



ENGAGING THE REGULATORY COMMUNITY TO AID ENVIRONMENTAL PERMITTING/CONSENTING PROCESSES FOR MARINE RENEWABLE ENERGY

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INTRODUCTION

The relatively new marine renewable energy (MRE) industry has faced regulatory challenges due to the uncertainty surrounding potential environmental impacts that have often stalled its advancement [1]. While the MRE industry continues to move forward, barriers and challenges remain for environmental permitting (consenting), including a lack of awareness of existing knowledge on environmental effects. A fundamental struggle for MRE is the high costs of baseline environmental assessments and post-installation monitoring and long timelines for obtaining permits, which leads to uncertainty and risk for financing developments [2]. The OES-Environmental¹ initiative set out to work with international regulators to decrease such barriers for permitting MRE developments.

REGULATOR SURVEY

Working with the 15 OES-Environmental countries, a regulator survey was deployed to engage key regulators to understand regulatory knowledge and perspectives on MRE as well as significant challenges and information needs for permitting environmental effects of MRE. The regulator survey has been completed in the United

States (US), United Kingdom (UK), Sweden, Spain, France, and Ireland and is in progress in Japan. A total of 62 regulators have responded to the survey (36 from the US, 12 from France, seven from the UK, four from Ireland, two from Spain, and one from Sweden).

Knowledge of the MRE Industry

While 65% of survey participants have been involved in permitting an MRE development, many are not familiar with specific MRE technologies (Figure 1). Overall, regulators are more familiar with tidal devices than wave energy converters. UK regulators are most familiar with MRE energy devices, followed by Ireland. This is likely due to the larger number of deployed MRE devices and knowledge acquired from offshore wind energy permitting in the UK. This lack of familiarity with wave and tidal technologies, despite participation in permitting processes, suggests the need for increased education and outreach.

Permitting Challenges

When asked to rank top challenges for permitting an MRE development, three challenges were noted as key concerns for both single devices and arrays: collision with underwater devices;

¹[OES-Environmental](#) is an international collaborative of 15 nations under the International Energy Agency Oceans Energy Systems to understand MRE environmental effects that affect permitting (consenting).

benthic/habitat disturbance; and avoidance, attraction, and/or displacement (Figure 2).

Regulators were then asked what is needed to move forward in the face of these top ranked challenges. Regulators agreed that sufficient field data, numerical models, policy guidance, and training for regulators are all needed. The responses to these questions shifted slightly when asked about arrays, suggesting greater support for the use of numerical models for permitting in France and the UK, and sufficient field data for permitting in Spain and Ireland. Overall, these results showed that regulators have a perception of increased risk as devices are scaled up to arrays and perceive a greater need for data in permitting arrays.

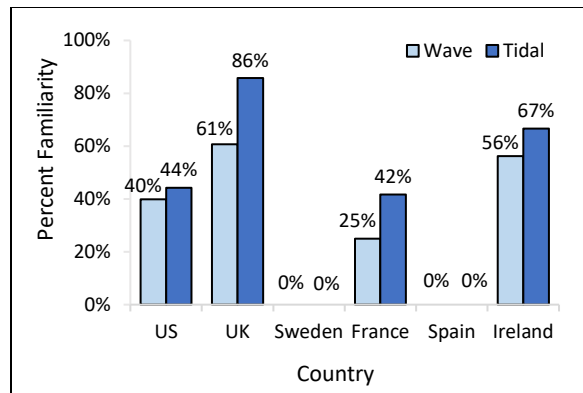


FIGURE 1. OVERALL REGULATOR FAMILIARITY WITH MRE TECHNOLOGY TYPES.

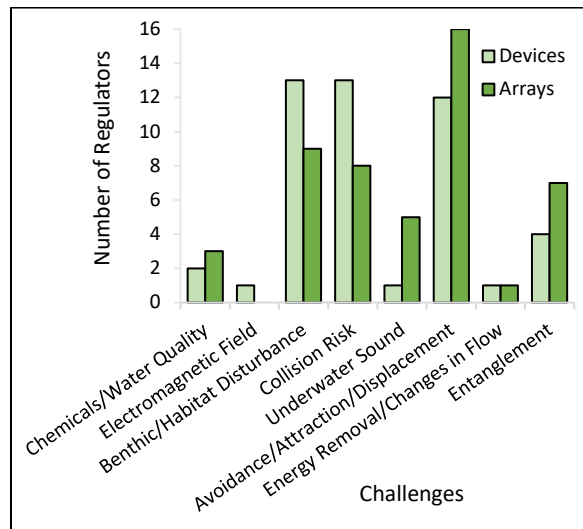


FIGURE 2. KEY CHALLENGES FOR REGULATORS PERMITTING ENVIRONMENTAL EFFECTS OF MRE DEVELOPMENTS FOR SINGLE DEVICES AND ARRAYS.

