Ocean Energy ORJIP working to accelerate offshore consenting

Llywodraeth Cymru Welsh Government

ORJIP Ocean Energy

Information Note: Cumulative Impact Assessment

Report to: Welsh Government

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MarineSpace Making Sense of the Marine Environment™

CONTENTS

Information Note: Cumulative Impact Assessment

1 INTRODUCTION

This series of technical, topic specific Information Notes has been co-produced by the Welsh Consenting Strategic Advisory Group's Science and Evidence subgroup (SEAGP) in order to support the consenting of wave and tidal stream energy projects. The Information Notes have been developed to establish the current position of key stakeholders in Wales on the evidence available on interactions of wave and tidal energy technologies with the marine environment. They are designed to set out a starting point for applicants by providing an understanding of where consenting challenges might lie. The aim of the Information Notes is to support marine licence applications that are robust, proportionate and focused on assessing the key potential significant impacts and possible interactions between marine renewable energy (MRE) devices and the marine environment.

These Information Notes will support careful consideration of how, for a particular development, potential impacts that are considered low risk could be safely retired from further detailed consideration within Environmental Impact Assessments (EIA), where available evidence supports this approach. Ocean Energy Systems-Environmental (OES-Environmental) has set out a general process for risk retirement[1,2] but for developments in Welsh waters, risk retirement should always be discussed between developers and Natural Resources Wales (NRW) at the pre-application stage. In the context of these Information Notes, risk retirement implies that all potential impacts are included for consideration at the project scoping stage, and that following a review of the evidence some impacts may be 'scoped out' of any further detailed assessment to focus EIA on key significant impacts[3]. In all cases, potential impacts should be acknowledged in EIAs, with evidence-based justifications describing why particular impacts could be 'scoped out' of further detailed assessment.

Further information about this series of Information Notes, who these documents are for, how they were produced, and how they should be used can be found in the accompanying document *Information Notes: Background*

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[1] https://tethys.pnnl.gov/events/oes-environmental-webinar-risk-retirement

[2] https://tethys.pnnl.gov/publications/state-of-the-science-2020-chapter-13-risk-retirement

[3] It should be noted that The Wildlife Trusts expressed concerns about the use of the phrase 'risk retirement' being applied in this context, particularly considering the uncertainties in impact assessment that are likely to arise with increasing scale of MRE developments.

Information. The *Information Notes: Background Information* documentation also contains information about the terminology used in this document.

1.1 CUMULATIVE IMPACT ASSESSMENT – GENERAL

The Welsh National Marine Plan[4] (WNMP) contains a policy framework designed to guide marine decision making in Wales, including policies relating to cumulative impact assessment (CIA) and in the context of supporting sustainable development of the Welsh Marine Area and achieving Good Environmental Status.

Cumulative effects, as set out in the WNMP[2] are:

*"those effects that result from incremental changes caused by two or more past, present and/or reasonably foreseeable actions. These can be economic, social or environmental in nature. Cumulative effects could arise from single or multiple responses (environmental, economic or social) to single or multiple pressures from single or multiple activities. The term "cumulative" is extended to include the term "**in combination**" effects as used in some legislation."*

Cumulative effects are addressed as part of the general cross-cutting policies. In Wales, it is required that applicants demonstrate that they have assessed potential cumulative effects. They should also avoid adverse effects, minimise effects where they cannot be avoided and/or mitigate effects where they cannot be minimised. For any particular project, the level of assessment:

"*should be proportionate to the expected scale and effect(s) of the project as well as the sensitivity of the [environmental] effects(s) concerned*".

The WNMP also recognises that both positive gain and negative impacts can emerge from cumulative effects, and notes that proposals that result in positive gain should be supported.

In addition to the Welsh National Marine Plan, the Marine Works (EIA) Regulations 2007 (as amended) requires developers to produce an Environmental Statement which includes a description of the likely significant effects of a proposed project on the environment and any cumulative effects that might occur with other existing or approved projects. This is only applicable where a need for EIA has been determined.

1.1.1 State of the science on CIA

[4] https://gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document_0.pdf

There is a range of public and industry guidance available on CIA (section 3). However, at present there is no single, agreed standard method, particularly for the marine renewable energy industry. As a result, the approach to CIA often varies between applications. However, the extent and scope of assessment for cumulative effects should be agreed with the regulatory body as part of the EIA scoping stage for a development.

