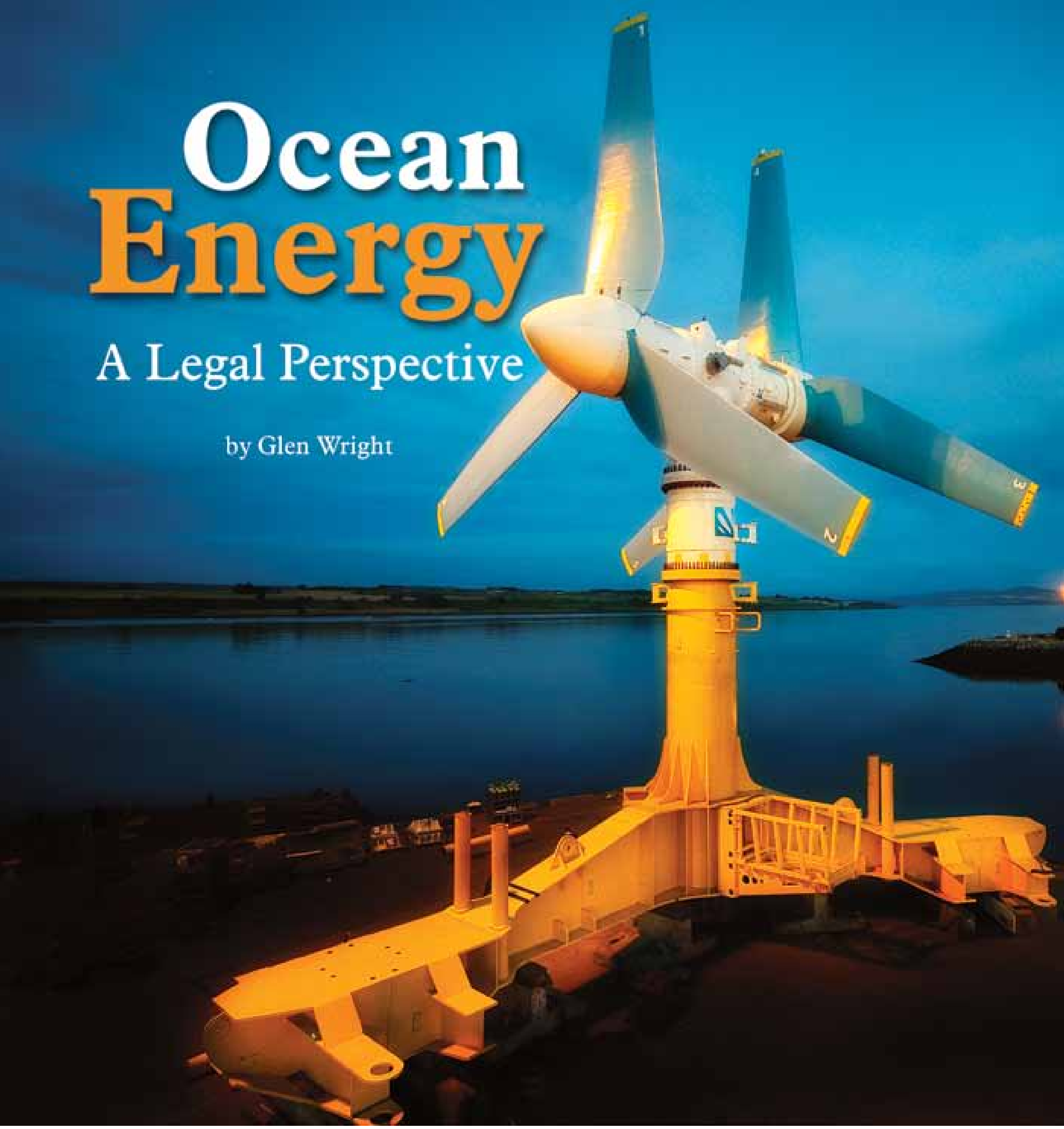
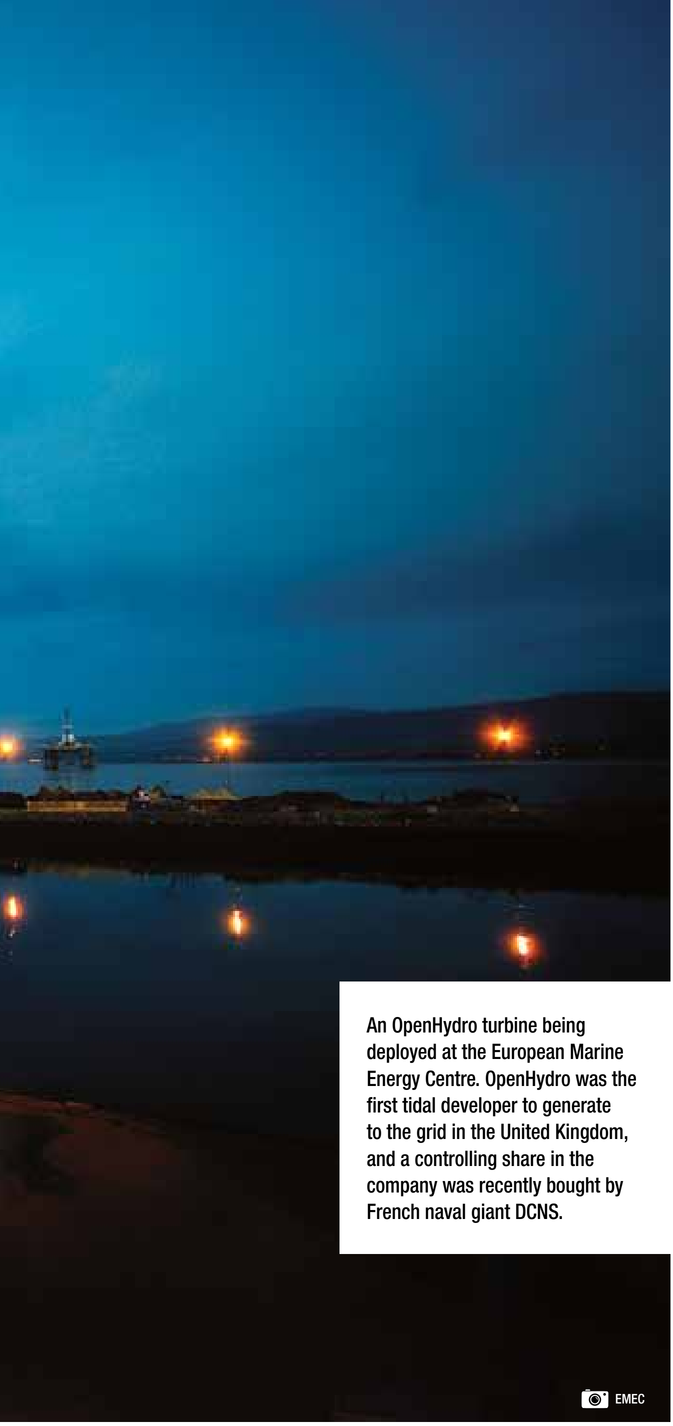
Ocean Energy
A Legal Perspective

