 4: Marine mammals (AS-010) with potential to be influenced by this updated project information include: **Injury and disturbance from elevated underwater sound during piling** • An increase in the magnitude of disturbance to marine mammals due to piling at additional projects within the cumulative marine mammal study area could occur due to the potential for a larger area to be ensonified at any one time (assuming that piling phases of these additional projects may overlap with piling at the Morgan Generation Assets). • The Morgan Generation Assets CEA concluded that there was potential for minor significant effects for piling on marine mammals, and, conservatively, potential for moderate significant effects specifically for bottlenose dolphins in the context of possible declining Irish Sea Management Unit (MU) population, and the semi-resident population in	No change to the conclusions of the Environmental Statement.

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	Cardigan Bay with seasonal movements across to the Isle of Man. Therefore, the focus for piling is on bottlenose dolphin. • **Llŷr Offshore Wind Project** will be in construction 2027 to 2028 and therefore piling may overlap with the Morgan Generation Assets. However, Llŷr Offshore Wind Project is located 298.5 km from the Morgan Generation Assets outside of the bottlenose dolphin MU and therefore there is no potential for additional cumulative effects of this project with Morgan Generation Assets with respect to bottlenose dolphin. • Quantitative information is available from the respective Environmental Statements for **Arklow Bank 2, Codling Array, North Irish Sea Array** and **Oriel**. These four Tier 1 projects sit within the bottlenose dolphin MU and are located at 107.6 km, 141.2 km, 107.6 km, and 119.4 km from the Morgan Generation Assets respectively. The project alone assessments for these four projects have concluded no significant effects on bottlenose dolphin (SSE Renewables, 2024; Codling, 2024; North Irish Sea Array, 2024; Oriel Windfarm Ltd, 2024) and cumulative modelling undertaken for the North Irish Sea Array application for all the western Irish Sea projects (which also includes Dublin Array (134.4 km from Morgan Generation Assets) (a Tier 2 project)) concluded that, whilst there would be a decrease in the population in the short-term (as some individuals could be affected during piling at cumulative projects), the long-term trajectory of the population would not alter and therefore the conclusion was reached that there would be no significant effects on bottlenose dolphin at the population level (North Irish Sea Array, 2024). Whilst the four additional projects in the Irish Sea MU (Arklow Bank 2, Codling, North Irish Sea Array and Oriel) could contribute to medium term effects on bottlenose dolphin if piling were to coincide with the Morgan Generation Assets, it is unlikely that piling for five projects would occur within the same timeframe and all would require a project specific MMMP (or equivalent) which includes industry standard measures to reduce or eliminate the risk of auditory injury effects of underwater sound on marine mammals. The western Irish Sea projects mapped construction phases of between two to five years but piling would only constitute a small proportion of the construction phase and the assessments highlighted that this was a very conservative assumption in the model (e.g. see section 4.9.4.6 in North Irish Sea Array, 2024). Furthermore, conclusions of no significant effect were reached for the five projects (including two Tier 2 projects) in the western Irish Sea on the basis of population modelling for the cumulative scenario (SSE Renewables, 2024; Codling, 2024; North Irish Sea Array, 2024). • In summary, it is considered highly unlikely that piling would coincide across all projects within the Irish Sea. Cumulative population models included in the applications for the western Irish Sea projects concluded no significant adverse effect and updated population modelling for projects in the eastern Irish Sea did not change the outcomes of the population model for bottlenose dolphin (Appendix B). Furthermore, the Applicant has committed to the Underwater Sound Management Strategy (UWSMS) (APP-068) which will take into account the final project design for the Morgan Generation Assets and the final MMMP alongside more definitive piling timelines for cumulative projects at the time of construction. This will reduce the magnitude of impact from the project alone such that any significant effect will be reduced to a non-significant level, which consequently contributes to reducing the project's contribution to potential cumulative impacts. Therefore, it is considered that the significance of effect considering the	

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	now Tier 1 projects would **remain unchanged** and would remain as **moderate adverse significance for bottlenose dolphin.** **Injury and disturbance from underwater sound from unexploded ordnance (UXO) detonation** • The Morgan Generation Assets CEA concluded a significant cumulative effect for potential injury from UXO clearance for harbour porpoise only (when assessed using the Maximum Design Scenario (MDS) of a high order clearance of a 907 kg UXO), however the UWSMS provides a strategy to reduce the magnitude of impacts from elevated underwater sound, such that there is no residual likely significant effect for marine mammals from the project alone. The Morgan Generation Assets CEA included the UXO clearance activities for Project Erebus, Mona Offshore Wind Project and Morecambe Offshore Windfarm: Generation Assets and it is considered that the conclusions of the CEA remain unchanged for these projects in light of the updated project parameters for the Morecambe Offshore Windfarm: Generation Assets. • Of the now Tier 1 projects, **Arklow Bank 2, Codling, North Irish Sea Array, Oriel,** and **Llŷr** are all located over 100 km from the Morgan Generation Assets and therefore there is no potential for spatial overlap in underwater sound from UXO clearance. A summary of the findings of the effects of UXO on marine mammals from these projects is provided below. • The application for **Arklow Bank 2**, which lies 107.6 km from Morgan Generation Assets, included an assessment of UXO clearance (based on high order and low order UXOs) for two project design options and concluded no significant effect for injury and disturbance and adopts a UXO specific Marine Mammal Mitigation Protocol (MMMP). **North Irish Sea Array** concluded no significant effect from injury for all species except for minke whale, which was assessed as moderate significance prior to the consideration of mitigation. However, the adoption of the MMMP with specific UXO measures led to a residual conclusion of no significant effect. Disturbance was concluded as not significant for all species for the project alone and scoped out of the CEA in **North Irish Sea Array** application. As no significant effect for minke whale was concluded for the Morgan Generation Assets and considering the distance between these two projects (107.6 km) and the likelihood that UXO will be cleared prior to construction at the Morgan Generation Assets (2026), it is anticipated that it is highly unlikely to result in an additional significant cumulative impact. **Llŷr** will be constructed in 2027 to 2028 and therefore there may be potential for temporal overlap with UXO clearance at the Morgan Generation Assets, however, this project concluded a negligible effect of both injury and disturbance to marine mammals. The **Oriel** application did not include UXO clearance in their project design envelope. • On the basis of the information presented above, the magnitude of the cumulative impact would not change from that set out in the Environmental Statement and therefore, it is considered that the conclusions of the Morgan Generation Assets CEA **remain unchanged**. Potential for **injury** from underwater sound from UXO detonation during construction remains of **moderate adverse significance**, which will be reduced through the UWSMS such that there	

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	is no residual likely significant effect for marine mammals from the project alone and the potential for **disturbance** from underwater sound during construction remains of **minor adverse significance**. **Injury and disturbance from pre-construction site investigation surveys** • The Morgan Generation Assets CEA considered potential for disturbance from pre-construction surveys only (as there is very low potential for cumulative impacts for injury as project-specific mitigation will reduce the risks to negligible for all projects). The methodology (as agreed with the Marine Mammal Expert Working Group (EWG) as described in Appendix C of the Technical Engagement Plan Appendices - Part 1 (A to E) (APP-042)) assumed up to 14 Tier 1 site investigation surveys identified in the CEA screening area for marine mammals, and as surveys typically occur over short durations (typically up to 2 months) (based on expert judgement) as a conservative approach the CEA assumed as a worst case scenario that up to additional two surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point. • Of the now Tier 1 projects, **Arklow Bank 2, Codling Array, North Irish Sea Array, Morecambe Offshore Windfarm: Generation,** and **Llŷr** also considered site investigation surveys and each concluded that the impact of disturbance was of minor adverse significance. Oriel considered routine geophysical surveys during the operational phase and concluded that the impact was of slight (minor) adverse significance. Site investigation surveys are predicted to be of local spatial extent, medium term duration and intermittent with high reversibility, and the likelihood of temporal overlap constrained by survey equipment availability. Therefore, it is considered that the conclusions of the Morgan Generation Assets CEA **remain unchanged**, and that the cumulative injury and disturbance effect from pre-construction site investigation surveys remains of **minor adverse significance.** **Injury and disturbance from vessel use and other (non-piling) sound producing activities** • The Morgan Generation Assets CEA focuses only on disturbance, as injury from underwater sound generated by vessels and other activities is not considered to be significant. For potential disturbance from vessel use and other non-piling sound producing activities, the Morgan Generation Assets assessment has not identified any significant effects. • The published Environmental Statement for the **Morecambe Offshore Windfarm: Generation Assets** showed only very minor changes in the number of vessels and sound producing activities to those assessed in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets Environmental Statement presents an increase in the maximum total number of construction vessels on site at any one time from 30 (in the Morecambe Offshore Windfarm: Generation Assets PEIR) to 37 vessels, but with fewer return trips per year (reducing from 2,778 support vessels per year and 150 return trips over the construction period for delivery of main components and installation in the PEIR, to 2,583 return trips per year including deliveries, installation vessels and support vessels in the Morecambe Offshore Windfarm: Generation Assets Environmental Statement). The magnitude of disturbance to marine mammals remained low to negligible in the Morecambe Offshore Windfarm: Generation Assets Environmental	