CIA in the marine environment is a topic that has been discussed in the scientific literature in many contexts over the past 15 years. Various methods for CIA have been proposed by governments in the UK and Europe, although at present there is no internationally agreed standard.

Risk-based frameworks for CIA have been proposed, dividing the assessment process into three steps: risk identification; risk analysis; and risk evaluation (Stelzenmüller et al. 2020). This approach can help to encourage the uptake and application of scientific evidence in decision-making (Cormier et al. 2018). A series of recommendations for risk-based CIA frameworks have been suggested (Stelzenmüller et al. 2020). These included:

- Clear identification of the drivers, management objectives, and targets associated with a CIA prior to identification of risk criteria;
- Strong definition of the roles of participants in CIA (regulators, scientists, stakeholder groups);
- Addressing complexity in a transparent and well-documented fashion and identifying trade-offs between the level of complexity and available resources and timelines; and
- Highlighting assumptions made in assessments and clear quantification of uncertainties throughout the process.

Significant knowledge gaps in understanding how the effects of multiple, large-scale MRE developments will propagate represents a key challenge to assessing cumulative impacts (Wilsteed et al. 2017). It has been suggested that data gathering during strategic planning and strategic environmental assessment phases could help to support CIA (Maclean et al. 2014). Other studies have highlighted the need to incorporate expert knowledge into CIA in such a way that the assessment accounts for 'knowledge-based uncertainty' (Jones et al. 2018).

Several publications have provided insight into CIA for the offshore wind energy industry, and some approaches identified in these studies may be appropriate for application within the wave and tidal energy industries. For example, a series of 11 guiding principles were developed for CIA of offshore wind energy developments as part of the Natural Environment Research Council's Marine Renewable Energy Knowledge Exchange Programme (RenewableUK 2013). Many of these guiding principles are applicable to MRE development, including

collaboration between stakeholders, provision and access to data, transparency, geographical boundary setting, and proportionate assessment of risk.

Risk-based approaches to CIA have been applied to offshore wind developments in France (Brignon et al. 2022) and in the UK (Wilsteed et al. 2018). Many of these studies highlighted challenges in developing a shared understanding of approaches between stakeholder groups and discrepancies between science and practice, as well as substantial variability in how projects are assessed.

Several initiatives are ongoing in the UK to address challenges in CIA, many of which are focused on offshore wind energy. Marine Scotland's Scottish Marine Environmental Research (ScotMER) programme has set out a research theme focused on producing a cumulative effects framework for key ecological receptors such as seabirds and marine mammals. The aim of this project, led by the UK Centre for Ecology and Hydrology, is to facilitate robust assessment of cumulative impacts using the best available data[5]. The Crown Estate's Offshore Wind Evidence and Change programme[6] is also supporting several projects to address the cumulative impacts of offshore wind energy expansion.

1.2 INFORMATION CONSIDERED BY SEAGP

The information contained in this Information Note represents the outputs of a workshop on CIA held on 8 February 2022 with SEAGP members. In advance of the workshop SEAGP members were provided with background information on CIA, including the introductory information found in this Information Note (Sections **Error! Reference source not found.** and 1.1.1). SEAGP members were then asked to apply their expertise to a series of discussion questions about CIA and how it could be best carried out in Welsh waters.

1.3 ABOUT THIS INFORMATION NOTE

Across all sectors, CIA is a challenging task, and has been discussed widely in government and academic publications. At present, few SEAGP members have set out positions on CIA. NRW has not yet set out its position on CIA, although this is in progress. Given the agreed challenges in addressing CIA, this Information Note aims to provide a summary of current approaches to CIA and to communicate the combined perspective of the SEAGP on the topic.

It should be noted that this Information Note focuses primarily on CIA. SEAGP members acknowledge that CIA and in-combination effects are often discussed together, and that in-combination assessments often draw on information from the applicant's environmental statements. However, in-combination

[5] https://www.ceh.ac.uk/our-science/projects/cumulative-effects-framework-key-ecological-receptors

[6] https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/offshore-wind-evidence-and-change-programme/offshore-wind-evidence-and-change-programe-themes-and-projects/

assessments are for a Competent Authority (usually the decision-maker) to undertake and are a requirement of the Conservation of Habitats and Species Regulations 2017 (and offshore equivalent) as set out in Section 2.1.2, and so are not the primary focus of this Information Note.

