

US Offshore Wind Collaborative 2009-2010 Prospectus



July 2009



US Offshore Wind Collaborative

USOWC Mission and History

The mission of the U.S. Offshore Wind Collaborative (USOWC) is to address the technical, environmental, economic, and regulatory issues necessary to catalyze the sustainable development of offshore wind energy in the waters of the United States.

The U.S. Offshore Wind Collaborative (USOWC) is an interdisciplinary, public/private, nonprofit organization created to help the United States harness its vast offshore wind resources. We believe in the great potential of offshore wind power development to increase national energy security, help mitigate the consequences of global climate change, and create new domestic jobs.

The USOWC is championed by experts in industry, academia, environmental advocacy, and public policy. All share a commitment to deploying offshore wind energy technologies in a manner which recognizes: (a) the urgency of our energy and climate change challenges, (b) the multiple values and uses of our marine and Great Lakes ecosystems, and (c) the technical innovations necessary to propel this burgeoning wind industry.

To achieve its mission USOWC will:

1. Serve as a forum for cross-sector communication, planning, and action on offshore wind development.
2. Collect and disseminate information that informs and advances a sustainable offshore wind industry.
3. Create an efficient and flexible organizational structure that fosters dialogue, problem-solving, and partnership.

Brief History and Current USOWC Status

The idea of creating an interdisciplinary, public/private partnership to facilitate the U.S. offshore wind industry's development was conceived in 2004 following the proposal to build Cape Wind—the nation's first offshore wind energy project—in federal waters off Massachusetts. After exploring Europe's decade-long experience with wind energy in the marine environment, gaining firsthand experience with Cape Wind's permitting deliberations, and learning about the potential of our domestic offshore wind resource, the Massachusetts Technology Collaborative (MTC) joined with General Electric Wind Energy and the U.S. Department of Energy (DOE) to consider the question, *"What would it take to launch an offshore wind energy industry in the United States, and do it right?"*

These three partners formed the initial Offshore Wind Collaborative, and convened a broad group of stakeholders in Washington, DC. Considered among the myriad opportunities and challenges were: (a) energy security, (b) global warming, (c) the vast offshore wind resources of the United States, (d) the complexities of working in marine ecosystems, and (e) the prospects for new technologies that would expand access to wind resources. The result was ***A Framework for Offshore Wind Energy Development in the United States*** (September 2005). The *Framework* is a comprehensive agenda for developing a sustainable offshore wind industry. It anticipates environmental and socioeconomic concerns, and calls for a robust partnership among government, industry, academia, and the NGO community—in short, collaboration able to address key issues and take advantage of every opportunity to *mitigate by design*.

With input from potential partners, MTC took the next step by funding a draft *Organizational Business Plan* which considered how best to structure a new national collaborative to facilitate a sustainable U.S. offshore wind industry.

Evolving Context: *The Time is Right*

Since publication of the initial *Organizational Business Plan*, the context for offshore wind development has changed considerably. While DOE and GE shifted focus (for the time being) to the high demand for land-based wind development, several coastal states launched significant initiatives to attract, incentivize, and plan for wind development offshore. The regulatory situation became clearer, with authority granted to the U.S. Department of the Interior's (DOI) Minerals Management Service (MMS) to develop the Rule for leasing Outer Continental Shelf (OCS) lands for renewable energy. In the private sector, research and development in deep-water technology has increased, along with investor interest in proposed projects. The American Wind Energy Association (AWEA)-based Offshore Wind Working Group has attracted over 100 members. Finally, energy development—renewable energy in particular—is emerging as one of the central issues in federal and state ocean planning.