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	Statement. Therefore, potential cumulative effects are considered to be **unchanged** from that presented in the Morgan Generation Assets Environmental Statement. • Of the now Tier 1 projects, **Arklow Bank 2, Codling Array, North Irish Sea Array, Oriel,** and **Llŷr** all lie over 100 km from the Morgan Generation Assets and therefore there is no potential for direct spatial overlap in disturbance effect ranges. Arklow Bank 2 predicted no significant effects from disturbance from vessels for the project alone, but excluded the impact from the CEA, and adopts an Environmental Vessel Management Plan (EVMP) which includes measures to minimise the potential disturbance of marine mammals from vessel activities. Both Codling and North Irish Sea Array predicted disturbance from vessels to be not significant for the construction, operational and decommissioning phases for the project alone and both projects have committed to adopting an EVMP. The effect was excluded from the North Irish Sea Array CEA due to the highly localised impact. Oriel concluded no significant effect from the project alone or cumulatively (which included the Morgan Generation Assets). For Llŷr, the assessment identified vessel noise effects of negligible adverse significance. Considering this conclusion and the distance between the Morgan Generation Assets and Llŷr (298.2 km), cumulative effects are highly unlikely. • On the basis of the information presented in the bullets above, it is considered that the conclusions of the Morgan Generation Assets CEA **remain unchanged**, and that the disturbance from vessel use and other (non-piling) sound producing activities during construction/decommissioning and operation remains of **minor adverse significance.**	
Offshore ornithology (Volume 2, Chapter 5 (APP-023))	Seven projects within the Offshore ornithology CEA study area for the Morgan Generation Assets have been identified as having the potential to have ornithological impacts. A detailed review of updated project information is ongoing to confirm if there are any changes to the cumulative effects assessed within the application. This will be submitted at Deadline 3.	Review to be submitted at Deadline 3.
Shipping and navigation (Volume 2, Chapter 7 (APP-025))	The proposed route of the **Microsoft Wales-Ireland telecommunications cable** is not currently known however based on the information provided in the written submission by Microsoft Ireland Operations Limited for the Mona Offshore Wind Project, there is potential for the cable to be located within the shipping and navigation CEA study area. Cable installation and maintenance and repair activities associated with the Microsoft Wales-Ireland telecommunications cable project have the potential to disrupt traffic navigating through the shipping and navigation CEA study area. It is assumed that this project would be required to implement similar measures to those outlined for the Morgan Generation Assets as outlined in section 7.8 of Volume 2, Chapter 7: Shipping and navigation (APP-025) in order to reduce their impacts as far as practical, such as a Vessel Traffic Management Plan and compliance with international conventions such as the Collision Regulations and Safety of Life at Sea (SOLAS) Convention. The cumulative effects assessed in section 7.10 of Volume 2, Chapter 7: Shipping and navigation (APP-025) with potential to be influenced by the new project information include: • Impact to commercial operators including strategic routes and lifeline ferries in both typical and adverse weather conditions: the newly identified cable project will result in increased vessel traffic, which has the potential to result in a minor change to the magnitude of impacts to shipping routes. The spatial extent of the potential impact is relatively	No change to the conclusions of the Environmental Statement.

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	small and the impacts will be of short duration. The anticipated increase in traffic is small compared to the baseline and would be managed through appropriate risk controls (such as Notice to Mariners and adherence to COLREGs), and therefore the significance of the cumulative effects **would not change** from that assessed in the Morgan Generation Assets CEA. • Impact on emergency response capability due to increased incident rates and reduced access for SAR responders: This will be managed by the respective projects, through for example an Emergency Response and Cooperation Plan (ERCoP), and therefore the significance of the cumulative effects **would not change** from that assessed in the Morgan Generation Assets CEA. • Impact of vessel to vessel collision risk: the newly identified cable project will result in increased vessel traffic which has the potential to result in a small change in the magnitude of impact of vessel to vessel collision risk. The spatial extent of the potential impact is relatively small and the impacts will be of short duration. Given the available searoom, minor increase in vessel movements and effective management through appropriate risk controls (such as Notice to Mariners and adherence to COLREGs), the significance of the cumulative effects **would not change** from that assessed in the Morgan Generation Assets CEA. • Impact on recreational craft passages and safety: the newly identified cable project will result in increased vessel traffic which has the potential to result in a minor change in the magnitude of impact of vessel to vessel collision risk, including with recreational craft. The spatial extent of the potential impact is relatively small and the impacts will be of short duration. Given the available searoom, minor increases in vessel movements and effective management through appropriate risk controls (such as Notice to Mariners and adherence to COLREGs), the significance of the cumulative effects **would not change** from that assessed in the Morgan Generation Assets CEA. • Impact on snagging risk to vessel anchors and fishing gear: additional cables and associated cable crossings have the potential to increase the likelihood of snagging risk to vessel anchors and fishing gear across the shipping and navigation cumulative study area, however, the measures likely to be put in place to manage this risk (such as marking and charting, cable burial or protection and fisheries liaison) are robust. The significance of the cumulative effects **would not change** from that assessed in the Morgan Generation Assets CEA.	
Other sea users (Volume 2, Chapter 9 (APP-027))	The proposed route of the **Microsoft Wales-Ireland telecommunications cable** is not currently known however based on information provided in the written submission by Microsoft Ireland Operations Limited for the Mona Offshore Wind Project there is potential for this to cross within the cumulative other sea users study area for the Morgan Generation Assets. The following potential cumulative impact is of relevance to this project: • Displacement of recreational activities: Recreational vessels may be displaced by activities underway at multiple offshore wind and cable projects, however the frequency of the potential impact is considered to be low as individual offshore cruising routes and activities are unlikely to cross multiple project areas. The spatial extent of the potential impact will be relatively small in the context of the available sailing and recreational fishing area in the east Irish Sea, with the potential for localised displacement of recreational craft. Recreational vessels are able to alter their route,	No change to the conclusions of the Environmental Statement.

Topic	Review of potential for further cumulative effects	Effect on conclusions of the ES
	dependent on the target destination. Notices to Mariners will be publicised regularly in line with industry standard, advising of the location and nature of any construction or operational activities, ensuring that recreational activities can be planned accordingly. As such, there are **no changes** to the conclusions of the Morgan Generation Assets CEA and the potential impact remains of **minor adverse significance**.	
Seascape, landscape and visual resources (Volume 2, Chapter 10 (APP-014))	The **Cair Vie Onshore Wind Farm**, currently at scoping stage, has recently come forward as a Tier 2 project. The project is located 33.8 km from the Morgan Generation Assets (Table 1.1), and is for up to five wind turbines of up to 180 m tip height. The cumulative SLVIA for the Morgan Generation Assets is documented in Volume 2, Chapter 10: Seascape, landscape and visual resources (APP-014). This considered the cumulative addition of the Morgan Generation Assets alongside Tier 1 and Tier 2 projects. The cumulative addition of the Morgan Generation Assets alongside the Tier 2 proposed offshore wind farms (Mooir Vannin offshore wind farm and Cair Vie Onshore Wind Farm), along with the Tier 1 projects, would not result in any increase in the significance of cumulative effects on the seascape, landscape and visual receptors assessed in the cumulative SLVIA. There is potential for localised cumulative effects on landscape character on the southern part of the Isle of Man as a result of the addition of the Morgan Generation Assets alongside the Tier 2 projects along with the Tier 1 projects. Similarly these cumulative visual effects may be experienced by viewers at the summit of South Barrule (representative viewpoint 45). Significant cumulative effects on these receptors due to the addition of the Morgan Generation Assets are not expected to arise and therefore there are **no changes** to the conclusions of the Environmental Statement.	No change to the conclusions of the Environmental Statement.
Aviation and radar (Volume 2, Chapter 11 (APP-015))	The **Cair Vie Onshore Wind Farm** is a new project identified within the CEA aviation and radar study area. Volume 2, Chapter 11: Aviation and radar (APP-015) provides a cumulative effects assessment at section 11.11. Unmitigated the Cair Vie Onshore Wind Farm is likely to contribute to the cumulative effect on the IoM Airport (Ronaldsway) Primary Surveillance Radar (PSR). With mitigation implemented and associated operational processes and procedures in place, the residual effect to the impacted PSR systems will be negligible. The inclusion of Cair Vie **does not change** the conclusions of the Morgan Generation Assets CEA.	No change to the conclusions of the Environmental Statement.

Table 1.5: Review of project updates that may affect in-combination effects assessment in the Morgan Generation Assets ISAA.

