

Fishing Frequently Asked Questions (FAQ) Related to Wind Energy on the Outer Continental Shelf (OCS)

1. Can Regional Fishery Management Councils have representation at BOEM's Intergovernmental Renewable Energy Task Force meetings?

- BOEM has established intergovernmental task forces with ten states.
- These task forces are for federal-state consultations and are limited to state government officials designated by the Governor, officials from affected federal agencies, elected local government officials, and elected tribal leaders. Regional Fisheries Management Councils do not meet these criteria, unless specific individuals from the Councils are also representatives of a state or Federal entity. Those members may represent Council interests on the intergovernmental task forces.
- Regional Council members and staff are encouraged to attend the meetings and participate in the question and answer period held at the conclusion of task force meetings.
- BOEM has participated in public information sessions and Regional Fisheries Management Council meetings in the North and Mid-Atlantic OCS Planning Areas as part of information-sharing efforts, and will continue to seek public input and comments on proposed activities.

2. How is Coastal and Marine Spatial Planning incorporated into the offshore wind energy planning process?

- BOEM recognizes the importance of coordinating with other OCS users and regulators, following principles of coastal and marine spatial planning (CMSP), and coordinating with the regional planning bodies as established by the National Ocean Council.

3. Will the U.S. Coast Guard (USCG) be able to conduct search and rescue operations within a wind turbine array?

- Yes. In the case of the Cape Wind Energy Project, a control center will be monitored 24 hours a day, 7 days a week. The control center will have the ability to shut down individual wind turbines within two minutes of notification from the USCG.
- The Cape Wind Energy Project is also required to have a helipad on the electrical service platform that could be accessed by USCG helicopters.

4. If fishermen are displaced or economically impacted, will compensation be available? If so, how?

- The Fishermen's Contingency Fund, established under the OCS Lands Act of 1978, compensates U.S. commercial fishermen and other eligible citizens and entities for property and economic loss caused by obstructions specifically related to oil and gas development activities on the OCS.
- BOEM does not have the authority to establish a similar mitigation fund related to OCS renewable energy development.

5. Will offshore wind facility structures be removed after the expiration of a lease?

- Within two years after cancellation, expiration, or other termination of the lease, the lessee would be required to remove all devices, works and structures from the site and restore the leased area to its original condition.
- Bottom-founded structures and their related components would be severed at least five meters (15 feet) below the mud-line to ensure that nothing would be exposed that could interfere with future lessees and other activities in the area.
- Rights-of-way facilities (such as electrical transmission cables) may stay in place as long as they are being used and properly maintained.

6. In its evaluation of offshore wind facilities and their potential impacts, does BOEM consider other marine uses that may also impact the fishing community?

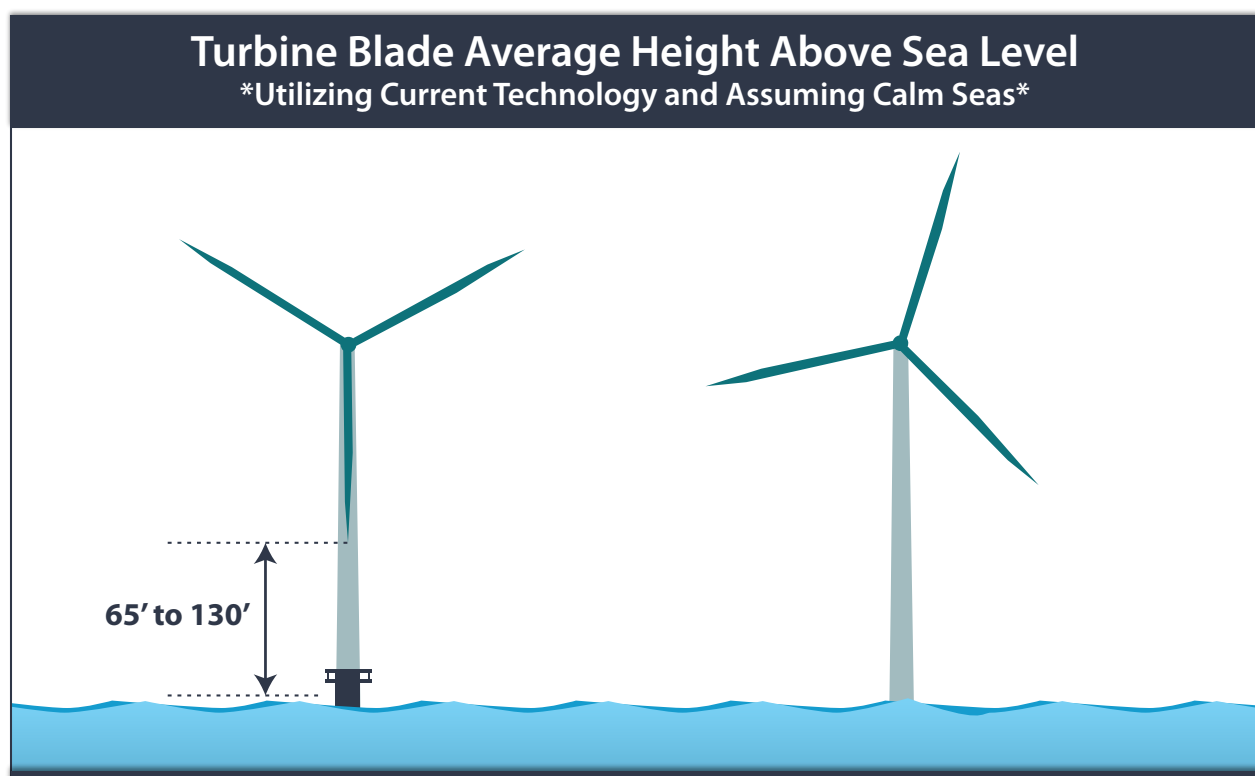
- Yes. As part of our analysis of potential impacts for construction, operation, and decommissioning of a commercial offshore wind facility, BOEM will evaluate existing and likely future uses of the coastal and ocean environment.
- This includes fishing; oil and gas development; military activities; sand and gravel extraction; commercial, recreational, and military vessel traffic; and other renewable energy facilities.