With this momentum, MTC acted to move the collaborative concept forward in time to prepare for the federal administration change of January 2009. A call was issued to organizations that participated in the previous stakeholder discussions, seeking individuals to join an *ad hoc* Steering Committee to orchestrate a formal launch of the USOWC. The Steering Committee currently includes several organizations that participated in the *Framework* and the *Organizational Business Plan*, and others representing the expanding interest in offshore wind energy development:

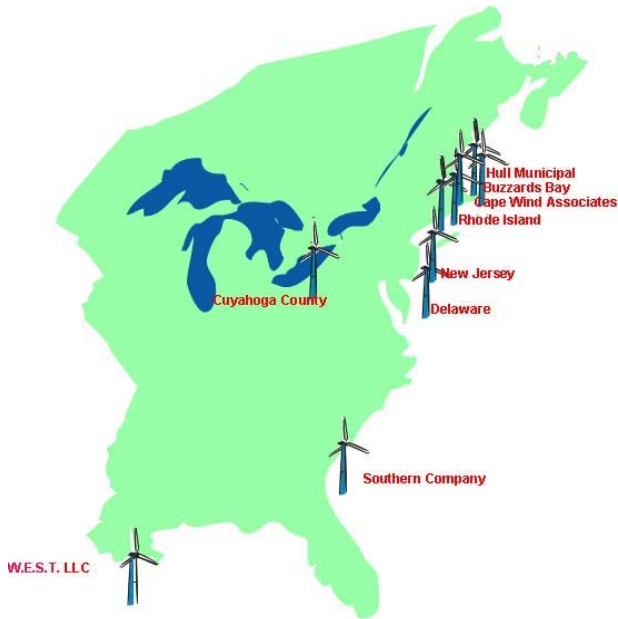
- **American Wind Energy Association** (Laurie Jodziewicz)
- **Clean Energy States Alliance** (Mark Sinclair)
- **Great Lakes Wind Collaborative** (John Hummer)
- **Mass Audubon** (Jack Clarke)
- **Massachusetts Executive Office of Energy & Environmental Affairs** (Greg Watson)
- **Massachusetts Institute of Technology** (Steve Connors)
- **Massachusetts Renewable Energy Trust** (Nils Bolgen)
- **Union of Concerned Scientists** (John Rogers)

In September 2008, the USOWC Steering Committee convened the first meeting of coastal and Great Lakes states engaged in exploring or promoting offshore wind development, in conjunction with AWEA's first Offshore Wind Workshop. Twenty-four states responded to a pre-meeting survey about their interest in offshore wind; 14 were represented at the meeting.

USOWC was registered as a nonprofit corporation in the Commonwealth of Massachusetts on April 28, 2009, and is in the process of applying for federal 501(c)(3) nonprofit status. Fara Courtney was appointed launch director in June 2009.

Offshore Wind Energy: Birth of a New U.S. Industry

Source: National Renewable Energy Laboratory



“More than three-fourths of the nation’s electricity demand comes from coastal states and the wind potential off the coasts of the lower 48 states actually exceeds our entire U.S. electricity demand.”

Ken Salazar, Secretary U.S. Dept. of the Interior

The winds over the U.S. Outer Continental Shelf and Great Lakes represent vast, untapped sources of clean and accessible renewable energy. The U.S. Department of the Interior recently estimated that offshore wind turbines could someday supply enough electricity to meet total U.S. demand.

A recent DOE study indicates that wind energy could provide 20% of the nation’s electricity

by 2030.¹ Of that total wind power, roughly one-fifth—54 gigawatts (GW)—would come from offshore sources. DOE reports that 28 of the lower 48 states have a coastal boundary (including the Great Lakes), and that offshore wind turbines located in shallow waters (defined as less than 30 meters) could meet at least 20% of the electricity needs in many of these coastal states. In addition to providing electricity, offshore wind development will reduce greenhouse gas emissions and create thousands of domestic jobs.

Background

With more than 900,000 megawatts of wind energy flowing over the nation’s Outer Continental Shelf—in close proximity to major urban load centers—offshore wind energy has the potential to emerge as a new growth industry in the United States. It represents an important component of President Barack Obama’s vision for a clean energy economy and is a key to meeting the renewable energy goals of a number of Atlantic coastal states.

Offshore wind energy systems differ from their traditional onshore counterparts in more ways than they are similar, primarily due to challenges associated with operating in the rugged marine environment. Tapping the vast wind resources off the U.S. coasts (Atlantic, Great Lakes, Gulf of Mexico, and eventually Pacific) will require significant near-term strategic investments in research and development, with the promise of attractive investment returns beginning within the decade.