Topic	Review of potential for further in-combination effects	Effect on conclusions of the ISAA
HRA Stage 2 ISAA - Annex II diadromous fish (APP-097))	**Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, Microsoft Wales-Ireland telecommunications cable, North Irish Sea Array (NISA), Oran na Mara Tidal Energy** and **Oriel Offshore Wind Farm** are all beyond the fish and shellfish ecology CEA study area and are therefore not considered further in the CEA review. There is potential for the **Microsoft Wales-Ireland telecommunications cable** to be located within the fish and shellfish ecology CEA study area. Review of the cumulative effects with potential to be influenced by the new project information is presented in Table 1.4 above. For all potential in-combination effects, there is **no predicted change** to the conclusions of the ISAA. The **Morecambe Offshore Windfarm: Generation Assets** was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The updated information presented in the final application does not result in the potential for additional or increased in combination effects with the Morgan Generation Assets due to a slight reduction in the project footprint and maximum number of turbines, which are not predicted to result in a material change to the assessment. As there is **no change** to the conclusions of the Morgan Generation Assets CEA, then **no change** is considered to apply to the conclusions of the ISAA.	No change to the conclusions of the ISAA.
HRA Stage 2 ISAA - Annex II marine mammals (APP-097))	There is the potential for in-combination effects from underwater sound generation as a result of the construction phase of the Morgan Generation Assets with other projects that involve pile driving and UXO clearance. The overlap in potential construction phases between the Morgan Generation Assets and other cumulative projects may lead to cumulative disturbance to marine mammals from piling. As noted in the review for marine mammals in Table 1.4 above, there are six additional Tier 1 projects within the Irish Sea and it is considered highly unlikely that piling would coincide across all projects. Cumulative population models for the **western Irish Sea projects** concluded no significant adverse effect and updated population modelling for projects in the eastern Irish Sea did not change the outcomes of the population model for bottlenose dolphin. Therefore, considering the now Tier 1 projects would **not change** the conclusions of the ISAA. The Morgan Generation Assets ISAA concluded that, even though the project had a moderate impact on bottlenose dolphin, adverse effects on the integrity of any sites considered in the ISAA could be ruled out. Therefore, as there is **no change** to the conclusions of the Morgan Generation Assets CEA, then **no change** is considered to apply to the conclusions of the ISAA.	No change to the conclusions of the ISAA.
HRA Stage 3 ISAA - Offshore ornithology (APP-098)	Seven projects within the Offshore ornithology CEA study area for the Morgan Generation Assets have been identified as having the potential to have ornithological impacts. A detailed review of updated project information is ongoing to confirm if there are any additional in-combination impacts. This will be submitted at Deadline 3.	Review to be submitted at Deadline 3.

1.5 Conclusions

1.5.1.1 This document has presented a review of the CEA and in-combination assessments presented in the Morgan Generation Assets application documents, published in April 2024. This review has considered all relevant known projects that have been published up to 27 September 2024. Further information has been published on a number of projects, and the review identified nine projects that had the potential to result in cumulative effects. Of these projects:

- Six are offshore wind projects (Tiers updated from Tier 2 to Tier 1)
- One is a tidal energy project (Tier updated from Tier 3 to Tier 2)
- One is a telecommunications cable (identified as a new project)
- One is an onshore wind farm (identified as a new project).

1.5.1.2 The Applicant has undertaken a review of the projects, including reviewing applicable Environmental Statements, scoping reports and application documents, to identify if these projects could result in a change to the conclusions of the CEA and in-combination assessments presented in the Morgan Generation Assets application. For all of the nine projects reviewed, there is no potential for new cumulative effects to arise or an increase in cumulative effects for each of the topics considered and the conclusions of the Morgan Generation Assets CEA and in-combination assessments therefore remain unchanged.

1.5.1.3 As noted in Table 1.3, the review for offshore ornithology is ongoing and will be presented at Deadline 3.

1.5.1.4 As no changes to the assessment conclusions have been identified for Scenario 3, which considers the Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets plus other projects and plans, the same conclusion automatically applies to Scenario 2, which considers the Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets.

1.6 References

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Appendix A CEA Screening justification

The justification for all projects screened out of the CEA review in accordance with the defined criteria is presented in Table A.1 and Table A.2.

Table A.1: Justification for projects screened out of the CEA review.

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Physical processes (Volume 2, Chapter 1 (APP-013))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, Microsoft Wales-Ireland telecommunications cable, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the physical processes CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The updated information presented in the final application does not result in the potential for additional cumulative effects with the Morgan Generation Assets as the type of infrastructure and activity remains the same as that proposed previously and included within the Tier 2 CEA assessment. Additionally, the reduction in area presented in the final application for the Morecambe Offshore Windfarm: Generation Assets has been undertaken to the west of the Morecambe Offshore Windfarm: Generation Assets increasing the distance from the Morgan Generation Assets and therefore providing a reduction in any potential for cumulative effects. For these reasons, the Morecambe Offshore Windfarm: Generation Assets was screened out of the review.								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Benthic subtidal ecology (Volume 2, Chapter 2 (APP-020))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the benthic subtidal ecology CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets site area has reduced since the publication of the PEIR, and the number of wind turbines has reduced, therefore the magnitude of the potential cumulative impacts on benthic subtidal ecology is likely to be the same, or less, than that assessed in the Morgan Generation Assets CEA. The updated information presented in the final application does not result in the potential for additional cumulative effects with the Morgan Generation Assets and therefore this project was screened out of the review.								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Fish and shellfish ecology (Volume 2, Chapter 3 (APP-021))	There will be potentially significant cumulative effects from the Morgan Generation Assets alongside other projects and plans to herring and cod during their respective spawning seasons through the impact of underwater sound from piling (moderate adverse significance). No residual significant cumulative effects are expected to occur.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, Microsoft Wales-Ireland telecommunications cable, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the fish and shellfish ecology CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The updated information presented in the final application does not result in the potential for additional cumulative effects with the Morgan Generation Assets due to the reduction in site area and the minor reduction in the maximum number of wind turbines, and therefore this project was screened out of the review.								
Marine mammals (Volume 2, Chapter 4 (AS-010))	Overall, it is concluded that for most impacts there will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans, except as a result of behavioural disturbance during piling for bottlenose dolphin within the Irish Sea MU and potential injury from Unexploded Ordnance (UXO) clearance for harbour porpoise, which have a potential significant cumulative effect.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (h)	No (h)	Yes (c)	No (d)	Yes (c)
		There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. Little is known about the project parameters for Microsoft Wales-Ireland telecommunications cable however it is considered there is no potential for temporary cable installation activities associated with the Microsoft Wales-Ireland telecommunications cable to significantly increase the cumulative effects assessed								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
		within the Morgan Generation Assets application based on receptor-impact pathways, and therefore this project was screened out of the CEA review. The Morgan Generation Assets CEA previously considered the Morecambe Offshore Windfarm: Generation Assets as part of the quantitative assessment as information was available from the PEIR, but this project has moved from Tier 2 to Tier 1 with updated information in the Environmental Statement. Population modelling was repeated with the same projects as modelled for the Morgan Generation Assets application but this time including the updated information from the Morecambe Offshore Windfarm: Generation Assets. The results demonstrated that there would be no additional cumulative impacts at a population-level on bottlenose dolphin (see Appendix B in this note). The Oran na Mara Tidal Energy was previously considered in the CEA screening undertaken for the application (Volume 3, Annex 5.1 Cumulative effects screening matrix (APP-031)), however the project is now a Tier 2 project (rather than Tier 3). The Oran na Mara Tidal Energy project was screened out of the CEA for marine mammals in the application on the basis of no conceptual or physical effect-receptor pathway, and the change in Tier does not affect this screening conclusion.								
Offshore ornithology (Volume 2, Chapter 5 (APP-023))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (d)	Yes (c)	Yes (c)	Yes (c)	Yes (c)
		There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. There is no potential for temporary cable installation activities associated with the Microsoft Wales-Ireland telecommunications cable to increase the cumulative effects assessed within the Morgan Generation Assets application, and therefore this project was screened out of the CEA review.								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Commercial fisheries (Volume 2, Chapter 6 (APP-024))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, Microsoft Wales-Ireland telecommunications cable, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the commercial fisheries CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets site area has reduced since the publication of the PEIR, and the number of wind turbines has reduced, therefore the magnitude of the potential cumulative impacts on commercial fisheries is likely to be the same, or less, than that assessed in the Morgan Generation Assets CEA. The updated information presented in the final application does not result in the potential for additional cumulative effects with the Morgan Generation Assets and therefore this project was screened out of the review.								
Shipping and navigation (Volume 2, Chapter 7 (APP-025))	A cumulative regional navigational risk assessment (CRNRA) was undertaken, which adopted a regional (co-ordinated) approach to assessment for the Mona Offshore Wind Project, Morgan Generation Assets and Morecambe Offshore Windfarm: Generation Assets	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
	projects, as well as known Tier 1 projects, and measures put in place to mitigate for significant effects.	beyond the shipping and navigation CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA and this took into account the reduced site area as presented in the final Morecambe Offshore Windfarm: Generation Assets application. Therefore the updated information presented in the final application does not result in the potential for additional cumulative effects with the Morgan Generation Assets and this project was screened out of the review.								
Marine archaeology and cultural heritage (Volume 2, Chapter 8 (APP-026))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the marine archaeology CEA study area and were therefore not considered further in the sensitivity review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets site area has reduced since the publication of the PEIR, and the number of wind turbines has reduced, therefore the magnitude of the potential cumulative impacts on marine archaeology and cultural heritage is likely to decrease rather than increase. The updated information presented in the final application does not								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
		result in the potential for additional cumulative effects with the Morgan Generation Assets and therefore this project was screened out of the review.								
Other sea users (Volume 2, Chapter 9 (APP-027))	There will be no significant cumulative effects from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the cumulative other sea users study area and therefore were not considered further in this review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets site area has reduced since the publication of the PEIR, and the number of wind turbines has reduced, therefore the magnitude of the potential cumulative impacts on other sea users is likely to decrease. The updated project information therefore does not result in the potential for additional cumulative effects with the Morgan Generation Assets and therefore this project was screened out of the review.								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Seascape, landscape and visual resources (Volume 2, Chapter 10 (APP-014))	Potential significant cumulative effects are assessed to arise to Isle of Man Landscape Character along the coast and for individuals on the Raad ny Foillan coastal path due to the addition of Morgan Generation Assets and existing offshore wind farms, and the consented Awel y Môr Offshore Wind Farm and the submitted Mona Offshore Wind Project.	No (d)	Yes (c)	No (d)	No (d)	No (h)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the seascape, landscape and visual resources (SLVR) CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). The Microsoft Wales-Ireland telecommunications cable is a new project identified within the SLVIA CEA study area, however, the construction of the subsea cable would not change the CEA for the Morgan Generation Assets. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets site area has reduced since the publication of the PEIR, and the number of wind turbines has reduced. The updated information presented in the final application therefore does not result in the potential for additional cumulative effects with the Morgan Generation Assets and therefore this project was screened out of the review.								
Aviation and radar (Volume 2, Chapter 11 (APP-015))	No significant cumulative effects from the Morgan Generation Assets alongside other projects/plans in relation to the potential impact: creation of obstacle to aircraft operations. Significant cumulative effects arising from the Morgan Generation Assets alongside other projects/plans due	No (d)	Yes (c)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the aviation and radar CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway).								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
	to wind turbines causing interference on aviation Primary Surveillance Radar (PSR) systems.	The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The Morecambe Offshore Windfarm: Generation Assets site area has reduced since the publication of the PEIR, and the number of wind turbines has reduced. The updated information presented in the final application therefore does not result in the potential for additional cumulative effects with the Morgan Generation Assets on aviation and radar and therefore this project was screened out of the review.								
Socio-economics (Volume 2, Chapter 13 (APP-017))	There will be no significant adverse cumulative effects from the Morgan Generation Assets alongside other projects/plans. Significant beneficial cumulative effects (moderate beneficial) identified for potential impact on economic receptors including employment and gross value added.	No (d)	No (d)	No (d)	No (d)	No (d)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the socio-economics CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The reduction in site area, increase in minimum rotor clearance, reduction in maximum blade tip height, and reduction in maximum number of wind turbines associated with the Morecambe Offshore Windfarm: Generation Assets since PEIR publication results in no change to the results of the CEA for socio-economics. This project was therefore screened out of the review.								

