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SOWFIA Project - Work Package 4

Final Report

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Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA) Project

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Deliverable D.4.6

Final work package report

Consenting procedures review with guidelines for expansion to larger projects and approval process streamlining, incorporating the findings of interim report and feedback from workshop D

November 2013



SOWFIA project synopsis

The Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA) Project (IEE/09/809/SI2.558291) is an EU Intelligent Energy Europe (IEE) funded project that draws together ten partners, across eight European countries, who are actively involved with planned wave farm test centres. The SOWFIA project aims to achieve the sharing and consolidation of pan-European experience of consenting processes and environmental and socio-economic impact assessment (IA) best practices for offshore wave energy conversion developments.

Studies of wave farm demonstration projects in each of the collaborating EU nations are contributing to the findings. The study sites comprise a wide range of device technologies, environmental settings and stakeholder interests. Through project workshops, meetings, on-going communication and networking amongst project partners, ideas and experiences relating to IA and policy are being shared, and co-ordinated studies addressing key questions for wave energy development are being carried out.

The overall goal of the SOWFIA project is to provide recommendations for approval process streamlining and European-wide streamlining of IA processes, thereby helping to remove legal, environmental and socio-economic barriers to the development of offshore power generation from waves. By utilising the findings from technology-specific monitoring at multiple sites, SOWFIA will accelerate knowledge transfer and promote European-wide expertise on environmental and socio-economic impact assessments of wave energy projects. In this way, the development of the future, commercial phase of offshore wave energy installations will benefit from the lessons learned from existing smaller-scale developments.



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Consenting procedures review with guidelines for expansion to larger projects and approval process streamlining, incorporating the findings of interim report and feedback from workshop

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Revision history

Rev.	Date	Description	Author	Checked by
01	June 2013	Report outline	T. Simas	All other partners
02	August 2013	Report filled with general recommendations	T. Simas	All other partners
03	October 2013	Report filled with contributions from each country (partner)	T. Simas	All other partners
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Acronyms

EIA: Environmental Impact Assessment

ICM: Integrated Coastal Management

MMO: Marine Management Organisation

MRE: Marine Renewable Energy

MS: Marine Scotland

MSP: Maritime/Marine Spatial Planning

SEA: Strategic Environmental Assessment



Executive Summary

This report summarises the findings from SOWFIA project WP4 examining wave energy consenting processes and stakeholder opinions (other marine users and regulators) on wave energy approval processes in six European countries where wave energy test centres have been established. The barriers and accelerators to wave energy consenting identified in SOWFIA WP2 were also considered and general and country-specific recommendations were developed under four main themes which were identified as critical to the expansion of wave energy across Europe: (i) integrated planning; (ii) administrative procedures; (iii) environmental impact assessment (EIA); and (iv) consultation. For each theme, strategic and operational recommendations were assigned.

Before presenting country-specific recommendations, and to support them, a summary of the context for each theme is presented covering: the implementation of strategic plans; wave energy consenting systems; experiences derived from EIA for wave energy developments in various countries; and developers and stakeholders' opinions on consultation activities for wave energy developments. In general, strategic plans like Maritime Spatial Planning (MSP) and Strategic Environmental Assessment (SEA) aimed at maximising and managing the sustainable use of maritime areas are not yet fully implemented. Suitably tailored licensing processes do not exist in most of the countries analysed, although some countries have taken steps recently to adapt existing legislation to accommodate wave energy licensing. Some experience exists on wave energy EIA but reliable baseline and long-term impact data are not yet available, partly because the industry is still relatively new. Such knowledge gaps hinder the transfer of knowledge and the improvement of the environmental assessment for projects. Consultation is sometimes perceived by stakeholders as mainly a "tick-box" exercise and there is a widespread perception that developers do not really take stakeholders' concerns and opinion into account. This may explain a common lack of interest in such events among many stakeholders. Furthermore, in some cases the time periods for consultation are too short to review technical and lengthy documentation. Nevertheless, most stakeholders are generally supportive of marine renewables, particularly wave energy, which is viewed as having lower visual and other impacts than some other marine renewable technologies, particularly offshore wind.

The following general recommendations to improve wave energy consenting processes in Europe are suggested:

- Further efforts to promote the development and implementation of MSP;
- Increased application of the SEA process to wave energy planning and future development;
- Where possible, the introduction of 'one-stop-shop' consenting approaches (or the definition of a coordinating body) for wave energy project or at least better collaboration between authorities in a parallel processing approach;
- The amendment of current consenting processes towards tailored and fit-for-purpose licensing and the availability of clear guidance documents on licensing procedures in each country;
- The establishment of more common and consistent timeframes for licensing developments;
- Greater availability of EIA results, particularly impact evaluations and monitoring results to increase the knowledge base for prediction and evaluation of impacts;
- The need for early engagement and consultation with stakeholders and the creation of a mechanism for considering and dealing with any concerns raised;
- The importance of giving more time to stakeholders to analyse project documentation;



- The need to carefully plan (time and venue) consultation events according to the stakeholder group being targeted (e.g. evenings for fishermen).

A number of country-specific recommendations are also identified and presented for each critical theme. These are based on the SOWFIA project team's expertise of their national context and feedback from stakeholders interviewed during the project.

Foreword

The current report is the final report of Work Package 4 (WP4) on “Integration and Streamlining”. WP4 aims:

- To integrate environmental data from wave energy sites in a data management platform that is intended to help decision making surrounding ocean energy projects;
- To understand project developers’ frustrations and stakeholders’ concerns during wave energy licensing procedures;
- To provide good practices examples and recommendations for streamlining consenting procedures of wave energy developments across Europe

Purpose of this document within the SOWFIA Project

This final work package report incorporates the information collected during WP4 programme in the discussion of good practices to streamline wave energy consenting processes across Europe. General and country specific recommendations are proposed based on the reviews of the licensing procedures in each country and on relevant stakeholders’ opinions collected during WP2 and WP4 workshops and surveys.



1 Introduction

Renewable energy technologies are sometimes regarded negatively by local communities mainly due to perceived environmental impacts and, in the case of marine renewable energy, overlaps with other uses of maritime areas. In other instances, developers are faced with difficulties in obtaining necessary permissions for reasons such as uncertainty surrounding their impacts and a consequent absence of clear terms and conditions in the licence. It is also recognised that barriers to marine renewables can be addressed effectively when national and local governments and developers work collaboratively to create a cooperative consenting environment. Countries or regions that have introduced local renewable energy resources have done so by enacting enabling national regulations and policies and providing appropriate support mechanisms. Efforts have also been assisted by the actions of proactive local authorities and, in some cases, proactive local communities. However, in certain regions, local opposition can become a barrier if projects do not sufficiently address environmental or socio-economic concerns. Projects with a high risk of public opposition require particularly careful project design by developers, and dialogue with local stakeholders becomes a key condition for success (IEA-RETD, 2013).

The existence of national frameworks to stimulate the deployment of renewable energy technologies, coupled with [local] planning systems that facilitate siting and deployment, is a vital pre-condition for renewables development. Given the importance of the latter, an EU Directive on Maritime Spatial Planning and Integrated Coastal Management (ICM) has been proposed by the Commission (2013 COM 133 final). This will make MSP and ICM strategies obligatory in all Member States and aims to bring certainty and transparency to development planning. The Directive needs to be formally adopted by the EU before Member States will be required to transpose it into their national legislation.

The European Commission's Entrepreneurship 2020 Action Plan (COM 2012, 795 final) published in January 2013, encourages Member States to reduce the time for licensing and other authorisations necessary to start a business activity to one month by the end of 2015. Other recommendations arising from this action plan are to establish user-friendly points of single contact (one-stop-shops) and to set up 'one-stop-shops for entrepreneurs' to bring together business support services including mentoring, facilitation and advice on access to conventional and non-conventional finance, access to 'incubators' and 'business accelerators'.

The EIA Directive (Directive 2011/92/EU¹) has also been reviewed recently in the context of better regulation and the simplification of regulatory frameworks. The general objective of the proposal is to correct shortcomings in the EIA Directive that have led to unsatisfactory or inconsistent implementation (for example no existing provisions ensure either the quality of information or quality standards for the EIA process and implementation gaps). The amendment proposal also reflects ongoing environmental and socio-economic changes and challenges and align the Directive with the principles of smart regulation. The shortcomings of the Directive were identified through public consultation and grouped into three problem areas: (1) the screening procedure; (2) the quality and analysis of EIAs; and (3) the risks of inconsistencies within the EIA process and in relation to other legislation. The outcome has led the Commission to propose a number of amendments. The main amendments are as follows (COM(2012) 628 final):

¹ Codifies Directive 85/337/EEC and its three subsequent amendments (Directives 97/11/EC, 2003/35/EC and 2009/31/EC)

- Clarification of the screening procedure by modifying the criteria of Annex III and specifying the content and justification of screening decisions. These amendments would ensure that EIAs are carried out only for projects that would have significant environmental effects, avoiding unnecessary administrative burden for small-scale projects.
- Improvements to the quality and analysis of the EIA (e.g. mandatory scoping and quality control of EIA information), greater specification of the content of EIA reports (mandatory assessment of reasonable alternatives, justification of final decisions, mandatory post-EIA monitoring of significant adverse effects); and the adaptation of EIA to wider challenges (i.e. biodiversity, climate change, disaster risks, availability of natural resources).
- Reduce procedural inconsistencies by specifying the time-frames for the main stages required by the Directive (public consultation, screening decision, final EIA decision) and introducing a form of EIA one-stop shop mechanism to ensure coordination or joint operation of the EIA with environmental assessments required under other relevant EU legislation, e.g. Directives 2010/75/EU, 92/43/EEC, 2001/42/EC.

Finally, the Aarhus Convention (1998) establishes a number of rights concerning public access to information on environmental issues. The Convention entered into force in the EU on 30 October 2011. The Convention provides for:

1. the right for everyone to receive environmental information held by public authorities (implemented by Directive 2003/4/EU on access to environmental information);
2. the right to participate in environmental decision-making (implemented by Directive 2003/35/EU on public participation in environmental decision-making”);
3. the right to challenge public decisions that have been made without respecting the two aforementioned rights or environmental law in general.

Regulation (EC) No. 1367/2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies goes some way towards implementing the access to justice provisions of the Convention but arguably does not yet have full implementation at Member State level. This Convention is also implemented through the provisions of the EIA Directive, especially those relating to consultation, which have direct implications for wave energy developers.

1.1 Objectives and report structure

This report summarises work completed during the SOWFIA project WP4 examining wave energy consenting processes and stakeholder opinions on wave energy approval processes in six European countries where wave energy test centres have been deployed (Fig. 1). Based on these findings, a number of strategic and operational recommendations were developed under four main themes: integrated planning; administrative procedures; EIA; and Consultation. These recommendations have been further discussed at European and national level in SOWFIA Workshop D, held in Brussels with several EC level and national regulator-level representatives, and in national events (in the Irish case), interviews and/or SOWFIA partners’ analysis.

The four critical themes are briefly introduced in section 2 of the report where the main barriers and accelerators for each theme are presented (based on the work of WP2; see SOWFIA D2.6 report). In sections 3 and 4, general and country-specific strategic and operational recommendations are proposed for each theme, based on the feedback received from the stakeholders described above. Section 5 presents overall conclusions.

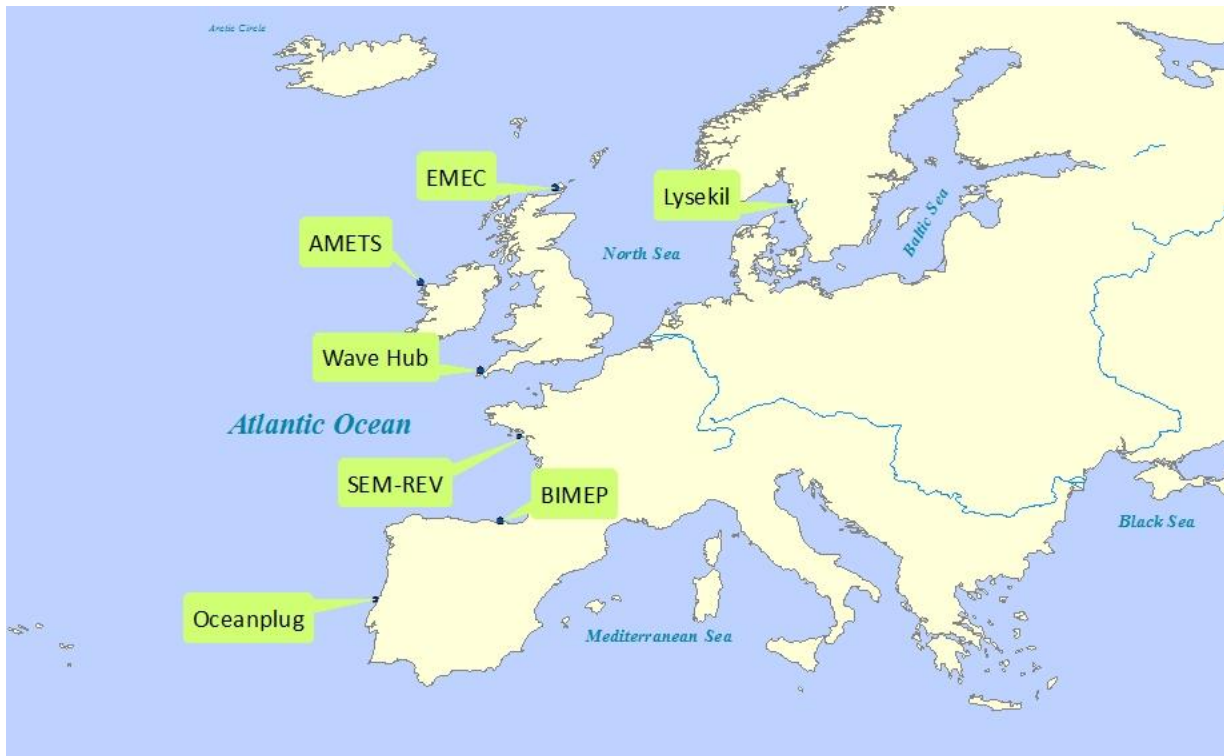


Fig. 1 – Location of the wave energy test centres under analysis.

2 Critical themes for streamlining approval processes

2.1 Integrated planning

The purpose of integrated planning is to ensure greater coordination and communication between authorities involved in wave energy consenting, both formal and informal. Strategic spatial planning is one approach for achieving more integrated planning aimed at providing a vision, setting priorities, dedicating resources and ensuring all actors work towards common goals. Strategic plans can be described as frameworks for action in contrast to project plans, which form more unambiguous guides for action. Strategic plans like Maritime Spatial Planning (MSP) and Strategic Environmental Assessment (SEA) can be viewed as sequential tools for integrated planning but are not yet fully developed or implemented in each Member State.

There are a number of barriers related to integrated planning that can impede the progress of wave energy developments. One is the somewhat conflicting objectives set at the EU and national levels for energy and conservation; sometimes renewable energy targets overlap or clash with conservation objectives. A lack of strategic planning and integration of all uses and actors in the marine space is another common hurdle. This can be linked to variations in the implementation of MSP between Member States; in countries where MSP is still under development, this tool cannot (yet) be used to prevent and manage conflicts of use. Furthermore, MSP tends to reflect existing uses more fully than future potential uses like ocean energy developments. The publication of a new framework Directive on MSP and ICM by the European Commission in March 2013 will, if adopted, oblige Member States to carry out MSP and ICM. Over time, this should provide greater clarity, certainty and identification

of compatible uses within development areas. The adaptive nature of the MSP process can react to changing circumstances, which is important for developing industrial sectors such as marine renewable energy.