This Information Note is an interim publication and will be updated as the positions of SEAGP members emerge, or when there are significant advances in guidance or academic literature on CIA.

2 DEFINITION OF TERMS

Several terms are used in the process of assessing the effects of multiple developments on the marine environment, including cumulative effects, cumulative impacts and in-combination effects. Linguistic ambiguity has been closely linked to decision-making and so it is important to use a standardised vocabulary (Masden et al. 2015).

2.1 CUMULATIVE EFFECTS AND IMPACTS AND IN-COMBINATION EFFECTS

The term 'cumulative effects' is often used interchangeably with the term 'cumulative impacts'. General audiences may consider the term 'effect' to represent either positive or negative outcomes, while the term 'impact' may often be considered to have negative connotations. Within the scientific and regulatory realms, however, the term 'effect' is considered to be an event, while an 'impact' is the influence that effect would have on a receptor. For example, the occurrence of a collision between an animal and device would be an 'effect', while the 'impact' would be the change on the population of that species.

To facilitate clear interactions between stakeholders on CIA, SEAGP agreed that the definitions in the Conservation of Habitats and Species Regulations 2017 and the Marine Works (EIA) Regulations 2007 (as amended) should be used. These definitions are set out in the following two sections.

2.1.1 Cumulative Impacts

Cumulative impacts are often defined as the environmental impacts from multiple projects or activities, and defined as:

"Impacts that result from incremental changes caused by other past, present, or reasonably foreseeable actions together with the project (Hyder 1999)."

CIA is part of the EIA process and therefore should be undertaken by the developer and their consultants. The Chartered Institute of Ecology and Environmental Management (CIEEM) have set out guidelines on ecological impact assessment. These guidelines set out that the following types of future development should be included in CIA, provided that they are within the same zone of influence:

- Proposals for which consent has been applied and which are awaiting determination in any regulatory process (this is not necessarily limited to planning permission);
- Projects which have been granted consent (not limited to planning permissions) but which have not yet been started or which have been started but are not yet completed (i.e. under construction);
- Proposals which have been refused permission but which are subject to appeal and the appeal is undetermined to the extent that their details are in the public domain; and
- Proposed projects that will be implemented by a public body for which no consent is needed from a competent authority.

The CIEEM guidelines also note that in some situations, it may be necessary to also consider:

- constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; and
- developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan (draft or adopted).

2.1.2 In-combination effects

Although in-combination effects are not the focus of this Information Note, they are described here to distinguish in-combination effects assessments from CIA. **In-combination effects** have a specific definition in the context of an appropriate assessment of effects on Marine Protected Areas (MPA), required to comply with the Conservation of Habitats and Species Regulations 2017 (and offshore equivalent):

"Any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implication of the site in view of the site's conservation objectives."

The key purpose of in-combination effects assessment is to protect MPAs from the cumulative effects of more than one project when the effects of individual projects alone would not likely be significant. In-combination effects assessment is the responsibility of a competent authority. The competent authority for marine licensing in Wales is NRW, the Welsh Ministers in respect of Section 36 energy consents and the Crown Estate in respect of seabed leasing.

3 EXISTING GUIDANCE ON CIA

There are several UK-specific guidance documents available to inform CIA:

- A strategic framework for scoping cumulative effects. (Marine Management Organisation (MMO) 2014)[7];
- Development of a generic framework for informing Cumulative Impact Assessments related to Marine Protected Areas through evaluation of best practice (Natural England 2014)[8];
- Cumulative Impact Assessment Guidelines - guiding principles for cumulative impacts assessment in offshore wind farms, (RenewableUK, 2013)[9];
- Advice note on cumulative effects assessment for nationally significant infrastructure projects (Planning Inspectorate, 2019)[10];
- The CIEEM guidelines for Ecological Impact Assessment in the UK and Ireland (2018)[11].

The RenewableUK guidelines considered several practical solutions to attempt to overcome the challenges of CIA. These included defining what a meaningful assessment is, and tackling challenges on scoping, data, assessment and monitoring and mitigation.