by Glen Wright



When talking about the marine renewable energy (MRE) industry, it is understandably engineering that comes to mind. The key question is: can devices reliably generate power while surviving in the harsh marine environment? Yet while the technology is already beginning to come of age, the legal, regulatory, and policy aspects surrounding deployment of MRE devices have been much slower to develop.

Other industrial uses of the sea, like offshore oil and gas, shipping and fishing, are well established and appropriate regulatory frameworks have developed over time to manage them. On the other hand, MRE is something of an uncharted territory. While some countries, such as Scotland, have pressed ahead with innovative reforms to help ensure that MRE devices can be deployed simply and smoothly, regulators in other countries



An OpenHydro turbine being deployed at the European Marine Energy Centre. OpenHydro was the first tidal developer to generate to the grid in the United Kingdom, and a controlling share in the company was recently bought by French naval giant DCNS.

EMEC

are using existing regulatory frameworks to permit proposed MRE projects.

Either way, no jurisdiction has yet reached the end of the road in terms of regulatory reform, and it is clear that additional strategic planning and resource management strategies are needed to address the specific requirements of a commercial MRE industry.

The European Ocean Energy Association states that "to guarantee investor confidence and to develop ocean energy demonstration installations, the sector needs a strong and stable political framework." Such a framework can facilitate development and sustainable deployment of MRE technologies by providing a stable environment in which investors can make long-term investment decisions; ensuring sustainable deployment of devices by balancing the need for renewable energy with potential local environmental impacts; and providing a framework for managing human use conflicts, ensuring public engagement and diffusing 'nimbyism' ('not in my backyard' philosophy). A suitable regulatory environment benefits developers by ensuring equitable allocation of the resource, managing industry expansion and conflicts between developers, assisting with the development and dissemination of knowledge, and providing defined process and timescales for project development.

