Overview of Global Regulatory Processes for Permits, Consents and Authorization of Marine Renewables

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Note: The views discussed in this paper are entirely the author's own, and do not represent the official position of OREC.

Executive Summary

Within the past two years, a number of first generation, commercial marine renewables projects came online, delivering power to the grid. These projects include: Verdant Power's RITE project,[1] Pelamis' Aguçadoura Wave Park,[2] Marine Current Turbines' SeaGen Project at Strangford Lough,[3] and Aquamarine's Oyster.[4]

Unfortunately, international regulatory processes for siting marine renewables have not kept pace with technological advancements. In many countries, deployment-ready projects face costly and protracted permitting procedures by multiple agencies, each with their own unique legal and regulatory requirements. Few regimes provide an expedited system for deploying smaller or early stage commercial arrays. In addition, most marine renewables find themselves in a "Catch-22" situation: regulatory bodies are reluctant to grant authorizations without information about project impacts, but developers cannot provide this information without first getting projects into the water to gather data on impacts. Finally, marine spatial planning (MSP) – a tool designed to facilitate coordinated decisions about use of marine resources on a programmatic level rather than case-by-case basis – is gaining traction, and raising questions about whether MSP will expedite marine renewables development through advance planning or interfere by potentially delaying near term development or putting promising sites off limits.

This paper provides an overview of the regulatory process and unique challenges for marine renewables in different parts of the world. The first part of this paper surveys the regulatory process in various countries governing permits, consents and other necessary authorizations for marine renewables projects. As Part I will discuss, most countries' existing regulatory systems share features such as environmental review, opportunities for stakeholder input, examination of competing uses and a method for acquisition of site access and adequate property rights to construct the project. Likewise, in recent years, many countries have enacted legislation to facilitate renewables' ability to secure grid access, which is another necessary component of the regulatory process. Part II will discuss obstacles to expedited permitting – such as lack of co-ordination between agencies or "regulatory overkill," *i.e.*, where projects are subject to extensive review and mitigation conditions disproportionate to the potential harm. Part II briefly evaluates various options to advance marine renewables development such as marine testing beds with blanket consents, pilot project licensing and adaptive management, strategic environmental assessment and coastal and marine spatial planning.

I. Summary of Regulatory Process

This section will describe the following components of the regulatory or process: (1) legislation or regulations that govern the consent or approval process (including any special processes for demonstration projects); (2) procedure for obtaining a lease or rights to use lands for the project, (3) review of project impacts, including environmental, navigation, fishing and recreational use and (4) grid access. The table below summarizes the discussion:

[1] Verdant Power Website, http://verdantpower.com/what-initiative/ (last visited December 4, 2009) (describing two year demonstration operation from 2006-2008 of 6 unit Roosevelt Island Tidal Energy project in East River, New York).

[2] The Aguçadoura Wave park, comprised of 3 x 750 kW units operated from September through November 2008, before being removed. Due to financial difficulties of the parent company, the project remains out of commission. See http://en.wikipedia.org/wiki/Aguçadoura_Wave_Park

[3] Marine Current Turbines 1.2 MW Seagen unit was deployed in Strangford Lough in April 2008 and remains in operation. See http://www.marineturbines.com/18/projects/19/seagen/ (accessed December 4, 2009).

[4] In November 2009, Aquamarine Power launched the Oyster at EMEC, which is feeding power to the grid through a shore-based hydropower project powered by water pumped from the Oyster wave energy device. See http://www.aquamarinepower.com/news-and-events/news/latest-news/view/112/scotland-s-first-minister-launches-oyster/ (accessed December 4, 2009).