New and/or amended government policies will be needed to facilitate offshore wind power development. For example, favorable policies addressing electrical transmission will be influential in allowing the successful integration of offshore wind into a national clean energy strategy designed to increase energy security and reduce greenhouse gas emissions.

¹ U.S. Department of Energy. *20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply*. May 2008, <http://www.20percentwind.org>.

The Challenges

The potential of America's offshore wind resources, as well as confidence gained from European successes in deploying shallow-water projects, have yet to translate into a federal government-led initiative to develop a U.S. offshore wind industry. President Barack Obama's Administration's receptivity to renewable energy bodes well for the future, but currently, individual offshore projects are evaluated on a state-by-state basis. Some contributing factors to the general lack of federal initiative include:

- Until recently there were no regulations or guidelines for establishing and operating offshore wind energy projects in federal waters. This situation was addressed on April 22, 2009, when MMS issued its Rule for developing alternative energy sources on the Outer Continental Shelf.
- The potential for offshore wind development is currently perceived as a primarily East Coast phenomenon, benefitting a relatively small number of states from Maine to Georgia. In reality, interest from Gulf of Mexico, Great Lakes, and West Coast states exists as well.
- Offshore wind farms are more expensive to build than onshore projects—in some cases construction costs are doubled. Thus it is essential to fund research and development designed to lower costs and increase reliability.
- The Obama Administration and Congress have identified the need to create a national transmission corridor to bring onshore wind-generated electricity from the Midwest to East Coast load centers. Some see this proposed electric grid expansion as a potential disincentive to invest in infrastructure necessary to support offshore wind energy.

How USOWC Will Help Address These Challenges

USOWC will provide a support structure for unbiased research, convening, dialogue, and multi-sector problem solving to support the efficient growth of the offshore wind industry. With the Obama Administration's interest in renewable energy, we are confident that federal initiatives supporting offshore wind will emerge, and we will work to integrate USOWC efforts with these new opportunities.

Through analysis of current trends, and discussion with U.S. offshore wind stakeholders, three initial areas of activity considered fundamental to improving the offshore wind power context have been identified:

- **Multi-state collaboration/coordination with federal agencies on regulatory and planning issues, with the intent of responsibly expediting offshore wind resource development.**
- **Research and analysis designed to fill critical information gaps regarding the economics, environmental benefits, and research and development priorities for offshore wind power.**
- **Creating an online clearinghouse that offers up-to-date information on U.S. and international offshore wind development efforts. This web resource will promote informed decision-making on the part of wind developers, investors, regulators, environmentalists, and private citizens.**

During several years of activity preceding incorporation, the USOWC concept and approach have gained credibility and support among many key stakeholders. The Northeast and Mid-Atlantic states have petitioned MMS to partner with USOWC to address issues of shared regional interest and to create a dynamic federal-state partnership. Wind industry representatives have asked USOWC to facilitate research and development efforts and to be an honest broker for the industry. USOWC has already been successful in facilitating mutually-beneficial communication between federal ocean agencies and the wind

industry, on issues including development of the *multi-purpose marine cadastre*—a marine information system for the Outer Continental Shelf and state waters—and data-sharing through the Integrated Ocean Observing System (IOOS).

“The Minerals Management Service intends to move forward with its mission regarding development of renewable energy resources in association with various stakeholder groups, including the U.S. Offshore Wind Collaborative.”

Report to the Secretary, U.S. Department of the Interior: “Survey of Available Data on OCS Resources and Identification of Data Gaps”

Northeast and Mid-Atlantic Governors, U.S. Minerals Management Service, U.S. Department of Energy, National Renewable Energy Laboratory, and the American Wind Energy Association Offshore Wind Working Group all support USOWC’s leadership roles in the activities identified above and described below.

Multi-State Collaboration/Coordination on Key Policy Issues

Objective: Create a States Offshore Wind Working Group

In the absence of a national-scale initiative (as noted above), private and state-level initiatives have been key catalysts for progress toward offshore wind development in the United States. Even with the recent emergence of federal leadership in this area, states will play an essential role in creating the support context for developing a domestic offshore wind industry.