In some countries, lack of integration between strategic-level MSP, SEA and operational-level EIA processes can also inhibit wave energy projects. The preparation of SEAs for the marine renewable energy sector has helped to inform developers and other stakeholders on the siting of ocean energy developments and has aided the identification of environmental effects that may need additional study. Moreover, the link between MSP and integrated coastal management has yet to be fully addressed in most countries; this will be critical for wave energy development given the associated onshore component to wave energy developments (e.g. connections to national electricity grids, substations etc.).

2.2 Administrative procedures

Wave energy projects are relatively new both to the public and the regulatory system, so are often considered under regulations developed for other technologies. The unique characteristics of wave energy developments may not be addressed sufficiently by these regulations and this can lead to unclear procedures, complex interactions, and a lack of coordination between the competent authorities involved. Long lead-in times for obtaining the necessary permits may arise as a consequence of these difficulties.

2.2.1 Complex and long administrative procedures

Many developers argue that consenting processes take too long and are too complex because numerous authorities are responsible for different permits. The situation is made more complex by the fact that the permits required vary between Member States. Furthermore, in some Member States, certain permits cannot be applied for until others have been granted. This can cause lengthy delays. Developers also noted that the lack of fixed time frames and deadlines for each licensing step is frustrating and can impact on financial planning. However, worthwhile contributions have been made by some wave energy test centres towards streamlining procedures and providing guidance to device developers.

2.2.2 The ‘one-stop-shop’ vs. parallel processing approaches to consenting

The implementation of a ‘one-stop-shop’ approach for marine energy consenting is seen by many developers as a panacea to administrative problems. Full implementation of a ‘one-stop-shop’ is difficult to achieve in practice. Even in places where one-stop-shops are understood to exist, these usually address only the marine environmental elements of projects (i.e. EIA process and licencing for works in marine areas but not associated onshore works). Implementing a ‘one-stop-shop’ in certain jurisdictions would be complex given the levels of regulatory amendment required to align different pieces of legislation and the work of different authorities.

In the parallel processing approach to consenting – the methodology followed by most of the countries analysed – there is often limited communication between authorities; this can lead to a duplication of work for developers. Furthermore, the number of stages, requirements and authorities responsible for elements of the application are often unclear, although well-coordinated procedures are already in place in some jurisdictions for wave energy or analogous industries. Such an approach



has the potential to inform the development or amendment of procedures in other countries (e.g. the approaches used by the Danish Energy Agency and Marine Scotland).

2.3 Environmental Impact Assessment

EIA processes can present many frustrations for wave energy developers and regulatory bodies. These are summarised below.

2.3.1 Lack of consistency in the application of the EIA Directive across Europe

Although the lack of consistency in the application of EIA to wave energy developments can be attributed partly to variations in national level implementation of the EIA Directive, the current version of the Directive is not always clear regarding its application procedure. This can result in the ineffective operation of screening processes for Annex II projects (where wave energy projects are usually included) and contribute to Member States interpreting and applying the EIA Directive in an inconsistent manner. Furthermore, scoping is not mandatory in most EU Member States and where it does exist, it is usually at the request of developers (to help manage their liability and workload), which can compromise requirements and delay the consenting process.

A proposal to amend the EIA Directive (COM (2012) 628 final) was published by the European Commission in October 2012. It is hoped that adoption of this amended Directive will strengthen the quality of EIAs and enhance policy coherence and synergies with other EU/international law. The proposal also aims to simplify procedures relating to the EIA, for example, by introducing an EIA 'one-stop shop', which would facilitate the coordination and integration of assessment procedures under the EIA Directive and other EU legislation by streamlining the screening procedure to improve consistency between Member States and by introducing new timeframes for consultation.

2.3.2 Uncertain effects of wave energy devices on the marine environment

Uncertainty about the environmental effects of wave energy can create problems for competent authorities that are aware of the need to apply the precautionary principle and the potential liabilities associated with incorrect application of the Directive's provisions. The resulting perception among developers is that consenting authorities sometimes take an over-precautionary approach and apply environmental monitoring requirements that are disproportionate to the present size of the wave energy industry noting that most deployments comprise just one or two devices. The intended focus of the EIA Directive, in contrast, is on significant environmental impacts. Some developers also felt that lessons learned from other marine sectors could contribute to the identification of specific environmental effects related to wave energy.

2.3.3 Environmental data availability

Data availability is sometimes compromised by developers' desire for commercial confidentiality. Additionally, diversity in the application of monitoring methodologies for different projects can hinder the comparison of results. To an extent, test centres could help to counteract this by being utilised as "environmental research centres" to study the effects of wave energy devices on key environmental descriptors; apply different monitoring methodologies; and analyse monitoring results and effectiveness of environmental mitigation measures. Tools such as the SOWFIA Data Management Platform can also be valuable for collating environmental information and making it available to regulators, developers and other stakeholders.

2.4 Consultation

Opinions gathered at the SOWFIA workshops and from questionnaires have suggested that, in many cases, stakeholder consultation processes are deemed to be satisfactory. High levels of uncertainty and unpredictability about the impacts of projects (because only small-scale wave projects have so far gone through consenting processes) means, however, that a reliable picture of stakeholder responses to larger-scale wave projects has yet to emerge. Additionally, consenting processes for large offshore wind farms provide a poor predictor of stakeholder reactions to major wave energy projects.

Further difficulties arise in identifying appropriate stakeholder representatives and intermediaries. As a matter of convenience, national representative bodies are often chosen but these may not always be the most appropriate to represent local opinions. Equally, the large number and diversity of stakeholder groups mean that a wide range of issues needs to be considered; gaining consensus can also be very difficult. Another important factor is the need for stakeholders to feel that they have the potential to influence key decisions prior to decisions on consenting being made, before they are prepared to invest significant time and effort in consultation processes. Some stakeholders have limited trust in developers and government bodies, and believe that they are guided by national and international concerns rather than having genuine regard for local concerns.

Stakeholders also recognise that wave energy developments can bring appreciable local benefits in terms of local employment and improved economic resilience for peripheral areas. Another common perception is that wave energy does not bring the same scale of negative environmental or amenity impacts (e.g. visual intrusion) normally associated with wind energy. Most (but not all) stakeholder groups support MRE but are hesitant to become fully involved in planning processes because of the complexity and technical nature of consenting processes. A number of suggestions have been made by stakeholders about the management of consultation events. These are summarised in Table 1. More information on this topic can be found in project deliverables: Stakeholder survey (D4.3 report), workshop B report and WP4 Interim report (D4.4 report), available from the project website.

3 General recommendations for streamlining approval processes

Throughout the SOWFIA project workshops and from responses received to the questionnaires, a number of recurring themes were identified that form the basis for the proposed recommendations outlined below. A critical analysis of the barriers and accelerators identified was the subject of a separate SOWFIA report (D2.6), where further information on each thematic area is presented.

3.1 Integrated planning

Management of the marine environment, and activities therein, is highly sectoral and often fragmented. This results in a multitude of management authorities being responsible for administering a variety of permits and consents. During the course of the SOWFIA project, the need for more integrated planning, whereby the authorities involved have established formal or informal approaches to coordination and communication with each other, was suggested by stakeholders and workshop participants. The SOWFIA project consortium has therefore developed recommendations on integrated planning that can be implemented at both the strategic level in the long-term, and at the operational level in the shorter-term.



Table 1 – Recommendations on consultation activities as proposed by stakeholders who participated in SOWFIA questionnaires and workshops (taken from project report D4.4).

Purpose	<ul style="list-style-type: none"> • Consultation events need to increase public awareness about MRE (including public authorities and regulators) in general as well as including project-specific information; • Project messages should be consistent.
Audience	<ul style="list-style-type: none"> • Additional effort is required to ensure the participation of local businesses and the public in consultation processes; • Levels of consultation needed may differ accordingly to stakeholder group – those in close proximity to a proposed development will have different concerns to those who live 10 km further away.
Technique	<ul style="list-style-type: none"> • Developers and those responsible for consultation activities should actively engage with the local media as a means of keeping stakeholders up-to-date with project progress; • There should be a balance between project updates and requirements to host consultation events so as to minimise consultation ‘fatigue’ and maximise input from participants; • Particular attention should be paid to the times and locations proposed for consultation activities, recognising that marine users are not always on land; • Upfront acknowledgement is needed of what can and cannot be influenced by stakeholders during consultations; • How stakeholder inputs will be used by developers should be explained clearly to stakeholders at the outset of the process.
Information	<ul style="list-style-type: none"> • Information provided should be clear, transparent and honest with a level of technical content appropriate for the audience; • Project successes should be celebrated but shortcomings should also be acknowledged – this builds trust with the stakeholder community; • To maximise consultation opportunities stakeholder groups should have a tentative list of concerns to raise at consultation events. • As information to be reviewed during the consultation process is often lengthy and response times are limited, it may be necessary to extend consultation periods. • Particular emphasis should be placed on the socio-economic impacts of proposed developments as these are of key importance to stakeholders.

3.1.1 Strategic recommendations

Responsible government departments at national level should integrate and coordinate their policies and implement these policies through dedicated Maritime Spatial Planning, supported where necessary by an appropriate consenting system. SEA of specific plans and programme areas should also be conducted to ensure strategic government oversight and avoid conflicts between sectors and marine users. Completion of an SEA will in turn inform project level environmental assessments such as EIA and Appropriate Assessment (AA) (under the Habitats Directive), acting as a first reference point for developers who plan to locate in the area covered by an SEA.

3.1.2 Operational recommendations

Government departments and responsible authorities are encouraged to develop guidance documents to advise marine renewable energy developers and other stakeholders on the siting of their developments within a given area and how to negotiate the consenting process applicable to their activity. Responsible authorities can also develop or improve public databases (like the Data Management Platform developed under the SOWFIA project) with information on natural marine resources and uses, including information on coastal infrastructure and socio-economic aspects. Such tools can be useful in public consultation events and engaging with stakeholders.

3.2 Administrative procedures

3.2.1 Strategic recommendations

Authorities should ensure that consenting procedures are fit for purpose, effective and efficient for all developers, regardless of the scale or type of development. The establishment of new or amended consenting regimes for wave energy should be based on realistic levels of resources and legislative amendments. The operation of a parallel processing approach requires careful consideration of the levels of interdependency between the various required consents.

3.2.2 Operational recommendations

A dedicated coordinating body (for both ‘one stop shop’ and ‘parallel processing’ approaches) could be allocated. This does not have to be a new body but could be facilitated through a formal requirement for clearer communication between all authorities with a remit relevant to wave energy development. The applicable process should have clear procedures stipulating responsibilities, timelines and ability to appeal. In some instances it will be necessary to introduce or amend the statutory timeframes in existing legislation. Within test centres, it is recommended that a scientific / commercial manager is appointed to assist in the scale development of the technology. Test centres are also encouraged to produce guidance on how licensing is managed within that centre and its deployment policy.

3.3 Environmental Impact Assessment

3.3.1 Strategic recommendations

Where possible, an adaptive management approach should be facilitated. This provides an opportunity to learn about the impacts of wave energy and to intervene to manage impacts in a more context sensitive manner. Given the scale of development of wave energy and the fact that devices are currently deployed in single units, very few definitive conclusions can be made on the impact of wave energy on the environment at this time. As the industry progresses, EU funding for specific research programmes on environmental impacts will be crucial, especially in wave energy test centres which, due to the variety of devices installed, could have an important role in establishing environmental monitoring methodologies and standards. There is also a compelling case for requiring developers and/or authorities to make EIA data and information publicly available (this is already the case in Denmark) so as to allow results to be compared between sites to facilitate learning and knowledge development.

3.3.2 Operational recommendations

Baseline and impact data should be made available for test centres, with site specific impacts a priority for small scale projects. Results from monitoring programmes should be analysed and synthesised so as to better inform management decisions. The environmental assessment should be based on site environmental sensitivity. Clear environmental assessment requirements should be established according to the site.



3.4 Consultation

3.4.1 Strategic recommendations

Public consultations processes need to reflect a number of overarching justice principles:

- Participatory justice: to ensure all major groups have the right to participate in consenting processes;
- Procedural justice: to ensure consenting processes enable stakeholder groups to have genuine input into decision-making;
- Outcome and distributional justice: to ensure that, wherever possible, decisions incorporate key community and stakeholder needs and that impacts and benefits are shared equitably between groups.

Credible, evidence-based information, both scientific and socio-economic, should be presented in an accessible and clear format so that stakeholders can understand it and make informed contributions. Realistic timelines should be provided to allow stakeholders to respond / make submissions whilst also recognising the limited resources held by small organisations and communities.

3.4.2 Operational recommendations

Developers should ensure that consultations take place at an early stage, before decisions are made and when local stakeholders are still able to influence consenting processes (e.g. related to design, location and conditions, or even certain cases, the decision to grant or refuse consents). Suitable representative(s) should be selected to consult with stakeholders to help build trust. Developers should take due consideration of the needs of different stakeholder audiences when arranging stakeholder meetings (e.g. suitable venues, times and formats).

4 Country specific recommendations

4.1 France

The recommendations presented herein are based on the results from different workshops carried out in the context of: a) the national energy transition debate in 2013, when the SER (Renewable Energy Syndicate) sent proposals to the relevant Ministries, regional authorities, and regulatory bodies to accelerate the development of offshore wind and other marine renewable energy technologies; b) the French Committee of the IUCN (International Union for Conservation of Nature), which has worked on biodiversity and marine renewable energy since 2011, It produced a first bibliographical report in October 2012 (“Marine Renewable Energy Development and Biodiversity Preservation, Bibliographic Synthesis and Recommendations”) and is currently compiling a synthesis for decision-makers.

The main objectives of these workshops were to suggest recommendations about the implementation of strategic plans, consultancy or administrative procedures to the relevant regulatory bodies and extends to the role of Environmental Impact Assessment. The recommendations presented from both workshops, are the results of more than one year of work and debate carried out by representatives of the relevant administration bodies. It presents key findings from two different points of view (industry and nature conservation).

Furthermore, an interview with Innosea, Engineering Company, specialising in Marine Renewable Energy, was carried out to obtain recommendations from an active stakeholder in the wave energy sector.

4.1.1 Integrated planning

4.1.1.1 **Implementation of strategic plans**

In France, ocean energy technologies are generally regarded as emerging and, hence, mainly in need of funding efforts for Research & Development. No specific policy, road map or strategy has yet been implemented for the marine renewable energy sector. Additionally, France has no dedicated MSP or SEA for wave energy (see SOWFIA D3.1 report). The national partnership initiative for the emergence of marine energy (IPANEMA) recognised that marine energy cannot develop independently of other types of renewable energy. It was also decided that the regulations applicable to marine renewable energy needed clarification and integration into the various levels of decision-making. The national strategy for renewable energy, including ocean energy technologies, is set out in a number of documents:

- The Climate Plan, updated in 2006, which sets overall strategies for renewable energies;
- The annual electricity investment plan stated in the 15th December 2009 Act: “Programmation pluriannuelle des investissements de production d’électricité”;
- The National Renewable Energy Action Plan for 2009-2020, released by the Energy and Environment Ministry.

The overall French Renewable Energy Sources target of 23% was enacted in the Grenelle law of 3 August 2009 (France’s response to the EU’s Integrated Maritime policy) and each technology target is presented in SOWFIA D2.1. Nevertheless, ocean energy targets and scenarios are difficult to trace to official documents and no specific respective targets exist for wave and tidal energy. The SOWFIA report “Catalogue of Wave Energy Test Centres and Review of National Targets” (D2.1 report) and “Site and technology developers, project financiers and authorities’ questionnaires” (D2.3 report) are of relevance as they refer to French targets for marine energy. Calls for tenders have been published in 2009 and 2013 by the national renewable energies agency (ADEME) to help establish demonstration projects of marine energy prototypes. A research centre was set up in 2012 with government support through the financial programme “Investments of tomorrow”.