Topic	Summary of Morgan Generation Assets CEA assessment conclusions for Scenario 3 as presented within the Environmental Statement	Projects with potential for additional cumulative effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
Human health (Volume 2, Chapter 14 (APP-018))	In relation to collision and allision risk when including the effects of the Mooir Vannin Offshore Wind Farm within the assessment, there would be a cumulative moderate adverse effect for human health. There will be a minor adverse and minor beneficial cumulative effect relating to community identity influences on population health and employment and income. Minor beneficial cumulative effect to climate change and public health and moderate beneficial effect on wider societal infrastructure and resources.	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)	No (h)
		The projects, plans and activities scoped into the human health CEA are informed by those considered within the CEA for commercial fisheries, shipping and navigation, other sea users, SLVR, climate change and socio-economics. The review for shipping and navigation and other sea users identified the Microsoft Wales-Ireland telecommunications project as having potential to cause additional cumulative effects with the Morgan Generation Assets. The review for these topics, presented in Table 1.4, concluded that there would be no additional significant cumulative effects. All projects were therefore screened out of the CEA review on the basis that the new or updated project information does not result in the potential for additional cumulative effects.									

Table A.2: Justification for projects screened out of the in-combination assessment review.

Topic	Summary of Morgan Generation Assets in-combination assessment conclusions for Scenario 3 as presented within the ISAA	Projects with potential for additional in-combination effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
HRA Stage 2 ISAA - Annex II diadromous fish (APP-097))	No adverse effect on the integrity of assessed sites from the Morgan Generation Assets alongside other projects/plans.	No (d)	No (d)	No (d)	No (d)	Yes (c)	No (h)	No (d)	No (d)	No (d)
		Arklow Bank Wind Park Phase 2, Codling Wind Park, Llŷr Offshore Wind Project, Microsoft Wales-Ireland telecommunications cable, North Irish Sea Array (NISA), Oran na Mara Tidal Energy and Oriel Offshore Wind Farm are all beyond the commercial fisheries CEA study area and were therefore not considered further in the review (i.e. no physical effect-receptor pathway). There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. The Morecambe Offshore Windfarm: Generation Assets was assessed as a Tier 2 project in the Morgan Generation Assets CEA. The updated information presented in the final application does not result in the potential for additional cumulative effects with the Morgan Generation Assets due to the reduction in site area and the minor reduction in the maximum number of wind turbines, and therefore this project was screened out of the review.								

Topic	Summary of Morgan Generation Assets in-combination assessment conclusions for Scenario 3 as presented within the ISAA	Projects with potential for additional in-combination effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
HRA Stage 2 ISAA - Annex II marine mammals (APP-097))	No adverse effect on the integrity of assessed sites from the Morgan Generation Assets alongside other projects/plans.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (h)	No (h)	Yes (c)	No (d)	Yes (c)
		There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. Little is known about the project parameters for Microsoft Wales-Ireland telecommunications cable however it is considered there is no potential for temporary cable installation activities associated with the Microsoft Wales-Ireland telecommunications cable to significantly increase the cumulative effects assessed within the Morgan Generation Assets application based on receptor-impact pathways, and therefore this project was screened out of the CEA review. The Morgan Generation Assets CEA previously considered the Morecambe Offshore Windfarm: Generation Assets as part of the quantitative assessment as information was available from the PEIR, but this project has moved from Tier 2 to Tier 1 with updated information in the Environmental Statement. Population modelling was repeated with the same projects as modelled for the Morgan Generation Assets application but this time including the updated information from the Morecambe Offshore Windfarm: Generation Assets. The results demonstrated that there would be no additional cumulative impacts at a population-level on bottlenose dolphin (see Appendix B in this note). The Oran na Mara Tidal Energy was previously considered in the CEA screening undertaken for the application (Volume 3, Annex 5.1 Cumulative effects screening matrix (APP-031)), however the project is now a Tier 2 project (rather than Tier 3). The Oran na Mara Tidal Energy project was screened out of the CEA for marine mammals in the application on the basis of no conceptual or physical effect-receptor pathway, and the change in Tier does not affect this screening conclusion.								

Topic	Summary of Morgan Generation Assets in-combination assessment conclusions for Scenario 3 as presented within the ISAA	Projects with potential for additional in-combination effects with the Morgan Generation Assets								
		Arklow Bank Wind Park Phase 2	Cair Vie Onshore Wind Farm	Codling Wind Park Offshore Wind Farm	Llŷr Offshore Wind Project	Microsoft Wales-Ireland telecommunications cable	Morecambe Offshore Windfarm: Generation Assets	NISA Offshore Wind Farm	Oran na Mara Tidal Energy	Oriel Offshore Wind Farm
HRA Stage 3 ISAA - Offshore ornithology (APP-098)	No adverse effect on the integrity of assessed sites from the Morgan Generation Assets alongside other projects/plans.	Yes (c)	No (d)	Yes (c)	Yes (c)	No (d)	Yes (c)	Yes (c)	Yes (c)	Yes (c)
		There is no conceptual or physical effect-receptor pathway with the Cair Vie onshore wind farm and therefore this project was screened out of the CEA review. There is no potential for temporary cable installation activities associated with the Microsoft Wales-Ireland telecommunications cable to increase the cumulative effects assessed within the Morgan Generation Assets application, and therefore this project was screened out of the CEA review.								

Appendix B Marine mammal population modelling report: Cumulative effects review

B.1.1 Introduction

B.1.1.1.1 Morecambe Offshore Windfarm Ltd has now submitted its Development Consent Order application, with refined project information available in their Environmental Statement (Morecambe Offshore Windfarm Ltd, 2024). The Applicant has revised the marine mammal population models to incorporate the most recent information presented for relevant cumulative projects and to identify any changes to the cumulative effects assessment (CEA).

B.1.1.1.2 In summary, the changes are as follows:

- All piling parameters and piling schedules and the number of animals disturbed have been updated for Morecambe Offshore Windfarm: Generation Assets using information from the project Environmental Statement (Morecambe Offshore Windfarm Ltd, 2024).

B.1.1.1.3 The parameters inputted into the model for all other projects in the CEA remain unchanged from the modelling presented in Volume 2, Chapter 4: Marine mammals (AS-010).

B.1.1.1.4 This report presents the outputs of the revised cumulative population models and concludes there is no material change in the conclusions of the CEA assessment presented in Volume 2, Chapter 4: Marine mammals (AS-010).

B.1.2 Modelled parameters

B.1.2.1.1 Full details of the iPCoD modelling approach are presented in Section B.1.2 Appendix B of Volume 2, Chapter 4: Marine mammals (AS-010). Input parameters for the population modelling, as agreed with relevant stakeholders via the Marine Mammals Expert Working Group process, were retained for this CEA review (presented in Table B.3 of Volume 2, Chapter 4: Marine mammals (AS-010)).