Country	Authority for Consents	Special processes	Lease	EA	Grid Access
US	FERC issues permits and licenses under Federal Power Act	Pilot project license for small (< 5 MW) demonstration projects; one year processing time.	State leases for state submerged lands, MMS lease on Outer Continental Shelf	Yes, by FERC for licenses and MMS for leases.	Yes, under FERC Interconnection Rules
Canada	Varies by province; Ontario establishes Renewable Energy Facilitation Office (REFO) for review	Renewable Energy Approval (REA) can issue in 6 months time.	Granted by provinces	Yes, though varies by province. Nova Scotia has SEA for tidal projects.	Yes, under Ontario Green Energy Act
UK	Marine and Coastal Access Bill for projects <100 MW; Planning Act for projects > 100 MW Scotland is developing similar bill.	Consolidated process by Marine Management Organization (MMO) for smaller marine renewables projects	Seabed lease or site option agreement from Crown Estate	Required for all marine renewables. Scotland, Northern Ireland preparing SEAs for marine renewables	Department of Energy is developing new regulations for grid access for offshore renewables.
Portugal	Decree Law No. 5/2008 for Pilot Zone	Pilot Zone for demonstration, pre-commercial and commercial wave energy devices up to 250 MW	Pilot Zone access	Environmental Incidence Study for Pilot Zone	Yes, in Pilot Zone
Denmark	Not discussed	One stop shopping	Not discussed	Yes	Yes
Australia	Authorization under Coastal Management Act	Not at present	Not discussed	Yes	Not discussed
NZ	Authorization under Resource Management Act, with regional councils issuing consents	Yes, 2009 amendments include streamlining decisions	Not discussed	Yes, all applications require Assessment of Environmental Effects of project impacts	Not discussed

A. United States

1. Authority for consent

In the United States, the Federal Power Act (FPA), 16 U.S.C. 791 *et. seq.* governs licensing of marine renewables projects. Under the FPA, Federal Energy Regulatory Commission (FERC) may preliminary permits and licenses for marine renewables. A preliminary permit enables a developer to study a site for three years and maintain priority to apply for license over competing applicants but does not authorize construction of a project (Federal Power Act, 16 U.S.C. sec. 800). As a result, a preliminary permit does not provide any opportunity to test projects in real world conditions. A FERC license, by contrast, allows a developer to construct and operate a project, generally for a term of up to 50 years. But the process for obtaining a license is lengthy (as long as three to seven years) and requires data on a project's potential impacts, which are often unknown until a project is deployed and observed.

Recognizing the limited options for demonstration projects, FERC developed two alternatives. The first alternative, known as "the Verdant exception"[5], allows a developer to deploy and operate a small (less than 5 MW) project for 18 months or less to gather data to support a license application, so long as the developer agrees not to sell power to the grid during the test period.

The second alternative is the FERC created "pilot license process" for new technologies in 2007. A pilot license has a five-year term, a processing time of one

[5] Verdant Power, FERC Decision, 111 FERC para. 61,024 (2005). The Verdant exemption was named for Verdant Power, which first asked for this policy. Now established, it is available to all developers.

year, limited study requirements up-front but rigorous post-deployment monitoring requirements. At the end of the five-year pilot license term, a developer has the option of removing the project or applying for a long-term license at the site. *See* FERC Hydrokinetic Pilot License Process at http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/energy-pilot.asp. Presently, three United States developers – Verdant Power, Snohomish Public Utilities District and Ocean Renewable Power Corporation – are pursuing pilot licenses for tidal sites in Washington State and Maine.

See http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics.asp

2. Property Interests/Site Access

The FERC process authorizes project operation but does not confer property rights for constructing the project. For projects located on "state submerged lands" – that is, lands up to three miles off shore (with the exception of Texas and the West Coast of Florida where states own lands up to ten miles offshore) – a developer will typically obtain a land lease or rights of usage from the state. Projects beyond these limits are located on the Outer Continental Shelf, where a developer must obtain a lease from the Minerals Management Service (MMS). In April 2009, MMS issued rules for grant of leases and also entered into a Memorandum of Understanding (MOU) with FERC to coordinate the leasing process with the licensing process. Under the MOU between FERC and MMS, a developer must secure a lease from MMS, before it can receive a FERC license.

3. Environmental Review

In the United States, federal agencies that issue a license must prepare an environmental analysis to assess the impacts of a project on the surrounding environment and other uses. The FPA also requires FERC to review the effect of a project on navigation and to consider whether it makes best use of the waterway (FPA, Section 803). Projects must also comply with a variety of federal environmental laws, such as the Endangered Species Act (protects endangered species), the Coastal Zone Management Act (CZMA – ensures that project is consistent with state plans for use of coastal areas), the Clean Water Act (protects water quality), whilst abiding by state environmental regulations as well. In addition to the FERC license and a land lease, developers must also obtain authorizations from the agencies that administer these federal statutes. There is no process for coordinating issuance of a FERC license and issuance of a CZMA authorization (issued by the state) or a water quality certificate and, as a result, the license process is quite lengthy.