4.1.1.2 **Strategic recommendations**

Renewable Energy Syndicate (SER, Syndicat des Energies Renouvelables)

- Ensuring effective public participation in MRE mapping and development;
- Anticipate and plan project grid connections within the framework of a marine renewable energy deployment strategy.

International Union for Conservation of Nature (IUCN)

- Implement a clear and coherent MRE policy;
- Define a general grid connection strategy;
- Greater consultation with organisations specialising in maritime and coastal ecology.

Innosea: Engineering Company specialising in Marine Renewable Energy



Innosea's view is that the development of a specific and long-term national marine energy agenda would benefit both administrative bodies, by helping them to prepare their work load, and project developers and owners by providing greater confidence about France's long-term approach to marine energy and its investment needs. Also, the integration of MRE into the French electrical grid must be planned accordingly to prevent it becoming an industrial deployment bottleneck.

4.1.1.3 Operational recommendations

Renewable Energy Syndicate (SER, Syndicat des Energies Renouvelables)

- Plan the terms according to which objectives for MRE are fixed in the SNML (National strategy for the sea and the coastlines);
- Specify in the Environmental Code that the DSF (strategic documents on the shoreline) establishes quantitative and qualitative objectives for MRE development.

International Union for Conservation of Nature (IUCN)

- Define national and regional zoning to improve protection of marine and coastal habitats;
- Analysis of different MRE technologies and deployment strategies within the framework of the multi-functional management of marine spaces;
- Further investigations to clarify the compatibility of MRE with the objectives of Marine Protected Area management.

4.1.2 Administrative procedures

4.1.2.1 Consenting process summary

No specific permitting procedure for ocean energy technologies and no licensing roadmap for the sector have yet been established in France. Nevertheless, based on the licensing procedure used for the SEM-REV full-scale wave energy test site, the consenting process consists of three main licenses:

- A power exploitation permit granted by the Ministry of Energy, Electricity Act February 2000;
- A temporary concession for the occupation of a restricted sea zone granted by the regional prefecture;
- An approval under the French "Water Act" granted by the regional prefecture.

Other consents, such as local construction permits, are also necessary for coastal construction and land infrastructure. An important part of the consenting process in France is to set up a clear regulatory pathway, since a number of strategic stakeholders are involved in project evaluation and the delivery of permits (see SOWFIA D3.1 and D4.5 reports). Regular meetings with stakeholders are also recommended. In addition, power production and grid connection require further permitting processes that involve the French utility distribution grid operator ERDF (Electricité Réseau Distribution de France). Finally, a power purchase agreement is needed to sell the electricity through the French marine renewables feedback tariff.

The time taken to licence projects is currently estimated at 14 months, starting from the official file deposit (see SOWFIA D4.5 report). However, initial consultations should start one year before this and, during this period, EIA and a feasibility study should also be conducted. The EIA may last for two years, although feasibility studies may only take three months.

During the licensing of the SEM-REV site, several hurdles were encountered which reveal inconsistencies in the current legislation affecting marine renewables (see also SOWFIA D2.3 and D4.3 reports). For instance:

- The French shores are protected by the “Shore Act” which does not allow cable shore landing works;
- Natura 2000 legislation is not well understood by some environmental stakeholders and the public; this can lead to misinterpretation of the legal requirements for protected areas;
- The administrative process is complex, general and not well structured.

Additionally, the lack of incentives caused by the absence of clear political and legal structures for marine technologies, coupled with the absence of wave energy technologies from the French National Grid, have discouraged private sector investment in the marine energy sector.

4.1.2.2 Strategic recommendations

Renewable Energy Syndicate (SER, Syndicat des Energies Renouvelables)

- Simplify the consenting process;
- Create a procedure dedicated to the MRE in the Energy Code;
- Anticipate and facilitate wave farm connection to the grid.

International Union for Conservation of Nature (IUCN)

- Simplify the regulatory framework.

Innosea: Engineering Company specialising in Marine Renewable Energy

- Simplify consenting for prototype and pilot projects based on a one-stop-shop administrative body;
- Establish a specific MRE offshore cable connection EIA procedure.

4.1.2.3 Operational recommendations

Renewable Energy Syndicate (SER, Syndicat des Energies Renouvelables)

- Extend the exemption for consenting requirements to certain marine installations;
- Eliminate the procedure of project approval for MRE installations;
- Ensure that marine archaeology is unaffected;
- Maintain the time for objection of third parties against water act authorisations in reasonable proportions;
- Generalise the implementation of an “information organism” and project monitoring;
- Allow the passage of private conduits in outstanding spaces for MRE projects;
- Specify the scope of the exemption of Planning Code formalities regarding the terrestrial part of the grid connection.

International Union for Conservation of Nature (IUCN)

- Create an official body for control and environmental evaluation;
- Realise a systematic energy balance to demonstrate the decrease of greenhouse gases emission;
- Plan a national strategy on the decommissioning and dismantling of devices / farms.

4.1.3 Environmental Impact Assessment

4.1.3.1 Experience on EIA for wave energy



The critical environmental and socio-economic impacts affecting the construction and operation of SEM-REV have been addressed by a comprehensive study conducted in 2010 for the development (see SOWFIA reports 2.6 and D4.4). In particular, the report considers:

- The initial state of the site and its surrounding environment;
- The direct, indirect, temporary and permanent effects of the project on the environment during the implementation, operation and dismantling phases;
- The physical environment (water, air and sediment quality);
- The living environment (macrofauna, marine mammals, avifauna, flora, protected areas, habitats and species);
- Landscape and heritage, human environment (fishing and leisure activities), public health and safety (navigation, noise).

In order to extend the concession to the installation of floating wind turbines, a complementary study was required. This was finalised in early 2013 and reconsiders the aspects noted above in respect of floating wind turbines. It also complements the first document by including, among other aspects, a landscape study.

Following comments by the national authorities, mitigation measures were introduced to reduce, suppress, mitigate, control and manage the impacts of the SEM-REV project during its implementation, operation, and dismantling phases, and to protect the environment, health and safety (navigation, waste treatment), mooring specifications (scouring effect), environmental constraints for devices (anti-fouling, recycling, pollution responsibilities), noise monitoring, cable survey, and impacts on marine mammals.

Most of these measures have been taken into account in the specifications required from the device developers. Noise measurement studies and a cable survey for the SEM-REV project are expected in 2013/2014.

Some informal positive socio-economic impacts are expected from the project's financiers as described in SOWFIA D4.4 report:

- Development of the Marine Renewable Energy industry sector in the region and in France;
- Job creation and large support to local SMEs/SMIs;
- Positive image and new attractiveness of the region (industries, tourism).

No specific socio-economic studies have been conducted for the test centre. The available data from the EIA of the SEM-REV test site are presented in D3.5 and on the SOWFIA Data Management Platform.

4.1.3.2 Strategic recommendations

International Union for Conservation of Nature (IUCN)

- Manage the impacts throughout the entire life cycle of the project;
- Improve the use of the impacts assessments;
- Improve the knowledge of the potential for MRE and the constraints on the marine environment associated with its development.

4.1.3.3 Operational recommendations

International Union for Conservation of Nature (IUCN)

- To limit the noise and vibrations incidences on living organisms;
-

- To consider the habitat attendance and the migration habits of sensitive species during the construction of wind farms;
- To develop and to implement the existing methods to limit erosion of the sea bed;
- To expand, when desired, the surface of the artificial reefs associated with the installations and the connectivity between them;
- To experiment with the creation of new areas of integrated management where activities coexist;
- To conduct a reflection on the interactions between MRE and fisheries;
- The implementation of recycling tubs;
- To consider the migration schemes of tortoises and marine mammals;
- Improve the knowledge on potential impacts of MRE on marine habitats.

Innosea: Engineering Company specialized in Marine Renewable Energy

- Build open source environmental databases;
- Provide each project developer with a specific third-party expert which helps preparing the EIA file;
- Provide guidance for developers on how to address unknown issues e.g. cable/EMF impacts.

4.1.4 Consultation

4.1.4.1 Developers and stakeholders concerns and opinions on consultation

All stakeholders listed in SOWFIA D4.3 were engaged during the planning, consenting and development of the SEM-REV test site. In addition, the advisory committee has set up a communication plan for the project's development (see SOWFIA D2.3). These engagements are still continuing even though the project has been consented.

In France, the procedures in place are sufficient to address a reasonable number of stakeholders concerns. For instance, companies could be represented in order to see some of their problems raised. However, some stakeholders had to ask to participate in the consultation process and some companies surveyed did not participate.

4.1.4.2 Strategic recommendations

Renewable Energy Syndicate (SER, Syndicat des Energies Renouvelables)

- Specify the definition, the impact, the field and the application terms of the public participation;
- Ensure effective public participation on MRE mapping and development.

International Union for Conservation of Nature (UICN)

- Use a coherent approach to gather all stakeholder opinions in association with the relevant official bodies.

4.1.4.3 Operational recommendations

Renewable Energy Syndicate (SER, Syndicat des Energies Renouvelables)

- Plan the CODERST (local comity of health and technological risks) consultation before the public inquiry is conducted;



- Adapt public consultation terms before the deposit of the authorisation documents.

In France, consultation is a very relevant phase of the project to establish links with relevant stakeholders. The main recommendation would be to hold consultation events early in order to involve all local stakeholders.

4.2 Ireland

A dedicated national stakeholder event was hosted at the Department of the Environment, Community and Local Government on 12 September 2013. Its purpose was to present the SOWFIA project recommendations to a select audience of Irish policy makers, regulators, environmental consultants, researchers, NGOs, developers and other stakeholder groups. The audience was given the opportunity to comment on the recommendations with a view to making them more appropriate to an Irish context. All participants agreed with the recommendations in principle but the majority expressed the view that they could be more explicit and made firmer in some instances. These suggestions are captured in the text following each critical theme under the recommendations section. The SOWFIA DMP was also presented at the workshop to alert attendees to its existence and usefulness with the added benefit of securing some additional data to be uploaded to the DMP.

4.2.1 Integrated planning

4.2.1.1 Implementation of strategic plans

Ireland's Sustainable Energy Authority and Marine Institute published an Ocean Energy Strategy in 2006. This brought with it dedicated funding to create an Ocean Energy Development Unit (OEDU) in the Sustainable Energy Authority of Ireland (SEAI) as well as support for a Prototype Development Fund (SEAI and MI, 2006). Since then, there has been on-going work in relation to R&D facilities, a supportive policy framework and test site infrastructure. In 2010 the Department of Communications, Energy & Natural Resources (DCENR) published a draft Offshore Renewable Energy Development Plan (OREDPA) for public consultation (DCENR, 2010a). This outlined the current state of offshore wind, wave and tidal energy in Ireland, explained how policy for this sector was developing, and reviewed some of the factors that were likely to affect development. As the OREDPA was intended to set the policy framework within which offshore marine renewable energy would develop, it was subject to the provisions of the SEA Directive. As outlined in SOWFIA D3.1, this examined various development scenarios for offshore wind, wave and tidal energy to ascertain the level of development that appears feasible when environmental considerations are taken into account. Specifically the SEA considered low, medium and high scenarios for the development of offshore wind, wave and tidal energy up to 2030. A final version of the OREDPA is expected to be published in October 2013 and this will take into account the previous findings of the SEA as well as those from a separate Appropriate Assessment (under the Habitats Directive) which was required because a large proportion of the Irish coastal and marine environment is subject to nature conservation designations.

Ireland does not have a Maritime Spatial Planning system at this time. Generally marine developments require a foreshore licence or lease depending on what they encompass. A review of the consenting process applicable to marine renewable energy was launched via public consultation in early 2013. This acknowledges the need for provision of an efficient foreshore licensing and leasing process for marine energy; streamlining of planning and regulatory processes for bringing energy reserves ashore; and the development of an integrated marine and coastal planning process in order to maximise the potential of Ireland's coastline in fishing, aquaculture, ocean energy and tourism; as

contained in the current Programme for Government. To take the foregoing commitments forward, the Department of Environment, Community & Local Government (DECLG) developed a Foreshore and Marine Area Development Bill. The options relating to the development of the Bill were outlined in a consultation paper and subject to a public consultation process that ended on 1 March 2013. The content of the new Bill is not in the public domain but it has recently been passed by government with expected publication in October 2013. Separately, the DECLG has submitted an initial assessment of Ireland's marine waters to the European Commission in accordance with the provisions of the Marine Strategy Framework Directive.

Independently, as an initiative of the high-level, inter-departmental Marine Coordination Group (MCG), "Harnessing Our Ocean Wealth", a Roadmap for an integrated marine plan for Ireland was published in July 2012 (Government of Ireland/MCG, 2012). This sets out the Government's vision, high-level goals and integrated actions across policy, governance and business to enable the country's marine potential to be realised. Implementation of this roadmap rests with the numerous Government departments that have a marine remit. Over-arching responsibility, however, rests with the MCG and the Minister for Agriculture, Food and the Marine, which will supervise cross-government delivery and implementation. As part of the implementation process, the Marine Coordination Group established a technical working group on Maritime Spatial Planning and commissioned a number of studies on this topic, including a legal analysis and best practice approaches. These were due for completion by the end of August 2013 but are not yet in the public domain. It is anticipated that these studies will inform the development of Maritime Spatial Planning in Ireland.

4.2.1.2 Strategic recommendations

The majority of Irish stakeholders involved in various ways with the SOWFIA project viewed the recommendations on integrated planning as fine in principle but thought they could be made more specific in places – and to Ireland – to have real value. The view was also that the barriers presented had been recurring for a long time and had been presented many times before. What is needed urgently, it was felt, is action on these barriers. Stakeholders felt that the recommendations needed to be presented to the right people for them to be implemented or taken forward in some way.

It was felt that in Ireland a clear development policy for its marine area which includes all activities was needed. If a plan-led approach is in place, problems associated with a 'free-for-all' like that seen/experienced from the onshore wind sector (where there has been a lack of coordinated planning on the siting of wind farms) could be avoided.

There was significant debate during the Irish national event on the format of future MSP for Ireland. If MSP takes the form of zoning particular ocean areas for particular purposes then there needs to be some form of certainty that only proven technologies will have the ability to locate in those zoned areas. Stakeholders also expressed the need for clear responsibility for MSP.

Stakeholders viewed the forthcoming publication of the OREDP as a mechanism for 'joining the dots' between different policies. There was a sense of frustration at the length of time it had taken from first publication of the draft OREDP to final publication (July 2010 to possibly October 2012).

In relation to ocean energy specifically, it was stated by a number of stakeholders that Ireland has lost out on business to Scotland (e.g. Vattenfall had planned a project in Ireland but instead moved its focus to Scotland). Stakeholders attributed this to the fact that Scotland had taken a proactive approach to planning and consenting, whilst there has been very little movement in Ireland on these



topics. The fact that there are only two people in the Sustainable Energy Authority of Ireland responsible for ocean energy also causes concern and the view was expressed that more staff and resources were needed there if the ocean energy industry was going to succeed in Ireland.