7. Will areas in and around wind turbines and other structures exclude vessel traffic and fishing activity?

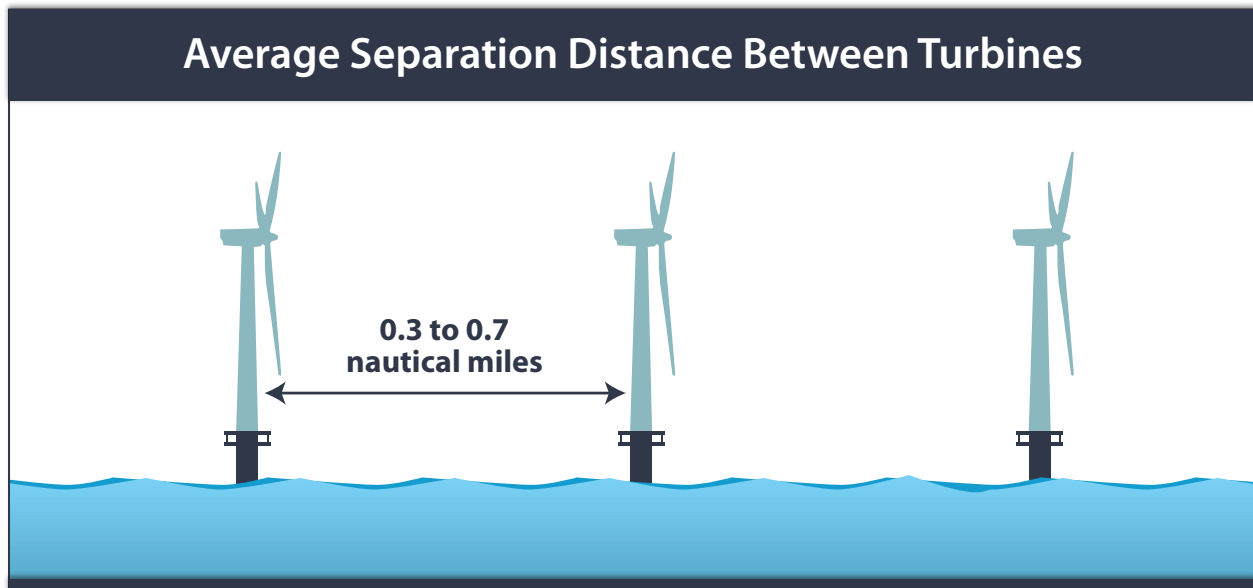
- BOEM does not intend to restrict vessel traffic in and around offshore wind facilities.
- If a safety zone or buffer were implemented, it would likely be implemented by the USCG under their mandate to ensure safety at sea. The USCG has stated that safety zones and buffers would be evaluated on a case-by-case basis.
- For the Cape Wind Energy Project, the USCG has stated that it does not intend to implement any safety zones around wind turbine locations.
- In certain oil and gas platforms in the Gulf of Mexico and Pacific Ocean, the USCG has implemented a 500-meter safety zone for all vessels, except those under 100-feet in length and not engaged in towing.