There are currently six states in the Northeast and Mid-Atlantic region—Delaware, Maine, Massachusetts, New Jersey, New York, and Rhode Island—that are actively engaged in comprehensive ocean planning (with offshore wind energy as a centerpiece issue) and/or partnering with developers to site projects in federal waters. These states will be competing for economic development opportunities associated with the emerging offshore wind industry. However, in areas of mutual interest and regional concern, it is clear that inter-state collaboration is vital for long-term success. State coordination is necessary for effectively implementing a new permitting regime in adjacent federal waters, and for data collection to support planning and infrastructure development. In October 2008, at the request of several states, USOWC began the process of inter-state dialogue and reached an agreement to approach MMS and other federal agencies with a request for collaboration.

Actions

- Develop a consistent, efficient approach to integrating state-federal activities, including resource assessment and data collection.
- Create a mechanism for addressing *regional* needs and issues in state-based ocean planning initiatives.
- Consider the interface between state planning and federal lease-sale activities.

Preliminary discussions yielded the following conclusions:

- **Data consistency:** Data collected from met towers should be standardized and tied into the Integrated Ocean Observing System (IOOS). Data analysis in general (e.g., avian and marine mammal studies) should be standardized in order to build a regional knowledge base that supports assessment of cumulative benefits and impacts. In the European Union, use of data collected with public support, and maintained in the public domain, has been an important contributor to growth of the European offshore wind industry.
- **Regional planning:** A state-federal partnership should be created to advance strategic, ocean-based renewable energy planning by region. Particularly when looking at development areas outside state waters, a regional view is essential. Early-stage partnerships among adjacent states can identify areas to avoid development, analyze cumulative impacts, and consider regional energy needs and shore-side infrastructure. States and federal agencies must encourage offshore wind projects as a common goal, facilitated by regional cooperation. Federal agencies with authority in state waters will be integral components of the regional approach toward planning wind projects in both state and federal waters. This collective effort will support, but not replace, the initiatives of individual states.
- **Clarify regulations and leasing procedures:** In April 2009, MMS released its Rule for alternative energy development on the Outer Continental Shelf. The Rule contains numerous provisions which are immediately relevant for those states aggressively planning offshore wind development, yet many of these regulatory provisions will require discussion and interpretation. A forum for multi-state dialogue will expedite the dissemination and clarification of information. Each state needs to understand how the Federal Consistency provisions of the Coastal Zone Management Act (CZMA) will be applied by adjacent states, and how to make this process efficient and cooperative.
- **Research and development:** The federal government should increase funding to DOE, MMS, National Oceanic and Atmospheric Administration (NOAA), and interested states, in order to establish a coordinated research and development program for offshore wind. Active areas of research and analysis include baseline resource conditions, potential impacts, best management practices, and effective mitigation measures related to offshore renewable energy development. A coordinated national/state research program will improve support for offshore wind development by (a) ensuring the propagation of objective, credible information, (b) maintaining focus on priority research needs and information gaps, (c) coordinating between public and private research institutions, and (d) reducing duplication and transaction costs for developers.

USOWC will continue to promote, facilitate, and provide infrastructure support for this effort to establish a regional government-to-government partnership between states, MMS, DOE, NOAA, and other federal agencies. As interest continues to grow, we intend to expand participation to include other East Coast, Gulf of Mexico, Great Lakes, and West Coast states.

USOWC Specific Activities

In the process of forging cooperative partnerships, USOWC will:

- Work to integrate state and federal offshore wind development and planning activities.
- Seek opportunities to standardize regional resource assessments and data collection.
- Coordinate between state ocean management planning and federal lease activities for offshore wind.

- Identify effective mitigation strategies for potential environmental and user conflicts.
- Develop processes to vet best-siting practices, and methodologies for assessing, minimizing, and monitoring impacts.
- Support high quality prototype projects to advance deep-water offshore wind technology.
- Facilitate dialogue between states and industry.
- Create a coordinated state/federal research and development program, with a focus on priority research needs and information gaps.