The major issues facing developers occur under domestic legal regimes (as opposed to international law) because MRE projects are sited relatively close to shore, within territorial waters. Regulation will vary depending on the jurisdiction, but there are some key issues regulators will generally face wherever there is a developing MRE industry. This essay provides an outline of some of these issues and an overview of the progress being made in this area.

Environmental Impact Assessment

While there is great potential in MRE, it is also one of the least mature renewable energy technologies. As such knowledge of the environmental impacts is limited. However, scholarly literature on the science and environmental impacts of MRE devices has grown rapidly over the last few years, and in May 2012 an international conference was held in the Orkney Islands to specifically discuss the environmental interactions of MRE devices.

Potential environmental impacts include alteration of current and wave strengths; changes to sediment dynamics; disruption of habitat; interference with animal movements; and collision of marine life with MRE devices. These potential impacts are in addition to those common to other electricity-generating technologies, such as construction impacts and noise during operation.

Managing these environmental impacts is a key facet of environmental law, which will have to ensure a balance between the needs of developers and the need for environmental protection and certainty surrounding the environmental impacts of MRE technologies.

At present, all jurisdictions require projects to undergo an environmental impact assessment (EIA) before devices can be put in the water. Although the EIA process varies, it is relatively uniform and generally comprises a number of distinct stages including scoping to identify the existing environmental data present and the key issues at the site; baseline studies to identify the status of the receiving environment; assessment of the significance of the potential impacts and mitigation options; and consenting where a statement of potential impacts goes through a determination process with the appropriate consenting body.

EIA can be expensive and time consuming, particularly in an immature field where there is little baseline data. This is in contrast to more well established technologies where baseline data exist and data collection follows an established process. In addition, while other technologies have homogenized, making it easier to generalize when conducting an EIA, MRE devices are diverse, with varying potential impacts. Moreover, ecosystem health in the marine environment is characterized by a wide range of criteria, with highly mobile and geographically disperse populations. This makes assessing environmental impacts difficult and leaves developers with the near impossible task of detecting a relatively small impact or change in a highly variable natural environment.

The scientific uncertainty surrounding environmental impacts of MRE technologies can be managed in different ways. Regulators generally follow the 'precautionary principle' – essentially the 'better safe than sorry' approach to regulation. This states that if an action risks causing harm to the environment, in the absence of scientific consensus or certainty that the action is not harmful, the burden of proof falls on the proponent of the action to provide this certainty.

This leaves developers to shoulder the burden of proving the new technology and leads to a potential impact being perceived as important, when in reality its likelihood, and therefore its importance, may actually be quite low. For example, Marine Current Turbines, who has deployed a tidal device in Strangford Lough, Northern Ireland, has spent around GBP3m (~CDN $4.7 million) monitoring for collision with harbour porpoises in order to satisfy the regulator that no collisions would occur, even though the risk of this happening could reasonably have been estimated to be low.

On the other hand, there is the risk-based approach to regulation, which aims to shift the focus away from precaution and toward the evidence-based assessment of risk. In this way, the resources of regulators and developers are channelled into assessing and mitigating the impacts that are most likely to occur, rather than requiring significant investment to rule out unlikely impacts. Interest in risk-based regulation has grown significantly in recent years, driven in part by pressure to modernize government and improve efficiency in the use of public funds.

The choice between risk and precaution has the potential to shape regulation and facilitate or hinder industry development, and as such it is an important and contested issue. In the United Kingdom, offshore wind farm developers and regulators have fiercely debated which model is the most appropriate. An important step in improving the regulatory environment for MRE may therefore be a move toward a more risk-based approach to regulation, as well as factoring in the positive environmental interactions of MRE technologies, such as climate change mitigation.

An Atlantis Resources tidal turbine, the most powerful single rotor subsea tidal turbine yet made, awaits deployment at the European Marine Energy Centre.

Improving EIA Processes
There are at least three concepts that have emerged as potential ways to decrease the regulatory burden of EIA. Firstly, there is the 'Rochdale Envelope,' named after a UK planning law case, which allows for a project to be broadly defined, within a number of agreed parameters, for the purposes of a consent application. This allows for a certain level of flexibility while a project is in the early stages of development. As development progresses and more detail and certainty become available, further information regarding potential impacts can be provided to the regulator.

Secondly, the 'deploy and monitor' approach allows a developer to deploy a device, or devices in small numbers, before having complete certainty as to impacts, in order to conduct monitoring and data collection. Projects can then be adapted over time as environmental impacts become clearer.

