RiCORE

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RiCORE Project Final Report (Deliverable 1.3)

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1. Introduction

1.1 Context

1.1.1 The RiCORE project was an 18 month project, funded by the Horizon 2020 programme

1.1.2 The project was charged with promoting a risk based approach to the consenting of offshore renewable energy. The cost and time taken to conduct environmental impact assessment remains one of the key barriers to the deployment of offshore energy arrays. Costly and time consuming environmental surveys are a prerequisite, even for known technologies in areas of low environmental sensitivity. There is little standardisation across different EU Member States in terms of the regulatory environment, how the consenting process is administered, and the interpretation of EU environmental legislation.

1.1.3 The aim of the RiCORE project was to establish a risk-based approach to consenting where the level of survey requirement is based on the environmental sensitivity of the site, the risk profile of the technology and the scale of the proposed project. RiCORE set out to examine the legal framework in place in the partner Member States to ensure the framework developed would be applicable for roll out across these Member States and further afield. The next stage of the RiCORE project was to consider the practices, methodologies and implementation of pre-consent surveys, post-consent and post-deployment monitoring. This would allow a feedback loop to inform the development of the risk-based framework for the environmental aspects of consent and provide best practice.

1.1.4 Consequently, RiCORE was expected to contribute to efforts by scientists, licensing bodies, stakeholders and lobby groups and the offshore renewables industry to reduce the time and cost involved in consenting small scale arrays of known risk. Using risk profiles, scientists and regulators could potentially reduce the amount of survey data required prior to the deployment of relatively small arrays of known technology in areas of low environmental sensitivity.

1.1.5 There were three main strands to this work:

- Understanding what happens in different Member States regarding the consenting process, the application of legislation and any legal barriers to the application of a risk based approach;
- Examining the potential for developing and using risk profiles in different partner countries;

- Building the case for more standardisation in post deployment environmental impact monitoring to allow developers, scientists and regulators to better understand the environmental effects of different devices.

1.1.6 The project used a combination of desk based research and expert workshops. Experts were engaged from different stakeholder groups including developers, scientists, regulators, legislators, development agencies, academia and representatives of other marine users and special interest groups.

1.2 Participants

Participant No	Participant organisation name	Country
1 (Coordinator)	Robert Gordon University (RGU)	UK
2	Marine Scotland (MS)	UK
3	University College Cork (UCC)	Ireland
4	WavEC Offshore Renewables (WavEC)	Portugal
5	AZTI-Tecnalia (AZTI)	Spain
6	E-CUBE	France

2. Explanation of the work carried out by the beneficiaries on each work package

2.1 Work Package 1

2.1.1 The objectives of WP1 were to ensure that:

- the project is completed on time
- the project aims are achieved
- the project is managed according to budget planning
- excellence and equality are maintained throughout the duration of the project
- stakeholders, including the European Commission, are informed fully about the progress of the project and its results and impact

2.1.2 These objectives have all been met:

- The project has been completed on time.
- Achievement of the project aims is detailed in the description for technical Work Packages 2 – 5.
- Budget planning was adhered to throughout.
- Equality: during the course of the project the partners and subcontractors used 19 female and 26 male participants**.**
- Communication with stakeholders and the European Commission has been maintained.

2.1.3 All deliverables have been completed:

- D1.1 Project Management Plan
- D1.2 Interim Report
- D1.3 Final Report

2.1.4 It should be noted that an additional expert workshop was held in Scotland in November 2015, organised by RGU with assistance from the other project partners. Because this workshop, "Understanding the barriers to, and providing recommendations for, a risk based approach to MRE licensing", was felt to encompass the scope of all of the technical work packages it was decided to hold this under WP1.

2.2 Work package 2

2.2.1 The objectives of WP2 were to develop an understanding of consenting processes for offshore renewable energy (ORE) in the Member States participating in the RiCORE

project. This paid particular attention to environmental requirements and the impact such requirements can have on development of the ORE sector in Europe. Environmental Impact Assessment (EIA) is a legal requirement in EU law but its implementation across the EU is varied and in certain circumstances this can create problems for developers. Likewise, for developments that have received consent, post-consent environmental monitoring is often challenging as it can be lengthy and costly and may not all be designed with the correct questions in mind. There is little consistency in approaches taken to measurement and interpretation of impacts between and within Member States. Species and habitats that are protected via EU environmental law represent another dimension to the consenting process.