Few CIA guidelines have been developed specifically for the MRE industry, although NatureScot provide guidance on assessing the cumulative impacts of MRE devices on seabirds:

- NatureScot assessment methodology for determining cumulative impacts of wave and tidal marine renewable energy devices on birds (RPS, 2010)[12].

4 SCOPE OF CIA

The geographical and temporal scope of CIA will be strongly dependent on the receptor in question for assessment and should be in line with the requirements of the Marine Works (EIA) Regulations 2007 (as amended), as set out in 2.1.1.

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[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/389876/MMO1055_Report_Final.pdf
[8] http://publications.naturalengland.org.uk/publication/6341085840277504
[9] https://nerc.ukri.org/innovation/activities/energy/offshore/cumulative-impact-assessment-guidelines/
[10] https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/
[11] https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/
[12] https://www.nature.scot/doc/naturescot-archive-report-050-assessment-methodology-determining-cumulative-impacts-wave-and-tidal

It should be noted that some impacts will be continuous throughout the life of a development (e.g. seabed impacts), while others may be limited to particular project phases (e.g. construction noise).

4.1 GEOGRAPHICAL AND TEMPORAL SCOPE FOR ASSESSMENTS

For benthic receptors, it is important that the CIA defines the duration of the impact, i.e. whether the impact is expected to be temporary (over part or all of the project lifetimes) or permanent (extending beyond the project lifetime). For example, at present cabling impacts are sometimes defined as temporary, provided that cables can be decommissioned and the seabed is able to recover to its baseline state.

It is advised that the foraging ranges of breeding seabirds are used to determine the geographical scope of seabird CIA (Woodward et al. 2019). To determine the potential impacts of MRE developments on seabirds outside of the breeding season, seabird populations at biologically defined minimum population scales should be used (BDMPS). Further information about the use of BDMPS in assessments can be found in the Natural England report on non-breeding season populations of seabirds in UK waters (NECR164, Furness 2015).

For marine mammals, NRW use marine mammal management units to indicate the spatial scales at which impacts should be assessed (including cumulative impacts) as set out in "NRW's position on the use of Marine Management Units for screening and assessment in Habitats Regulations Assessments for Special Areas of Conservation with marine mammal features"[13].

4.2 CHALLENGES TO SETTING A SCOPE FOR CIA

A key challenge to setting a proportionate scope for CIA arises in situations where consent is sought for a phased MRE development. In some cases, consent may be granted for an overall site capacity that is greater than the actual realised capacity of the site once it is fully developed. At present, CIA that include such developments are determined based on the consented capacity, rather than the actual built capacity of projects, and so predicted cumulative impacts are likely to be greater. In the future, it may be possible to amend consent capacities to reflect the realised build-out capacity of the site in a variation of consent, although this is not yet routinely carried out. In doing so, more realistic evidence would be used for CIA, resulting in more proportionate assessment outcomes.

Phased projects can also pose a challenge to CIA as it is difficult to determine the point at which a project is declared to be 'complete', and so included as part

[13] This position statement is not yet available on NRW's website but can be made available on request.

of the associated baseline, rather than as a proposed or incomplete project, the effects of which should be included in the assessment.

5 PROPORTIONATE CIA

Proportionate CIA is enabled by the application of the best available evidence at the time of assessment. Evidence should be provided in clear, agreed formats to empower good decision-making.

CIAs should be limited to aspects of the environment that are likely to be significantly affected, in proportion to the scale and scope of the development. It should be noted that the level of significance apportioned to an effect is a subjective judgement, but one that should be based on the evidence provided.

5.1 CHALLENGES TO PROPORTIONATE CIA

Some experience can be gleaned from the offshore wind energy industry, where extensive development has challenged approaches to CIA. Rapid developments in technology mean that the project Rochdale envelope approach is becoming increasingly broad, and that EIA and CIA often reflect a 'worst case' scenario associated with substantial uncertainty, rather than the actual likely effects of a project. When multiple projects are scoped into CIA, the overall uncertainty increases accordingly and may lead to more risk-averse assessments. MRE developers are encouraged to refine their project envelope as much as possible to support proportionate EIA and CIA for the wider sector, as well as for their own projects.