B.1.2.1.2 As detailed in paragraph A.3.8.1.5 of Volume 2, Chapter 4: Marine mammals (AS-010), the original cumulative models in the Morgan Generation Assets Environmental Statement were run in two stages: one set of models incorporating the Morgan Generation Assets and only Tier 1 projects in the regional marine mammal study area, and one set incorporating all Tier 1 and Tier 2 projects. Cumulative projects were only included in species' models if they overlapped spatially with the species-specific management units (MU) relevant to the Morgan Generation Assets.

B.1.3 Numbers of animals disturbed

B.1.3.1.1 The number of animals affected for each of the key species and number of days on which piling occurred were taken from the maximum design scenario (MDS) for each of the cumulative projects, including the Morecambe Offshore Windfarm: Generation Assets Environmental Statement.

B.1.3.1.2 For each project, piling days were spread evenly throughout the offshore construction phases. As was the case for Volume 2, Chapter 4: Marine mammals (AS-010), the time points selected from the iPCoD model outputs for cumulative

projects were chosen to coincide with key periods in the piling programmes, and with statutory reporting periods for SACs (see Table B.11 and Table A.12 in Volume 2, Chapter 4: Marine mammals (AS-010)).

B.1.3.1.3 As discussed in paragraph B.1.2.1.2, the Environmental Statement for the Morecambe Offshore Windfarm: Generation Assets has now been published. This includes updated project parameters and updated assessment of disturbance, which leads to updated numbers of animals estimated to experience disturbance. Morecambe Offshore Windfarm: Generation Assets is now a Tier 1 project. All other projects remained unchanged and no new projects required inclusion for the population modelling undertaken for this CEA review.

1.6.1.1 A summary of the number of animals for each species affected and the number of piling days for each cumulative project, updated with the information from the Environmental Statement for Morecambe Offshore Windfarm: Generation Assets, is provided in Table B.1.

Table B.1: Summary of number of animals estimated to experience disturbance for revised cumulative iPCoD models for the maximum adverse spatial scenario.

Numbers shown in blue are the new values taken forward for this CEA review, while the numbers in red are those applied in the CEA population modelling for the Morgan Generation Assets application as presented in Volume 2, Chapter 4: Marine mammals (AS-010).

Project		Piling days	Maximum number of animals disturbed			
			Harbour porpoise	Bottlenose dolphin	Minke whale	Grey seal
Morgan Generation Assets	Wind turbine (3,000 kJ, concurrent)	24	1,007	5	67	61
	Wind turbine (4,400 kJ)	16	858	4	57	54
	OSP (4,400 kJ)	12	858	4	57	54
	Wind turbine (GBF: 3000 kJ)	38	713	4	48	41
Tier 1 projects in Morgan Generation Assets CEA						
Mona Offshore Wind Project	Wind turbine (3,000 kJ, concurrent)	24	1,142	7	72	31
	Wind turbine (4,400 kJ)	16	971	6	61	27
	OSP (4,400 kJ)	12	971	6	61	27
	Wind turbine (Gravity Base Foundation (GBF): 3,000 kJ)	38	803	5	51	17
Awel y Môr	Wind turbine (monopile, 5,000 kJ)	201	2,112	23	36	81
Project Erebus	Wind turbine (pin pile, 800 kJ)	18	1,967	n/a	55	18
White Cross Offshore Windfarm	Wind turbine (pin pile, 800 kJ) plus OSP (pin pile, 2,500 kJ)	6	2,754	n/a	61	10

Project		Piling days	Maximum number of animals disturbed			
			Harbour porpoise	Bottlenose dolphin	Minke whale	Grey seal
Tier 1 projects (previously in Tier 2) updated for this CEA review						
Morecambe Offshore Windfarm: Generation Assets (Environmental Statement)	Wind turbine (monopile, 6,600 kJ)	37	3,443	57	25	197
Morecambe Offshore Windfarm: Generation Assets (PEIR)	Wind turbine (monopile, 5,000 kJ)	42	2,961	<1	2	<1
Tier 2 projects (no change from submitted application)						
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	Morgan OSP	2	2,465	11	69	88
	Morecambe OSP	2	2,465	<1	2	88
	Morgan booster station	2	1,793	4	17	28

B.1.4 Results

B.1.4.1.1 In line with the population modelling presented in Volume 2, Chapter 4: Marine mammals (AS-010), the metrics used to assess the impact on the population are:

- The predicted mean population at the end of 25 years (time point 261)
- The mean ratio of the impacted to un-impacted population (counterfactual, at time point 26).

B.1.4.1.2 If the ratio of impacted to unimpacted population size equals one, this represents a situation where the impacted population size is no different to the unimpacted population size. If the ratio of impacted to unimpacted population size is less than one, this represents a situation where the impacted population size is smaller than the median unimpacted population size.

[1] Time points refer to a discrete interval in the simulation timeline where the model evaluates the state of the population. e.g. Time Point 1 = the start of year 1, before any time has passed. Time point 26 = the start of year 26, after 25 simulated years.

B.1.4.3 Harbour porpoise

B.1.4.3.1 Results of the iPCoD modelling for harbour porpoise for this CEA review are presented in Table B.2 and illustrated in Figure B.1.

B.1.4.3.2 The impacted population in Volume 2, Chapter 4: Marine mammals (AS-010) at time point 26 was 41,078 harbour porpoise (392 animals less than the unimpacted scenario), whilst for the revised iPCoD model the impacted population for the same time point was 41,276 animals (401 animals less than the unimpacted scenario), leading to a difference of 198 animals between the impacted population in the Environmental Statement model and the impacted population in this CEA review (= 0.317% of the MU). This equates to a 0.480% increase in the number of animals disturbed in the cumulative scenario from the Environmental Statement CEA model and this CEA review model. Whilst it may be counterintuitive that the population at time point 26 is predicted to be greater for the revised iPCoD model compared to the population presented in the Morgan Generation Assets application (Volume 2, Chapter 4: Marine mammals (AS-010)) since a larger number of harbour porpoise could be affected at any one time during each piling event, it is highlighted that overall the number of days of piling over the cumulative scenario has decreased and this is likely to have a bearing on the final population prediction.

B.1.4.3.3 The median and mean counterfactual of population size at the 26-year time point in the Environmental Statement was 0.9937 and 0.9903, respectively, at the 26-year time point. For the population model in this CEA review, the median and mean counterfactual of population was 0.9939 and 0.9904 respectively at the 26-year time point.

B.1.4.3.4 The results show that the differences in disturbed to undisturbed populations approach a ratio of 1 (0.99) for both mean and median ratio in the population modelling for this CEA review; therefore, there is not considered to be a potential for a long-term effect upon harbour porpoise, and therefore, these results do not affect the conclusions of the assessment in Volume 2, Chapter 4: Marine mammals (AS-010).