2.2.2 An Expert Workshop on ORE Licensing and Regulatory Systems was organised jointly by E-CUBE and UCC (D2.1). All of these various aspects were examined within WP2. Specifically, consenting processes for ORE were reviewed and the extent to which a risk-based approach is already taken was determined (D2.2); how environmental effects are addressed in existing national consenting processes was also established determined (D2.2), and the possible national and European legal impediments to a more widespread uptake of risk based management were presented (D2.3/4. Guidance on a risk-based approach could be implemented in a manner that is compatible with EU nature conservation legislation was also produced (D2.3/4).

2.2.3 WavEC developed guidance on the Portuguese licensing process. This initiative was considered an important step to advance the sector in the country since no overall documents of this kind were available. This work was carried out as an additional effort of the team which was approved by the project Coordinator.

2.3 Work package 3

2.3.1 The objective of WP3 was to further develop the Survey, Deploy and Monitor (SDM) policy Guidance, pioneered by Marine Scotland, to include all relevant technologies in the ORE sector, including the adaptation of the policy as new technologies are developed.

2.3.2 Marine Scotland conducted a review of the current SDM policy (D3.1), and E-CUBE co-ordinated a partner review of novel technologies and wrote the resulting report (D3.2). It should be noted that although the Description of Action states that this will be an internal report it was established during the research to create it that it would contain no confidential information so it was decided to make the deliverable publicly available. Work on the main deliverable from WP3, to develop risk profiling, was led by AZTI assisted by MS and E-CUBE (D3.3).

2.4 Work package 4

2.4.1 The objective of WP4 was to build upon and utilise the information collected in the review of consenting task in WP2 to assess comprehensively how well existing methods can be optimised across EU Member States, taking into account the

consequent potential positive implications for project timescales and costs. A key outcome of this work package will be to develop guidance for pre-consent surveys considering the spectrum of survey requirements for projects under SDM and existing project experience. The guidance will encompass the transferability of methods and technologies.

2.4.2 WavEC led the work carried out under this WP which started with the organisation of the first project workshop (D4.1) in Bilbao "Marine Renewables and Environmental Risks – Current practices in pre and post consent monitoring". WavEC organised this workshop together with AZTI and MS, which corresponded to activities under WP4 and WP5. The workshop was held on the 20th April 2015, in the context of the Bilbao Marine Energy Week, at the Bilbao Exhibition Centre in Spain. The workshop included the participation of 39 experts from all consortium partner countries plus experts from The Netherlands and Germany.

2.4.3 The WavEC team led the development of Deliverable 4.2 on the identification of differences and commonalities of the pre-consent surveying techniques among all marine renewable energy technology types, including wave, tidal, and floating and fixed offshore wind. With input from all partners in this task, WavEC compiled information on survey techniques for seven environmental components (physical environment, marine mammals, fish and shellfish, benthos and seabed habitats, seabirds, bats and other users (socio-economy).

2.4.4 The other two deliverables from this WP were developed through close collaboration between the project partners: a report on potential emerging innovative monitoring approaches, identifying potential reductions in monitoring costs and evaluation of existing long-term datasets (D4.3), and pre-consent survey guidance (D4.4).

2.4.5 The objectives of deliverable 4.3 were to highlight the potential for using emerging and innovative technologies for pre-consent surveys of key receptor groups (e.g. benthos, fish, seabirds, marine mammals) at proposed MRE sites and to identify potential reductions in cost through comparison of survey methods currently utilised. In many cases costs varied substantially within receptor groups, with some approaches more suitable for a particular data type or more suitable because of certain logistical constraints. It was concluded that, although cost is an important consideration in survey design, the initial stage of the process should consider the logistical constraints of the site coupled with the requirements of the regulators to ensure that these can be met by selecting a suitable survey method or combination of survey methods. Deliverable 4.3 also reviewed and examined patterns and trends in data from long-term studies to investigate how interpretation of data changes over time and what the implications of these findings have on defining a suitable survey duration for gathering baseline data, where required. The benefit of using power analysis for survey design was discussed; the major benefit being that it can identify

how much data are required to meet the requirements set by regulators. In using this approach, developers can obtain a better understanding of the financial costs likely to be involved during the pre- (and post-) consent phase of the monitoring programme, and, if suitable data for the area already exist, then it may be possible to use power analysis to assess data requirements and survey design without having to conduct initial surveys at the proposed MRE site.