Thirdly, EIA requirements have been relaxed in some jurisdictions for small scale testing of devices. This avoids having to produce such detailed studies when a deployment is a small test deployment and has generally been used in conjunction with hubs or pilot zones for small-scale testing, such as at the European Marine Energy Centre. Relaxed EIA requirements are likely to be an essential part of a suite of regulatory reforms designed to assist the MRE industry, and may be particularly useful in jurisdictions where the impetus for more costly reforms is low as it can provide a way to assist the industry without extensive policymaking or financial support.

Strategic Environmental Assessment
A further tool that has gained prominence in environmental regulation more generally is strategic environmental assessment (SEA). SEA is a planning tool that involves an overarching environmental assessment of an area across all levels of decision making. Originally seen as just the production of a report on the environmental factors of a particular area, SEA is now viewed as a more holistic process to manage environmental interactions and an overarching and ongoing appraisal of the environmental impacts of a particular policy or technology.

A key benefit of SEA for the MRE industry is that it could take some of the burden off developers. If an SEA can establish adequate baseline data and assist with device siting, developers will have to spend less time and capital developing detailed EIAs and forging a process for project approval. At the same time, an SEA could potentially provide environmental safeguards in the context of imperfect scientific knowledge and balance MRE with other uses of the oceans.

Two SEAs conducted in the MRE context have highlighted their potential to facilitate development of this industry. In 2007, the Scottish Government commissioned an SEA to answer the question: "can wave and tidal stream energy contribute towards [Scotland's renewable energy targets] without significant effects on the environment, and if so, how can this best be achieved?" Similarly the government of Nova Scotia, Canada, commissioned an SEA to "assess social, economic and environmental effects and factors associated with potential development of renewable energy resources in the Bay of Fundy [to] inform decisions on whether, when, and under what conditions to allow pilot and commercial projects into the water ..."

The Scottish SEA was productive insofar as it identified key areas of sensitivity, and resulted in the production of a number of relevant

Marine Current Turbines' tidal turbine is seen out of the water for maintenance in Strangford Lough, Northern Ireland.

studies. However, the final SEA contains no recommendation or provision for filling knowledge gaps identified. Meinhard Doelle, a Co-Chair of the Nova Scotia SEA process, notes that the SEA was positive, but that it is too early to predict what the long-term effects of conducting the SEA are.

Overall it is clear that SEAs can be a constructive part of a complete regulatory framework for MRE deployment, but that there are still lessons to be learned to ensure that SEAs are useful for all parties. In particular, work is needed to ensure that the SEA process is configured to be of most assistance to developers and how SEAs ultimately relate to decision making. This final element is crucial for the effectiveness of an SEA: how can SEAs be positioned within decision making structures to ensure that the SEA process filters through to other levels of decision making, particularly regarding EIA and consenting processes for developers.

A major concern is that SEAs to date have tended to take a negative approach, focusing on mitigation of impacts and ignoring the opportunity to promote environmental benefits. For example, the Government's post-adoption statement to the Scottish SEA process notes that many of those consulted felt that positive effects of MRE were not considered in sufficient detail.

As MRE technologies have the potential not only to impact negatively on the environment, but also to improve it, SEAs should encourage MRE activities, so long as they are consistent with sustainable development. This issue has affected SEAs generally, but will be particularly important in the context of facilitating an emerging industry. SEAs therefore need to examine ways in which regulatory decisions can not only prevent environmental damage, but also positively enhance, restore and utilize existing natural resources.

Marine Spatial Planning

Marine Spatial Planning (MSP) is, in many ways, similar to SEA, in that it aims to provide an overarching view of the marine environment that can be used to make planning decisions. However, MSP is focused on the use of marine space, rather than environmental effects. The Intergovernmental Oceanographic Commission considers MSP to be an essential element of sea use management, and defines MSP as the process of analysing and allocating parts of marine spaces to specific uses to achieve ecological, economic and social objectives.

Unlike spatial planning on land, which is well established, MSP is a relatively new approach to managing the marine environment. Historically, human exploitation of the sea was mostly limited to transportation and fishing, and the oceans have traditionally been regulated with a single-sector management approach whereby each activity is considered separately by different regulatory regimes. While conflicts between these uses were rare, the addition of other uses of the sea has complicated the landscape. Fossil fuel extraction, seabed mining, bio-prospecting, offshore aquaculture and tourism have increased both conflicts between human uses and pressures on the marine ecosystem. This is concerning because marine processes and ecosystems are essential to life on Earth and provide goods and services of vast economic and social significance.