Substantial uncertainty associated with the environmental effects of MRE developments has made it difficult to set clear significance thresholds for EIA and CIA because thresholds set with such great uncertainty are likely to be biologically meaningless. However, the decision-making process is informed both by scientific evidence and by policy, which is strongly influenced by society. It should be recognised that societal perspectives are also factored into decision-making and can influence the ultimate outcomes of an assessment (i.e. consent or lack thereof).

Finally, CIAs currently incorporate both licensable and non-licensable activities. Non-licensable and/or unregulated activities may not require an EIA, making their incorporation into CIAs challenging. Furthermore, some stakeholders may perceive that it would be more proportionate to assess unlicensed activities through mechanisms other than the cumulative element of EIA.

6 RECOGNISING HISTORICAL IMPACTS IN CIA

Previous academic studies have highlighted that historical impacts to receptors are not always adequately addressed in CIA (Wilsteed et al. 2018, Hammar et al. 2020). It is presently common practice to incorporate known historical impacts affecting the state of the receiving environment into the baseline

assessment of environmental conditions and receptor sensitivity within CIAs. However, there is some uncertainty as to where and how historical changes in environmental conditions and sensitivities would be documented and accessed by those undertaking assessments.

At present, it is often unclear how CIA legislation should be applied in the context of already declining populations (Masden et al. 2015). It has been identified that many offshore wind CIAs do not adequately include the historical impacts to receptors, and that CIA often concluded that receptors were able to adapt to past and existing activities (Wilsteed et al. 2018, Hammar et al. 2020). This has contributed to the persistence of a 'shifting baseline syndrome' in CIA, which could be addressed by agreeing a common baseline for specific geographical areas of assessment (Wilsteed et al. 2018).

It is currently advised that only existing plans and projects should be considered for CIA, as set out in 2.1.1.

7 SUMMARY AND RECOMMENDATIONS

7.1 DEVELOPING A FRAMEWORK FOR CIA

In Wales, NRW encourage developers and their consultants to communicate at an early stage of the consenting process to identify what is and is not appropriate to include in CIA. This case-by-case approach is useful in that it enables bespoke assessments that consider the characteristics of each development and its proximity to MPAs.

Across the UK, however, CIA is not always approached in a consistent fashion, which creates inconsistencies in assessments that can be difficult for developers looking to develop projects in multiple locations, or in areas that are close to jurisdictional boundaries. A key challenge in the latter case is assessing potential impacts on highly mobile species (seabirds, migratory fish, marine mammals) whose range spans jurisdictional boundaries and that are important features of MPAs. Where there are discrepancies in opinion between the regulatory bodies involved, it will be important to develop a transparent process to address such discrepancies effectively. This may be a first step towards developing a common UK framework for CIA, although such a framework would need to recognise discrete Welsh regulatory requirements.

A common CIA framework for the UK might include:

- Agreed terminology and language for CIA;
- Transparent definition of what activities are considered to be 'foreseeable', and so included in CIA;
- Agreed reporting structures for environmental statements and assessment processes so as to avoid organisational silos;

- Advice on addressing cross-boundary CIA where national requirements for CIA may differ; and
- A statement of need for development of an easily accessible and authoritative evidence base for CIA that is applicable to projects across the UK.

7.2 RECOMMENDATIONS

- Improved clarity in key terminology and language, and transparent guidelines on activities that should and should not be included in CIA would help to facilitate better quality assessments.
- Currently, statutory nature conservation bodies take different approaches to assessing impacts on specific receptors in EIA and CIA. A common approach to assessment would be helpful.
- A consistent approach to CIA across the UK is important from a policy perspective. A common framework for CIA is attractive, but it will be important that discrete Welsh regulatory needs are accommodated.
- A single, standardised, publicly accessible source of information to support CIA would support more efficient and higher quality CIA and would improve transparency and public trust in assessments.
- It will be important for the MRE sector to learn from the experience of the offshore wind energy sector, where larger scales of development have warranted increased investment in examining the cumulative impacts of the sector. Links should be developed between the MRE sector and key offshore wind initiatives including the Crown Estate's Offshore Wind Evidence and Change programme and Marine Scotland's ScotMER programme.