2.5 Work package 5

2.5.1 The objective of WP5 was to develop best practice for post consent and post deployment monitoring strategies, including industry standards where appropriate, with particular reference to risk-based approaches to survey and consenting/licensing for novel technologies.

- An expert workshop (D5.1) was held jointly with WP4 in Bilbao (see section 2.4.2).
- A second workshop (D5.3) was held in Cork in April 2016 to consider how to convert the research findings into recommendations, entitled "Risk-based approach in MRE consenting process: What needs to be done?".

2.5.2 Two of the WP tasks, development of recommendations on standardisation of post-deployment monitoring strategies (D5.2) and development of recommendations on data availability (D5.4), were combined into a single report, "Guidance on effective Adaptive Management and post-consent monitoring strategies".

2.6 Work package 6

2.6.1 The main objectives of Work Package 6 were to:

- Ensure full engagement of relevant stakeholders in participating Member States, the wider EU community and worldwide
- Disseminate the project objectives, deliverables and outcomes to the offshore renewables energy community and other interested parties.
- Ensure that the impact of the project among the offshore renewables industry is maximised.
- Implement a communication and dissemination strategy based on targeted communication that is tailored for the needs of individual partners in their respective countries and which utilities appropriate media and communication tools.

2.6.2 In order to achieve these objectives the project has completed seven deliverables:

- D6.1 Project website: http://ricore-project.eu
- D6.2 Communication strategy

- D6.3 Project movie. In consultation with the film company selected to create the movie it was decided to make two versions from the footage that had been shot, a short version offering an introduction to the project to general visitors to the website, and a longer more in-depth version for those seeking a technical understanding of the project and its conclusions. The short video is available with subtitles in English, French, Spanish, Portuguese, German and Dutch.
- D6.4 Targeted communication tools. A matrix of stakeholder groups and countries was drawn up to allow targeted emails and other communications to be sent.
- D6.5 Conference presentations at external events. The RiCORE project members either gave presentations or had a presence (exhibition or stand) in at least 15 conferences and other events.
- D6.6 Academic journal articles. While no articles were completed for submission by the end of the project, due to the need to undertake the full range of research tasks first, a number of articles are planned for publication in the months following the conclusion of the project.
- D6.7 Final project conference. The project took part in the EU Sustainable Energy Week policy conference in Brussels in June 2016 in order to present recommendations to conference delegates, and organised a second event held at Scotland House in Brussels following the EUSEW session for invited guests.

3. Impact

3.1 The expected impacts listed in the DoA are:

- Increasing the share of renewable electricity in the final energy consumption
- Reductions in the time taken to authorise the construction of renewable energy plants and related infrastructure
- Substantial and measurable reductions in the transaction costs for project developers as well as for the permitting authorities, whilst still fully addressing the needs for environmental impact assessments and public acceptance
- Development of better policy, regulatory, market support and financing frameworks, including at regional and local level
- Support the achievement of over-arching European policies, such as the Integrated Maritime Policy and more recent Blue Growth strategy

3.2 The project believes that its outputs make a significant contribution to the achievement of these impacts, although this can only be confirmed in the long term. To have maximum impact, Member States must take on board the recommendations of the project and implement them within their own specific context (technological, policy, administrative, legal and environmental frameworks).

4. Summary of findings

Terminology

Adaptive Management: a process used to manage "resources that are responsive to management interventions but subject to uncertainties about the impacts of those interventions" and has been described as "a structured process of learning by doing, and adapting based on what is learned." The goal of Adaptive Management is to reduce scientific uncertainty.