Expected Outcomes

By developing opportunities for cross-regional cooperation and learning, USOWC will offer critical support for the national offshore wind industry. Coordination across state boundaries will allow USOWC to leverage existing resources for offshore wind research and development. The communication that USOWC will facilitate is vital for maximizing efficiency on a national scale and for avoiding redundant efforts. This inter-state collaboration will (a) optimize research and development efforts on various levels, (b) improve efficiency in best-siting practices, (c) identify and address critical issues from a broader perspective, and (d) promote consistency in policy, regulation, and development.

Addressing Information Gaps: A Critical Step Toward Sustainable Wind Resource Development on the U.S. Outer Continental Shelf

Objective

USOWC will oversee development of strategic analyses designed to better understand and quantify issues relating to offshore wind development. If the United States is going to generate 54 GW of offshore wind energy by 2030, areas of analysis must include key infrastructure needs, cost assessments, and benefit projections for the country and for the world. This project will, in part, build on recommendations that emerged from the DOE's "20% Wind by 2030" workshop held in Washington, DC on October 6-7, 2008.

USOWC will work with representatives from industry, government, and academia to identify gaps in our understanding of offshore wind power generation. Research efforts must be well coordinated and well directed in order to support the emergence of a robust and sustainable U.S. wind industry.

Actions

Port and Vessel Infrastructure

- Determine what port facilities are needed to support offshore wind turbine deployment to meet states' renewable energy targets. How should we approach support vessel development? What are the regional synergies among ports? How can we incentivize development of efficient, integrated port infrastructure?

Electrical Transmission

- Identify what transmission improvements will be necessary to *deliver* electricity from offshore wind developments to East Coast load centers. What will be the costs? How does regional, offshore transmission relate to the national transmission corridor currently being discussed in Congress? Could offshore wind energy development benefit from the construction of this proposed national transmission corridor?

- Assess the viability of an offshore wind “super grid” (physically linking wind projects via an offshore infrastructure) to enhance economics, improve reliability, and dampen variability of offshore wind energy projects along the East Coast. Could such a system reduce the need for coal-fired power plants in the region?

Value Chain Analysis

- Determine the existing capacity among coastal and Great Lakes states to provide parts and services necessary to develop, support, and maintain the offshore wind energy industry.

Offshore Wind Costs and Benefits

- Clearly articulate and quantify (whenever possible) the environmental and socioeconomic benefits of offshore wind development. More specifically, analyze the costs and benefits associated with offshore wind sources providing 54 GW of electricity, as outlined in the U.S. Department of Energy’s “20% Wind by 2030” scenario.
- Identify synergistic opportunities for state collaboration, with the goal of increasing reliability and reducing costs of offshore wind projects.
- Analyze wind power benefits associated with decreasing consumer exposure to fossil fuel price volatility. Suggest how the value of risk reduction should be incorporated into cost estimates for offshore wind energy. Existing metrics for power source comparisons do not consider price volatility; however, a value-based comparison including both risk reduction and cost per kWh will improve the economic justification for offshore wind energy.

USOWC Specific Activities

- USOWC will work with experts within and outside the offshore wind industry to identify, prioritize, and guide the implementation of work plans to address the above topic areas, including pursuing, developing, and implementing detailed scopes of study.
- USOWC will identify funding sources and draft requests for proposals.
- Review teams will evaluate and select proposals.

Expected Outcomes

By pursuing the activities listed above, USOWC will:

- Provide credible, unbiased information that is vitally important for the offshore wind industry’s success.
- Coordinate multi-sector technical teams to address key questions.
- Leverage funds from multiple sources, in order to best serve the interests of the wind industry and the public.

USOWC's Online Presence: Creating an Information Clearinghouse for Offshore Wind

Objective

USOWC will design and develop a website that will serve as a comprehensive, interdisciplinary, and evolving resource to support the U.S. offshore wind industry. By serving as an information hub, this website will allow leveraging of existing assets to the fullest extent possible. The centralized online clearinghouse will improve efficiency in collecting, analyzing, and updating information relevant to the industry.