4. Grid Access

For projects that connect to the interstate grid, FERC has power, under the Federal Power Act and FERC's own regulations, to oversee interconnection. FERC established a straightforward protocol that developers must follow to obtain grid access; the rules for smaller generators are not complicated and the process is relatively quick. [*See* FERC Regulations on Interconnection,http://www.ferc.gov/industries/electric/indus-act/gi.asp]. As marine renewables projects expand in size, they will impose greater demands on the grid.

Marine renewables projects may face longer "queues" for access, as the utility or the regional transmission system operator[6] evaluates how to incorporate large amounts of new and variable power into the system.

B. Canada

1. Consents and Environmental Review

In Canada, projects are approved and monitored by a series of federal and provincial environmental agencies and laws. Permitting processes differ by province, with regulations too varied to summarize in detail. Generally, projects are subject to some type of environmental assessment – either an individual Environmental Assessment (EA) (for larger projects), a class EA (evaluates impacts of classes of activity) or screened EA (where projects falling below certain impact levels are exempt from further review. An Environmental Assessment includes an evaluation of effects on fish habitats under the Federal Fisheries Act and on endangered species under the Species at Risk Act. Navigational impacts are also evaluated by the Navigable Waters Protection Division.

Some provinces have made modifications to these general practices. In September 2009, Ontario's new Green Energy Act took effect, with significant improvements for streamlining of siting of tidal energy projects. The Green Energy Act establishes a Renew-

[6] In some parts of the United States, the grid is operated by a regional transmission authority, rather than an individual utility)

able Energy Facilitation Office (REFO) to assist renewable developers by connecting them with resources in other government ministries and agencies and providing information on government incentive programs. The Act creates a comprehensive "renewable energy approval" (REA) which consolidates environmental review processes, creates procedures for stakeholder input and exempts renewables projects from municipal zoning requirements, which had previously thwarted expeditious permitting.[7] As a result of the changes, developers can obtain required permits in six months' time.[8] There is even discussion of a six-month guarantee for processing approvals.

In Nova Scotia, tidal project development begins with a strategic environmental assessment of a site, after which access is awarded to a company through a competitive process.[9] The developer must then obtain all necessary permits to site the project, with fewer rigorous up front requirements for test facilities (which are subject to post-deployment monitoring).

2. Property Rights

In Canada, offshore Crown lands are controlled by the adjacent coastal province, which has powers of disposition. Provinces have different policies for granting use of Crown lands for marine renewables projects, with eased requirements for test or demonstration projects.[10] Most provinces require developers to pay a fee for leases for commercial tidal projects.

3. Grid Access

In Ontario, the Green Energy Act established a feed-in tariff, which also provides access to the grid. In other provinces, standard offer contracts for power purchases are available.

C. Europe

1. United Kingdom

a. Consents and Environmental Review

In November 2009, the United Kingdom's Marine and Coastal Access Bill received Royal Assent. The new law consolidates licensing of marine renewables of 100 MW or less within the newly created Marine Management Organization (MMO), thus eliminating the need for multiple consents under both the Food and Environmental Protection Act and the Electricity Act.[11] For projects larger than 100 MW (known as "nationally significant infrastructure projects"), the 2008 Planning Act establishes an Infrastructure Planning Commission to streamline the licensing process.[12]

In the UK, there are two types of environmental review: strategic environmental assessment (SEA) prepared by the government to evaluate impacts of marine renewables on a system wide basis, and an Environmental Impact Assessment (EIA), prepared by the developer addressing site specific impacts.

All marine renewables projects require an EIA. At this time, the UK does not prepare a SEA for marine renewables, because the impacts are yet unknown that the SEA would not produce any definitive data to inform siting decisions. The UK prepares a strategic environmental assessment (SEA) for offshore wind, and will likely prepare an SEA for marine renewables prior to the siting of large scale arrays.[13]

The Marine and Coastal Access bill has limited applicability in Scotland, Northern Ireland and Wales. Scotland is developing a similar a Marine Bill that will also streamline the licensing process and adopt a one-stop shopping approach.[14] In contrast to the UK, both Scotland and Northern Ireland are preparing SEAs that will include marine renewables.[15]

[7] See Green Energy Act (September 2009) (online at http://www.elaws.gov.on.ca/html/statutes/english/elaws_statutes_09g12_e.htm; additional information at http://www.greenenergyact.ca/Page.asp?PageID=122&ContentID=1360&SiteNodeID=243)

[8] *See* http://greenenergyreporter.com/2009/02/ontario-introduces-sweeping-green-energy-reforms/ (describing that elimination of municipal regulations will allow for six month processing).