4.2.1.3 Operational recommendations

Lack of communication between the various responsible authorities has been a major source of frustration and delay in obtaining consent in Ireland according to stakeholder opinion. Delays have been experienced in relation to foreshore licences and leases as well as grid connection offers which applies across the board and is not limited to wave energy device deployments. Specifically, delays are common in the Department responsible for foreshore licensing and the authority responsible for nature conservation and site designation. The latter suffers from a severe lack of resources (human and financial), which might be one reason for poor communications. The responsible departments need to “sing from the same hymn sheet”. A number of stakeholders were of the opinion that too much faith was being placed on the future implementation of MSP. They felt that something needed to happen in the short term which would facilitate ‘quicker’ development.

Regulatory authorities and developers need to work together to improve the process in relation to consenting or environmental impacts. Effort should be concerted not the responsibility of one single entity/person. Under the new consenting regime, An Bord Pleanála [Irish Planning Board - ABP] will have responsibility for planning. Concern was expressed by some stakeholders that the possibility of appeal would be removed i.e. challenges would go straight to judicial review which is a lengthy and expensive process. The hope was expressed that there would be some internal appeal mechanism within ABP which would involve people separately to the original decision. ABP does not currently have the power to address breaches of planning conditions and accordingly this will also need to be addressed in the legislation.

4.2.2 Administrative procedures

4.2.2.1 Consenting process summary

In relation to the planning and consenting process in Ireland, there is as yet no dedicated legislation dealing with marine renewables (offshore wind, wave or tidal). Consequently, there is a reliance on existing foreshore, environmental and maritime jurisdiction legislation. For a complete discussion of the last operational regime, see O’Hagan and Lewis (2011) and the SOWFIA report on “Review of consenting processes for ocean energy in different EU Member States” (D4.5 report).

In summary, developers require a foreshore licence (for EIA / survey activities); a foreshore lease (for sole occupation); an EIA (currently required as a matter of policy when making an application for a foreshore lease); planning permission (for onshore works); Appropriate Assessment (site dependent); as well as a Licence to Generate and a Licence to Construct, both under the Electricity Regulation Act, 1999. In addition developers will also require a Grid Connection Offer and a Power Purchase Agreement which operate outside the legal system.

4.2.2.2 Strategic recommendations

Ideally, all elements of ocean energy projects should be included in one application and be overseen by one consenting body. Many Irish stakeholders felt that this would never be the case in Ireland, even in the long term. Lack of a coordinated process means that there are many pitfalls in the consenting process, into which a developer may fall. These relate to the foreshore lease, grid connection, planning permission, EIA and/or public consultation process.

Small scale developments such as research projects or demonstrations should not require planning permission provided they do not need an EIA. This was viewed as a means of expediting both the development of wave energy as well as providing an opportunity to learn about device and environment interactions. A number of stakeholders made the point that many other marine activities go ahead on a daily basis with no environmental assessment (e.g. trawling) and which are more damaging than the deployment of a wave energy device.

4.2.2.3 Operational recommendations

The development of a one-stop-shop, or designation of a coordinating body, would be a positive move. In the short-term, a coordinating body would help to address some of the current inadequacies in the system.

In the Irish consenting process, it was stated that there needs to be a separation of the role of landlord and that of consentor. The landlord should have a promotion role: encouraging maritime activity (be it shipping, aquaculture, energy etc.). This could be modelled on the UK approach where the Crown Estate is the landlord and its role is to maximise returns to the State. The consenting authority cannot have a promotion and a licensing role, as is current situation with Galway Bay aquaculture development. Separation of these powers adds legitimacy to the process and builds public faith and trust in procedures.

Ireland and its institutions must focus on the interdependency of permits. A one-stop-shop cannot deal solely with permits relating to the marine elements of the project. The consenting process also needs to include permits associated with electrical elements, and particularly grid connection and development. Grid development presents a no-win (“Catch 22”) situation but it still needs to be considered in the consenting process.

It was thought that guidance for energy developments should be included in the new consenting Bill. It was also felt that it would be helpful if statutory timelines, which limited the period for response, were included as part of this guidance. This statutory timeline would have to be dependent on the scale of the project involved to give the authority, and stakeholders, sufficient time to respond. Some stakeholders felt that, for small scale test sites and time-limited projects, responsibility for planning and consenting should rest with the local authority. Otherwise, the consenting process becomes prohibitive for small scale developers.

4.2.3 Environmental Impact Assessment

4.2.3.1 Experience on EIA for wave energy

The AMETS wave energy test site is currently under development off the west coast of Ireland. A foreshore lease application for the test site was submitted to the Department of the Environment, Community & Local Government in December 2011. A decision on this was expected before the end of 2012 but has not as yet been issued. As part of the lease application, an Environmental Impact Statement (EIS) was carried out for the project and has been published. The details of this were discussed in the final work package 3 (D3.5). During the course of the studies to support the Environmental Impact Statement, potential significant impacts on the human population; flora and fauna; avifauna; water quality; soil, geology and groundwater; air quality and climate; noise; landscape and seascape; navigation risk; cultural heritage; coastal processes; material assets; and cumulative impacts were included.



In relation to flora and fauna, at the time of the lease application there were no designated cSAC, proposed Natural Heritage Area (pNHA under Irish law) or SPA in the marine environment at the location of the test areas or along the cable route. The Mullet/Blacksod Bay Complex cSAC and pNHA extend along the shoreline and in the vicinity of the proposed substation location. The cables will pass through the cSAC area. There is also protected habitat in the marine environment comprising of reefs in the near shore test area. In addition to these, and since the foreshore lease application, the National Parks & Wildlife Service (NPWS) has published an intention to designate notice for an area entitled 'West Connacht Coast SAC' which would encompass the waters around the test site. A variety of seabed structures, including reefs, islets and sedimentary basins, are present in this area. The site also contains physical and hydrographical features believed to be important for Bottlenose Dolphins *Tursiops truncatus*, one of two cetacean species listed on Annex II of the EU Habitats Directive. These features include shallow coastal bays, areas of steep seafloor topography and complex areas of strong current flow adjacent to estuaries, coastal headlands and islands, sandbanks, shoals and reefs. Bottlenose Dolphins are found within the site in all seasons and the area comprises a key habitat for the species both regionally and within Irish waters as a whole. Due to the proximity of AMETS to existing designated sites, and the proposed new site, a screening assessment under the requirements of Appropriate Assessment was conducted for the proposed project. The screening report states that, with the exception of the cable landfall and construction of an underground cable bay at Belderra strand, which is within the Mullet/Blacksod Bay Complex Special Area of Conservation (SAC) and pNHA, none of the remaining development will impact or occur within any designated area. Changes to the Mullet/Blacksod Complex SAC site will be temporary in nature within the intertidal area and will be insignificant given the exposed dynamic nature of the area (MERC Consultants, 2011).

There are limited data and information on the environmental impacts of wave energy devices on avifauna. The potential impacts on birds may vary depending on nature, age and reproductive stage of the species. As with marine mammals, the main potential for impacts comes from physical disturbance, risk of collision and noise disturbance. Entrapment of birds within WEC structures is also a possibility. The potential impacts on birds will vary depending on the location of the installations and on the timing of construction activities.

During construction, cable burial and anchoring operations will generate suspended sediment close to the cables but this will be temporary and have little or no impact on water quality. The proposed development does not present any significant risks to soil or sediment, geology, groundwater, air quality or climate during construction or operation. In terms of coastal processes, the modelling undertaken as part of the Environmental Impact Statement process indicated that the impact of the wave energy converters when deployed at the test area would be insignificant in comparison to the natural processes occurring in the bay. Accordingly the EIS states that there will be no significant impacts on sediment transport, coastal landform or surfing waves (ESBI and SEAI, 2011).

The greatest visual impacts during the construction stage would occur in the vicinity of the substation site and at the location of the underground cable. These impacts would be negative but would be moderate and temporary. In terms of impacts on material assets or economic activities such as commercial fisheries, tourism and land use, the EIS found that the development of AMETS would have some impact on these but that the impacts would be temporary in nature and of low significance overall. During the operational phase, the test area locations will effectively constitute fishing exclusion zones. The impact on the crab and lobster fishing industry will, however, be low as Test Area A was redesigned following an extensive consultation process with the fishing community. During cable laying at Belderra Strand, the beach and certain local roads will be closed, but these

closures will be short and are unlikely to impact on tourism or other land uses. A summary of the magnitudes for different environmental receptors at AMETS is shown in Table 2 (from D3.5).

Table 2 – Summary of the magnitudes for different environmental receptors at AMETS, Ireland.

Receptors		AMETS, Ireland
Physical	Water quality and groundwater	Moderate
	Physical processes	Moderate
	Air quality and climate	Compatible
Flora and fauna	Marine mammals	Moderate
	Seabirds	Moderate
	Fish and shellfish	N/A
	Benthos	Moderate

4.2.3.2 Strategic recommendations

There is still a lack of data to make definitive conclusions about the impacts of WECs, given that there are only a few wave energy devices in the water and no wave energy farms.

Participants at the Irish SOWFIA workshop stated that numerous positive effects are cited in the literature but that it is not actually known if these are positive effects: e.g. FADs – do they remove fish from another habitat?; also artificial reefs – a different substrate may also act as a means of introducing invasive species, is this something that should be encouraged? There needs to be a concerted effort made at studying these effects more before it can be said if they are positive or negative.

There is a need for more independent research to reduce uncertainty. It was suggested that information produced in an EIA or by a developer should not be relied upon solely and that there should be other sources of information used. All data must be capable of critique and investigation.

Given the on-going uncertainty over impacts, some stakeholders raised the question of whether there is a level of environmental impact that would be acceptable for test sites. If a consenting authority were to state this, would it be possible to rely on expert judgement on what an acceptable level of impact would be?

Decision makers need the best quality information to be able to make the best decisions. There needs to be a central repository for all EIAs. In Ireland this is possibly a role for SEAI. Other stakeholders felt that SEAI was not the most appropriate body as it would be primarily concerned with energy developments and there may be EIAs for other marine developments that could be instructive and informative to wave energy.

The differences between information and data need to be distinguished very clearly as well as the implications of this. Data should be publicly available so that it can be analysed independently. The issue arising is from whom and where should data be available?

Developers should be required to make all their data associated with EIA (studies) available as a condition of their consent. This avoids any problems regarding commercial sensitivity etc.



There is a clear recognition that environmental concerns are important but it was stated that there is also a need to get devices in the water to be able to see (and measure) impacts from full scale devices in situ, provided the necessary baseline information already exists. Accordingly, device deployment should be promoted but in a sensible manner: in a phased way in appropriate locations. Devices need to be deployed in order to monitor them and learn.

The wave energy industry should not be held to a different level of accountability than other marine industries in terms of assessments, consents, procedures, consultations.

4.2.3.3 Operational recommendations

There has been an improvement in recent years in the availability of environmental monitoring data e.g. data gathered as part of OREDP is available. The significance of the impact varies according to location – in an SAC or SPA, for example, the barrier is much higher.

Developers and everyone else need to be aware that if there is uncertainty surrounding an impact in a Natura 2000 site, then the consenting authority cannot authorise development. The EIA is taken into account by the consenting authority but its outcomes are not binding. Some concern was expressed over the proposed SAC designation of the area surrounding AMETS and how this would impact upon its future development. [Studies informing the Appropriate Assessment have been conducted but a final assessment has not yet been made].

In Ireland, oral hearings are the only way to challenge the findings of an EIA. This is not ideal. Stakeholders wondered if all scientists interpret scientific data in the same way. It was suggested that utilisation of common methodologies might address this factor.

One stakeholder suggested that the SOWFIA project consortium propose to the European Commission that research and demonstration-type WECs be exempted from the EIA Directive.

Impacts from onshore activities such as laying of underground cables, construction of power lines etc., need to be taken into consideration in a single EIA process and not subjected to two separate assessments. This was cited as often being the most potentially disruptive part of a development.

Standard monitoring methodologies are useful in certain circumstances but are not required for certain monitoring. As long as monitoring methodologies have been shown to produce the same or very similar results, each of these methodologies should be acceptable.

Adaptive management is in place for Corrib gas development. This comprises construction of a gas pipeline and processing plant in north Co. Mayo, relatively close to the AMETS wave energy test site. There was widespread public objection to this development by Shell E&P Ireland based on lack of public consultation, environmental (land use and marine ecology) and safety concerns. Stakeholders at the SOWFIA event were of the opinion that the adaptive management approach in place at the Corrib site should set a precedent for use in respect of other marine developments.

It was suggested that projects be assessed in terms of the net benefits they may provide – impacts may be mitigated by benefits.

The State should provide funding towards the gathering of baseline data. The State has responsibility for environmental protection so it should shoulder some of the duties that this responsibility entails.

NOTE: There has been a lot attention paid to the EIA Directive, Birds and Habitats Directives and Renewable Energy Directives in SOWFIA outputs but attention should also be paid to Environmental Liability Directive which includes Annex I Habitats (e.g. reefs). This is very applicable to Ireland and particularly to the area around AMETS.

4.2.4 Consultation

4.2.4.1 **Developers and stakeholders concerns and opinions on consultation**

The AMETS project is a full scale pre-commercial wave energy test centre. It is currently in the consenting phase with an Environmental Impact Statement (EIS) completed and submitted in parallel to a foreshore lease application to the Department of Environment, Community & Local Government (DECLG). During the EIS process, stakeholders including local authorities, the fishing industry, local inhabitants, local businesses, local organisations and relevant government entities were consulted with extensively by the project management team. Information days were held for the local community to ensure that they were aware of all stages of the project and to gather feedback. Given the proposed location of the test site and the likely impact on local fishing activity, it was decided to meet separately with the fishing representatives to ensure that the final locations of the test areas were agreed in conjunction with their own needs, the local authority and government entities.

In addition to public meetings and independent discussions with the local fishermen, the Sustainable Energy Authority of Ireland (SEAI), as site developer on behalf of the State, appointed a local liaison officer who was permanently employed on site to provide a direct interface to all stakeholders. In general, there is widespread support for the AMETS project from all sectors of the local community and industry. This can be attributed to the potential job and industry opportunities that are anticipated to result from the test site development.

Further details on stakeholder engagement at AMETS can be found in SOWFIA report on stakeholder questionnaires results (D2.3).

4.2.4.2 **Strategic recommendations**

There is a definite perception amongst some stakeholders that consultation is a merely a ‘tick the box’ exercise. Examples were given whereby statutory consultation, advertised in newspapers, was responded to; however, it was felt that these responses were not taken into consideration.

SEAs and development plans are only useful if they are actually used and adhered to by the authorities. An example was given of a County Development Plan with designated zones for onshore wind farms but an application for an onshore wind outside the designated zone was granted permission by that same County Council (before being rejected by ABP).

The time periods for consultation on EIA are too short: the public have five weeks to respond, local authorities have 12 weeks. These should be the same so as to reflect the principles of procedural justice. A simple legislative amendment would resolve this.

A champion and a policy for ocean energy development in Ireland are needed – this will inform the public thereby reducing the need for the developer to do this as part of their statutory stakeholder consultation. An ‘aware’ public should also increase public acceptance of the technology.

Under the Strategic Infrastructure Development regime in Ireland, community benefit funds are collected by the Local Authorities who are also tasked with deciding how that money should be spent. Participating developers do not favour local authority involvement in this.

Who is a stakeholder when the developer is offshore? Is it the person with the view of the sea or the fisherman from 200 miles north? How can we address this when implementing community benefit



schemes? It is perceived that some stakeholders are deemed to be more important than others e.g. the bird lobby has more influence in Ireland than the marine mammal lobby.

4.2.4.3 Operational recommendations

Why are there no mention of community benefits in the recommendations on stakeholder consultation and conflicts of use? Many stakeholders were of the opinion that every development should have a community benefit in some form.

