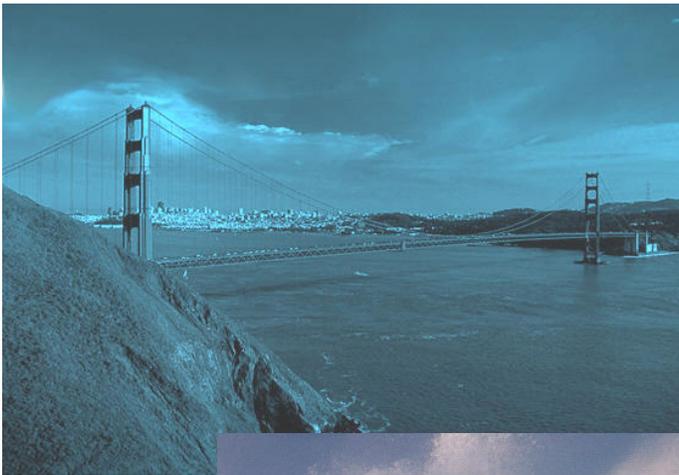




# OCEAN RENEWABLE ENERGY

A Shared Vision and Call for Action





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## INTRODUCTION

Ocean waves, currents and tides carry immense amounts of energy. Because moving water is at least 700 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. 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.

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. 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 nearshore 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 we believe 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, and we also care deeply about our oceans and coasts and the economic viability of coastal communities. Use of the oceans for renewable energy production will require a new commitment to “blue” energy development that promotes clean, renewable 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.



At the invitation of Environmental Defense Fund, leading participants in the ocean renewable energy and hydropower industries and the conservation community have come together to explore the opportunities and challenges presented by ocean renewable energy. These participants agree on the following general principles, and we urge the Obama Administration to act quickly to implement them.

## PRINCIPLES THE NEED FOR ACTION

America urgently needs new sources of clean energy. While the deployment and evaluation of ocean energy technologies<sup>1</sup> 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.

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 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. 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. The Obama Administration should urgently pursue more favorable policies that facilitate such development while ensuring protection of the marine environment and existing uses of it.

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<sup>1</sup> 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.



## ENCOURAGING PILOT PROJECTS and FUNDING R&D

Without increased government action to encourage demonstration projects and to fund 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.

- 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 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. As these 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.



- 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 we have more than a century of experience in design and operation, there is limited experience about the environmental impacts of ocean power. The federal government and the states 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.

The federal government and states 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. There may be analogs from other types of development in the ocean, such as oil and gas platforms, that can provide reliable assessments of the impacts of a wide range of ocean renewable energy technologies. Further, we recommend that federal and state agencies that monitor the baseline condition of ocean resources coordinate these programs

A common library of all available data, particularly data about the baseline condition of the ocean resources, would reduce the transaction costs faced by developers. We believe that 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.

Such an organized effort will lead to better projects by building on the collective experience of the federal and state governments, and will help avoid unnecessary mistakes.



In addition, by funding research on the common impacts of these technologies, the federal government would allow developers, most of which are start-up companies, to spend more of their resources on refining the technologies and reducing impacts, rather than on 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.

- 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 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. The new law did not, however, waive any preexisting federal authority in marine areas. 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.

The agencies' respective jurisdictional claims overlap in the band of federal (but not state) waters within 12 nm of the shore, and perhaps beyond.<sup>2</sup> The two agencies are well aware that their jurisdictional claims conflict. Despite considerable discussion, and efforts to negotiate an interagency MOU, FERC and MMS have been unable to reach a resolution. Both agencies have acknowledged that they know how to reconcile their competing claims under existing law, but have not done so. The conflicting claims impact a 9 nm-wide marine zone that is potentially critical to the development of ocean renewable energy projects. The interagency conflict has generated considerable uncertainty within the regulated community and among stakeholders. The conflict, because it creates regulatory uncertainty, is an impediment to financing the development of the nascent ocean renewable energy industry.

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<sup>2</sup> FERC recently issued an order asserting jurisdiction over projects beyond 12 nm as well. 125 FERC 61,045 (Oct. 16, 2008).



If the leadership of FERC and MMS do not move quickly at the beginning of 2009 to resolve their dispute, the Administration should issue an Executive Order that clarifies the exercise of existing federal authorities for regulation of ocean power. Whatever choice the Administration makes should take into account ecosystem-based management principles and the principles articulated in this document, while ensuring that the risk and confusion created by the MMS-FERC impasse is resolved.

- 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.

Recognizing the difficulties inherent in inter-agency and state-federal coordination, we recommend that the Obama Administration charge a senior White House office, ideally the Council on Environmental Quality, 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.

- 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 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). 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.

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. 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 we believe can be achieved through adoption of a system in line with the recommendations of the National Environmental Conflict Resolution Advisory Committee.<sup>3</sup>

## CONCLUSION

We believe that these principles can generally be implemented under existing law and rules. We urge early action on these principles, understanding that the Obama Administration, Congress, and the States will undertake a much broader discussion how best to advance renewable energy policy as a whole. With such strong and early action, America can become the leader in the development of ocean energy resources.

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<sup>3</sup> Final Report, National Environmental Conflict Resolution Advisory Committee, as submitted to the U.S. Institute for Environmental Conflict Resolution, <http://www.ecr.gov/necrac/reports.htm> (April 2005).