[9] *See* http://www.gov.ns.ca/energy/resources/EM/tidal/Tidal-Policy-Framework-Nova-Scotia.pdf.

[10] *See e.g.*, New Brunswick Policy for Allocation of Crown Land for in-stream tidal projects at www.gnb.ca/0078/policies/clm0192007e.pdf Ontario crown land policy, http://www.mnr.gov.on.ca/en/Business/CrownLand/2ColumnSubPage/STEL02_165785.html.

[11] *See* Marine and Coastal Access Act (2009) online at http://www.opsi.gov.uk/acts/acts2009/pdf/ukpga_20090023_en.pdf, BWEA Summary Report (October 2009) at www.bwea.org.

[12] *See* Planning Act, http://www.opsi.gov.uk/acts/acts2008/ukpga_20080029_en_1.

[13] *See* http://www.offshore-sea.org.uk/site/scripts/documents_info.php?categoryID=39&documentID=5 (January 2009)(describing SEA process).

[14] *See* http://www.scotland.gov.uk/News/Releases/2009/04/29162907 (describing introduction of Scottish Marine Bill) (April 2009).

[15] *See* http://www.sei.ie/Renewables/Ocean_Energy/Offshore_Renewable_SEA/ (describing Irish SEA); http://www.seaenergyscotland.net/ (Scotland's Marine Renewable SEA).

b. Property Rights

Developers wishing to deploy a wave or tidal device or small array of up to 20 devices with capacity of less than 10 MW in UK waters or Renewable Energy Zone (REZ)[16] beyond 12 nautical miles, must obtain a seabed lease or site option agreement from the Crown Estate.[17] To obtain a lease, developers must show that the site is suitable for deployment of a marine energy device/array and provide a business plan, with a timetable of steps leading to deployment. Currently, the Crown Estate is opening large swaths within the REZ for offshore wind development off the coast of the UK. In 2008 the Crown Estate opened the first competitive bidding round for acreage to deploy wave and tidal energy projects in the Pentland Firth off the NE Scottish mainland.

Leases for test and demonstration projects will be short term, generally up to seven years. Rent will be discounted for the initial term of a demonstration lease.

c. Grid Access

The Department of Energy is developing a new regulatory regime for offshore electricity transmission, exploring ways for the capital cost of grid connection to be borne by the offshore transmission owner, rather than the marine energy project developer, who would just pay an annual charge. [18]

2. Portugal

a. Consents and Environmental Review

In Portugal, Decree Law No. 5/2008 establishes a Pilot Zone for the installation of demonstration, pre-commercial and commercial wave energy devices with rated capacity of up to 250 MW. The Pilot Zone is located 120 km north of Lisbon, off Sao Pedro de Moel and covers 320 km^2.[19] The Pilot Zone will be connected to the grid and will be managed by REN (*Redes Energéticas Nacionais* – National Energy Networks, S.A.). REN is responsible for licensing in the Pilot Zone, with regulatory processes varying, dependent upon whether a project is a pilot or commercial project. The licence process should be accompanied by an Environmental Incidence Study that is a less demanding administrative instrument than the Environmental Impact Assessment.

3. Denmark

Denmark's consent process for wave energy projects follows a one-stop shopping procedure used for offshore wind.[20] In issuing permit for wave projects, the Danish Energy Authority followed the consent procedures for offshore wind, with approval given based on a project's location, the results of an environmental impact assessment and plans for decommissioning. Denmark's system also allows for grid access.

D. Australia

In Australia, wave and tidal project developers can obtain consent to use and develop Crown lands under the Coastal Management Act (CMA). However, the process is imperfect.[21] First, the consents available under the CMA are subject to a company's ability to define a specific location for a specific unit. But most companies would prefer a consent that covers a broader area to allow for additional exploratory activities to identify the optimal location for the units. Second, the CMA is administered by different states, and there is much uncertainty at the departmental level.