At AMETS, due to past experience with Shell and the Corrib gas field, there may be the expectation of financial compensation among fishermen. The provision of generous compensation packages by Shell to the local fishermen has set something of a precedent that might have adverse consequences for the financial attractiveness of projects if stakeholder groups come to see this as the norm.

One suggestion made was for developers to set up a fund which could compensate fishermen for lost gear or damage to vessels as a result of wave energy devices. Similar compensation funds are common in the offshore oil and gas sector and could be applied to wave energy. Such a compensation fund would have to be managed with direct involvement of fishing organisations and associations that may be affected.

It was noted that community benefit schemes such as those provided by some onshore wind developers would be difficult to implement for wave energy and this is not likely to be an option for test sites.

It was reiterated that the wave energy industry should not be held to a different level of accountability than other marine industries especially with regard to consultation.

4.3 Portugal

4.3.1 Integrated planning

4.3.1.1 Implementation of strategic plans

In Portugal, the implementation of MSP was launched in December 2008. After being in public consultation for about 3 months (from November 2010 to February 2011), the plan was finally published in November 2012 and released on the official website of the Directorate-General of Marine Policies². The plan provides spatial information on the current and potential situation regarding marine activities, uses and functions within coastal and marine areas along the continental Portuguese territorial waters³, integrating also management guidelines. Meanwhile, a SEA has been conducted on the MSP considering the strategic options and the programme of actions, as well as occupation of the marine space together with management guidelines.

The Portuguese MSP identifies not only existing areas for marine renewable energy testing and exploitation but also potential areas for both activities. In the case of wave energy, alongside assessing wave energy resources, other criteria such as conflicts of use with fisheries, navigation routes and marine protected or sensitive areas have been considered to establish two main groups of areas along the Portuguese coast: 1) areas with a good resource and without significant

² http://www.dgpm.gov.pt/Pages/POEM_PlanoDeOrdenamentoDoEspacoMarinho.aspx

³ Territorial waters of Azores's and Madeira's MSPs are being considered separately and MSPs are still under development.

interference with other uses; 2) areas with a good resource but with possible overlap of uses (mainly with fisheries). Areas without conflict of uses but with grid access difficulties have been also identified. These areas are mainly located at 50 m depth but can also extend to 80 m. In addition, areas already designated or used for wave energy projects were mapped: the Aguçadoura site, the Ocean Plug near S. Pedro de Muel (Leiria District), and the Peniche site (WaveRoller Technology).

On land, and as discussed in SOWFIA reports D2.1 and D3.1, a SEA was completed in 2008 for the National Electrical Grid Distribution, which considers the development of the Portuguese Pilot Zone within the list of critical decision factors. It also establishes a number of collaborative actions within public and private institutions regarding the incorporation and compatibility of the implementation of new projects including renewables.

4.3.1.2 Strategic recommendations

The legal and planning context for ocean energy development in Portugal has been shaped in the last five years since the maritime sector was recognised by policy makers as an important contributor to national economic recovery. However, the current recession period promoted by the world economic crisis, is hindering progress, particularly regarding the implementation of competitive financial instruments like feed-in-tariffs, which have recently been altered to less favourable conditions.

The continuance of strategic public policies on marine renewable energy promotion is possibly an important strategic recommendation, which has to be considered by the government to ensure long-term and attractive conditions for developers to locate projects in Portuguese waters.

4.3.1.3 Operational recommendations

The construction and effective operation of the Ocean Plug facility is possibly the strongest operational recommendation on the plan to accelerate the sector's development in the country. The site will promote device prototype demonstration or testing and pre-commercial and commercial projects to be developed. Furthermore, dedicated permitting will be ensured for this area; this will facilitate licensing and instruct regulatory bodies on licensing procedures for projects to be implemented in other potential areas defined in the MSP.

4.3.2 Administrative procedures

4.3.2.1 Consenting process summary

Although Portugal has no dedicated consenting system for ocean energy, existing consents have been adapted to the needs of wave energy developments. A detailed description of how the licensing process is carried out for wave energy is presented in the SOWFIA report "Review of consenting processes for ocean energy in different EU Member States" (D4.5 report). In summary, developers require a "title of water resources use", a favourable or conditionally favourable evaluation of the project's environmental impacts in a licence provided by the regional authority, a licence for the power production installation and, where relevant, a grid connection licence and/or a licence on construction of infrastructure on land (e.g. substation, cable routes). The consenting process for wave energy projects in Portugal generally takes no more than 18 months. This is a worst-case estimate (if the time for all intermediate licensing steps are included) but does not include the preparation of EIA reports (which may incorporate baseline fieldwork for reference characterisation).



4.3.2.2 Strategic recommendations

The parallel processing approach of the Portuguese wave energy consenting process lacks communication between the different authorities involved. This can lead to a duplication of work for developers. The implementation of a fit-for-purpose consenting process coordinated by one consenting body would be a preferred way to improve the system. However, it is also recognised that adopting the one-stop-shop method might shift a significant proportion of the burden of consenting from developers to administrations, in which case extra resources are likely to be needed. In this context, and given the current recession, a possible solution would be to review the consenting system in order to achieve better coordination between licensing authorities. The recent changes made by the government to public administration agencies included the integration of the maritime affairs authorities into a single Ministry. It is hoped that this will facilitate more integrated decision-making, improved coordination between authorities, and a less bureaucratic consultation process for marine renewable energy. However, these changes are still being implemented and, thus, an effort on speed up this process would be one important recommendation.

4.3.2.3 Operational recommendations

A short term recommendation to facilitate administrative procedures is to make available a clear description of the wave energy licensing process in Portugal, e.g. through institutional websites or documents. Some clarification already exists for parts of the process covering water-resource and EIA licences (on the regional authorities' websites). This will mainly help developers, since they are the current managers of the licensing process, but also regulators in the process of obtaining information from other authorities if needed.

4.3.3 Environmental Impact Assessment

4.3.3.1 Experience on EIA for wave energy

Some experience on EIA has been gathered in Portugal from the projects installed in Aguçadoura (AWS in 2004, Pelamis in 2008) and Peniche (WaveRoller in 2004 and 2012-2013). For each of these projects, an EIA has been delivered to the authorities focusing on a number of descriptors: greenhouse gas emissions avoided due to project, seascape, geology and geomorphology, natural values (flora, fauna and habitats), archaeological and heritage features, soils, airborne noise (for projects with infrastructures or equipment on land) and socio-economic effects. In general, the EIA results for the wave energy projects analysed showed that none have prohibitive impacts in the sites considered. However, most parts of the EIS classified the decision on project as conditionally favourable, meaning that a number mitigation measures and monitoring activities should be implemented before, during and after the project's installation.

As a designated area, the Ocean Plug which will be managed through a concession regime, the required environmental assessment of the Ocean Plug is a baseline geophysical and environmental characterisation, which has to be carried out prior to the installation of the test site infrastructure. An EIA will also be required for each project to be installed there. To date, data on hydrodynamics, seabed sediments, seabirds and marine mammals have been collected and a yearly monitoring programme is being developed for data collection to complete the information already gathered. The main conclusions taken from the analysis of the information collected are presented in SOWFIA report D4.4. The physical and biological data collected to date in the Ocean Plug area, are compiled in the DMP.

4.3.3.2 Strategic recommendations

All applications for the installation of marine renewable projects in Portugal have been approved under several conditions associated with monitoring activities and mitigation measures. These have to be implemented by developers during project installation, deployment and decommissioning. All monitoring plans have to receive prior approval by regulators and this process is very time-consuming in some cases because it involves advice from several authorities and direct discussions between developers and regulators. This is mainly because of the lack of information regarding 1) marine renewable energy impacts, and 2) comprehensive baseline data on the Portuguese marine environment to provide a context for impact evaluations. The first issue can be addressed through the organisation of workshops, seminars, short courses, etc. to train regulators and decision-makers on the state-of-the-art of ocean energy impacts. The second issue will possibly be addressed through the implementation of the Marine Strategy Framework Directive, which will require activities in the Portuguese marine space to be monitored and the creation of a database to compile information collected during monitoring activities to assess Good Environmental Status.

4.3.3.3 Operational recommendations

EIA guidance is needed for developers and test centres (Aguçadoura site, Ocean Plug). As far as possible, this guidance and its methodologies should be periodically reviewed to check their effectiveness and improve the process. Furthermore, the availability of baseline data and impact data (monitoring reports) through a national database (like the DMP) would help developers in the EIA process, e.g. environmental descriptors assessment, monitoring planning design; and will also help regulators to find specific information e.g. about sites' sensitivity and wave energy relevant impacts.

4.3.4 Consultation

4.3.4.1 Developers and stakeholders concerns and opinions on consultation

Formal consultation is a statutory requirement in the Portuguese permitting process. Among statutory consultees, there were some concerns about protected species using the site and about habitat destruction during the installation of infrastructure (e.g. substations) on sand dune areas. However, the projects have been accepted for installation with some monitoring recommendations. General public consultation is required under the EIA process but only after the EIA report is delivered to the authorities. Non-technical summaries are then made available on the Portuguese Environmental Agency website for a period of about one month for public comment.

From the developers and test centres managers' perspective, the most concerned stakeholder groups are: the environmental authorities, which due to the uncertainties on environmental impacts require comprehensive studies; local fishermen due to their potential exclusion from fishing areas; and some local community groups and/or residents like surfers. However, public consultation activities on wave energy projects in Portugal have generally been carried out by developers following an informal path and the involvement of the local community (e.g. town hall major, harbour captain, education institutions like universities and other local stakeholders) in dissemination events (e.g. wave energy seminars, web pages, local and national newspapers and Portuguese television).

In the case of Ocean Plug, the main reason why informal consultations with stakeholders have not yet been carried out relates to uncertainties surrounding the Ocean Plug development plan for the area. It is intended by the managing authority that formal contacts with local authorities, users of the



marine area and residents will only be productive when there are clearer details on where the Ocean Plug infrastructure will be placed (e.g. cable and substation location, exclusion areas). On the other hand, the statutory consultation process – which has not been carried out yet – should involve a number of public regulators at the national level on energy and geology, water use, environment, fisheries and maritime transportation and harbours.

For the Ocean Plug (Portuguese Pilot Zone) the main supporting groups are developers and sections of Portuguese industry (e.g. shipyards, tugboat companies, electrical components). It is also expected that business opportunities can be created for local communities, for example for fishermen, who may wish to offer their services in terms of boat facilities to the wave energy developers, and local communities that are dependent on the nearby harbour development (e.g. maritime equipment stores, hotels, shipyards).

Rather than being consulted, most local authorities interviewed during the SOWFIA project (see SOWFIA report on stakeholders' opinions D4.3) claimed only to have been informed about Ocean Plug by the media. Most respondents from local authorities expressed the opinion that they would like to know the details of the project and its progress on a periodic basis, saying this would benefit public awareness and acceptance. Respondents from the local businesses group stated that they had never heard of the Ocean Plug project before. Some respondents felt this situation was now the rule rather than the exception and gave examples of other maritime developments that took place recently (e.g. oil prospection) where marine users were not informed in a timely manner. All local business representatives interviewed recommended that information on project details should be made available as soon as possible, particularly where restrictions on sea areas were expected. Local community respondents classified the available information about the Ocean Plug project as insufficient or scarce and additional comments requested more information on wave energy and Ocean Plug project.

4.3.4.2 Strategic recommendations

In general, more information on marine renewable energy needs to be publicly available, especially in locations where wave energy projects are starting to be developed (e.g. Peniche and S. Pedro de Moel). In a country where the sea is recognised as a vital national resource, information on marine renewables should be introduced early in scholarly programmes as well as in educational activities on the subject.

4.3.4.3 Operational recommendations

Developers and/or test centre managers should dedicate more efforts towards consulting with local stakeholder groups and the public during wave energy developments. Informal consultation events are important not only to promote public awareness of developments but also to understand and consider community concerns during project installation and deployment. This enables stakeholders' trust on developers and may avoid further problems of public acceptance and foster project success.

4.4 Spain

4.4.1 Integrated planning

4.4.1.1 Implementation of strategic plans

In Spain, national targets for ocean energy and wave energy were fixed by the Renewable Energy Plan for the period 2011-2020 published by the Institute for Diversification and Saving of Energy

(IDAE) in 2009. The projection for these energies was 100MW installed by 2020, from which the first 10MW were to be installed by 2016. These figures included 50MW of installed power in the Canary Islands by 2015 and 5MW in the Basque Country by 2010. This latter target has since changed with the publication of the Basque Energy Policy 2020, which aims for 60MW of installed power by 2020. These two regions have promoted the construction of two testing and demonstration sites for accelerating the development of marine energy and the launch of the first commercial plant as soon as possible.

4.4.1.2 Strategic recommendations

In order to implement integrated planning, a dedicated MSP should be undertaken following the proposed MSP and ICM Directive published by the European Commission in March 2013.

Constructing and promoting marine infrastructures for testing and demonstrating prototypes and arrays will accelerate the development of the sector contributing to the achievement of the above mentioned targets. With this idea, bimep promoted by the Basque Government through EVE and PLOCAN promoted by the Canary Government are under construction at the moment.

The promotion of pre-commercial demonstration projects is another important recommendation.

Finally, as was proposed for the demonstration phase, the pre-commercial phase of wave farms should be supported by economic incentives to help make these developments profitable.

4.4.1.3 Operational recommendations

The strategic recommendations listed above can be implemented through the following operational recommendations:

- The Spanish MSP should be oriented towards proactive planning for developing maritime sectors and not just towards complying with the Directive's environmental goals;
- Research and development (R&D) should be established in collaboration with other Member States to avoid repetition of ideas; the FP7 funded Oceranet project, about to start this year, is focused in this purpose and some Spanish regions such as Asturias, Cantabria, the Basque Country and the Canary Islands, as well as the Spanish Central Government, are part of this consortium;
- It is important not only to build test sites but also to promote them; following this idea and with the aim of attracting WEC developers to bimep, EVE has created a technology validation and demonstration R&D grant programme;
- Pilot zones should be established for developers to share costs of their first wave farms;
- As previously experienced with other renewable energy technology start-ups, the Spanish Government should incentivise developers and manufacturers with a feed-in tariff system and advantageous access to the electricity market.

4.4.2 Administrative procedures

4.4.2.1 Consenting process summary

As outlined in the SOWFIA report on “Review of consenting processes for ocean energy in different EU Member States” (D4.5 report), in Spain no dedicated consenting process exists for ocean energy technologies. The consenting process is based on three main legal instruments:



- The Royal Decree 1/2008, of 11 January that governs the need for EIA of projects to be located in the natural environment;
- The Coast Law (28th July 1998), the legal framework governing occupation of the territorial sea together with the issues affecting the fishing sector and safety conditions for maritime navigation;
- The Royal Decree 1028/2007 establishes administrative procedures for processing applications for electricity generating facilities in territorial waters.

The following administrative procedures are required for the construction, extension, modification and exploitation of any electric installation:

- Request for Administrative Authorisation: refers to the project's draft installation plan as a technical document.
- Approval of Execution Project: refers to the commissioning of the specific project and allows the applicant to start construction.
- Exploitation Authorisation: allows installed projects to generate power and proceed to commercial exploitation.

The administrative procedure is widely regarded as complex. It is a sequential consenting process and provides no guaranteed timeframe for each stage. The time taken to obtain the final consent varies depending on whether an EIA is required or not. In Spain, the EIA may constitute two years of the overall consenting period. This period should then be added to the rest of the consenting period, which is estimated to be two further years to obtain all permits. The lack of experience of the authorities in dealing with offshore renewable energy projects, the lack of standards in areas such as design and calculation, construction, commissioning, O&M, etc., and the lack of procedures for inspecting and certifying types of constructions are other contributory factors to delays. However, this timetable is expected to be reduced as the consenting process evolves and authorities' experience of this type of projects increases.