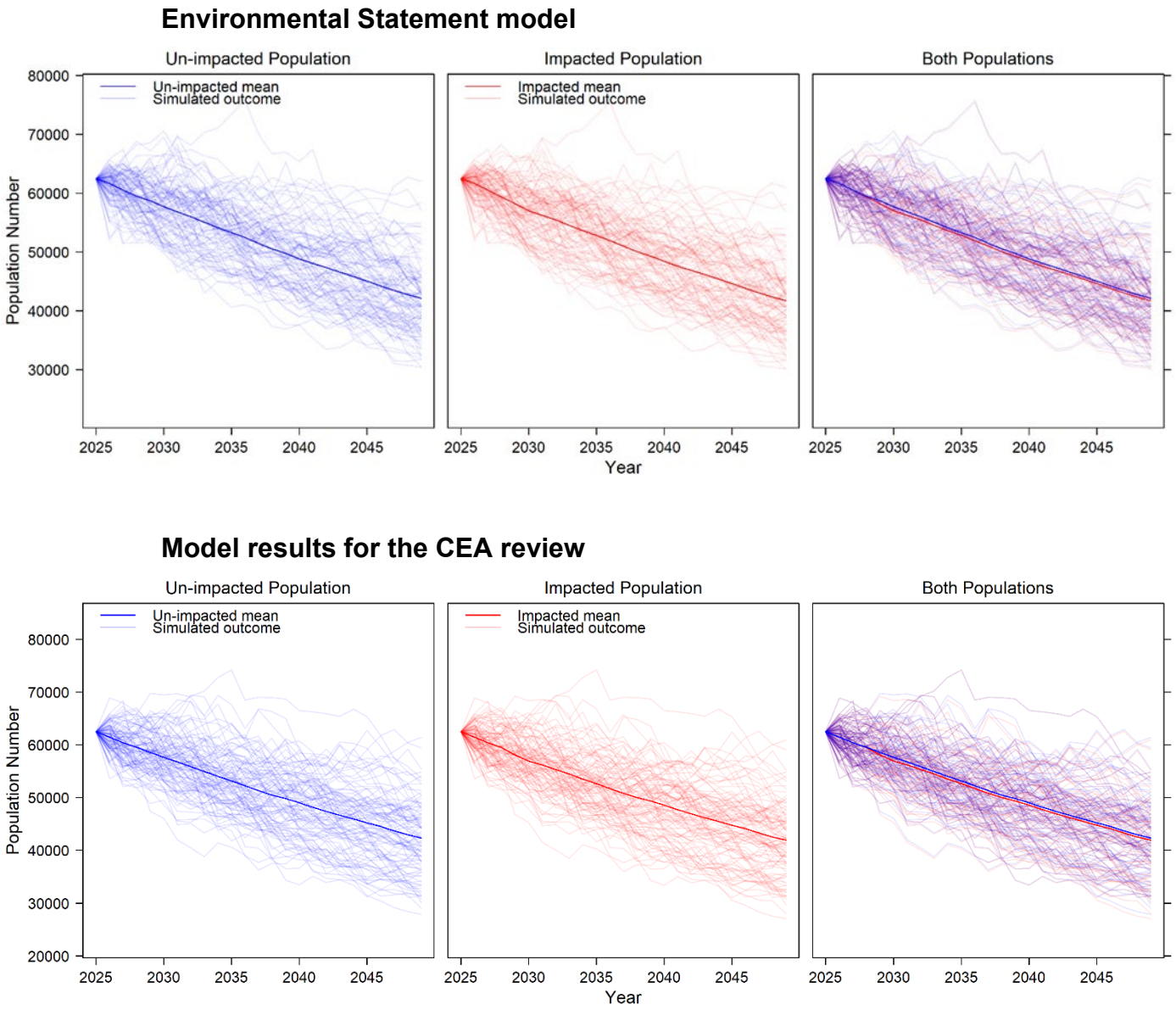

Figure B.1: Simulated harbour porpoise population trajectories in un-impacted versus impacted populations, for the Environmental Statement scenario as presented in Volume 2, Chapter 4: Marine mammals (AS-010) (Top Row) versus the CEA review model (Bottom Row).

Table B.2: Comparison of mean population estimates and mean counterfactuals of population size for harbour porpoise, from the Environmental Statement (scenario HP-C2) as presented in Volume 2, Chapter 4: Marine mammals (AS-010) and the CEA review model.

Time Point	Un-Impacted Pop Mean			Impacted Pop Mean			Mean Counterfactual			Median Counterfactual		
	ES	Review	Percent Change (%)	ES	Review	Percent Change (%)	ES	Review	Difference	ES	Review	Difference
1	62,514	62,514	0.000	62,514	62,514	0.000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
3	60,543	60,414	-0.214	60,531	60,397	-0.222	0.9996	0.9997	0.0001	1.0000	1.0000	0.0000
4	59,487	59,563	0.128	59,390	59,479	0.150	0.9984	0.9986	0.0002	0.9995	0.9996	0.0001
5	58,721	58,547	-0.297	58,268	58,088	-0.310	0.9921	0.9922	0.0001	0.9948	0.9951	0.0003
7	56,825	56,766	-0.104	56,248	56,180	-0.121	0.9895	0.9897	0.0002	0.9930	0.9933	0.0003
9	55,059	54,966	-0.169	54,571	54,468	-0.189	0.9909	0.9911	0.0002	0.9942	0.9943	0.0001
10	54,152	54,012	-0.259	53,648	53,499	-0.279	0.9904	0.9906	0.0002	0.9939	0.9940	0.0001
11	53,330	53,135	-0.367	52,821	52,618	-0.386	0.9902	0.9904	0.0002	0.9938	0.9938	0.0000
13	51,482	51,303	-0.349	50,991	50,803	-0.370	0.9902	0.9904	0.0002	0.9938	0.9938	0.0000
15	49,780	49,804	0.048	49,308	49,323	0.030	0.9903	0.9904	0.0001	0.9938	0.9939	0.0001
23	43,484	43,697	0.487	43,073	43,277	0.471	0.9903	0.9904	0.0001	0.9938	0.9939	0.0001
26	41,470	41,677	0.497	41,078	41,276	0.480	0.9903	0.9904	0.0001	0.9937	0.9939	0.02

B.1.4.4 Bottlenose dolphin

B.1.4.4.1 Results of the iPCoD modelling for bottlenose dolphin for this CEA review with a 0.22 fertility rate are presented in and illustrated in Figure B.2.

B.1.4.4.2 The impacted population in Volume 2, Chapter 4: Marine mammals (AS-010) at time point 26 was 238 animals (six animals less than the unimpacted scenario), whilst for the revised iPCoD model the population was 236 animals (six animals less than the unimpacted scenario), leading to a difference of two animals between the impacted population in the Environmental Statement model and the population model in this CEA review (= 0.683% of the MU). Therefore, there is a 0.847% decrease in the number of animals disturbed cumulatively between the Environmental Statement CEA model and the population model in this CEA review at time point 26, when using a fertility rate of 0.22.

B.1.4.4.3 The median and mean counterfactual of population size for the Environmental Statement was 1 and 0.97 respectively at the 26-year time point. For the population model in this CEA review, the median and mean counterfactual of population was 1 and 0.97 respectively at the 26-year time point.

B.1.4.4.4 Therefore, given that the differences in disturbed to undisturbed populations approaches a ratio of 1 in the population modelling for this CEA review and remains at 0.97 (the same as the modelling for the Environmental Statement), there is not considered to be an increased potential for a long-term effect upon bottlenose dolphin. The results of the population modelling for this CEA review therefore do not affect the conclusions of the assessment in Volume 2, Chapter 4: Marine mammals (AS-010).

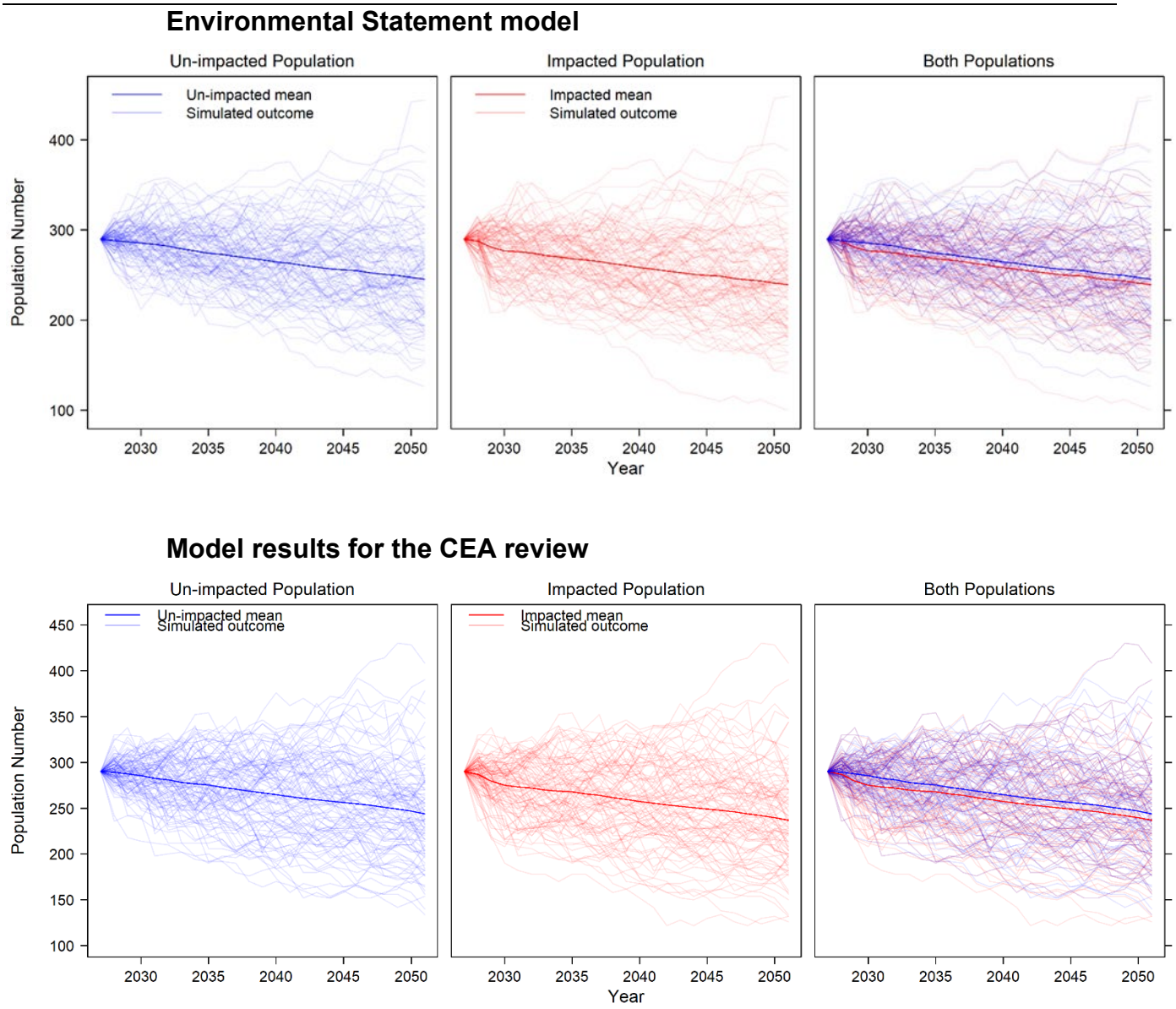

Figure B.2: Simulated bottlenose dolphin population trajectories (fertility rate = 0.22) in un-impacted versus impacted populations, for the Environmental Statement scenario as presented in Volume 2, Chapter 4: Marine mammals (AS-010) (Top Row) versus the CEA review model (Bottom Row).