Despite barriers, Carnegie successfully obtained a consent for its CETO I wave project prototype.[22] According to the PB Power Report (previous footnote), the project was subject to environmental review including impacts on marine flora and fauna observed at the site. However, it was also recommended that the developers conduct further studies to support project expansion, including studies of shoreline, bird and marine mammals, subsea and terrestrial acoustic surveys and wave monitoring ahead of and behind units. The developer also worked with many different stakeholder groups, and consulted with the State Government of Western Australia, the Department of Land Administration, Sustainable Energy Development Office, Fremantle Port Authority and Yachting Association of Western Australia for approvals for deployment.

[16] The UK declared a Renewable Energy Zone (REZ) in 2004. The REZ extends up to 200 nautical miles form shore and within the REZ, the UK has claimed exclusive rights to production of energy from wave and wind. *See* Section 84, Energy Act (UK) 2004.

[17] *See* Crown Estates Website, http://www.thecrownestate.co.uk/our_portfolio/marine/wave-tidal/application_process.htm

[18] BWEA Report (October 2009).

[19] *See* International Energy Agency, Global Renewable Energy: Policies and Measures database, http://www.iea.org/textbase/pm/?mode=re&id=4249&action=detail.

[20] *See* Wave Energy Centre Paper, Uppsala (September 7-10, 2009).

[21] Transcript, Environment and Natural Resources Committee, September 29, 2009.

[22] PB Power Report on CETO Technology, www.ceto.com.au/ceto-technology/pdf/pb-report-full.pdf (2007), (describing permit process).

E. New Zealand

In New Zealand, developers must obtain authorization for a project under the Resource Management Act (RMA). Regional councils and territorial authorities issue the required consents. All applications for a consent must include an Assessment of Environmental Effects (AEE) of likely project effects and mitigation strategies.[23]

In September 2009, the RMA was amended, largely to expedite and improve the resource consent process.[24] Changes include:

- Deterring frivolous, vexatious and anti-competitive objections that can add tens of thousands of dollars to consent applicants
- Streamlining processes for projects of national significance
- Creating an Environmental Protection Authority
- Improving plan development and plan change processes
- Improved resource consent processes
- Streamlined decision making
- Strengthening compliance by increasing penalties and proving for a wider range of enforcement
- Improvements to national instruments[25]

In 2008, two projects received approval under the former version of the RMA. Consents were issued to Neptune Power Limited by Greater Wellington Regional Council allowing it to deploy a 1 MW prototype tidal turbine in the Cook Strait. The environmental review for the Cook Strait Neptune Project examined impacts on marine mammals and whales, sedimentation, visual impacts, and navigation.[26] Consents were also issued to Crest Energy Kaipara Limited by Northland Regional Council for a 200 MW tidal project but these were immediately appealed by four groups, including Crest Energy itself (which objected to some of the consent conditions). The appeals were heard by the Environment Court in June 2009 and an interim decision published in late December 2009 indicates that the judge is minded to grant consents subject to conditions and an approved environmental monitoring plan.

[23] Wikipedia, "New Zealand Resource Management Act", http://en.wikipedia.org/wiki/Resource_consent#Plan_classificationshttp://en.wikipedia.org/wiki/Resource_consent#Plan_classifications

[24] *See* http://www.scoop.co.nz/stories/PA0909/S00123.htm (summary of RMA amendments).

[25] *See* http://www.scoop.co.nz/stories/PA0909/S00123.htm

[26] *Development of Marine Energy in New Zealand*, Power Projects Limited (June 30, 2008).

II. Regulatory Trends and Challenges for Marine Renewables

Having described the regulatory regime for licensing marine renewables in various locations in Part I, it is now possible to identify options for addressing problems and discuss future regulatory trends.

A. The Challenge: Deploying Demonstration and Early-Stage Projects

Advancement of the marine renewables industry depends on projects getting into the water so that developers can observe operation and impacts in real world conditions. Up until recently, many pilot projects have been subject to crippling environmental review disproportionate to predicted impacts, which increases the costs and delays associated with deployment.

1. Pilot Licensing Programs: A special "pilot project" authorization might cure this problem. In the U.S., FERC's pilot license process takes one year by replacing extensive environmental review up front with rigorous post-deployment monitoring. Meanwhile, the short term of the pilot license (five years) and application of principles of adaptive management (whereby developers must modify or cease project operation to address any observed adverse impacts) ensure adequate environmental protection. Unfortunately, the FERC pilot license program is still slow to reach its intended one year process goal since some regulatory agencies are requesting two years worth of data collection, thereby extending the one year process.