4.4.2.2 Strategic recommendations

The establishment of negotiations between ministries involved in the ocean energy consenting could be one way of streamlining the Spanish licensing process. Legal amendment is required before the consenting process and associated procedures can change. The Ministry of Innovation and Competitiveness is trying to identify what and who is involved in the process and some meetings have been held between the Environmental department and the ministry responsible for consenting wave energy project.

4.4.2.3 Operational recommendations

In the Spanish case, some authority and regulatory body representatives think that adopting the 'one-stop-shop' approach might offer a way to shift responsibilities from developers to administrators. However, it seems to be more viable to implement a parallel processing by different administrative bodies where projects would be divided into sub-processes that could be managed by different departments that could shorten the consenting procedure.

From the developers' point of view, obtaining standards and procedures from authorities may also assist in accelerating transactions. Furthermore, statutory timelines should be established to limit the period for consenting response.

4.4.3 Environmental Impact Assessment

4.4.3.1 **Experience on EIA for wave energy**

The influence of the environmental impact of any project in the marine environment is assessed under the provisions of EU EIA Directive, the provisions of which are implemented through national and regional legislation.

Due to the novelty of the technology and the state of the art, no regulatory context exists in the Spanish legislation on wave energy EIA. Thus, and although the environmental regulatory body decided that an EIA was unnecessary for the bimep project, the site managing body (Ente Vasco de la Energía, EVE) opted to conduct an EIA. The Environmental Authority stipulated that EVE should undertake comprehensive environmental surveillance during each part of the project. Subsequent to this, an environmental inventory of the natural environment most directly affected was conducted through *in situ* campaigns for characterising the hydrography of the site, the sediments, the benthic communities and the hydrodynamics (see SOWFIA WP4 interim report, D4.4).

The potentially most severe impacts identified related to mooring of the devices as this can significantly affect both the sediments and benthic communities. The cables could result in changes to the electromagnetic fields which could potentially impact fish fauna. The functioning of the WECs and O&M operations could also affect marine mammals (see SOWFIA WP4 interim report, D4.4). All the information above is presented in the EIA for bimep, which is already in the SOWFIA DMP.

4.4.3.2 **Strategic recommendations**

From a strategic point of view, it would be beneficial to set up a national standardisation committee to establish environmental standards. It would also be useful if the environmental authorities took already existing experience from wave energy EIAs into account when making future decisions. When possible, it would be easier for authorities to follow a path based on previous experiences.

4.4.3.3 **Operational recommendations**

It is important to establish mechanisms that allow project developers to exchange information and knowledge of their wave energy development experience and also those from other offshore sectors (see SOWFIA D2.5 report). This would help developers avoid repeating the same surveys regarding environmental issues and allow them to estimate how long the process would last.

4.4.4 Consultation

4.4.4.1 **Developers and stakeholders concerns and opinions on consultation**

Spanish procedures offer ample opportunities for any stakeholder that might be affected by any project, to express their concerns (see SOWFIA D2.3 report). Whilst it is not always possible to reach a consensus before a development begins, the procedures in place enable all interested parties to raise any concerns they might have during the associated public meetings and in this way amendments can be made to the project. This stage of the procedures gives the opportunity not only to stakeholders to express their views about the project but also to promoters to change the project since sometimes those proposed amendments may improve the implementation of the whole project.



4.4.4.2 Strategic recommendations

It is vital to provide stakeholders with realistic timelines to allow them to respond to consultations. At same time, timelines should not be too extensive, since the promoter or the developer will have to respond to any queries raised, adding time to the consenting process and potentially delaying the project's progress.

4.4.4.3 Operational recommendations

The only recommendation given on this matter is to hold informative meetings with the interested parties as soon as the project is defined in order to save time at the beginning of the process. When doing so it should be borne in mind that not all stakeholders are equal. It is also advisable to avoid consultation fatigue (see SOWFIA D4.3 report).

4.5 Sweden

4.5.1 Integrated planning

4.5.1.1 Implementation of strategic plans

The main legislation in Sweden for consenting marine energy projects is the Environmental Code (effective since 1999). In chapter 6, the EIA Directive is implemented and this chapter states the requirements of the consenting procedure. Whilst offshore wind power projects are governed by chapter 17, wave power projects in Sweden are and are likely to continue to fall under chapter 11 on "Water activities".

No MSP or SEA has yet been undertaken for the use of marine space in general or marine energy specifically. The responsibilities of future MSP will be managed within the new and recently started (2011) Swedish Agency for Marine and Water Management. However, by summer 2013 only preparatory work on MSP was underway.

Uppsala University, being one of the consultees and institutional bodies considering the proposed legislation and work outline for the Swedish Agency for Marine and Water Management emphasised the importance of MSP. The forecast for a published MSP is not foreseen for several years.

No national goal or policy declaration for renewable energy has yet included wave or tidal energy within its plans or calculations for future renewable energy production. The EU-goal of 50% renewable energy in the Swedish electrical mix is perhaps already met (2013) or will most certainly be met within the next few years. This is due to the high percentage of existing hydro power (+40%) production, along with wind power (7%) and a considerable contribution from bio fuels. Tidal power is not feasible in Sweden due to lack of a tidal resource. However, the use of similar techniques for stream/current power, using e.g. rivers and currents in straits etc., has the potential to contribute several TWh/year. A resource assessment of wave power in Swedish waters has recently been estimated to be approximately 10 TWh/year, and for the wider Baltic region to approximately 24 TWh/year.

Consequently, the lack of national initiatives for wave power means that no special support exists for the industry or its general development, and no resources are set aside from the government.

4.5.1.2 Strategic recommendations

The implementation of strategic work, such as MSP, is of utmost importance as the use of marine space in Sweden is accelerating quickly and a comprehensive view of present and future need and sharing of the marine space cannot be underestimated.

4.5.1.3 Operational recommendations

The need for integrated planning is pressing and has been highlighted by educational bodies, developers, local stakeholders and entrepreneurs, and most likely within local and regional authorities. In fact, several local authorities are now cooperating within “Blue” agendas in order to promote appropriate marine initiatives. Initiatives and concrete agendas at national level are, however, still missing or not in effect, and should be advanced at a faster pace to meet future requirements.

4.5.2 Administrative procedures

4.5.2.1 Consenting process summary

There is no “dedicated” and especially well-functioning consenting process for marine energy projects such as wave power in Sweden. Instead, the consenting process is similar to that for any project in “common” waters. Although offshore wind power projects are dealt with under a different chapter of the Environmental Code, consenting for wave power projects shares many features with that of offshore wind projects, including pre- and post-consent investigations and research and consideration of conflicting activities, such shipping, fishing and, e.g. military activities.

Apart from the general contents of the EIA process, described in SOWFIA report on “Review of consenting processes for ocean energy in different EU Member States” (D4.5 report), additional requirements are likely to arise, including permits and consents from a number of authorities, all slowing down the consenting process as a whole. Moreover, several authorities also ask for relatively detailed EIA-documentation (e.g. copies of EIA documents are required by the Environmental Court). The value of this may be questioned, since these authorities (e.g. dealing with the Electrical Act) have no, or at least very little, insight on matters related to the environment, with the result that unnecessary requirements are imposed on the developer.

The Swedish experience is as follows. The 24 regional authorities (Länsstyrelsen) have the main responsibility for the EIA process and the process does, to a large extent, function comparatively smoothly. Rather, it is the additional requirements and consents required that are not streamlined and which may make the process more time consuming and costly for developers and marine energy development in general.

4.5.2.2 Strategic recommendations

Whereas a “one stop shop” procedure may not be justifiable at the current stage in the development of the wave energy sector, in part because it would require multiple changes to existing legislation, a more simplified and pragmatic process would benefit the authorities (that often have limited resources and personnel), as well as technology and site developers. It would also be highly desirable to reduce the duplication and triplication of documentation currently required by different authorities.

4.5.2.3 Operational recommendations



Better coordination between the different relevant authorities involved in areas such as marine renewable energy is common sense and should not be problematic to achieve. Administrative tasks and costs could certainly be reduced in many areas, for instance, if common standards for project information and documentation required could be agreed upon. The waiting time during and between different stages of the consenting process are also at risk of increasing because of a lack of personnel within the relevant authorities and among stakeholders from which comments are needed during the review and consultation process. Lack of human resources, or their willingness to reply in time, is therefore a major concern.

4.5.3 Environmental Impact Assessment

4.5.3.1 **Experience on EIA for wave energy**

The Swedish experience on EIA, related consenting process, and other aspects of wave energy ventures is generally positive. The whole process is still too slow but the EIA-process is reasonably consistent and, compared to other countries, somewhat more pragmatic.

EIA experience in Sweden derives from two wave power projects: the Lysekil project operated as a research and test facility for the WEC-concept developed at Uppsala University, and the commercial Sotenäs project. The Lysekil site received its first consents in 2004 and experiments have been ongoing at the site since then. During 2013, new rounds of consultations continued alongside the preparation of an EIA and an application to the Environmental Court. Permits for a more permanent project and an extension to the test site area will be applied for to enable more equipment to be employed as well as providing a possibility for external developers to use the marine test site.

The second experience relates to the commercial wave power park planned outside the municipality of Smögen on the Swedish west coast, the “Sotenäs-project” developed by Seabased and the utility company Fortum. The Seabased wave power technique was first developed at Uppsala University.

Regarding the physical and the biological marine environment, the Swedish scientific and authority approach has taken a reasonably pragmatic approach. The questions brought up have mainly been appropriate, although in the Sotenäs-project the court decision required the project to “investigate fish” without further explanation. The limited size of the project has not raised questions on e.g. changes in currents and sedimentation or other coastal processes, although these might be likely questions in larger future projects, or if projects are located in more sensitive environments. No special concern has been given to marine mammals or birds in the area.

Sweden is a large country with a relatively sparse population in comparison with other European countries. Conversely, entirely “conflict free” sites for wave power may be unachievable due to a lack of economically feasible connections to nearest grid connection. If care is taken, however, it is still relatively easy to find suitable locations for wave power whilst respecting nature conservation issues. Compared to most other SOWFIA member states, the marine fauna is less rich in species and there is less chance of “red-listed” species occurring at a project site.

4.5.3.2 **Strategic recommendations**

New technologies are being developed and financed by small-medium enterprises; however, smaller-scale projects can face disproportionate burdens if they are required to commission environmental and societal studies while, at the same time, being actively encouraged by politicians and policies. Ideally, greater financial and other forms of assistance (e.g. with conducting studies) would help to equalise this burden whilst speeding up the implementation of marine renewable energy projects.

In Sweden, it is definitely the case that more governmental support is required for studies on common environmental issues, since they are often of a strategic, regional or national nature as well as being local concerns, and should be treated as such. This should be seen in the perspective of the strong governmental incentives for the promotion of renewable energy.

4.5.3.3 Operational recommendations

A national Swedish “red book” on where and where not to locate marine renewable projects, along with guidelines on how to approach necessary environmental issues and how to find support for financing them, would help planned future marine energy projects and hasten their entry into the market on a national level. This is, of course, also a goal within MSP.

4.5.4 Consultation

4.5.4.1 Developers and stakeholders concerns and opinions on consultation

Some insights into the views of Swedish stakeholders were achieved during the questionnaire conducted as part of the SOWFIA project. Further insights have also been obtained from the latest consenting and consultation process for the Lysekil project as well as for the commercial Sotenäs project.

The consultation process has functioned relatively smoothly for all three Swedish wave power projects. For the most part, the public seems to be relatively well acquainted with the process, although consultation meetings are not necessarily always well attended. Some authorities do not always respond, though one could foresee some interest in the issue from a particular authority. Others do respond with unusual questions and requirements that arguably reflect a lack of knowledge and understanding of the marine energy sector’s needs rather than an appreciation of these.

Important experience can be derived from the fact that all three projects have placed special emphasis on the dissemination of general information that has been distributed both before and after the consultation meetings.

4.5.4.2 Strategic recommendations

Well-prepared meetings with presentations adapted to the level of interest and understanding of the audience are seen as essential for effective consultation. Meetings should also be held at early stages in the consenting process, giving time for reflection and responses. Strategic guidance to developers and authorities on organising effective consultation processes could be of significant value as and if the wave energy sector expands.

4.5.4.3 Operational recommendations

It is important to organise effective consultation processes in terms of time and resources, especially when a large number of authorities and stakeholders are involved. Authorities should ensure that both competent and a satisfactory number of officials are available to handle the processing and evaluation of evaluations. Time delays by authorities may further delay a number of other deadlines, resulting in avoidable and costly delays to projects.



4.6 United Kingdom

4.6.1 Integrated planning

4.6.1.1 Implementation of strategic plans

The EIA Directive is the main EU legislation setting out procedural requirements for granting permissions for projects that are likely to have a significant impact on the environment. Most proposals for marine renewable energy developments will fall within the scope of the EIA Directive. In the UK, for those under 100 MW, the Marine Management Organisation (MMO) determines whether an EIA must be completed, but for Nationally Significant Infrastructure Projects (NSIP), this task currently falls to the Major Infrastructure Unit of the Planning Inspectorate, with final decisions being made by the relevant Secretary of State. If an EIA must be conducted, the applicant is required to prepare an Environmental Statement (ES); under the Planning Act 2008 this process is governed by the Infrastructure Planning (EIA) Regulations 2009. In its explanatory notes, the regulations restate that the EIA Directive requires an EIA to be conducted before development consent is granted for projects that have significant environmental impacts.

Regulation 11 of the Infrastructure Planning (EIA) Regulation 2009 requires that the pre-application consultation must include consultation with relevant consultation bodies on the preliminary environmental information required for the EIA process (Department for Communities and Local Government, 2009). The EIA directive does not establish mandatory environmental standards and, although the relevant authorities must take the results of the EIA and consultation into account, they are not obliged to draw specific conclusions from them. Consultation in an EIA procedure takes place during the consultation phase, at which point environmental authorities and the public must be consulted. After decisions have been made, the public will be informed and an opportunity is provided to mount legal challenges to decisions.

One major difficulty with assessing the environmental impacts of marine renewable energy developments is that the levels of risk and ecological impacts of developments are largely unknown, since wave and tidal technologies are at a relatively early stage of development and local ecological conditions can vary significantly. The Marine Policy Statement calls for further research to develop a better understanding of the impacts of the technologies on potentially sensitive environmental features. In contrast, the Department for Communities and Local Government's National Planning Policy Framework indicates that developments must be approved without delay, unless the adverse impacts of allowing development would demonstrably and significantly outweigh the benefits, when assessed against the wider policy objectives in the National Planning Policy Framework (Department for Communities and Local Government, 2011). This presumption in favour of development has been challenged by a parliamentary committee as giving a green light to inappropriate development.

Onshore developments connected to marine renewable energy development, such as the construction of electrical sub-stations or above-ground onshore cables, are likely to require consent from the relevant Secretary of State under Section 37 of the Electricity Act 1989. In applying for consent, an application can also be made for deemed planning permission under the Town and Country Planning Act 1990 and the Secretary of State may attach conditions to the consent relating to the control and impact of overhead lines. An alternative route for consent is where consent can be granted under Section 3 of the Transport and Works Act 1992. Both consenting routes have been validated through the experiences of offshore wind developers in UK waters.

The Marine and Coastal Access Act 2009 requires the preparation of a marine plan for each English inshore and offshore region. These are intended to: 'provide a clear, spatial and locally-relevant

expression of policy, implementation and delivery’ (HM Government, 2011: 10) and to ensure that management of different and potentially competing activities takes place in a manner consistent with sustainable development. Key foci of the plans will be promoting compatibility between uses of marine areas and the reduction of conflicts. In the marine plans, general policies and objectives will be closely linked to local circumstances, with local authorities adopting the relevant marine plan.