The USOWC website will promote accessibility to information by allowing users to search, sort, and view data from a variety of different perspectives, including by developer, manufacturer, state/federal government, academia, or special interest advocacy. The site's design will also allow queries on a number of environmental, policy, and regulatory issues, and will provide relevant international resources.

Actions

- Develop a comprehensive online clearinghouse that will cover (a) all public and private-sector offshore wind energy activities in the United States, (b) government and university research and development efforts, and (c) international resources.
- Monitor U.S. offshore projects through all phases of development, including regulatory procedures, stakeholder involvement, siting analysis, best management practices, turbine performance, environmental impacts, and public perception.
- Provide news about offshore wind technology development, funding opportunities, and relevant ocean management initiatives.

USOWC Approach to Website Development

In its early phases, the USOWC website will provide information on relevant government policies, planning initiatives, and incentives and will allow users to compare domestic and international initiatives. These resources will provide developers, regulators, environmentalists, and the general public with an understanding of what works and what doesn't—giving us the ability to benefit from international experiences while we move forward with offshore wind development in the United States.

Expected Outcomes

Over time USOWC's website will provide:

- Clarity regarding the status of offshore wind projects, key industry players, and ocean management initiatives.
- Easy, logical access to current business, policy, and project information.
- Integration of information from technical, environmental, and economic sectors.
- A virtual forum for education, communication, and sharing information and experiences.

The Unprecedented Opportunity Before Us

The U.S. Offshore Wind Collaborative occupies a unique niche in the nation's energy topography that is taking shape within the 21st century context of acknowledged global climate change. The U.S. offshore wind resource is vast, clean, and renewable—but currently untapped. Offshore wind energy has the potential to contribute significantly to climate change mitigation, energy independence, and economic development. Its proximity to major urban load centers (most of which import virtually all of their energy) adds to the intrinsic value.

While the promise of offshore wind is undeniable, the fact remains that there are currently no projects off the coasts of the United States (although nearly 1.5 GW are installed offshore in the European Union). Fortunately, proven technologies already exist—from the wind turbines themselves to the underwater foundations. Challenges that remain include improving reliability, creating industry supply chains, and driving down costs to the point where offshore wind is competitive with conventional energy sources.

Ensuring that the technical solutions are environmentally and socially acceptable represents a different set of challenges that must be addressed through outreach and public education—in the broadest sense of the term.

The offshore wind industry needs:

- A guiding strategic vision to achieve sustainable offshore wind energy development in the U.S.
- Collaboration and coordination among government agencies, states, and citizens to realize this vision within a core set of values.
- Policy development, financial support, and organizational development equal to the task.

Government policy is a key to attaining these goals. Yet the success of this offshore wind strategy calls for a significant change in the way that government characteristically functions. The walls separating departments within agencies, and agencies from one another, must be lowered to permit new levels of collaboration and organizational synergy. This holds true for all levels of government.

The programs and activities outlined in this prospectus describe the role USOWC will play in achieving our nation's offshore wind energy goals. Ultimately, USOWC's success will be measured in terms of both the deliverables outlined above and the degree to which USOWC helps foster what Peter Senge, Director of the Center for Organizational Learning at the MIT Sloan School of Management, calls "a more robust organizational ecology." A critical mass of stakeholders, each invested in this ecology, will be able to leverage the creation of a sustainable U.S. offshore wind industry.

Offshore wind energy is one of the most promising options for addressing global climate change. Here in the United States, we possess one of the richest offshore wind resources in the world. This potential can be realized, but it will take large investments of time, talent, and resources from a broad group of stakeholders willing to work together in pursuit of common goals. With the USOWC as a facilitator, we believe this can happen.



US Offshore Wind Collaborative

2009-2010 Prospectus

The USOWC Steering Committee developed this prospectus. Committee members wish to thank all those who contributed to its creation.

We are especially grateful to Jared Dourdeville for his invaluable editing contributions.

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Contact:

Sonya P. Mitchell
mitchell@usowc.org
508-737-0809
Fax 508-898-9226