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Department of Energy
Office of Energy Efficiency and Renewable Energy
Wind & Water Power Technologies Office

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Researching the Environmental Effects of Offshore Wind at the First U.S. Facilities

The enclosed comments are provided by Oregon's Department of Land Conservation and Development (DLCD) and Oregon Department of Fish and Wildlife (ODFW) to assist the Department of Energy (DOE) and Bureau of Ocean Energy Management (BOEM) in researching and understanding the potential impacts associated with offshore wind energy projects and to evaluate the efficacy of monitoring technologies and techniques. The State of Oregon regards the offshore area out to the toe of the continental slope as its Ocean Stewardship area within which it has a continuing interest in the conservation of ocean resources.

The state's ocean resource policies seek to protect marine resources and ecological functions for the purpose of conserving long-term ecological, economic, and social values. Resources of concern include those that are important to maintaining the functional integrity of the marine ecosystem, marine habitat, and biological productivity, as well as those that may affect other uses such as fishing, research, navigation, recreation, or aesthetic enjoyment. To that end, we are concerned that energy project components may have adverse impacts on marine resources and uses.

In this Request for Information (RFI), DOE and BOEM are specifically soliciting recommendations for studies to be conducted during construction and operation of the first offshore wind projects. According to the RFI, this information will be used to improve assessments of wind energy facility environmental effects and advance the national strategy for offshore wind research and development. We recognize that the first round of this effort (i.e., over the next three years) is most applicable to the types of facilities that are already permitted along the eastern seaboard. These facilities are likely to share many aspects of their technology and design with devices that may be deployed in the future along the Pacific coast. However, facilities designed for the shallow, gentle slope of the Atlantic continental shelf may not have the same type of tower structure (e.g., monopile, floating ballast system), anchor type, or mooring

requirements that will be required in the deeper waters off the Pacific coast. Differences in device design will correspond to dissimilar impacts on habitat and resources, resulting in a need to approach west coast research needs in a manner similar to, but not identical to that of the east coast first round of this effort. Future research may focus on information gaps associated with the development of ocean platform wind energy facilities on the Pacific coast, understanding that the types of platforms, anchoring needs and mooring design may change over time. DLCD, ODFW, and the Oregon Department of Energy (ODOE), have collaborated to prepare these recommendations in anticipation of these future research needs, which may be applied during the second phase (i.e., three to eight years from now) of this DOE and BOEM effort.

Executive Summary

DLCD and ODFW agree that a robust environmental research strategy will help maximize the value of the first generation of offshore wind turbines deployed in the United States. Such a strategy could improve future regulatory processes and reduce environmental risks associated with further development of offshore wind. We support the approach proposed in this RFI and encourage DOE and BOEM to develop a research strategy designed to answer the questions posed as “representative samples” in the RFI, as well as the additional research questions listed below. At this time, answers to all questions posed in the RFI and in this letter are equally important to satisfy information needs relevant to the state’s assessment of offshore wind project impacts, and priorities have not been assigned. We anticipate that the scope of research topics could be narrowed on a site-specific or project-specific basis. However, viewing this new industry broadly and holistically, we suggest that DOE and BOEM consider all research topics and questions equally because each one could have transferability across projects if planned for and implemented appropriately. In this way, management goals stated in this RFI would be best achieved and west coast resource management might benefit from research results and lessons learned during the first U.S. offshore wind projects.

Specific Research Topics and Questions for Consideration (in addition to “Example Topics and Questions for Near-Term Research” listed in the RFI):

Underwater Acoustics

- Can acoustic deterrents be used effectively to minimize collision risk between turbines and marine mammals or other organisms? What level of sound would effectively deter sensitive species above the noise of the device and the local environment?
- How does propagation of sound differ based on local characteristics of the site (e.g. seafloor geology, proximity to shore)? How far from a facility might the sound be perceived by marine organisms?
- How does a facility’s acoustic signature change as more devices become operational? Does it increase, and if so is there a linear relationship between the number of devices and the sound produced?
- What are the preferred techniques for monitoring acoustic levels *in situ* and responding within a reasonable timeframe in the event that a critical acoustic threshold is exceeded?

Seafloor Disturbance

- What is the extent of changes to benthic communities due to habitat conversion from soft-bottom to hard substrate (e.g., sand to concrete anchor)?
- If ocean currents are altered by project installation or operation, to what distance might sediment transport be altered? Would nearshore rocky reefs or shorelines be affected?
- What are the chronic seafloor disturbance impacts of anchor maintenance (assuming frequent need to replace and reposition anchors due to storms)?
- What impact minimization techniques (e.g. siting, burial, drilling) are most successful to mitigate environmental consequences of cabling offshore, nearshore, and beneath the shoreline?
- What are the most significant impacts during construction? Do advance planning and management methods vary in successful minimization of impacts and if so, which methods are preferred?
- What unique features or key design components of electric transmission cables (e.g. depth, size, burial, directional drill, colocation, etc.) are most successful at maintaining cable integrity while simultaneously reducing environmental impacts?
- Do advance planning and management methods vary in successful minimization of impacts and if so, which methods are preferred?

Monitoring, Methodologies, and Instrumentation

- What types of observations would be appropriate for inclusion in an Adaptive Management Plan? What metrics should be measured, what thresholds would need to be met, and what measures would be taken if a threshold were not met?
- What measurement instrumentation would be successful at detecting effects on marine species behavior and distribution?

Construction Areas (new topic area)

- Where and for what duration will wind facility staging areas be needed? What effects will occur in the estuary, adjacent upland area, or other staging area? Are particular areas

more susceptible to impacts due to sensitive habitat, heavy reliance on a single area for construction, or other factors? How can these effects be managed and reduced?

Introduced Structure (new topic area)

Subsurface

- What technologies or methods are most effective to maintain tension of mooring cables? What is the potential for a failure in calm or high seas? What is the potential for entanglement of a marine organism in the event of a tension failure?
- What is the collision potential between new structure and marine organisms? How to marine organisms respond to the new structure?
- What is the change in the local community resulting from the new in-water structure? What is the rate of biofouling and is maintenance necessary and effective? Does the new structure act as a fish attraction device (FAD) and does the amount or type of fish attracted change over time? If fish attraction occurs, does this correspond to predator (e.g., seabird, pinniped, shark) attraction or change in predation?
- If subsurface structure accumulates derelict fishing gear, what maintenance procedures must be adopted to regularly remove derelict gear to reduce the risk of entanglement of marine organisms?

Above Surface

- Are deterrents available and effective at reducing avian (i.e., bird or bat) species approach or collision with wind turbines? What methods are available to monitor turbines during operation throughout high and low wind states and detect bird and bat collisions?
- Do small pilot-scale or large commercial-scale wind farms influence wind stress to such a degree that local upwelling is induced, ocean mixing is disturbed, or changes in primary productivity occur in the vicinity of the wind farm?

Thank you for the opportunity to express our support for advanced research of offshore wind facilities and the potential associated effects on marine resources and uses. We look forward to hearing more about DOE and BOEM research projects and hope these suggested topics will be among those scheduled for further study.

Sincerely,

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