Decision-making for the marine plans will be required to take into account a number of principles. The ones relevant for stakeholder consultation and MRE development are that decisions:

- Involve appropriate liaison with terrestrial planning authorities and other regulators, in consultation with statutory and other consultees when appropriate;
- Are sensitive to any potential impacts on sites of particular significance, including those protected under environmental legislation or cultural heritage, or of particular social or economic significance (HM Government, 2011).

Plans must also be based on widespread participation and the input of information from consultees, stakeholders, regulators and relevant experts. More specifically, input for the plans should be based on a wide range of sources, including: existing plans (e.g. terrestrial development plans and river basin management plans); scientific advice; statutory and other advisors; industry and other marine users; and the plan area community. Among other things, marine plans should identify the areas where deploying marine renewables would be most appropriate, and also include measures to prevent, mitigate, or when this is not possible, compensate for potential negative impacts in line with legislative requirements such as the Birds and Habitats directives.

In order to comply with other EU and UK legal requirements, each marine plan must undergo a Sustainability Appraisal, which should consider the benefits and adverse social, economic and environmental effects of the draft marine plan for the area. It must also incorporate an SEA that fulfils the requirements of the European SEA Directive (2001/42/EC). The SEA Directive requires that: ‘during the preparation of the plan, the marine plan authority must prepare an Environmental Report on the likely significant environmental effects, consult designated environmental bodies and the public, and take the report and the results of consultation into account. Requirements for monitoring the effects of implementing the plan must also be met’ (HM Government, 2011).

In England, the preparation of marine plans has been delegated to the Marine Management Organisation. However, the Secretary of State must approve marine plans. Demands on the plan area must also be identified, including different activities planned to take place in the area, so as to assist in reducing conflicts. Again, the involvement of stakeholders and local communities in the planning process is required to achieve this.

One task of marine planning is to contribute to sustainable economic growth and resilient local economies, including the creation and protection of local jobs. Local infrastructure developments and the optimisation of environmental resources through eco-tourism and recreation are given as examples of activities that meet these goals. Marine planning also highlights the need for integrating social considerations into plans, related to equality, community cohesion, wellbeing and health, and the assessment of implications for the marine environment (HM Government, 2011). The broader aim is that marine plan authorities should integrate marine plans with terrestrial planning and community engagement so as to contribute to vibrant coastal communities, taking into account cultural heritage, seascape and local environmental quality (HM Government, 2011). Integration is likely to pose significant challenges in some areas suffering from high levels of stress or use.



Both the Marine Policy Statement and the Marine and Coastal Access Act 2009 promise individuals the opportunity to have a real say in marine planning. The Act also promises simplification of marine renewable energy consenting by ensuring only one administrative process is used to consider all the marine elements of applications.

4.6.1.2 Strategic recommendations

The implementation of integrated planning through area-specific MSP and SEAs is relatively well-advanced in the UK. Dedicated wave energy documents, alongside those for other offshore energies, have been produced for both MSP (European Commission 2010) and SEAs (European Parliament, Council 2001) and the Department of Energy and Climate Change (DECC) is conducting a specific Offshore Energy Strategic Environmental Assessment (OESEA) of a draft plan/programme for future leasing of offshore wind, wave and tidal devices (Department of Energy and Climate Change 2011). In 2013, the MMO produced an updated strategic scoping report identifying the natural resources and activities for the UK marine area (Marine Management Organisation 2013a). An evaluation of the potential for the co-location of activities in marine plan areas was also produced in 2013 (Marine Management Organisation 2013b).

Initiatives that address the strategic recommendations identified within the SOWFIA project are, thus, already underway in the UK and especially advanced in Scotland through the activities of the Scottish Government and Marine Scotland (MS). DECC's Marine Energy Programme Board makes recommendations to the government on priorities for the Marine Energy Programme which in turn can be taken forward and implemented by the individual governments of the devolved administrations and their agencies. Regular review and reinforcement of these plans and, crucially, their implementation are required to maintain their momentum and to adapt to possible future changes on the technological, economic, political or social circumstances. Priority should also be given to promoting knowledge exchange and the transfer of successful practices between the various consenting authorities. One option to consider is adoption of the Marine Scotland model across other parts of the UK or, if this is legally or administratively difficult, the promotion of functional convergence involving the incorporation of elements of different systems that have a proven track record of reducing the time and costs involved in consenting.

Another strategic challenge to the expansion of the wave energy sector in the UK is regulatory uncertainty surrounding the financial incentive mechanisms used to promote renewable energy. This is outside the scope of the consenting process, so is not discussed in detail here except to say that although elements of the switch from the Renewables Obligation to Contracts for Difference may be advantageous to wave energy, long-term policy stability combined with appropriate price support is vital if private investment the emerging wave energy sector is to materialise. Frequent changes in policy instruments and support prices will not provide such conditions.

4.6.1.3 Operational recommendations

Two main operational recommendations can be outlined for the UK regarding the integrated planning actions on MSP and SEAs. The first is to continue implementation of the initiatives throughout the UK and to promote knowledge exchange between actors involved in the sector over and above formal or functional convergence of UK consenting systems. For example, the South West Marine Energy Park (SWMEP) provides advice to regional offshore renewable energy plans. The recently created Marine Data Exchange, the Wave and Tidal Knowledge Network developed by the Crown Estate, and the Data Management Platform developed by SOWFIA project will help with planning and the identification of areas for development. The second, again following the strategic

recommendations detailed above, is to encourage continued collaboration between the different UK agencies as already occurs between MS and the MMO.

4.6.2 Administrative procedures

4.6.2.1 **Consenting process summary**

As has already been noted, the consenting process for ocean energy projects in the UK varies according to the jurisdiction in question. To make an application in England and Wales, applicants must register for an online service account with the MMO, submit an initial enquiry and receive pre-application advice about screening, scoping and the Environmental Statement (ES) prior to making a licence application. Although there is no dedicated legislation for ocean energy projects, the MMO has established an Offshore Renewable Energy Licensing Group (ORELG) to provide assistance and guidelines. Again as noted previously, two consenting regimes exist for projects in English waters: (i) Nationally Significant Infrastructure Projects (NSIPs) covering projects over 100 MW capacity; and (ii) projects under 100 MW capacity. The former are determined by the Secretary of State for Energy and Climate Change acting on advice from the Major Infrastructure Planning Unit. The MMO is the licensing body for projects under 100 MW capacity and is also a statutory consultee for NSIP elements affecting marine areas. Other components of projects are licensed under different legal requirements. These are:

- Marine licence, required under section 66 of Marine and Coastal Access Act 2009;
- Section 36 consent (Electricity Act 1989) to build and operate an energy generation site;
- Safety zones consent (section 95 of Energy Act 2004); and
- European Protected Species licence (Conservation of Habitats and Species Regulations 2010 and Wildlife and Countryside Act 1981 (as amended)).

In Wales, developers are required to submit an application for a Marine Licence and, in some cases, an Emissions Performance Standard (EPS) licence. Local planning authorities are responsible for onshore planning for projects in both Welsh and English waters (<http://www.marinemanagement.org.uk/>).

Marine Scotland is the “one stop shop” authority for issuing marine licences in Scotland (Scottish Government, 2010). First, developers hold a pre-screening consultation to receive advice on: the appropriateness of the site; whether an Appropriate Assessment may be needed; environmental information required; stakeholders to be consulted; and likely costs and timeframes. This is followed by formal EIA screening and scoping, where advice is again offered and opportunities exist to consult with other relevant authorities. Mandatory documentation, including the EIA, Navigational Risk Assessment and Habitats Regulations Appraisal, is then submitted for processing. During this stage, developers may be asked to provide clarifications or further information. If the application is unsuccessful, developers are given explanations and advice on how to proceed. If successful, consents and conditions (e.g. on environmental monitoring) are issued. According to Marine Scotland, developers should allow nine months for consents depending on the completeness and quality of information submitted (Scottish Government, 2010). It is important to note, however, that although Marine Scotland has sole responsibility for administering and issuing deployment consents (hence its common “one stop shop” label), seabed leasing remains the responsibility of The Crown Estate and requires separate negotiation.



The Department of the Environment Northern Ireland (DOENI) and Northern Ireland Environment Agency (NIEA) are responsible for marine licensing in Northern Ireland waters. No specific consenting rules for ocean energy projects exist, though new Marine Licensing legislation came into operation in April 2011. Additionally, a draft Marine Position Paper published in March 2012 sets out objectives and steps for the sustainable development of marine areas under Northern Irish jurisdiction. A Northern Ireland Marine Plan (NIMP) is being prepared under the Marine and Coastal Access Act 2009, whilst the Northern Ireland Marine Bill will further clarify the consenting process for ocean energy developments.

The timescale for consenting ocean energy projects varies across the UK depending on the complexity of the proposal, public interest, and the nature of appeals. Marine Scotland aims to deliver licences in nine months, excluding EIA scoping. As an indication, MMO processes for offshore wind projects can take around 15 months. The only statutory period in legislation is the 42 days allowed for public comments following formal application. Applicants can normally expect screening and scoping opinions within 12 weeks of request and inquiries to be set up within 4-6 months. Around nine months from the date of inquiry should be expected before final decisions are made. An EIA is required for all devolved administrations in the UK. In addition, developers should provide detailed methodologies for the installation, operation and decommissioning of proposed devices and are encouraged to identify all potential hazards and risks associated with the project.

4.6.2.2 Strategic recommendations

The UK government has been developing the Red Tape Challenge initiative designed to draw on the experience and ideas of business and individuals to assist Departments in a review of the regulatory stock, to ensure regulations are fit for purpose. There are number of themes, one of which is dedicated for water and marine. The marine proposals were considered in the Focus on Enforcement review into Coastal Development which reported in February 2013 (Department for Business Innovation and Skills 2013). This document deals with good practice and highlights DECC's approach to dealing with wave energy, as part of which, DECC has established a working group with regulators, which is working to prepare the regulatory environment (Department of Environment Food and Rural Affairs 2013).

4.6.2.3 Operational recommendations

Marine Scotland acts as the main consenting body in Scotland, the MMO in England, NRW/MMO in Wales, and DOENI in Northern Ireland. These bodies are actively engaged with, and have made significant advances already in, improving the administrative procedures relating to wave and other offshore renewables. A clear example of this is the "one-stop shop" approach taken by Marine Scotland, which has been found to be a very efficient approach that aims to boost the sector in a sustainable manner. As mentioned above, it is also recommended that increased collaboration and standardisation among the different jurisdictions of the UK be encouraged.

4.6.3 Environmental Impact Assessment

4.6.3.1 Experience on EIA for wave energy

Experience of wave energy EIA in the UK to date has been gained mainly through the environmental assessments of wave energy technologies at the UK's two major wave energy test centres: EMEC in the Orkney Islands (Scotland) and the Wave Hub (South West England). The SOWFIA project has examined lessons from these sites in deliverable D.4.4 (analysing EIA experiences in these test centres and others in Europe) and deliverable D.3.5 (EIA experience for wave energy in Europe,

including EIA monitoring methods). The SOWFIA project has also collected environmental data for each of the European test centres analysed; these are available through the online Data Management Platform.

Analysis was conducted of the environmental assessment for Wave Hub, focusing on water quality, groundwater, coastal processes and marine fauna. According to the EIA, impacts on water quality, groundwater and sediments were not considered to be significant throughout the construction, operation or decommissioning phases. Impacts on coastal processes were also not classified as significant. The EIA also found that minimal changes in sediment transportation on beaches were expected along the northern Cornish coast.

The main aspects of marine fauna examined in the EIA were marine mammals, sea birds, fish and shellfish and benthos. The impact on the marine mammals was judged to be acceptable because the installation of WEC anchors or moorings was unlikely to involve either pile driving or seabed drilling. Construction noise was considered to have only a minor adverse impact on marine mammals because noise levels were likely to lie within the hearing range of marine mammals, whilst no significant impacts on sea birds was foreseen provided appropriate mitigation measures were employed. The main sensitive fish species analysed was basking sharks, where the main impact of concern was the electromagnetic fields generated by cables, although this was again considered to be unlikely to cause major disruption. Nonetheless, the sensitivity of the species meant that ongoing monitoring was required. The impact on the benthic environment was not seen as significant because disturbance to intertidal seabed communities from the installation and decommissioning of the connecting cable was considered to have minimal impact due to rapid re-colonisation of the surrounding seabed.

4.6.3.2 Strategic recommendations

The following strategic recommendations are made based on the findings of the UK EIAs for marine projects. First, specific research projects comparing the impacts of different wave energy technologies deployed in the same location are recommended to help improve understanding of how different technologies interact with the marine environment that can then be used to produce guidelines for future deployments. Second, further research programmes to promote understanding of the environmental impact of marine renewables, such as the NERC and EPSRC SuperGen Marine Research programmes, are encouraged. Third, enforcement of existing initiatives and development of necessary infrastructures to enhance data exchange for publicly-funded data collection activities are encouraged. Parallel efforts to make data from privately-funded studies publicly available are also encouraged.

4.6.3.3 Operational recommendations

Marine Scotland and Scottish Natural Heritage, among others, have developed EIA guidance documents for developers and test sites. These documents should be monitored to check their effectiveness and establish a continuous improvement process. Baseline and impact data should be made publicly available for the EMEC and Wave Hub test centres. Additionally, specific EIA requirements should be established for each site building on existing knowledge of their respective sensitivities.



4.6.4 Consultation

4.6.4.1 **Developers and stakeholders concerns and opinions on consultation**

Analysis of developer and stakeholder opinions on consultation was based on the Wave Hub (Cornwall); and European Marine Energy Centre (EMEC, Orkney) test sites, so does not necessarily reflect the situation in other areas. Analysis of opinions on consultation processes is also constrained by the limited participation by many groups in consultations. For instance, only 8% of residents surveyed in Cornwall had attended public consultations for the Wave Hub; attendance by other groups was also low, except for representative organisations such as commercial fishing.

The impression among statutory consultees was that consultations for the Wave Hub provided good opportunities to review data and offer opinions. Similar views were expressed by some recreational water-user groups and non-government organisations about technical data provided on the effects of wave devices on waves and benthic habitats, though some groups argued that decisions on key issues, such as the location of test centres, appeared to have been made prior to consultations taking place and that they were mainly public relations exercise. Opinions on whether stakeholder views had been taken into account often appeared to be determined by whether decisions reflected groups' interests. Most stakeholder organisations were nevertheless generally satisfied with the opportunities provided – and the publicity for events – and felt that communities did not always take advantage of opportunities, though others felt that the timing and locations for events were not always convenient.

A more general criticism of Wave Hub consultations was the strong emphasis placed on local economic benefits by developers and local authorities. This led to some disappointment, particularly where high-skill jobs created were not suitable for the general workforce. Similar criticisms were levelled about the information provided to support claims made about the lack of environmental impacts and projected local economic benefits. Some stakeholders argued that full evaluation of many impacts would only be feasible after several years and that uncertainties were communicated inadequately. The main conclusions from stakeholders were that, in general: they were satisfied with the timing and levels of information and communication channels offered; and that consultations were well organised and publicised. Lack of engagement and knowledge about MRE among local residents remains an issue.