8. What is the average height above sea surface and distance between wind turbines?

- Based on the current technology, the lowest point of the rotor sweep would be 65 to 100 feet above the sea surface. As larger turbines are used, rotor sweep would be almost 200 feet above the sea surface.
- For example, on a 3.5 MW Siemens unit, the rotor diameter is 120 m (blade length of 58 m). If the unit is installed on an 80 to 90 m tower, the tip from the blade to calm seas would be from 20 to 40 m, or 65 to 130 ft.
- For larger turbines, such as the Siemens 6 MW, the rotor diameter is 154 m (blade length of 75 m). If the unit is installed on a 100 to 120 m tower, the tip from the blade to calm seas would be from 25 to 45 m, or 81 to 146 ft.



- Spacing between turbines is determined on a project-by-project basis to minimize wake effect between turbines and is based on rotor diameter and turbine size.
- A spacing of seven rotor diameters between units has been used in Denmark.
- In some land-based settings, turbines are separated by much greater distances, as much as 10 rotor diameters from each other.
- It is anticipated that U.S. offshore wind turbines will use rotors of 100 m or more in diameter, so turbines would be spaced at least 0.3 to 0.5 nautical miles apart.
- The Cape Wind Energy Project will have an overall rotor diameter of approximately 107 m (351 ft) with a spacing of six rotor diameters between rows and nine rotor diameters between columns. Therefore, spacing within the array will be 0.34 nautical miles (629 meters) by 0.54 nautical miles (1,000 meters) between each wind turbine generator.



9. How deep are the electrical transmission cables buried under the sediment?

- Varies by project, but cables will be buried below the seafloor at an appropriate depth based on the underlying geology.
- Mitigation measures, such as concrete mats, may be used in cases where a minimum burial depth is not practicable.
- The standard commercial practice is typically to bury submarine cable 1 to 3 m deep in water shallower than 2,000 m to protect it from external aggression hazards, such as fishing gear and anchors.
- Cables may be buried as deep as 10 m under the seabed, depending on the local hazards, water depth, and substrate composition.

10. What are the effects of turbines on navigation and radar issues for fishing operations within or near the turbine arrays?

- The USCG has statutory authority for promoting the safety of life and property on the OCS. Vessels used for offshore wind facilities are subject to USCG licensing and inspection.
- To ensure navigational safety, all structures will have appropriate markings and lighting in accordance with USCG requirements for Private Aids to Navigation.
- Wind facilities will be sited at reasonable distances from radar installations to minimize interference with commercial air traffic control, national defense, and weather radar systems.
- As each project is unique, a radar study will be needed for a site-specific project.



- BOEM has several best management practices (BMPs) to address the potential effects of alternative energy project development including:
 - Siting of facilities to avoid unreasonable interference with major ports and USCG-designated Traffic Separation Schemes.
 - Placing proper lighting and signage on structures to aid navigation and comply with any other applicable USCG requirements.
 - Studying proposed wind turbines potential interference and solutions with commercial air traffic control, national defense, and weather radar systems.

11. Are there siting considerations to address potential impacts to fisheries and habitat (e.g., turbine configuration to minimize navigational impacts and turbine design options to provide habitat for species such as lobster)?

- BOEM has received public input regarding the placement of wind turbine inner array cables in a manner that would facilitate the use of bottom tending mobile gear within the array with the least amount of cable crossings.
- BOEM plans to gather additional information through future public comments and studies.

12. What are the effects of electromagnetic fields (EMF) on fish species?

The following studies examine the effects of EMF on marine animals (primarily fish):

- On July 7, 2011, BOEM completed the study “Effects of EMFs from Undersea Power Cables on Elasmobranchs (Sharks and Rays) and Other Marine Species.” This study researched potential ecological effects of EMFs emitted by sub-sea power transmission cables, suggested solutions that reduce EMF exposure, and identified data gaps and future research priorities.
- The Department of Energy’s Pacific Northwest National Laboratory is concluding a study titled “Effects of Electromagnetic Fields on Fish and Invertebrates.” This study looks at behavioral responses of selected finfish, crabs, and spiny lobster to EMF produced in a laboratory setting.
- The Oregon Wave Energy Trust has also conducted an EMF study that will be released soon.
- A United Kingdom study, “EMF-Sensitive Fish Response to EM Emissions from Sub-Sea Electricity Cables”, looked at behavioral reactions of certain sharks and rays to EMF in a large sea pen. The report concluded that although some fish appeared to respond to EMF, no positive or negative effects could be determined.

13. Where can I find more information about offshore wind energy development in the Atlantic?

- Information on the planning process and the status offshore wind leases, including opportunities for comment, can be found on the BOEM website at: <http://www.BOEM.gov/offshore/RenewableEnergy/index.htm>
- Information specific to off-shore wind development and fisheries conflicts can be found in the document “Identification of OCS Renewable Energy Space-Use Conflicts and Analysis of Potential Mitigation” located at the BOEM website at:
<http://www.boem.gov/Environmental-Stewardship/Environmental-Studies/Renewable-Energy/Renewable-Energy-Research-Completed-Studies.aspx>