Survey Deploy and Monitor (SDM): an example of a policy developed by Marine Scotland that promotes Adaptive Management approaches by enabling the consenting of wave and tidal energy projects. SDM combines existing information on the environmental risks, technology risks, and project scale to distinguish between proposed projects for which there are sufficient grounds to seek determination on a consent application based on 1 year of wildlife survey and those proposed projects where a greater level of site characterisation is required. SDM represents a risk-based approach to consenting.

Risk-based approach: any approach that seeks to inform decision making through an understanding of the scientific uncertainties and associated consequences in terms of likelihood and magnitude of impact. SDM is an example of a risk-based approach with respect to project consenting and adaptive management adopts a risk-based approach to reducing scientific uncertainties.

4.1 Consultation and dissemination events

4.1.1 Summary of expert workshops

Location	*Date*	*Title* *Purpose*	*Number of Attendees*
Bilbao	April 20th 2015	Marine renewables & environmental risks – current practices in pre and post consent monitoring	39
Paris	May 21st 2015	Dealing with the risk of licensing marine renewables: the role and experience of regulators	23
Dunkeld	November 16th-17th 2015	Towards findings & recommendations: combining the earning from Workshops 1 & 2	47
Cork	April 12th 2016	Risk based approach in MRE consenting process: what needs to be done?)	37

4.1.2 Final Conference

Location	*Date*	*Title*	*Number of*

		Purpose	*Attendees*
Brussels	15th June 2016	Marine renewables & environmental risks – current practices in pre and post consent monitoring	25

4.2 Work package 2: Profiling Member State consenting processes and reconciling EU legal requirements

4.2.1 The primary objective was to understand the consenting requirements across participant Member States, with a particular focus on environmental requirements, and their effect as a non-technical barrier on offshore renewable energy development. The work conducted sought to determine how environmental effects are addressed in existing national consenting processes, the extent to which these processes currently take a risk-based approach and the possible legal impediments to widespread uptake of risk based management.

Key findings

4.2.2 The absence of an ORE-specific consenting process, the lack of clear and focused EIA guidance, and multiple competent authorities are key barriers to project consenting. The legal basis for Adaptive Management is not a problem but entrenched administrative processes may hamper the ability to take an Adaptive Management approach.

4.2.3 There appears to be little consistency in the approaches taken to measure or interpret environmental data and information between and within Member States. In many instances the presence of a European protected site or species under nature conservation legislation complicates consenting of ORE projects.

4.2.4 Guidance is needed to explain Adaptive Management and risk-based approaches to regulators and developers as well as other marine users.

4.3 Work package 3: Survey, Deploy and Monitor

4.3.1 The primary objective was to further develop the Survey, Deploy and Monitor (SDM) policy guidance, pioneered by Marine Scotland, to include all relevant technologies in the Offshore Renewable Energy (ORE) sector, including the adaptation of the policy as new technologies are developed. The work conducted sought to review the state of the art of the SDM policy, review the novel technologies currently in development and further develop the SDM acting as a guide for users wishing to apply a risk profiling approach at a Member State level.

Key findings

4.3.2 Following the description of the SDM policy and the analysis of the case studies different aspects of improvement were identified:

- Extend the risk-based approach to post-consenting processes;
- Update the criteria for the evaluation of the scale of the project;
- Establish a set of common criteria for the evaluation of the environmental sensitivity of a specific location;
- Update and review of the expected environmental impacts of the different technologies;
- Include some guidance on the methodology for pre- and post-consenting monitoring and;
- Introduce the aspect of uncertainty in the risk based approach.

4.3.3 Taking into account the 19 technology types across all three technology categories that were identified and the above mentioned point of improvement, a review and further development of the three main pillars on which the SDM approach is based was undertaken: (i) environmental sensitivity of the site, (ii) the risk profile of the technology and (iii) the scale of the proposed project.

4.4 Work package 4: Pre-consent survey optimisation

4.4.1 In order to implement a risk based approach existing requirements for Pre-Consent Surveys in the participating countries were first assessed. Generally, such pre-consent survey may be part of a preliminary site characterisation exercise or scoping as part of the EIA process. This work package utilised information collected in previous work packages and in a workshop to assess comprehensively how well existing methods could be optimised across EU Member States, taking into account the potential positive implications for project timescales and costs.