In this increasingly crowded space, single-sector management has often failed to resolve conflicts between different users of the marine environment and has meant that we have not explicitly assessed trade-offs among uses or managed the cumulative effects of multiple uses of the marine environment. The dominant approach is reactive and may result in one activity at a particular time being the ‘straw that broke the camel’s back’: a regulator could decide that MRE is the activity that will push an ecosystem beyond its limits, resulting in a loss for the developer, and the loss of a technology whose deployment could contribute to climate mitigation and clean energy goals. This reactive situation has denied decision makers the opportunity to actively shape a more sustainable future for the marine environment. MSP is instead a future-oriented process which allows for planning to select appropriate measures to protect marine ecosystems while pursuing sustainable development of the oceans.

The principal output of MSP is a comprehensive spatial management plan for a marine area, though, as with SEA, MSP is better seen as an ongoing process. The plan moves the whole system toward a “vision for the future,” setting out the priorities for the area. The plan can be given force through zoning regulations and permitting, with decisions on individual permit applications made within individual sectors based on the zoning maps and regulations.

MSP is often cited as crucial for the development of the MRE industry, but its relationship with MRE has not been explored in detail by the MRE ‘road-map’ style documents produced by many governments and MRE industry associations, and MSP processes have generally not been cognizant of MRE or the impact of the MSP on MRE industry development. The final report of the Seanergy 2020 project notes that a number of national and international MSP instruments have been developed, but that none of these account for the specific features and needs of the emerging MRE industry. As a developing industry, MRE has not yet been a driver for MSP, though this is now changing as policy-makers look to the future and realize the potential scale of the resource.

Differing approaches have been taken to MSP and, as with SEA, ascertaining which approach is most effective, rather than simply asserting that MSP is necessary, will be an important step in correctly configuring regulatory frameworks for the development of the MRE industry. Scotland has again led the way in this field, with Marine Scotland commencing an MSP process for the prospective Pentland Firth and Orkney region following the decision of the Crown Estate to hold the world’s first leasing round for MRE projects. The state of Oregon in the United States has also conducted an MSP process as a result of proposals to deploy MRE devices in its waters, which has been controversial.

The Scottish MSP process appears to have been successful, though time will tell how useful the plan itself is in the long-term. The Oregon process, however, was somewhat limited by a negative approach which excluded MRE deployment where existing uses already exist and focused on constraints to deployment rather than opportunities. This approach concerns developers, who feel that the unduly cautious or negative approach taken toward their technology is retarding industry development. Indeed, excluding areas from consideration for MRE development undermines one of the core benefits of MSP, which is that it allows explicit trade-offs between uses.

Permitting and Licensing

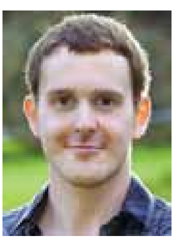
The specific nature of the MRE resource means that there is likely to be competition over resources as MRE technologies become cheaper and commercially available. In order to manage the resource, it is important that some system of permitting and resource allocation is developed.

The International Energy Agency’s Renewable Energy Technology Deployment project notes that permitting can be a barrier for an MRE project when there is an inconsistent process, a lack of a clear permitting pathway, an over-reliance on bespoke permitting processes, overly detailed design requirements, or a lack of regulator resources/expertise. Clear, consistent and well-designed permitting frameworks for MRE projects can help sustainably manage the resource and provide confidence to investors and developers.

There are, broadly, two approaches to granting licences for exploration and exploitation of the MRE resource: a developer-led process – a 'first come, first served' approach where developers apply for permits as and when they are ready; and the tendered approach, where the regulator maintains a much greater degree of control over development through tendering for projects. The former is the default position in jurisdictions that have not yet regulated specifically for MRE projects, and could lead to the unstructured development of the resource. The latter is better suited to long-term strategic development of the resource and the use of SEA and MSP, and has been pioneered by the UK's Crown Estate, which has so far agreed to leases for 37 MRE projects.

Conclusion

A strong and suitable regulatory framework is a key factor in determining the success of an emerging industry. As with many innovations, the science and engineering of MRE is advancing at a truly breathtaking rate, but law and policy is lagging behind. While some jurisdictions are pressing ahead with impressive reforms, it is clear that even the most advanced regulatory frameworks still have some teething problems, while those jurisdictions yet to begin reforming laws to accommodate this exciting new technology have much to learn, and much to do.



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