2. One-Stop Shopping: A streamlined, one-stop shopping process can also reduce licensing costs and delays. Some of the countries discussed – such as the UK or Canada (Ontario) have attempted to create a one-stop shopping approach to licensing. For example, in the UK, smaller projects are sited by the MMO, which helps with coordination, while Ontario's Renewable Energy Facilitation Office does the same. One-stop shopping reduces developer costs and cuts down on the complexity of permitting. Moreover, a one-stop approach puts one agency in the lead, and forces the others to cooperate. Unfortunately, in the U.S., one-stop shopping would require additional legislation to give the lead agency jurisdiction over other federal agencies. Moreover, without set deadlines, even a one stop process can be lengthy. But one-stop shopping apparently worked well for Denmark's offshore wind program and certainly deserves additional discussion inasmuch as the process could assist in siting marine renewables.

3. Test Centers and Pre-Screened Test Sites A third option for expediting deployment of pilot projects is creation of pre-screened test centers or sites. Though projects located in test sites may require additional environmental review, it is generally less extensive because the sites have been pre-screened. Test sites are also connected to the grid, so that developers can potentially sell power and earn revenues to offset development costs. Portugals's Pilot Zone is one example of a test site, as is the European Marine Energy Center (EMEC) in Scotland (for smaller projects) and the U.K.'s anticipated Wave Hub (http://www.wavehub.co.uk/) (for larger projects). In Ireland, the Galway Bay test facility is used for smaller devices in a less robust wave environment protected by the bay and Irish authorities have started developing a larger open ocean test facility. The Galway Bay facility benefits greatly from a collaboration with IBM and its SmartBay program, which has installed sensors throughout the Bay, which can measure sedimentation transport, turbine efficiencies, environmental impacts, fish and marine mammal behavior, and data for other industries and sea uses.

Test centers will play an important role in the marine renewables industry since they allow for expeditious deployment of demonstration and smaller projects. Even when marine renewables projects outgrow the capacity of the test center, because they provide a readily accessible site that will support ongoing innovation.

B. The Challenge: Moving Beyond Pilot Projects to Larger Projects and a Marine Renewables Industry

Once marine renewables move past the pilot phase to commercial operation, it will be necessary to explore ways to facilitate deployment on a systemic, rather than case by case basis. Strategic environmental assessments (SEA) and marine spatial planning (MSP) offer two options.

1. Lack of data on impacts

The SEA is a legally enforced assessment procedure required by Directive 2001/42/EC (known as the SEA Directive). The SEA Directive aims at introducing systematic assessment of the environmental effects of strategic land use related plans and programs. Both Scotland and Northern Ireland are preparing SEAs that will include marine renewables. Though the UK has been unable to perform an SEA for marine renewables for want of data, it will likely prepare one for prior to siting of larger arrays.

The U.S. has a similar concept to the SEA, known as a programmatic environmental impact statement (PEIS). In December 2007, MMS released a PEIS for development of alternative energy on the Outer Continental Shelf which mentioned marine renewables, though also noted that these technologies were not likely to be deployed for another five to eight years.[27]

2. Marine Spatial Planning

Many countries are exploring ways to manage competing uses in oceans through Marine Spatial Planning (MSP). The European Union (EU) has directives which require an examination of MSP issues, while the Obama Administration just released a draft report endorsing the adoption of MSP in U.S. waters up through the limit of the Exclusive Economic Zone (EEZ). Finally, a cursory review of the UK's Marine and Coastal Access Bill suggests that it adopts a version of marine spatial planning by allowing for creation of marine conservation zones.

Marine spatial planning can assist marine renewables by creating a system to deal with overlapping uses and competing claims. In addition, data collected using the MSP process can inform developers' siting decisions and thereby speed the license process.

Despite potential benefits, some developers in the United States remain wary of MSP, fearing that it might put off limits areas with prime wave or tidal power, which could constrain growth of the industry. In addition, there is concern about "zoning" the ocean without adequate data, or putting a moratorium on existing development while MSP is implemented. Whether MSP will help or hinder the marine renewables industry, at least in the short term, is a topic that will certainly generate much discussion in the year ahead.

[27] *See* MMS PEIS at http://ocsenergy.anl.gov/documents/index.cfm