Most developers surveyed felt that the stakeholder consultation procedures used for the Wave Hub and EMEC were adequate or more than adequate, and argued that industry best practice and precedents had been established for managing stakeholder engagement. There were still risks, however, that developers might use inappropriate approaches in order to strengthen the case for approval. A further area of tension identified was the business risks of EIA and consultation; most developers understood the business case for rigorous site selection and stakeholder engagement procedures but noted that they added to developers' costs during the consenting phase.

Other developers felt that consenting still needed to improve in the UK, in particular to reduce discrepancies between different parts of the UK. Some developers had found that techniques which had operated successfully in some jurisdictions had not translated well into other contexts. Another concern was that licensing teams in the UK appeared to be under-resourced and that expertise and resource shortages had created delays in organising applications and consents. It can sometimes take months to see licensing teams.

Other comments made by developers to improve stakeholder consultation included:

- Greater strategic management at regional and national level through constraint mapping and spatial planning (though see Section 4.6.1 on MSP);
- Clearer commitment by national and regional government to mitigate and reduce regulatory overlaps and inconsistencies;
- The award of a licence should not depend on granting local benefits. Developers should be free to find competitive contractors and not use local ones.

4.6.4.2 Strategic recommendations

Legal and regulatory frameworks for stakeholder consultation are generally well-developed in the UK as a result of the Marine and Coastal Access Act 2009 and the consultation requirements of the EIA and SEA directives. The roll-out of MSP has also contributed to an accumulation of experience by the MMO and other relevant authorities with local - and regional-level consultation over the “in-principle” siting of marine renewable energy developments. The UK nevertheless still faces challenges created by the different consenting processes operating in different parts of the UK. Marine Scotland’s “one-stop shop” approach is widely regarded as an efficient approach for managing consents compared with the English and Welsh systems. However, comparisons are often based on the relative simplicity, speed and success rate of applications, not necessarily the effectiveness or equity of consultation processes. Equally, the lower population densities around many parts of the Scottish coast combined with the concentration of most marine energy activities around the Orkney Islands mean that the potential for stakeholder tensions is less severe in general in Scotland compared with England and Wales. Moves towards greater convergence between the UK’s consenting systems (within legal and other constraints operating in the UK) may therefore be desirable not just in helping to accelerate the growth of the marine energy sector but also in addressing inconsistencies between consultation approaches.

The classification of marine renewable energy projects in excess of 100 MW as NSIPs has the potential, if future developments reach this size of deployment, to place constraints on the capacity of local stakeholders to influence decision-making because applications are decided by the Secretary of State rather than through local processes. This tension is highlighted in the 2007 Energy White Paper, which comments that the: ‘wider benefits [of NSIPs] are not always immediately visible to the specific locality in which the project is sited. However, the benefits to society and the wider economy as a whole are significant and this must be reflected in the weight given to the considerations by decision makers in reaching their decisions’ (Department for Trade and Industry 2007). No strategic recommendations are immediately obvious to manage this trade off, though rigorous application of EIA and SEA procedures preceded by active consultation during the development of marine spatial plans for different areas of UK waters will be needed to ensure the decisions and advice from the Major Infrastructure Unit are adequately informed by stakeholder input.

4.6.4.3 Operational recommendations

It is recommended that wave energy project developers ensure early consultation with local stakeholders in order to increase their participation in consultation processes. Benefits can also be gained through providing appropriate and timely information and giving careful consideration to effective communication channels.



5 Conclusions

This report has summarised the work done during Work Package 4 of the SOWFIA project examining consenting processes for wave energy in the European countries examined and the integration of stakeholder opinions into wave energy consenting processes. The barriers and accelerators identified in WP2 have also been considered and recommendations have been proposed under four main themes: integrated planning; administrative procedures; EIA; and consultation. These encapsulate a range of more detailed issues that require consideration and further work to streamline wave energy consenting in EU countries, particularly with respect to development of larger projects.

First, further progress towards the implementation of strategic plans like MSP and SEA in all the Member States would represent a major step towards the effective management of different uses of maritime areas. Second, customised licensing procedures for marine renewable energy do not exist in most of the countries analysed, although some countries have taken steps in recent years to adapt existing legislation to accommodate wave energy. The size of the wave energy sector perhaps does not yet justify the development of bespoke legislation; however, the growing focus on marine renewables technologies in the last decade (particularly off-shore wind), combined with the potential for wave and other technologies to achieve commercial viability and differences in the profiles of different technologies, indicates a need for ongoing monitoring of developments and anticipatory planning for further changes in legal frameworks to avoid the absence of suitable legislation hindering the development of the sector.

Third, some experience with wave energy EIA exists but reliable baseline and impact data are not yet available because few installations have been developed and even fewer have been operating for a significant period of time. The lack of data and structured data sharing arrangements has the potential to hinder the transfer of knowledge and the improvement of environmental assessment for wave energy projects. Fourth, despite the existence of detailed consultation requirements in MSP, SEA, and EIA, for instance, concerns remain among many stakeholders that developers and licensing authorities still do not take local or sectoral concerns seriously enough, particularly with respect to decisions about the location of installations. This may explain the limited engagement by many stakeholders in consultation processes and limited attendance at consultation events. The time periods for consultation are also often too short for local groups to respond as documentation relating to the EIA process is usually lengthy and technical. Nevertheless, people are generally supportive of marine renewables including wave energy.

The following general recommendations to improve wave energy consenting processes in Europe are made:

- Further efforts to promote the development and implementation of MSP;
- Fully apply the SEA process to marine renewables and wave energy so as to inform development siting and locational guidance;
- Where possible, the introduction of ‘one-stop-shop’ consenting approaches (or the definition of a coordinating body) for wave energy project or at least better collaboration between authorities in a parallel processing approach;
- The amendment of current consenting processes towards tailored and fit-for-purpose licensing and the availability of clear guidance documents on licensing procedures in each country;
- The establishment of more common and consistent timeframes for licensing developments;
- Greater availability of EIA results, particularly impact evaluations and monitoring results to increase the knowledge base for the prediction and evaluation of impacts;

- The need for early engagement and consultation with local stakeholders and the creation of mechanism for considering concerns;
- The importance of giving more time for stakeholders to analyse project documentation and of appropriate consultation on the types of stakeholder contacted and the time and location of events

A summary of country specific recommendations are presented in Table 3.



Table 3 – Summary of the country specific recommendations proposed under the SOWFIA project. “S” means strategic and “O” Operational.

Critical themes	France	Ireland	
Integrated planning	<p>S</p> <ul style="list-style-type: none"> • Ensure effective public participation in MRE • Anticipate and plan grid connections within the framework of MRE deployment consenting • Introduce a coherent MRE policy • Consult more with agencies involved in marine ecology 	<ul style="list-style-type: none"> • Clear development policy for the marine area • A clear responsibility should be assigned for the MSP • Publication of the OREDP • More staff and resources are needed in SEAI for ocean energy 	<ul style="list-style-type: none"> • Implement the project attract project
	<p>O</p> <ul style="list-style-type: none"> • Plan the terms of MRE according to the objectives in the SNML • Specify in the Environmental Code the quantitative and qualitative objectives of DSF for MRE • Define national and regional zoning to improve protection of marine and coastal habitats • Clarify the compatibility of MRE with the objectives of Marine Protected Area management 	<ul style="list-style-type: none"> • More resources for foreshore licensing section • Quicker development of MSP • Concerted effort of regulators and developers to improve the process 	<ul style="list-style-type: none"> • The co-Plug fa
	<p>S</p> <ul style="list-style-type: none"> • Simplify the consenting process • Create a procedure dedicated to MRE in the Energy Code • Anticipate and facilitate MRE connections to the grid • Facilitate the deployment demands for MRE • Encourage administrative simplification • Create a one stop shop administrative body • Create a specific EIA procedure for MREs cable connection 	<ul style="list-style-type: none"> • Coordination between authorities is needed • Small scale projects should not require planning permission since they do not need an EIA 	<ul style="list-style-type: none"> • Review coordin
Administrative procedures	<p>O</p> <ul style="list-style-type: none"> • Adapt regimes for preventive marine archaeology • Demonstrate decrease in emissions from MRE • Establishment of statutory time frames for consenting to limit the period for responses • Standardise national procedures to allow coherence between regions • Notify the planned purchase tariff with the European Commission to ensure its juridical safety 	<ul style="list-style-type: none"> • Creation of a one-stop-shop, or coordinating body • Separation of the role of landlord and the consentor to avoid conflicts of interest • Institutions must focus on the interdependency of permits • Guidance for energy developments included in the new Bill • Establishment of statutory timelines to limit the period for consenting response • Consenting small scale developments should rest with local authorities 	<ul style="list-style-type: none"> • Publish licensin website consen
	<p>S</p> <ul style="list-style-type: none"> • Establish clearer systems for ensuring impacts management during the project • Improve the use of the impacts assessment • Improve the knowledge of MRE potential and the maritime constraints associated with their development 	<ul style="list-style-type: none"> • More independent research to reduce uncertainty • Require developers to make all their data associated with EIA available as condition for consent 	<ul style="list-style-type: none"> • Organise regulat ocean • Create Portug impact
EIA	<p>O</p> <ul style="list-style-type: none"> • Implement effective mitigation measures regarding e.g. noise, seabed erosion and sensitive species • Experiment with the creation of new areas of integrated management of impacts from MRE farms • Conduct detailed analysis on the interactions between MRE and fisheries • Improve the knowledge on MRE potential impacts • Create open source environmental databases • Provide guidance on how to address unknown issues 	<ul style="list-style-type: none"> • Creation of a central repository of EIAs; make clear environmental assessment requirements available to all parties 	<ul style="list-style-type: none"> • Develop reports
	<p>S</p> <ul style="list-style-type: none"> • Ensure effective public participation in MRE mapping and development, e.g. via MSP • Use a coherent approach for gathering stakeholders’ opinions for consenting authorities 	<ul style="list-style-type: none"> • Ensure authorities and developers comply with the provisions of the Aarhus Convention 	<ul style="list-style-type: none"> • Provide especi being c • Introduce progra
Consultation	<p>O</p> <ul style="list-style-type: none"> • Plan the CODERST (local comity of health and technological risks) consultation before establishing public inquiries 	<ul style="list-style-type: none"> • Increase time available for public consultations 	<ul style="list-style-type: none"> • Develop efforts genera

Table 4 – Summary of the country specific recommendations proposed under the SOWFIA project. “S” means strategic and “O” Operational.

Critical themes		Spain		Sweden	
Integrated planning	S	<ul style="list-style-type: none"> Start MSP as a priority to identify and manage conflicts Construct and promote wave energy test centres and pre-commercial demonstration projects Establish financial incentives and funding for test centres 		<ul style="list-style-type: none"> Implement MSP to promote a comprehensive view of current and future needs and marine space 	<ul style="list-style-type: none"> Contin... and th... and to...
	O	<ul style="list-style-type: none"> MSP should promote the development of MSP Create R&D grant programmes for demonstration projects in test centres Implement a feed-in tariff system and preferential access to the electricity market 		<ul style="list-style-type: none"> Promote “blue growth agendas” at local and national levels 	<ul style="list-style-type: none"> Contin... UK, an... Englan... To incr... betwe...
Administrative procedures	S	<ul style="list-style-type: none"> Establishment of negotiations between ministries involved in the ocean energy consenting to improve the process 		<ul style="list-style-type: none"> Simplification of the consenting process to benefit both authorities and developers Minimise requirements for new documentation by different authorities overseeing different parts of consenting 	<ul style="list-style-type: none"> Contin... initiati... regulat...
	O	<ul style="list-style-type: none"> Implement a coordinated parallel processing approach Establishment of statutory time frames to limit the period for consenting response 		<ul style="list-style-type: none"> Better coordination between relevant authorities Reduce administrative work and costs Increase human resources in regulatory bodies 	<ul style="list-style-type: none"> Encour... among...
EIA	S	<ul style="list-style-type: none"> Establish national standards for environmental assessment 		<ul style="list-style-type: none"> More governmental support for studies on environmental issues to recognise them as strategic, regional or national concerns as well as local ones 	<ul style="list-style-type: none"> Promo... assess... Encour... data e...
	O	<ul style="list-style-type: none"> Establish mechanisms that allow project developers to exchange knowledge and experiences Facilitate transfer of experiences from other offshore sectors 		<ul style="list-style-type: none"> Develop a national Swedish “red book” on where to, and not to, locate marine renewable projects Produce guidelines on environmental assessment and how to find support to finance them 	<ul style="list-style-type: none"> Monito... contin... Baselin... availab... Establi...
Consultation	S	<ul style="list-style-type: none"> Provide stakeholders with realistic timelines to respond to consultations 		<ul style="list-style-type: none"> Early stage and well prepared consultation, adapted to the level of interest and understanding of the audiences 	<ul style="list-style-type: none"> Rigoro... consul... Infrast...
	O	<ul style="list-style-type: none"> Hold information meetings with interested parties as soon as the project is defined 		<ul style="list-style-type: none"> Ensure that competent and satisfactory numbers of officials are available to evaluate applications 	<ul style="list-style-type: none"> Ensue... Provid... consid...



6 References

- Commission of the European Communities (2012) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions. Entrepreneurship 2020 action plan COM (2012) 795 final. Available from: http://ec.europa.eu/enterprise/policies/sme/entrepreneurship-2020/index_en.htm
- Commission of the European Communities (2013) Proposal for a Directive of the European Parliament and of the Council establishing a framework for maritime spatial planning and integrated coastal management COM (2013) 133 final. Available from: http://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning/index_en.htm
- Conley, D.C., Magagna, D., Greaves, D., Aires, E., Chambel Leitao, J., Witt, M., Embling, C., Godley, B., Bicknell, A., Saulnier, J. B., Simas, T., O'Hagan, A. M., O'Callagahn, J., Holmes, B., Sundberg, J., Torre Encirso, Y. & Marina, D. (2013) SOWFIA Deliverable D3.5 - Work package 3 final report: Report on the Analysis of Environmental Impact Assessment Experience for Wave Energy. Plymouth. 98 pp. Available at: www.sowfia.eu
- Department for Business Innovation & Skills (2013) Focus on enforcement regulatory reviews. Review of Coastal Projects and Investments.
- Department for Communities and Local Government (2009) Planning Act 2008: guidance on pre-application consultation, <http://infrastructure.independent.gov.uk/wpcontent/uploads/2009/08/guidancepreapplication.pdf>
- Department for Communities and Local Government (2011) Planning, building and the environment, <http://www.communities.gov.uk/planningandbuilding/about/>
- Department for Trade and Industry (2007) Energy White Paper: Meeting the Energy Challenge, London: The Stationery Office.
- Department of Energy and Climate Change (2011) OSEAS2 Environmental Report and supporting annexes, London.
- Department of Environment Food and Rural affairs (2013) Red Tape Challenge – Water and Marine Theme. Marine Proposals.
- European Commission (2010) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions Maritime Spatial Planning in the EU – achievements and future development.
- European Parliament, Council (2001) Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.
- HM Government (2011) UK Marine Policy Statement. London, The Stationary Office.
- IEA-RETD (International Energy Agency – Renewable Energy Technology Deployment). 2013. Overcoming environmental, administrative and socio-economic barriers to renewable energy technology deployment – A guidebook. RENBAR. 39 p. Available from: http://iea-retd.org/wp-content/uploads/2013/07/RENBAR_Guidelines_IEA-RETD_2013.pdf
- Marine Management Organisation (2013a) Strategic Scoping Report.
- Marine management Organisation (2013b) Evaluation of the potential for co-location of activities in marine plan areas.
- O'Hagan, A.M. and Lewis, A.W. (2011) The existing law and policy framework for ocean energy development in Ireland. *Marine Policy* 35, 772–783.

- UN Economic Commission for Europe (1998) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), <http://www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf>