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The Seven Principles of Ocean Renewable Energy: A Shared Vision and Call for Action

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Man has long been fascinated by the oceans that surround us. As sources of myth, of sustenance, of renewal, the oceans are at the center. As we enter the 21st century, oceans are gaining additional significance as potential contributors to a sustainable energy future. The energy potential of the oceans is vast, nearly beyond our capability to comprehend. The drive to develop that energy is picking up steam. But so are concerns that energy development in the oceans will damage fragile ecosystems, push out other established commercial uses and diminish important scenic and recreational values. Responsible development of ocean energy will require a regulatory system that honors all interests and requires rigorous scientific analysis, while providing certainty and acceptable costs for developers.

This paper will describe the current regulatory system for ocean renewable energy and ongoing efforts to resolve key issues. In particular, it will discuss the efforts of a group of participants in the ocean renewable energy and hydropower industries and the conservation community to explore opportunities and challenges presented by these technologies. Under the leadership of the Environmental Defense Fund, these participants agreed on a set of first principles that are analyzed here.

Section One of this article gives an overview of ocean renewable energy. Section Two outlines the themes of these principles and the process leading to their development. Section Three discusses the first theme, "The Need for Action." Section

Four presents the second theme, "Encouraging Pilot Projects and Funding Research and Development." Section Five discusses the principles of the third theme, "Leadership and Cooperation in Regulation. Section Six presents the fourth theme, "Planning and Participation.

INTRODUCTION TO OCEAN ENERGY AND ITS PRESENT STATE

Ocean waves, currents and tides carry immense amounts of energy. Because moving water is about 800 times denser than wind blowing at the same speed, the power of the oceans is concentrated much more than the more diffuse power of the wind and the sun.[1] New technologies to capture that force hold great promise for reducing worldwide fossil fuel use, an essential step in defending the oceans from climate change-driven environmental damage. It is an elegant symmetry that power drawn from waves and tides could actually help ensure the health of the oceans themselves.

Currently, the United States receives the majority of its electricity from thermal power plants that burn a variety of fossil fuels, including coal and natural gas.[2] The use of fossil fuels emits greenhouse gases into the atmosphere contributing to global warming which causes climate change. In fact, fossil fuel emissions are the largest contributor of CO_2 emissions globally and electricity generation using fossil fuels is the largest contributor to CO_2 emissions in the United States.[3] These environmental concerns grouped with national security and economic concerns resulting from importing our nation's energy, such as oil used for transportation, has enhanced the interest in domestic renewable sources. As stated above, renewable ocean energy has the potential to be a significant contributor to the

1. *See* U.S. Dep't of the Interior, Minerals Mgmt Serv., *Technology White Paper on Ocean Current Energy Potential on the U.S. Outer Continental Shelf*, 3 (2006).

2. George Hagerman, Oceanographer, Elec. Power Research Inst. Ocean Energy Team, PowerPoint presentation at FERC Technical Conference: Hydroelectric Generation Ocean Waves, Tides & Currents and from Free-Flowing Rivers (Dec. 6, 2006), *available at* http://ferc.gov/EventCalendar/Files/20061206144646-Hagerman.pdf.

3. Envt'l Prot. Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006, USEPA #430-R-08-005 (Apr. 2008), *available at* http://www.epa.gov/climatechange/emissions/co2_human.html#fossil.

nation's energy needs.

Entrepreneurs and inventors in the United States and Europe have refined a variety of devices that may efficiently convert waves, tides, and currents (collectively "ocean energy") into electrical power. Several devices have been tested in the ocean.[4] Others are on the verge of being test-ready. The rapid maturation of these ocean power technologies depends upon deployment of substantial demonstration and commercial projects in near shore areas in the United States. Development of the industry in this country is hampered by a number of challenges, not the least of which is a regulatory system that is not designed to encourage pilot and demonstration projects, as well as insufficient investment in basic research and development.

The compelling appeal of ocean renewable energy must, at this point, be tempered by frank acknowledgment that deployment of devices to capture and convey that energy is likely to have some impacts on the environment and coastal communities. The nature of those impacts and their significance, especially from large-scale deployments, are essentially unknown at this point. While sufficient information exists to allow demonstration projects, there may not be enough information to weigh any tradeoffs of large-scale deployments. Unless corrected, that uncertainty will impair the ability of regulatory agencies, developers, and other stakeholders to timely make necessary decisions. This situation urgently needs to change, and it will require strong leadership to change it. The time is now to begin testing the potential for ocean power to provide a renewable domestic energy source.

Americans are rightly demanding more renewable energy, but also care deeply about their oceans and coasts and the economic viability of coastal communities. It is estimated that over half of the US population lives on or near the coast.[5] Use of the oceans for renewable energy production will require a new commitment to "blue" energy development that promotes clean, renewable

4. *See* e.g. Finavera Renewables, The AquaBuOY, http://www.finavera.com/en/wavetech/configuration (last visited Apr. 12, 2009); *and* Verdant Power, http://www.verdantpower.com/what-initiative (last visited Apr. 12, 2009).

5. Comm'n on Ocean Policy, An Ocean Blueprint for the 21st Century, Executive Summary 2 (2004), http://oceancommission.gov/documents/full_color_rpt/00b_executive_summary.pdf.

energy, ensures protection of living marine resources, and takes into account existing ocean users and the concerns of coastal communities. Such development must proceed from an understanding that our oceans are held in public trust for all citizens, and that multiple uses (including energy production) must be reasonable and consistent with the long-term productivity of these resources.

Development of renewable energy technologies that can help reduce greenhouse gas emissions is a critical component of emerging strategies to address the issue of climate change. Ocean energy technologies are among the handful of technologies poised to benefit from spreading climate change concerns. Public support for renewable energy technologies is at an all-time high. At the same time, it is clear that in order to contribute to the nation's energy supply, ocean renewable energy must be developed in ways that do not overlook potentially adverse environmental impacts.

The present federal system of ocean regulation is confusing at best; it is a mish mash of statutory authorities that were enacted without consideration of renewable ocean energy. It is unclear exactly how the federal government will regulate new renewable sources of ocean energy. Indeed, federal agencies have been actively contesting the asserted jurisdiction of sister agencies.[6] This conflict poses a problem for renewable ocean energy technology; regulatory uncertainty inhibits investment by industry. Moreover, because the ocean renewable technologies are largely untested, the scientific criteria are unclear and in the minds of many developers, agency requirements for studies and information gathering create a significant barrier to deployment of pilot projects. Regulatory uncertainty, high transaction costs and limited markets create a situation in which ocean renewable energy projects struggle to attract capital in an increasing fierce market.

THE DEVELOPMENT OF THE SEVEN PRINCIPLES

In light of this situation, the Environmental Defense Fund convened a group of leading stakeholders in ocean energy issues. The goal of the group was to develop a set of principles which, in

6. *See* Platts Inside FERC, *Jurisdictional Tussle over Ocean Power Projects Brewing between FERC, MMS* (Dec. 18, 2006).

their collective thinking, could form the basis for a new federal policy initiative that would allow the responsible development of ocean renewable energy and that would, in particular, lower barriers to the deployment of pilot projects. These parties met over the course of nine months, and responded to ideas presented by the lead authors of this article (the "Drafting Committee"). During that period, they refined seven principles that should drive the development of hydrokinetic energy in the oceans. A coalition of over 30 environmental groups, academic institutions, local government officials, technology developers and utilities signed on to this document in December 2008 and met with the Transition Team for the incoming Obama Administration to urge quick administrative action on the principles.[7]

The Seven Principles the parties ultimately agreed to are:

1. As general policy, the United States should substantially increase electrical generation from renewable sources. Ocean renewable energy has significant potential to contribute to this increase. The United States

7. The full list of signatories to the document includes: Caithness Development, LLC; Central Lincoln People's Utility District; Environmental Defense Fund; Florida Power & Light; Free Flow Power; Global Energy Horizons, Inc.; Hawaii Department of Business, Economic Development & Tourism; Hawaiian Electric Company; Hydropower Reform Coalition; Independent Natural Resources, Inc.; Natural Heritage Institute; National Hydropower Association; Natural Resources Defense Council; New England Marine Renewable Energy Center at University of Massachusetts Dartmouth; Northwest National Marine Renewable Energy Center; Ocean Champions; Ocean Power Technologies; Ocean Renewable Power Company LLC; Oceana Energy Company; Oceanlinx LLC; Oregon State University, Hatfield Marine Science Center; Oregon Wave Energy Trust; Pacific Gas & Electric; Pacific Energy Ventures LLC; Portland General Electric; Renewable Energy Holdings PLC; Sonnenschein, Nath & Rosenthal LLP; Surfrider Foundation; University of Hawaii at Manoa; WaveBob LLC. In addition, the following coastal mayors also added their support to the document: Bill Baarsma, Tacoma, WA; Mark Begich, Anchorage, AK; Marty Blum, Santa Barbara, CA; Keith Bohr, Huntington Beach, CA; Gavin Newsom, San Francisco, CA; Tom Potter, Portland, OR. *See* Jack Sterne, et al., *Ocean Renewable Energy: A Shared Vision and Call for Action*, *available at* http://www.edf.org/documents/8969_OceanRenewableEnergy_JointPrinciples_08.pdf. For full list of signatories *see also* Press Release, Env'l Def. Fund, Ocean Energy Agenda Supported by Coastal Mayors, Industrial Leaders, Academics and Environmentalists (Dec. 22, 2008), *available at* http://www.edf.org/pressrelease.cfm?ContentID=8996.

government should use its authorities and commit the resources needed to support a robust evaluation of ocean renewable energy technology and its potential environmental impacts.

2. State and federal regulatory policy should explicitly encourage pilot and demonstration scale projects under permitting conditions that assure protection of ocean resources.

3. Beginning in 2009, the federal government and the States should increase research and development funding to study, monitor, and report on common impacts (e.g., by location or technology type) and the effectiveness of corresponding mitigation measures so that these issues are not faced from the beginning in individual proceedings. Federal and state regulatory agencies should also compile existing information under their control that is relevant to testing and deployment of ocean renewable energy, including information on baseline resources condition, potential impacts, and potential mitigation measures, and publish it in a publicly accessible common library within the next year.

4. FERC and MMS should, after further consultation with stakeholders, resolve their jurisdictional dispute under the 2005 Energy Policy Act and Federal Power Act and clarify their respective authorities for regulation of ocean hydrokinetic energy. If they have not done so by February 2009, the new Administration should direct the agencies to each propose a solution by April 2009, and then resolve the dispute by June 2009.

5. Federal and State regulatory agencies should cooperate to prepare a unified environmental document for each application for deployment of demonstration projects, and should otherwise coordinate their permitting procedures and decisions.

6. A mechanism is needed to support coordinated federal,

state, interstate and interagency planning for ocean renewable energy development.

7. The regulatory process for ocean power should permit and encourage effective participation of all stakeholders affected by a given project.

Each of these principles are explained in greater detail below, and fall under four general themes: (1) the need for action; (2) the importance of facilitating pilot projects and funding research and development; (3) the need for leadership and cooperation in regulation; and (4) the importance of planning and public participation.

THE NEED FOR ACTION

America urgently needs new sources of clean energy. While the deployment and evaluation of ocean energy technologies[8] represent a unique and important renewable energy opportunity, these technologies are being hampered and constrained by several factors. The technologies are generally recognized as not sufficiently mature for commercial-scale development. This makes it difficult for project developers to attract sufficient capital, due to the perceived risk of these projects. Another factor, which is the focus of this paper, is an uncertain regulatory system that results in larger transaction costs than are appropriate for this demonstration phase of these emerging technologies.

Principle 1. As general policy, the United States should substantially increase electrical generation from renewable sources. Ocean renewable energy has significant potential to contribute to this increase. The United States government should use its authorities and commit the resources needed to support a robust evaluation of ocean renewable energy technology and its potential environmental impacts.

Development of diverse and numerous sources of alternative

8. This paper focuses on ocean energy generated from waves, tides, and currents. It does not address other technologies deployable in the marine environment, including thermal conversion or offshore wind, although these recommendations may also have relevance to those technologies.

renewable energy is critical to our nation's energy security and environmental well being. According to the Electric Power Research Institute, ocean renewable energy in U.S. waters has the estimated potential to supply some 400 Terawatt hours of clean power annually, or roughly 10% of today's electrical demand.[9] Yet project testing and deployment in coastal waters is almost non-existent.

The federal role is crucial because virtually every site where ocean renewable energy technology is likely to be tested or deployed is subject to federal jurisdiction. Unlike conventional wind and solar, ocean renewable energy technology cannot be tested or deployed on private land. The industry will emerge and mature in the United States only if the federal government uses its considerable resources and authorities to answer critical questions and encourage appropriate use of marine areas.

Congressional support for renewable technologies, including a national renewable portfolio standard has been growing and more states have been enacting their own every year. However, more mature technologies, such as wind power have been a major beneficiary of such policies. Regardless of the lack of significant federal support, whether through research and development funding or through the production tax credit, some hydrokinetic energy technologies have been advancing appreciably. The U.S. Department of Energy recently observed:

> Companies are often judged by how far they have proceeded along a gauntlet of regulatory requirements; structural design development; scientific evaluation and testing; and bench-scale, pilot-scale, and full-scale demonstrations. A more valuable metric for evaluating technical viability and commercial applicability would be to grade the technologies upon performance, cost, and reliability criteria that can be effectively applied to each device in a standardized format.[10]

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9. Elec. Power Research Inst., Primer: Power from Ocean Waves and Tides 3 (2007), *available at* http://www.aidea.org/AEA/PDF%20files/OceanRiverEnergy/6-22-2007EPRIprimer.pdf.

10. Dept. of Energy, Ocean Energy Technology Development, *available at* http://www.science.doe.gov/sbir/solicitations/FY%202008/27.EE.Ocean.htm.

DOE's description sounds sympathetic, but it also underscores the "chicken-and-egg" problem of attracting capital to commercially unproven technologies. Clear federal policy supporting development of ocean renewable technologies would be a step in the correct direction. While it is possible that the National Oceanic and Atmospheric Administration (NOAA), the Department of the Interior (DOI), and other agencies could play a significant role in developing the necessary information regarding the environmental impact of ocean renewable technologies, the DOE remains the government entity most likely to be assigned the lead role in supporting the development of these technologies.

As compared to Europe however, federal support through DOE is off to a slow start. After initial funding of $9.9 million in Fiscal Year (FY) 2008, the Bush Administration proposed to cut the program back to just $3 million in FY 2009 in order "to evaluate the findings" of the start-up program.[11] According to the budget proposal, the funds will support:

> A comprehensive technology assessment of water power in the United States, including wave and current (ocean and tidal) resources; technology characterizations to identify manufacturers, performance limits and issues; known environmental impacts and issues, and other relevant technical and market variables; cooperative research and development agreements, and ... key collaborative international activities... [12]

By contrast, the European Union has already invested tens of millions of dollars in developing wave power along Europe's West Coast.[13]

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11. *See* Dep't of Energy, Fiscal Year 2009 Budget-in-Brief, http://www1.eere.energy.gov/ba/pba/pdfs/FY09_budget_brief.pdf, 47.

12. *See id.*

13. *See generally,* Comm'n of the European Communities, Communication from the Commission to the Council and the European Parliament: Renewable Energy Roap Map (Oct. 1, 2007), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0848:FIN:EN:PDF (proposing that European Union member states enter into a legally binding agreement to use renewable energy for 20% of their power by 2020), *see also,* i.e., *UK's Wave Hub Proceeds wth $43 M Investment*, Renewable Energy

Fortunately, Congress appropriated significantly more in the final '09 budget bill than the previous Administration had requested, providing $40 million to the water power program at DOE, $30 million of which is expected to go to hydrokinetics. In addition, the stimulus bill passed by Congress at the request of the Obama Administration provides $16.8 billion of research and development funds for renewable energy, and includes ocean renewables as a potential recipient of these funds.[14] The Department of Energy will determine what percentage of those funds will go to hydrokinetics, but a modest investment of $100 million could help close the gap with Europe and provide a huge boost to the U.S. industry.

ENCOURAGING PILOT PROJECTS AND FUNDING R&D

Without increased government action to encourage demonstration projects and to funding research and development, the promise of ocean renewable energy may never be realized, and the U.S. may see Europe corner the market on these technologies, in much the same way that it did with wind in the 1970s.

Principle 2. State and federal regulatory policy should explicitly encourage pilot and demonstration scale projects under permitting conditions that assure protection of ocean resources (e.g., an obligation to achieve performance standards for such protection, not just implementation of mitigation measures).

For the most part, wave, tidal and current energy technologies are at least several years from being ready for full-scale commercial deployment. Getting small-scale projects in the water will speed the development of technologies, allow their refinement, produce relevant environmental data, and advance the competitive market. The technologies will continue to mature for years to come, and there will be a long-term need for ocean resource managers to be able to accommodate pilot or

World, Apr. 30, 2007, http://www.renewableenergyworld.com/rea/news/article/2007/04/uks-wave-hub-proceeds-with-43-m-investment-48315.

14. American Recovery and Reinvestment Act of 2009, 111 P.L. 5, Tit. IV, 123 Stat. 115. The law provides that "the Secretary [of Energy] may make guarantees ... for ... renewable energy systems, including incremental hydropower, that generate electricity or thermal energy, and facilities that manufacture related compounds." *Id.* at Tit. IV, § 1705.

demonstration projects.

State and federal governments should create licensing/permitting processes that encourage development of these pilot and demonstration projects while ensuring protection of the marine environment. State and federal governments should work together to streamline and standardize the licensing/permitting processes to make it more efficient to obtain regulatory approvals. Agencies should also award licenses based on clear and trackable performance standards for protection of the marine environment, wildlife, and existing uses.

Because the environmental impacts of these technologies are largely unknown, it will not be possible to have perfect information before small-scale projects go in the water. The state and federal regulatory approach for conventional hydropower should be scaled to reflect the relatively small impact and potential risk associated with the size of these pilot and demonstration projects. While allowing small-scale projects to go forward entails some environmental risk, it appears such risk may be managed adequately through permitting conditions that require modification, redeployment, or removal of projects as appropriate to achieve the trackable performance standards. In addition, state and federal governments should cooperate on siting criteria and engage in marine spatial planning to identify those areas with the best combination of high-energy potential and low risk of environmental harm and interference with existing uses.

Any small-scale demonstration project should be allowed to generate and sell electricity, or otherwise earn an economic benefit from the project during its demonstration phase, so long as the project complies with the other operational and environmental conditions of its permits. This contrasts with the present exception to licensing provided by the Federal Energy Regulatory Commission (FERC). Commonly known as the "Verdant Exemption," experimental demonstration projects may be tested in navigable waters without a license provided FERC makes three findings: the technology is experimental, the proposed facilities are used for a short period of time with the objective of conducting necessary studies in the preparation of a license application, *and power generated from the project does not transmit into or displace*

power from the national grid.[15] As the small-scale demonstration projects prove themselves, they can be expanded to commercial scale under appropriate permitting procedures, which should acknowledge and address issues associated with the potentially greater impact on ecosystems of removing larger amounts of energy from those natural systems.

Principle 3. Beginning in 2009, the federal government and the States should increase research and development funding to study, monitor, and report on common impacts (e.g., by location or technology type) and the effectiveness of corresponding mitigation measures so that these issues are not faced from the beginning in individual proceedings. Federal and state regulatory agencies should also compile existing information under their control that is relevant to testing and deployment of ocean renewable energy, including information on baseline resources condition, potential impacts, and potential mitigation measures, and publish it in a publicly accessible common library within the next year.

The decision-making environment for development and regulation of ocean renewable energy suffers from a shortage of relevant, reliable public information. By comparison with conventional hydropower, where there is more than a century of experience in design and operation, there is limited experience about the environmental impacts of ocean power. Federal and state governments should provide leadership with regard to analyses of impacts that are likely to be common among the various technologies and projects.

Very few pilot projects have been put in the water, and none have been fully tested for extended periods, so there is very little data on potential environmental impacts from project deployment, operation, maintenance, or decommissioning. Further, developers are being asked to generate baseline data on the condition of various ocean resources. The resulting transaction costs are an effective barrier to development and privately funded data collection is less likely to be publicly available to benefit good management and ocean renewable energy as a whole.

15. *See* Verdant Power LLC, 111 F.E.R.C. ¶ 61,024 (2005) (emphasis added).

Federal and state governments could provide very effective assistance by funding research on environmental baseline conditions and common impacts among these technologies. For instance, almost all ocean renewable energy technologies must be anchored to the ocean bottom, and may cause impacts on sedimentation processes and benthic resources. Analogs from other types of development in the ocean, such as oil and gas platforms, may provide reliable assessments of the impacts of a wide range of ocean renewable energy technologies. Further, it is recommended that federal and state agencies responsible for monitoring the baseline conditions of ocean resources coordinate these programs.

A common library of all available data, particularly data about the baseline conditions of the ocean resources, would reduce the transaction costs faced by developers. A single federal agency, such as the National Oceanic and Atmospheric Administration, should lead a coordinated effort to compile public data. The U.S. should also fully participate in and fund international efforts to compile such information being coordinated by the International Energy Agency.

An organized effort, as described above, will lead to better projects by building on the collective experience of the federal and state governments and help avoid unnecessary mistakes. Additionally, by funding research on the common impacts of these technologies, the federal government allows developers, most of whom are start-up companies, to focus more of their resources on refining their technologies and reducing impacts, rather than performing baseline research and environmental analyses.

LEADERSHIP AND COOPERATION IN REGULATION

Regulation of ocean power should be efficient, organized and transparent. There should be one federal lead agency and other federal and state agencies should cooperate with the lead agency in environmental review and procedures.

Principle 4. FERC and MMS should, after further consultation with stakeholders, resolve their jurisdictional dispute under the 2005 Energy Policy Act and Federal Power Act and clarify their respective authorities for regulation of ocean hydrokinetic energy. If they have not done so by February 2009, the new

Administration should direct the agencies to each propose a solution by April 2009, and then resolve the dispute by June 2009. Existing law permits several different resolutions of this dispute, and it is incumbent on the Obama Administration to choose promptly among the alternatives.

Responding to the regulatory void exposed by the Cape Wind project controversy, Congress included a provision in the Energy Policy Act of 2005 that authorized the Department of the Interior's Minerals Management Service (MMS) to issue leases for renewable energy projects located in the federal Outer Continental Shelf area, the zone of federally owned seabed outside of state waters, typically 3-200 nautical miles (nm) offshore.[16] The new law did not, however, waive any preexisting federal authority in marine areas.[17] The Federal Energy Regulatory Commission (FERC) had previously asserted Federal Power Act-based authority to license wave and tidal energy projects located in U.S. territorial waters, the ocean zone within 12 nm of the shoreline.[18]

The agencies' respective jurisdictional claims overlapped in the band of federal (but not state) waters within 12 nm of the shore, and perhaps beyond.[19] The two agencies, despite considerable discussion and efforts to negotiate an interagency Memorandum on Understanding (MOU), were unable to reach a timely resolution.[20] Both agencies acknowledged that they knew how to reconcile their competing claims under existing law but negotiations over the terms of the MOU lasted until 2009.[21] The

16. *See* Energy Policy Act of 2005, H.R. 6, 109th Cong. § 388(a) (2005).

17. *See id.*

18. *See* AquaEnergy Group, Ltd., 101 F.E.R.C. ¶ 62,009 (2002).

19. FERC recently issued an order asserting jurisdiction over projects beyond 12 nm as well. *See* Pacific Gas & Elec. Co., 125 F.E.R.C. ¶ 61,045 (2008).

20. *See e.g.* Nic Lane, Wave, Tidal, and In-Stream Energy Projects: Which Federal Agency Has the Lead? (Congress'l Research Serv. Rpt. for Cong.) (2008), *available at* http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-10715:1).

21. *See* U.S. Senate Hearing Committee on Energy and Natural Resources, ALTERNATE ENERGY-RELATED USES ON THE OUTER CONTINENTAL SHELF, S. Hrg. 110-134, JUNE 7, 2007 and *see* Memorandum of Understanding between the U.S. Dept. of the Interior and Fed. Energy Regulatory Comm'n (Apr. 9, 2009) *available at* http://www.mms.gov/offshore/AlternativeEnergy/PDFs/DOI_FERC_MOU.pdf.

conflicting claims impacted a 9 nm-wide marine zone that is potentially critical to the development of ocean renewable energy projects. The interagency conflict generated considerable uncertainty within the regulated community and among stakeholders. The conflict, because it created regulatory uncertainty, was seen as an impediment to financing the development of the nascent ocean renewable energy industry.

Resolving the FERC and MMS conflict became increasingly critical since FERC claimed the authority to issue "conditional licenses."[22] Conditional licenses allowed FERC to approve projects before receiving the necessary authorizations from state and federal agencies. This licensing program differs from FERC's original proposal: a "pilot project permitting process" under which projects less than 5 MW would be fast-tracked and granted 5-year licenses. These pilot project licenses included the proviso that projects would not be located in "sensitive waters" and capable of quick removal or shut down should monitoring reveal unacceptable environmental impacts.[23] The ambition behind the pilot project process was to get projects into the water quickly so developers could test their technologies, determine appropriate sites, and confirm environmental effects. At the end of the five-year period, developers could apply for 30- to 50-year licenses.

While some in the environmental community were supportive of the pilot project permitting process, the failure to define "sensitive" waters was a significant problem.[24] Developers,

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22. Conditional licenses authorize on-site construction of hydrokinetic projects provided these projects have received all other federal authorizations required by law. *See* Fed. Energy Regulatory Comm'n, Policy Statement on Conditioned Licenses for Hydrokinetic Projects, 121 FERC ¶ 61,221 (2007) (hereinafter FERC Policy Statement).

23. *See* Chairman Joseph T. Kelliher's statement on Hydrokinetic - Energy Pilot Project Licensing Process, Docket No: AD07-14-000 (July 19, 2007), *available at* http://www.ferc.gov/news/statements-speeches/kelliher/2007/07-19-07-kelliher-hydro.pdf (announcing the Pilot Project Licensing Process).

24. *See e.g.* N.Y. State Dept. of Envt'l Conservation, Agency Comments on Proposed Licensing Process for Hydrokinetic Pilot Projects, Docket No. AD07-14-000 at *3 (Nov. 9, 2007), *available at* http://elibrary.ferc.gov/idmws/search/fercgensearch.asp (search docket number: "AD-07-14"); *and* Elizabeth R. Mitchell, Re: FERC Docket No. AD07-14-000, Proposed Licensing Process for Hydrokinetic Pilot Projects, Docket No. AD07-14-000 at *11-2 (Oct. 31, 2007), *available at* http://elibrary.ferc.gov/idmws/search/fercgensearch.asp (search docket

although supportive of the goals of the process, were generally less sanguine; upset that the process required similar amounts of preparation as applying for a long-term license but without the certainty.[25] Developers expected this lack of certainty to inhibit investment.[26]

As a response to these comments, FERC produced a statement providing for the issuance of "conditioned licenses."[27] The conditional license allowed developers to move forward on all aspects of the project short of construction, commencement of which is subject to securing all other state and federal approvals, which include for example authorizations required under the Coastal Zone Management Act (CZMA), Clean Water Act (CWA), and Endangered Species Act.[28]

At best, it was unclear how these conditional licenses advanced ocean energy technologies and may have significantly stifled advancement. The State of Washington filed a request for the rehearing of Finavera's license on the grounds that FERC has no statutory authority to issue even a conditional license absent prior CZMA and CWA certifications by the state.[29] This is a legal issue that has very little relation to the substance of ocean energy, but may go all the way to the United States Supreme Court and negatively affect the regulatory climate.

In July 2008, MMS proposed rules regulating the leasing and related property rights of the ocean seabed for the use of alternative energy projects.[30] The proposed rule offered two types

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number: "AD-07-14").

25. *See e.g.* Stephen D. Padula, Long View Associates Inc., Comments of Long View Associates Inc. under AD07-14, Docket No. AD07-14-000 at *2, 3 (Nov. 5, 2007), *available at* http://elibrary.ferc.gov/idmws/search/fercgensearch.asp (search docket number: "AD-07-14"); *and* Gilbert P. Sperling, Verdant Power, Re: Proposed Licensing Process for Hydrokinetic Pilot Projects A Framework for Discussion: Docket AD07-14-000, Docket No. AD07-14-000 (Oct. 30, 2007), *available at* http://elibrary.ferc.gov/idmws/search/fercgensearch.asp (search docket number: "AD-07-14").

26. *See* Stephen D. Padula, Long View Associates Inc., Comments of Long View Associates Inc. under AD07-14, *supra* note 25, at *2.

27. *See* FERC Policy Statement, *supra* note 22.

28. *See id.*

29. *See* State of Washington Dep't of Ecology v. FERC No. 08-1191 (D.C. Cir. filed May 15, 2008).

30. *See,* Press Release, Minerals Management Service, MMS Proposes Offshore Alternative Energy and Alternate Use Regulations (July 8, 2008), *available at* http://www.mms.gov/ooc/press/2008/press0708.htm.

of leases for alternative energy projects; a commercial lease intended for a full-scale energy project which could last "approximately 30 years" and/or a limited lease intended for site assessment, technology testing and related activities, but which would last only five years.[31] The commercial leases would provide the lessee with the ability to produce, transmit and sell power and convey preferential rights for easements and right-of-ways related to the energy project.[32] The limited lease would not provide for any preferential treatment in acquiring commercial lease rights to the lease area.[33]

Environmental groups criticized the proposed rule as lacking specific criteria for basing agency decisions.[34] They also saw the agency's proposal to make use applications and competing use determinations on a case-by-case basis as failing to adequately account for cumulative environmental impacts.[35] Both environmental and industry commenters lamented that the framework too closely resembles the agency's regulation of oil and gas leasing. [36] Developers asserted that the regulatory scheme resembled that which would apply to a mature industry and that alternative energy needs more favorable policies in order to compete.[37] Some industry commenters requested all data associated with site assessment and technology testing be held confidential by MMS.[38]

Within the proposed rule MMS also took the opportunity to assert its jurisdiction over renewable ocean energy projects stating "[t]he MMS is the lead Federal agency for NEPA compliance and

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31. *See* Alternative Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf, 73 Fed. Reg. 39376, 39383 (proposed July 9, 2008).

32. *Id.*

33. *Id.*

34. *See* e.g. The Nature Conservancy, Re: Alternative Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf, RIN 1010-AD30 (Sept. 8, 2008).

35. *See id.*

36. *See e.g.* Florida Power & Light Company, Alternative Energy & Alternate Uses of Existing Facilities on the Outer Continental Shelf, 010-AD30, (Sept. 8, 2008). *See also* Surfrider Foundation, Alternative Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf (Sept. 8, 2008).

37. *See e.g.* Florida Power & Light Company, *supra* note 36.

38. *Id.*

alternative energy and alternate use activities on the OCS [Outer Continental Shelf]."[39] FERC responded through a comment submission recommending wave and ocean current energy be removed from the proposed rule, arguing that "the MMS' [proposed rule] offers little hope of attracting the private capital necessary for development of wave and ocean current projects..."[40]

Thus, rather than getting closer to resolving their differences, FERC and MMS only seemed to be getting further apart. The authors are pleased to report, however, that the Obama Administration acted quickly on this recommendation, and in early April 2009 FERC and MMS released an MOU that defined "jurisdictional understandings" relating to hydrokinetic projects on the OCS.[41] The agencies agreed MMS has exclusive jurisdiction to issue leases, easements and rights-of-way for hydrokinetic projects on the OCS and is responsible for NEPA and related environmental reviews relating to these activities.[42] Likewise FERC has exclusive jurisdiction to issue licenses for the construction and operation of hydrokinetic projects on the OCS and retains responsibility for NEPA and other environmental reviews for its licensing activities.[43] Each agency has the option to become a cooperating agency during the NEPA review conducted by the other.[44] The agreement implies MMS will have lead agency status under NEPA review during the leasing phase of a hydrokinetic process and FERC will have lead agency status during the licensing phase.

The MOU also states "the Commission will not issue preliminary permits for hydrokinetic projects on the OCS...[and]...not issue a license ...until the applicant has first

39. Alternative Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf, *supra* note 31 at 39384.

40. Fed. Energy Regulatory Comm'n, Comments of the Federal Energy Regulatory Commission Staff on the Alternative Energy and Alternate Uses on the Outer Continental Shelf, RIN 1010-AD30 at 4 (2008), *available at* http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/pdf/mms082808.pdf.

41. Memorandum of Understanding between the U.S. Dep't of the Interior and Fed. Energy Regulatory Comm'n (Apr. 9, 2009).

42. *Id.*

43. *Id.*

44. *Id.*

obtained a lease..."[45] Thus, a lease must be obtained from MMS prior to obtaining a FERC license and MMS will be responsible for making the siting decisions- thereby setting the priority of OCS energy projects. The statement should clarify procedure and help avoid conflict based on opposing site claims as seen most recently off the coast of New Jersey.[46]

FERC further agreed that MMS may include terms and conditions to its leases and FERC will require compliance with these terms prior to obtaining a license.[47] FERC will issue licenses based on its authority under the FPA to regulate hydroelectric projects.[48] The MOU reinforces MMS's ability to mandate conditions on the FERC licenses but states plainly MMS may not communicate "off the record" with other agencies either during the NEPA review or during the licensing process.[49] The MOU appears to let both agencies exercise their relevant expertise (regulation of electrical power for FERC, leasing the seabed for MMS) and does not require a return to Congress. In addition, by bringing the Federal Power Act into play, such a scheme gives NOAA and the Fish and Wildlife Service a formal role in licensing and therefore provides greater protection for fish and wildlife through §10(j) and §18 of the FPA.[50]

MMS apparently withdrew its final rule from OMB in response to the Obama Administration's freeze on the issuance of rules developed under the previous administration, thus affording an opportunity for it to reassess policy in this area. Consequentially, as this article was going to press MMS issued revised regulations finalizing the framework for renewable energy production on the OCS.[51]

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45. *Id.*

46. Sandy Bauers, *A Clash of Wind, Wave Wnergy Permits off N.J.*, Sandy Bauers, Philadelphia Inquirer, Apr. 4, 2009, *available at* www.philly.com/philly/business/20090404_A_clash_of_wind__wave_energy_permits_off_N_J_.html?viewAll=y&c=y.

47. *See supra* note 41.

48. *Id.*

49. *Id.*

50. 16 U.S.C.S. § 803 (1966).

51. *See* Press Release, Minerals Management Service, President Obama, Sec'y Salazar Announce Framework for Renewable Energy Development on the U.S. Outer Cont'l Shelf (Apr. 22, 2009), http://www.mms.gov/ooc/press/2009/press0422.htm.

Principle 5. Federal and State regulatory agencies should cooperate to prepare a unified environmental document for each application for deployment of demonstration projects, and should otherwise coordinate their permitting procedures and decisions.

Regulation by multiple jurisdictional agencies, if uncoordinated, is an impediment to investment in ocean wave, tidal and current technologies. The transaction costs of permitting a given project increase if these agencies do not collaborate on matters of common regulatory concern, particularly preparation of the environmental impact reviews that underpin their permitting decisions. Multiple, overlapping environmental reviews do not necessarily improve environmental protection. Federal and state regulatory agencies with jurisdiction over ocean wave, tidal and current projects should coordinate their environmental review and permitting processes, as well as their responsibilities for administration and enforcement of the permit conditions for approved projects.

FERC offers an integrated licensing process (ILP), which improves coordination with other federal and state agencies as well as Native American tribes, non-governmental organizations, and the public.[52] This coordination, according to FERC, will make licensing more efficient, predictable and reduce costs from the licensing process.[53] The ILP is designed to improve coordination between FERC and other agencies; involving the contemporaneous preparation of environmental documents.[54] An applicant simultaneously files a Notice of Intent (NOI) to relicense the project and a Pre-Application Document (PAD) with FERC.[55] The NOI formally notifies FERC of an applicant's intent to apply for a new license.[56] The PAD is a detailed collection of information about the project provided at the beginning of the relicensing process for the purpose of focusing participants on key issues.[57] The ILP additionally seeks to "[streamline] dispute

52. *See* Fed. Energy Regulatory Comm'n, FERC Issues First Hydroelectric License Using Integrated Licensing Process (Dec. 17, 2007).
53. *See id.*
54. *Id.*
55. *See* 18 C.F.R. § 5.6 (2003).
56. *See* 18 C.F.R. § 5.5 (2003).
57. *See* 18 C.F.R. § 5.6 (2003).

resolution and [expand] opportunities for public participation in pre-filing consultation."[58]

While this progress in ocean energy regulation is welcome developers face many other assessment requirements from other statutes and agencies, with varying standards of review, including the Clean Water Act,[59] the Outer Continental Shelf Lands Act,[60] the National Historic Preservation Act,[61] the Fish and Wildlife Coordination Act,[62] the Endangered Species Act,[63] and the Marine Mammals Protection Act,[64] among others.

Difficulties are inherent in inter-agency and state-federal coordination. The Obama Administration should charge a senior White House office, ideally the Council on Environmental Quality (CEQ), with responsibility to lead an interagency, federal-state process to create a coordinated environmental review and permitting system for pilot and demonstration-scale ocean renewable energy projects that fulfills the requirements of the National Environmental Policy Act (NEPA), state environmental review laws, and other applicable mandates.

PLANNING & PARTICIPATION

A public process to consider appropriate locations for ocean renewable energy and that addresses the concerns of all stakeholders – including all relevant state and federal agencies – is critical to public acceptance of ocean renewable energy projects.

Principle 6. A mechanism is needed to support coordinated federal, state, interstate and interagency planning for ocean renewable energy development.

No federal or interstate body has taken on the task of planning for ocean renewable energy development. For example, FERC permits individual projects, but does not provide planning for multiple projects along the coast. MMS neither plans nor regulates within state waters, where many projects, and virtually

58. *See supra* note 41.
59. *See* 33 U.S.C.S. § 125 (2008).
60. *See* 43 U.S.C.S. § 1337 (1953).
61. 16 U.S.C.S. § 470 (1966).
62. 16 U.S.C.S. § 661 (1934).
63. 16 U.S.C.S. § 1531 (1973).
64. 16 U.S.C.S. § 1361 (1972).

all grid interconnections, will occur. There also may be conflicts between FERC and the states over consistency review for projects under the Coastal Zone Management Act (CZMA).[65] Creative thinking will be required to find ways to coordinate necessary ocean planning and the permitting processes for energy development. A federal-level approach may be necessary to coordinate and integrate planning for ocean renewable energy development and may require new legislative authority. In the short-term, the Obama Administration might clarify the agencies' roles, providing appropriate deference and support to states in their mandates under the CZMA, in an Executive Order addressing the FERC-MMS conflict.

Principle 7. The regulatory process for ocean power should permit and encourage effective participation of all stakeholders affected by a given project. Specifically, it should include: (A) transparency, including disclosure of documents and communications, and (B) reasonable opportunities for stakeholders to engage directly with applicants and agencies to address and resolve any concern, in addition to the ordinary procedure of filing written comments for the record. Such participation should balance the public's need to have input on decisions affecting public resources with the imperative to move forward quickly with pilot and demonstration projects.

Because they involve public resources, ocean renewable energy projects bring with them an inherent need for public participation in decision-making. Numerous stakeholders – including coastal community members and recreational users such as fishermen, property owners, boaters, surfers, and conservationists – want to ensure that their interests are adequately addressed during decisions on siting and operation of such projects.

Formal procedures for public input have long been a feature of state and federal regulatory processes. Nonetheless, many project sponsors have struggled to make sense of overlapping and potentially conflicting regulatory regimes that often do not seem suited to address the public interest, legislative intent, or the

65. *See* 16 U.S.C.S. § 1456(c)(1)(A) (1966), 16 U.S.C.S. § 1456(c)(3)(A)(1966).

needs of the fledgling industry. Similarly, the challenges of winning public acceptance for technologies that in many ways hold the promise of dramatic improvement over older forms of electricity generation are arguably different in one important respect: ocean energy technologies have little operational history from which the public can draw informed conclusions about impacts, or the lack thereof.

For this reason, ocean energy project sponsors face considerable pressure to commit to intensive monitoring of pilot projects. NEPA provides the fundamental framework for transparent decision-making. Stakeholder engagement processes should meet the highest levels of integrity and effectiveness and support robust NEPA analysis and decision making, which can be achieved through the adoption of a system in line with the recommendations of the National Environmental Conflict Resolution Advisory Committee.[66]

The Committee found enormous potential for resolution of environmental conflicts by promoting greater awareness of the values and principles manifested in NEPA §101,[67] specifically, the guiding of agencies and affected stakeholders away from conflicts or facilitating their resolution through techniques offered in NEPA. These policies and environmental conflict resolution techniques help the federal government improve decision-making and provide a common language. The environmental conflict resolution practices create the conditions under which a common language can be established and productive strategies can be applied, leading to more mutually agreed outcomes. Conflicts are approached with federal government agencies as partners in a collective process without relinquishing federal obligations.

Collaboration and conflict resolution through increased public participation can build public trust and confidence and is doubtlessly an important means of reducing local opposition to proposed ocean projects, but can also be linked to an explicit strategy for improving regulatory outcomes. For example, the Reedsport Settlement Process, coordinated by Oregon Solutions, a non-profit sustainable development group, brings together diverse

66. Nat'l Envtl Conflict Resolution Advisory Comm'n., Final Report 5 (2005), *available at* http://www.ecr.gov/pdf/NECRAC_Report.pdf.

67. *Id.*

community, industry, and government interests.[68] Together, they work to identify and resolve issues associated with a proposed large-scale commercial wave energy project sponsored by Reedsport OPT (Ocean Power Technologies) Wave Park. Federal and state permitting agencies are part of the effort, along with conservation groups, elected officials, and fishermen. By using a voluntary, collaborative process aimed at building consensus and resolving conflicts prior to formal regulatory proceedings, the project sponsor expects not only to enhance public support, but also to save time and expense by presenting regulators with a package of agreed-upon measures. Since the process includes discussion of key regulatory requirements, formal permit and license applications can reflect measures and conditions that have been agreed to previously by the participants. With such a package, regulators, in theory, can move more quickly to complete their work.

CONCLUSION

The principles agreed to by the group and articulated in this article can generally be implemented under existing law and rules. Because most of these actions can be implemented without new statutory authorities, all they really require is strong executive leadership. With early action on these concepts, the Obama Administration can help kick-start a promising new source of renewable energy while ensuring protection of the marine environment.

68. *See* Oregon Solutions Declaration of Cooperation, June 2007, http://www.orsolutions.org/southwest/waveenergy.htm.