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NOTE THAT ADDITIONAL REFERENCES ARE INCLUDED THAT ARE NOT CITED IN THIS INFORMATION NOTE

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APPENDIX A ADDRESSING CUMULATIVE IMPACTS IN PREVIOUS MARINE ENERGY PROJECTS: LICENSING DOCUMENTS AND CONSENT CONDITIONS

Project Name	Location	Technology	Consenting Status	How Cumulative Impacts are addressed	EIA/ HRA/ Other
MeyGen	Scotland	Tidal Stream Array	Constructed	In addition to the Project-specific mitigation, the following measures have been identified to minimise potential cumulative impacts in relation to Shipping and Navigation: -Liaison with ScottishPower Renewables UK Limited should installation or decommissioning activities overlap at the Ness of Duncansby site; -and Consultation with stakeholders and development of appropriate procedures should MeyGen Phase 1 and 2 be decommissioned simultaneously resulting in increased work vessel activity in the Inner Sound.	EIA
MeyGen	Scotland	Tidal Stream Array	Constructed	No mitigation to minimise potential cumulative impacts is required over and above the Project specific mitigation, in relation to marine mammals. It should however be noted that there is still some uncertainty over the potential impacts on marine mammals from potential collision with the tidal turbines. Should monitoring of the early years of deployment indicate mitigation is required to avoid significant cumulative impacts, MeyGen will develop and adopt mitigation as appropriate.	EIA

Project Name	Location	Technology	Consenting Status	How Cumulative Impacts are addressed	EIA/ HRA/ Other
Morlais	Wales	Tidal Stream Demo Zone	Consented	Potential cumulative impacts with one other project, the DG Holyhead Deep Tidal Array project, was identified in the cumulative impact assessment. The one area where potential cumulative impact may occur were if construction activities were to occur simultaneously on both projects, which could produce a cumulative impact via spill events and accidental discharges of liquids/materials. Both projects independently adopted standard best practice measures with respect to spill prevention and response and as such, the significance of this potential cumulative impact was reduced to a negligible level.	EIA
Dounreay Tri	Scotland	Floating Offshore Wind	Consented	Potential for cumulative impacts to arise from the development of the Project and the SHE-T Orkney-Caithness interconnector cable and the HIW Dounreay Centre (DDC) was addressed through the developer liaising with SHE-T and HIE and negotiating suitable timings and locations for the development so as not to conflict with or impede activity to develop either of the projects	EIA
Dounreay Tri	Scotland	Floating Offshore Wind	Consented	Combined footprint of the DDC and Project areas occupied by turbines, platforms and associated moorings and infrastructure. The activity from these sites combined may increase the operational impacts on benthic and fish ecology. The location of export cables, and the burial or use of protection material used mitigate this impact.	EIA

Project Name	Location	Technology	Consenting Status	How Cumulative Impacts are addressed	EIA/ HRA/ Other
Dounreay Tri	Scotland	Floating Offshore Wind	Consented	Impacts of underwater noise generated by piling activities that contributes to the cumulative impact assessment are addressed using standard mitigation measures associated with offshore piling (MMs and PAM) or ADD based mitigation, the risk of injury to marine mammals and basking sharks will be completely mitigated	EIA
Hywind Scotland	Scotland	Floating Offshore Wind	Consented	Identified a list of projects and their location which together with Hywind, may result in potential cumulative impacts. A cumulative impact assessment was undertaken which only considered projects that were at the EIA Scoping Stage and beyond.	EIA
Hywind Scotland	Scotland	Floating Offshore Wind	Consented	It is noted that a proportion of the vessels passing the Project also pass close to the EOWFL site in Aberdeen Bay. However, the site layout has been designed to avoid any significant impact on the main shipping routes to and from Aberdeen Harbour.	EIA
Hywind Scotland	Scotland	Floating Offshore Wind	Consented	The potential for the Hywind Project to result in cumulative impacts from the loss of spawning and nursery grounds and simultaneous noise generated during construction and installation phases and O&M, impacts from the Hywind Project will be restricted to very short timescales and only occur over very small geographical areas and not be significant	EIA
Kincardine	Scotland	Floating Offshore Wind	Consented	European Commission (EC) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (1999) are followed throughout the EIA.	EIA