Approaches for Advancing the MRE Industry

Regulators were asked what their preferred management approach for permitting MRE developments was in the face of uncertainty from

environmental effects. A learning-based adaptive management approach was the preferred approach for the regulators in France, UK, and US (41% total), whereas more cautious approaches were preferred in Ireland and Spain (Figure 3). Adaptive management allows for adapting monitoring and mitigation over time (or throughout the duration of a project) to understand risks, decrease uncertainty, and mitigate impacts [3]. Understanding preferred approaches allows developers looking to permit an MRE development to align their proposals with regulator preferences. In this regard, adaptive management appears to be the best approach to satisfy regulatory requirements.

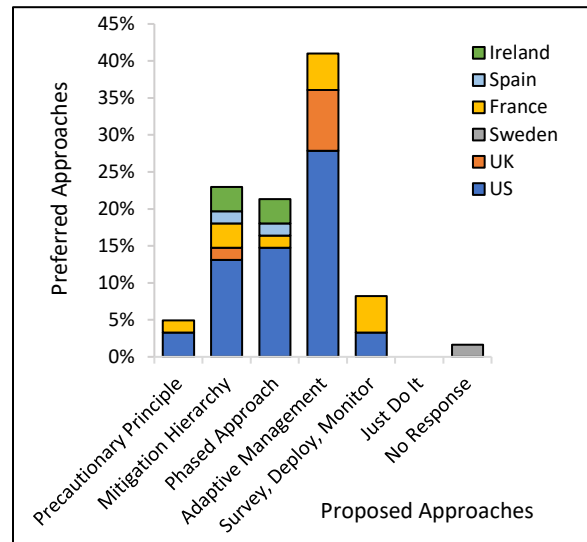


FIGURE 3. REGULATOR'S PREFERRED APPROACHES FOR ADVANCING THE MRE INDUSTRY.

A Need for MRE Data Transfer & Industry Development Approaches

An important step for reducing permitting timelines and high costs of environmental monitoring requirements is the ability to use data from one location (or MRE development) for permitting to another location (or development). To understand regulatory perspectives on this concept of data transferability, regulators were asked if data collected from other locations could be applied towards permitting MRE developments within their jurisdiction. Most regulators responded that data transfer is possible (20% responded "absolutely" and 76% responded "maybe"). Additional comments from regulators noted that data transfer is dependent on site and development characteristics (species present, local context, environmental factors, technology type, etc.) and may not be applicable in every scenario. When used properly, data transferability can help

developers comply with regulatory requirements, amplify understanding of environmental effects of MRE devices, and lead to standardized processes for data collection and analysis.

DISCUSSION

Based on the initial (US) regulator survey results and the willingness of US regulators to transfer data, OES-Environmental developed a data transferability process to guide the transfer of data and information between MRE developments. This data transferability process includes a framework, best management practices, and an online tool for regulators and project developers to easily find and access environmental effects data for transfer [4]. The importance of developing this process was strengthened by the responses from regulators in other countries indicating that data transfer was both possible and useful for permitting. The data transferability process also supports a larger concept of risk retirement that aims to retire specific environmental risks (such as impacts from electromagnetic fields, underwater noise, habitat changes, etc.) that may be low risk for single devices.

Survey results show that progress can be made through the following recommendations: provide education on MRE technologies and environmental effects to regulators, address key uncertainties or gaps for top challenges, and increase regulatory engagement. With the awareness that regulator knowledge on MRE technologies is low, providing education would greatly improve overall understanding of various MRE technologies and current MRE developments around the world. In addition, disseminating the wealth of knowledge on MRE environmental effects that is available, albeit not often known to regulators, would enable regulators to align permitting requirements with science-based, priority environmental concerns. Any remaining uncertainties or gaps in knowledge can be addressed by working together with the research community to guide efforts towards key environmental challenges.

While outreach efforts with regulators to complete the survey were widespread, in some countries there was low survey participation. Increasing engagement and willingness of regulators to participate will help inform how best to move the industry forward while decreasing permitting timelines and costs. Without the participation of regulators in processes to understand key challenges and barriers in permitting MRE development, it will be difficult to move the industry forward.

CONCLUSION

This paper presents the findings of the regulator surveys deployed by OES-Environmental, including key challenges and information needs. These results provide insight into the process of data transferability and provide a path forward to engage the MRE community in furthering this process.

The regulator survey results provide insight into regulatory knowledge of the MRE industry within each OES-Environmental country and key challenges for permitting MRE developments. These results provide guidance on research and regulator needs to address barriers for permitting MRE. Next steps for OES-Environmental include deploying the survey in the remaining OES-Environmental countries as well as continuing to advance both risk retirement and data transferability to aid permitting processes.

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