Table B.3: Comparison of mean population estimates (fertility rate = 0.22) and mean counterfactuals of population size for bottlenose dolphin, from the Environmental Statement (scenario BND-C2) as presented in Volume 2, Chapter 4: Marine mammals (AS-010) and the CEA review model.

Time Point	Un-Impacted Pop Mean			Impacted Pop Mean			Mean Counterfactual			Median Counterfactual		
	ES	Review	Percent Change (%)	ES	Review	Percent Change (%)	ES	Review	Difference	ES	Review	Difference
1	290	290	0.000	290	290	0.000	1.000	1.0000	0.0000	1.0000	1.0000	0.0000
2	288	289	0.346	288	287	-0.348	0.9974	0.9917	-0.0057	1.0000	1.0000	0.0000
3	287	288	0.347	281	280	-0.357	0.9772	0.9729	-0.0043	1.0000	1.0000	0.0000
7	279	278	-0.360	272	270	-0.741	0.972	0.9707	-0.0013	1.0000	0.9937	-0.0063
8	277	276	-0.362	270	269	-0.372	0.9738	0.9725	-0.0013	1.0000	0.9943	-0.0057
9	274	275	0.364	268	268	0.000	0.9756	0.9740	-0.0016	1.0000	1.0000	0.0000
11	271	271	0.000	265	264	-0.379	0.977	0.9746	-0.0024	1.0000	1.0000	0.0000
13	267	267	0.000	261	260	-0.385	0.976	0.9734	-0.0026	1.0000	1.0000	0.0000
21	252	253	0.395	246	246	0.000	0.9757	0.9725	-0.0032	1.0000	1.0000	0.0000
26	244	242	-0.826	238	236	-0.847	0.9757	0.9724	-0.0033	1.0000	1.0000	0.0000

B.1.4.5 Minke whale

B.1.4.5.1 Results of the iPCoD modelling for minke whale for this CEA review are presented in Table B.4 and illustrated in 3 against the Environmental Statement scenario.

B.1.4.5.2 The impacted population at time point 26 in Volume 2, Chapter 4: Marine mammals (AS-010) is 19,911 animals (40 animals less than the unimpacted scenario), whilst for the revised iPCoD model the population was 19,775 animals (72 animals less than the unimpacted scenario), leading to a difference of 136 animals between the impacted population in the Environmental Statement model and population model in this CEA review (=0.676% of the MU). Therefore, there is a 0.688% decrease in the number of animals disturbed cumulatively between the Environmental Statement CEA model and the population model in this CEA review at time point 26.

B.1.4.5.3 The median and mean counterfactual of population size for the Environmental Statement was 0.9985 and 0.9980, respectively, at the 26-year time point. For the population model in this CEA review, the median and mean counterfactual of population was 0.9970 and 0.9964, respectively, at the 26-year time point.

B.1.4.5.4 Therefore, given that the differences in disturbed to undisturbed populations approach a ratio of 1 in the population modelling for this CEA review, there is not considered to be a potential for a long-term effect upon minke whale. The results of the population modelling for this CEA review therefore do not affect the conclusions of the assessment in Volume 2, Chapter 4: Marine mammals (AS-010).

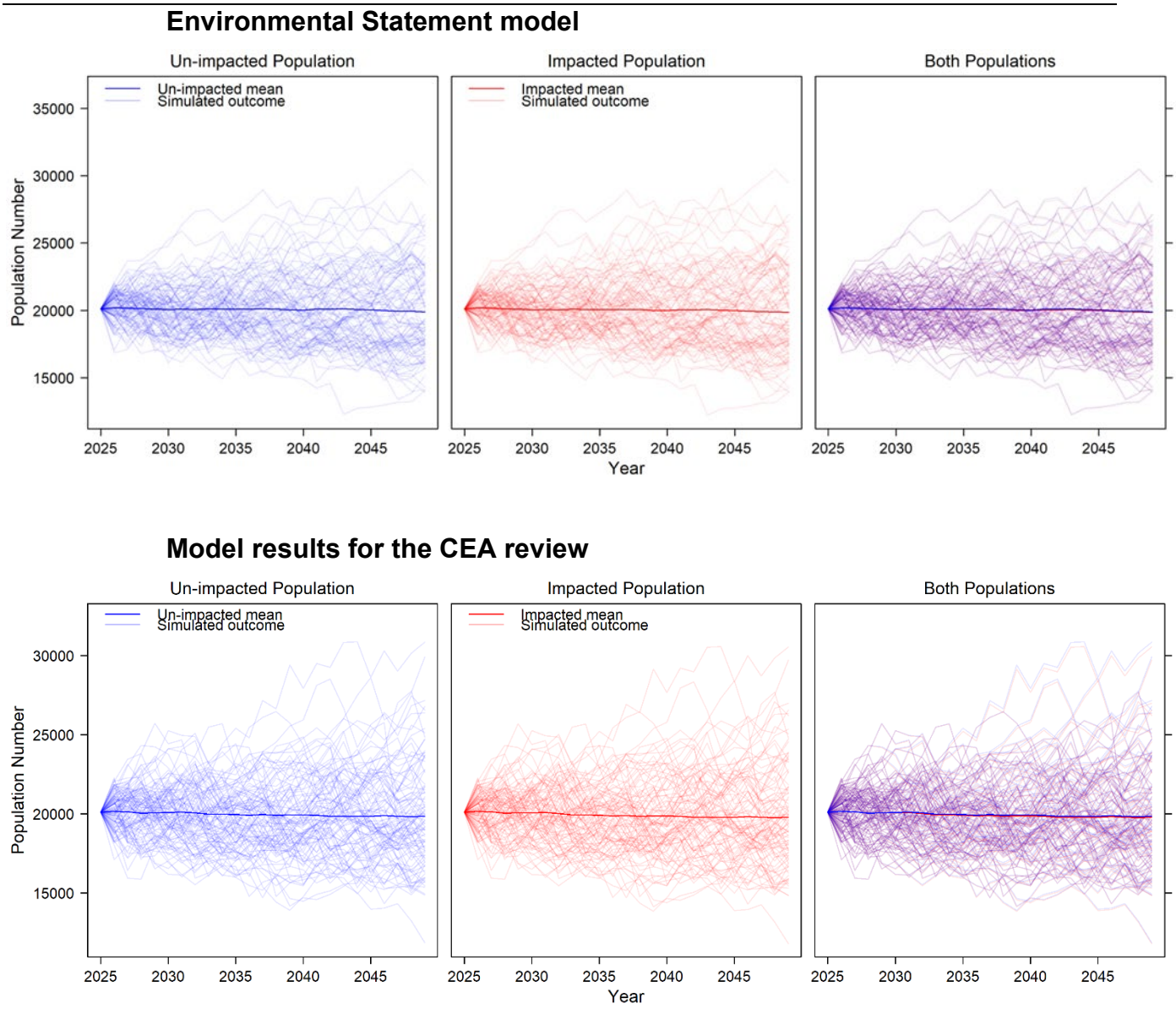

Figure B.3: Simulated minke whale population trajectories in un-impacted versus impacted populations, for the Environmental Statement scenario as presented in Volume 2, Chapter 4: Marine mammals (AS-010) (Top Row) versus the CEA review model (Bottom Row).

Table B.4: Comparison of mean population estimates and mean counterfactuals of population size for minke whale, from the Environmental Statement (scenario MW-C2) as presented in Volume 2, Chapter 4: Marine mammals (AS-010) and the CEA review model.

Time point	Un-Impacted Pop Mean			Impacted Pop Mean			Mean Counterfactual			Median Counterfactual		
	ES	Review	Percent Change (%)	ES	Review	Percent Change (%)	ES	Review	Difference	ES	Review	Difference
1	20,120	20,120	0.000	20,120	20,120	0.000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
3	20,169	20,144	-0.124	20,169	20,144	-0.124	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
4	20,136	20,059	-0.384	20,133	20,056	-0.384	0.9999	0.9999	0.0000	1.0000	1.0000	0.0000
5	20,101	20,078	-0.115	20,091	20,066	-0.125	0.9995	0.9994	-0.0001	0.9997	0.9996	-0.0001
7	20,089	20,126	0.184	20,069	20,094	0.124	0.9990	0.9984	-0.0006	0.9994	0.9989	-0.0005
9	20,120	19,992	-0.640	20,093	19,948	-0.727	0.9987	0.9978	-0.0009	0.9992	0.9984	-0.0008
10	20,088	19,992	-0.480	20,059	19,943	-0.582	0.9986	0.9976	-0.0010	0.9991	0.9981	-0.0010
11	20,090	19,973	-0.586	20,059	19,921	-0.693	0.9985	0.9974	-0.0011	0.9990	0.9980	-0.0010
13	20,109	19,963	-0.731	20,073	19,904	-0.849	0.9983	0.9970	-0.0013	0.9988	0.9976	-0.0012
15	20,043	19,950	-0.466	20,005	19,885	-0.603	0.9981	0.9968	-0.0013	0.9986	0.9974	-0.0012
23	19,950	19,856	-0.473	19,909	19,784	-0.632	0.9980	0.9964	-0.0016	0.9985	0.9970	-0.0015
26	19,951	19,847	-0.524	19,911	19,775	-0.688	0.9980	0.9964	-0.0016	0.9985	0.9970	-0.0015

B.1.4.6 Grey seal

B.1.4.6.1 For grey seal, iPCoD models incorporating the maximum temporal scenario and the maximum spatial scenario were based upon two reference populations: the Grey Seal Reference Population (GSRP) and the OSPAR Region III population (as described in section B.3.3 and Table B. 4 in Volume 2, Chapter 4: Marine mammals (AS-010)). For the cumulative scenarios, projects were included within the GSRP (White Cross Offshore Wind Farm has been included in grey seal cumulative models due to proximity of boundary with the Wales Seal Management Unit (SMU), a constituent of the GSRP).

Grey Seal Reference Population

B.1.4.6.2 Results of the iPCoD modelling at the time points described for grey seal using the GSRP for this CEA review are presented in Table B.5 and illustrated in Figure B.4.

B.1.4.6.3 The impacted population in Volume 2, Chapter 4: Marine mammals at time point 26 is 17,921 animals (the same as the unimpacted scenario), whilst for the revised iPCoD model the population was 18,086 animals (also the same as the unimpacted scenario), leading to a difference of 165 animals between the impacted population in the Environmental Statement model and the population model in this CEA review (= 1.278% of the MU). Therefore, there is a 0.912% increase in the numbers of animals disturbed cumulatively between the Environmental Statement CEA model and this CEA review model at time point 26.

B.1.4.6.4 The median and mean counterfactual of population size for the Environmental Statement was 1 and 1, respectively, at the 26-year time point. For the CEA review model, the median and mean counterfactual of population was 1 and 1, respectively, at the 26-year time point.

B.1.4.6.5 Therefore, given that the differences in disturbed to undisturbed populations is a ratio of 1 in the population modelling for this CEA review, there is not considered to be a potential for a long-term effect upon grey seal. The results of the population modelling for this CEA review, therefore, do not affect the conclusions of the assessment in Volume 2, Chapter 4: Marine mammals (AS-010).

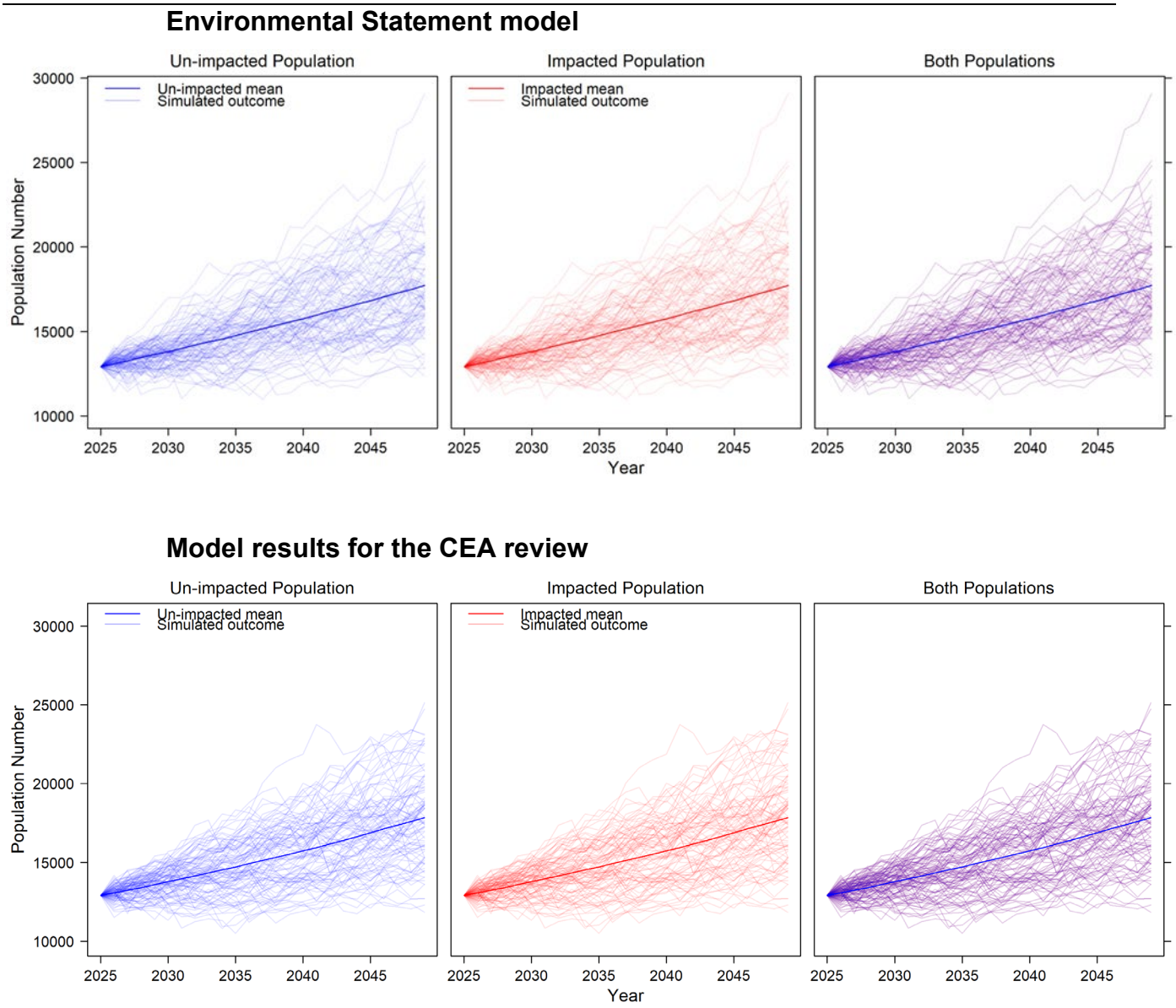

Figure B.4: Simulated grey seal population trajectories for the GSRP in an un-impacted versus impacted population, for the Environmental Statement scenario as presented in Volume 2, Chapter 4: Marine mammals (AS-010) (Top Row) versus the CEA review model (Bottom Row).

Table B.5: Comparison of mean population estimates (GSRP) and mean counterfactuals of population size for grey seal, from the Environmental Statement (scenario GS-C2a) as presented in Volume 2, Chapter 4: Marine mammals (AS-010) and the CEA review model.

Time point	Un-Impacted Pop Mean			Impacted Pop Mean			Mean Counterfactual			Median Counterfactual		
	ES	Review	Percent change (%)	ES	Review	Percent change (%)	ES	Review	Difference	ES	Review	Difference
1	12,908	12,908	0.000	12,908	12,908	0.000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
3	13,254	13,242	-0.091	13,254	13,242	-0.091	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
4	13,454	13,402	-0.388	13,454	13,402	-0.388	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
5	13,635	13,584	-0.375	13,635	13,584	-0.375	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
7	13,991	13,961	-0.215	13,991	13,961	-0.215	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
9	14,383	14,327	-0.391	14,383	14,327	-0.391	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
10	14,545	14,524	-0.145	14,545	14,524	-0.145	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
11	14,737	14,701	-0.245	14,737	14,701	-0.245	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
13	15,151	15,123	-0.185	15,151	15,123	-0.185	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
15	15,560	15,521	-0.251	15,560	15,521	-0.251	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
23	17,274	17,348	0.427	17,274	17,348	0.427	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
26	17,921	18,086	0.912	17,921	18,086	0.912	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000

B.1.4.7 Summary

B.1.4.7.1 Population modelling was undertaken using the updated project parameters and numbers of animals disturbed for the Morecambe Offshore Windfarm: Generation Assets project from the application Environmental Statement.

B.1.4.7.2 The median ratio was close to 1 for harbour porpoise (0.99), and minke whale (0.99), and 1 for bottlenose dolphin and grey seal II population models. For all species, this represents a situation where the median impacted population size is very close to or is no different to the median unimpacted population size and was the same median ratio as predicted in models presented in the Environmental Statement. The mean ratio remained the same in the modelling undertaken for this CEA review as for the modelling presented in Volume 2: Chapter 4: Marine Mammals (AS-010); 0.99 for harbour porpoise and minke whale, 0.97 for bottlenose dolphin and 1 for grey seal (for both the GSRP and OSPAR Region III population models). Therefore, the conclusions in the iPCoD modelling (Appendix B) of Volume 2: Chapter 4: Marine Mammals (AS-010) (which demonstrated no long-term population level effects for any of the species assessed), remains valid based on the modelling undertaken for this CEA review.

B.1.4.7.3 The results showed whilst more animals were disturbed using the information from the Environmental Statement for the Morecambe Offshore Windfarm: Generation Assets, this does not give rise to increased population level impacts and therefore does not change the conclusions of the Morgan Generation Assets cumulative assessment presented in Volume 2, Chapter 4: Marine mammals (AS-010).