Project Name	Location	Technology	Consenting Status	How Cumulative Impacts are addressed	EIA/ HRA/ Other
Kincardine	Scotland	Floating Offshore Wind	Consented	The inter-array cables are due to be installed first, followed by the anchors, and then export cables, before the floating structures and WTGs are towed to site. Therefore, any increases in Suspended Sediment Concentration (SSC) created during installation of the inter-array cables will have decreased back to baseline conditions before the anchors will be installed. Similarly, with the laying of the export cables, this will occur post deployment of the inter-array cables and anchors, and so there will be no cumulative impacts from the Development Area and Offshore Export Cable Corridor resulting from the site development.	EIA
Kincardine	Scotland	Floating Offshore Wind	Consented	The potential for the Project to result in cumulative impacts from the loss of spawning and nursery grounds and simultaneous noise during the installation and construction and O&M is insignificant, as the Project will be restricted to very short timescales and only occur over a small geographical area in relation to the wider geographical context of available habitats and will not be significant.	EIA
DeltaStream	Wales	Tidal Stream Demo Zone	Consented	Close communication with developers throughout the project to ensure cumulative impacts are minimised as much as possible	EIA
META	Wales	Marine Energy Test Area	Consented	Followed Cumulative Impact Assessment (CIA) Guidelines - Guiding Principles for CIA in Offshore Wind Farms (RenewableUK, 2013); throughout	EIA

Project Name	Location	Technology	Consenting Status	How Cumulative Impacts are addressed	EIA/ HRA/ Other
META	Wales	Marine Energy Test Area	Consented	Increased underwater noise emissions may occur as a result of cumulative impacts arising from projects that spatially or temporally overlapping with the META project. These include dredging operations at Neyland Yacht Haven, and MHPA in proximity to Warrior Way (site 6), and dredge disposal at dredge disposal sites LU170 and LU180 in proximity to East Pickard Bay (site 8). Research activities are not considered likely to result in potential for cumulative noise impacts.	EIA
META	Wales	Marine Energy Test Area	Consented	Pile replacement at Neyland Marina is scheduled to have completed by the time the META project is installed therefore there is no potential for cumulative impact. Installation of the Greenlink Interconnector and Bombora Wave Energy temporary communications cable may result in very short duration increases in underwater noise in proximity to East Pickard Bay (site 8), however other infrastructure projects are land based and therefore considered unlikely to result in increased underwater noise.	EIA
META	Wales	Marine Energy Test Area	Consented	In addition, in relation to East Pickard Bay (site 8), MOD activities are on-going and considered to constitute part of the baseline. Pembroke Dock Infrastructure may result in short-term increases in underwater noise in proximity to Warrior Way (site 6), however META phase 1 is not considered likely to result in increased underwater noise and WaveHub is considered to be of sufficient distance from the META project not to have the potential for cumulative impact.	EIA
Beatrice	Scotland	Offshore Wind	Consented	Cumulative Impact Assessment Discussion Document (CIADD) was undertaken	EIA

Project Name	Location	Technology	Consenting Status	How Cumulative Impacts are addressed	EIA/ HRA/ Other
Moray Offshore Renewables (Moray East)	Scotland	Offshore Wind	Consented	Based on the results presented in SNH model, impacts of increased vessel usage on bottlenose dolphins and grey seals, the cumulative impact of increased vessel traffic on the resident population of bottlenose dolphins and grey seals is considered to be of low magnitude, of medium duration and thus of minor significance	EIA
Moray Offshore Renewables (Moray East)	Scotland	Offshore Wind	Consented	Noise modelling was conducted to predict impact ranges from piling noise produced at the MORL and BOWL (Beatrice Offshore Wind Farm) sites simultaneously on key fish species. Impact ranges were found to be similar to those derived from the worst-case scenarios for the Telford, Stevenson and MacColl sites alone suggesting limited cumulative effects with the BOWL development.	EIA
Moray Offshore Renewables (Moray West)	Scotland	Offshore Wind	Consented	Cumulative effects assessment was carried out with due regard to informative guidance, such as PINS Advice Note Seventeen: (PINS, 2015) and the Renewable UK CIA Guidelines (Renewable UK, 2013)	EIA
EMEC	Scotland	Wave and Tidal Demo Zone	Consented	Installation activities at EMEC Billia Croo will be limited temporally and to the Project Envelope. Although activities at the Billia Croo test site may take place at the same time as activities associated with adjacent projects any simultaneous activities will only take place over a limited period and therefore it is considered that the potential for activities within Billia Croo to act cumulatively with disturbance and noise from other projects is limited.	EIA

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