4.4.2 A key outcome of this work package was the development of guidance for pre-consent surveys considering the spectrum of survey requirements of existing project experience. The guidance encompasses the transferability of methods and technologies among MRE types.

Key findings:

4.4.3 Information on pre-consent monitoring practices has been compiled for the assessment of the effects of MRE developments on relevant receptors (seabirds, marine mammals, fish and shellfish and the seabed and benthic environment). In general, methodologies to assess most of the parameters identified for each receptor seemed to be applicable to all MRE types. A compilation was also made of the innovative technologies that are currently being developed for marine environment monitoring. The costs of many of the listed approaches were also considered and it was found that these costs varied substantially among receptor groups.

4.4.4 Although the cost is an important consideration in survey design, the logistical constraints and the requirements requested by regulators should be coupled to ensure that these can be met by selecting a suitable survey method. The use of power analysis can provide useful information on the ability of data gathered to create a baseline for detecting change. It is likely to become a commonly used approach in pre-consent survey design, as it can identify how much data are required to address the requests made by regulators and at the same time contribute to a better understanding of the costs involved, considering the data that already exists.

4.4.5 It is considered unlikely that pre-consent site characterisation surveys will have sufficient statistical power for fully achieving this purpose and their main utility is to inform consenting decisions. The information gathered supports the development of guidance on pre-consent surveys taking into account risk based approaches such as SDM, and is available through the project website.

4.5 Work package 5: Post-Consent & Post-Deployment monitoring standardisation

4.5.1 The focus of this work package was the development of best practice for post consent and post deployment monitoring strategies, including industry standards where appropriate, with particular reference to risk-based approaches to survey and consenting/licensing for novel technologies. Currently Member States do not have cohesive strategies for undertaking monitoring at operational devices with the clear goal of reducing the scientific uncertainties associated with consenting in order to have greater confidence in future decision making associated with commercial scale arrays.

4.5.2 This ‘learning-by-doing’ process is formally known as Adaptive Management and the Survey, Deploy, Monitor (SDM) policy is an example. The need for guidance to support licensing regimes and industry relates to the development of an over-arching adaptive management approach for marine renewables and to the scientific issues associated with undertaking monitoring that is able to reduce the uncertainties in a meaningful manner.

Key findings:

4.5.3 Under this work package workshop attendees provided feedback on post-consent monitoring approaches during workshops, details of which are contained in the workshop reports. The further tasks were to review the suitability of Adaptive Management as a policy approach to guide post-consent monitoring that is able to meaningfully inform risk-based consenting of marine renewable energy by reducing key scientific uncertainties that could serve to delay decision making by regulators.

4.5.4 Examples of applying the approach are considered and recommendations on good practice provided. The RiCORE project has identified that post-consent monitoring that is able to meaningfully reduce key scientific uncertainties remains challenging owing to a range of issues relating to the scientific quality of studies that are

undertaken. A further task is to identify the key scientific issues that can hinder the provision of results that are useful in the context of risk-based decision making.

4.5.5 The need for a question-led approach, study designs that can provide sufficient relevant information and the need for decision makers to engage with the issues associated with sampling intensity and statistical power are reviewed. Recommendations to enable regulators to apply risk-based approaches that can provide them with greater confidence are made.

4.6 Additional points from final conference discussion

Points from discussion at Final Conference

- Risk-based approaches such as Adaptive Management & Survey-Deploy-Monitor (SDM) can be used to improve consenting.
- There is a definite need for guidance on how risk-based approaches such as Adaptive Management & SDM relate to Environment Assessment (SEA, EIA) and conservation legislation (AA).
- The new EIA Directive requires monitoring and this should be seen as opportunity to reinforce that monitoring is not simply a step in a process.
- Monitoring programmes should be appropriately designed and flexible in order to be fit for purpose – not monitoring for monitoring sake.
- Direct engagement with stakeholders should be facilitated throughout the planning and consenting processes and lessons learned widely disseminated.
- The entire Offshore Renewable Energy (ORE) sector would welcome a more integrated, strategic and adaptive approach in order to remove barriers to consenting.

Glossary:
AA = Appropriate Assessment
EIA = Environmental Impact Assessment
SEA = Strategic Environmental Assessment