UNSOLICITED APPLICATION FOR AN OUTER CONTINENTAL SHELF RENEWABLE ENERGY COMMERCIAL LEASE UNDER 30 CFR 585.230

Principle Power WindFloat Pacific Pilot Project

Submitted To:

U.S. Department of the Interior
Bureau of Ocean Energy Management (BOEM)
Pacific Region
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I. INTRODUCTION

Principle Power, Inc. (PP) is pleased to submit this unsolicited request for a United States Outer Continental Shelf (OCS) commercial lease in accordance with the requirements of 30 CFR § 585.230. Principle Power expects to establish a project company to which the requested lease may be assigned in the future.

Principle Power and partners propose a pre-commercial, pilot-scale wind farm for deployment offshore of Coos Bay, Oregon. The 30 megawatt (MW) project, named the WindFloat Pacific Offshore Wind Demonstration Project ("WindFloat Pacific Project" or "WFP"), consists of five WindFloat units outfitted with Siemens Wind Turbine 6.0 MW, direct-drive, offshore wind turbines and would be sited in 300-400 meters of water approximately 15 nautical miles (nm) (24 kilometers [km]) from shore. An offshore grid and subsea cable would be used to export produced electricity to facilities at the planned South Dunes Power Plant, a combined cycle natural gas power plant associated with the Jordan Cove Energy Project. The Jordan Cove Energy Project is a $7.5 billion (US dollars) liquid natural gas export facility currently under development at the International Port of Coos Bay. Jordan Cove Energy and Principle Power are negotiating a power purchase agreement with a term and price sufficient to meet the economic needs of the WindFloat Pacific Project. Infrastructure planning in conjunction with Jordan Cove Energy is already underway at the Port of Coos Bay. Additional development funds are being allocated towards the development of a multi-purpose berth that would facilitate efficient WindFloat deployments. Principle Power plans for facilities at the Port of Coos Bay to serve as the final assembly, hull load-out, turbine installation, and future maintenance base for WindFloat units.

The WindFloat, a semi-submersible floating foundation for multi-megawatt offshore wind turbines, was developed by Principle Power specifically to address current cost, risk, and execution barriers in the offshore wind industry. The WindFloat Pacific Project units, including the turbine, will be assembled and tested on-shore or quayside in a controlled environment. No heavy lift operations or commissioning of the turbines will be conducted at sea. As a result, transport and installation of the unit is simplified, requires less-costly vessels, and is not subject to the same weather restrictions as offshore wind projects employing bottom-fixed foundations.

The wind resource off the Oregon, Washington, and California coasts is robust. The WindFloat Pacific Project units will be deployed in water depths of approximately 1,200 feet (365 meters), allowing development to occur outside of areas where existing uses might conflict. A preliminary analysis of the Coos Bay area's wind resource and known environmental and stakeholder constraints suggests that the proposed location is favorable for project development.

The proposed project plans for five WindFloat units to be arranged in an array with one row of three units and one row of two units; the final configuration will be determined as the engineering, leasing and environmental assessments progress. Each unit will be moored using vertical load anchors, a technology that requires no piling and is well suited to deep and variable seabed conditions. The installation is completely reversible (no permanent infrastructure will be left on the sea bed upon decommissioning), and acoustic disturbances are expected to be minimal. Principle Power and project partners will conduct comprehensive stakeholder interviews and environmental/existing-use analyses prior to final site selection.

The WindFloat Pacific Project represents a significant first step towards commercial offshore wind energy production on the West Coast of the United States. Furthermore, the project has the support of major wind energy industry leaders committed to the successful delivery of the project and future United States offshore wind industry investments.

The project team's experience spans industries from high-tech manufacturing to offshore construction and oil and gas. The proposed project will leverage the collective know-how of these industry professionals and pair them with lessons learned from Principle Power's full-scale prototype project, which was installed off the coast of Portugal in 2011.

Principle Power has engaged with agencies (state and federal) and stakeholders regarding the development of the WFP project near Coos Bay, OR, including U.S. Fish and Wildlife, NOAA Fisheries, U.S. Coast Guard, and U.S. Army Corps of Engineers. Conversations held with the Coos Bay fishing community and the Southern Oregon Resource Coalition (SOORC) revealed the general location of several valued fishing areas including Rockfish Conservation Area within proximity to the original proposed WFP project area. Based on this input, Principle Power has relocated the WindFloat Pacific project area further offshore past 200 fathoms and the Rockfish Conservation Area to respect these requests. The Principle Power team has entered into preliminary discussions with non –governmental organizations interested in the intersection of energy development and environmental protection in Oregon.

II. INFORMATION REQUIRED FOR AN UNSOLICITED REQUEST FOR A COMMERCIAL LEASE

The Bureau of Ocean Energy Management (BOEM) regulations allow for the submission of an unsolicited request for a commercial lease. The following information addresses each of the elements required, under 30 CFR 585.230, for a commercial lease.

a) Area Requested for Lease - 30 CFR 585.230(a)

The WindFloat Pacific pilot project proposes the deployment of a multi-turbine floating wind park off of Coos Bay, Oregon, at a location that is approximately 300-400 meters (984- 1312 feet) deep and approximately 15 nm (24 km) from any land area of the State (Figure 1).

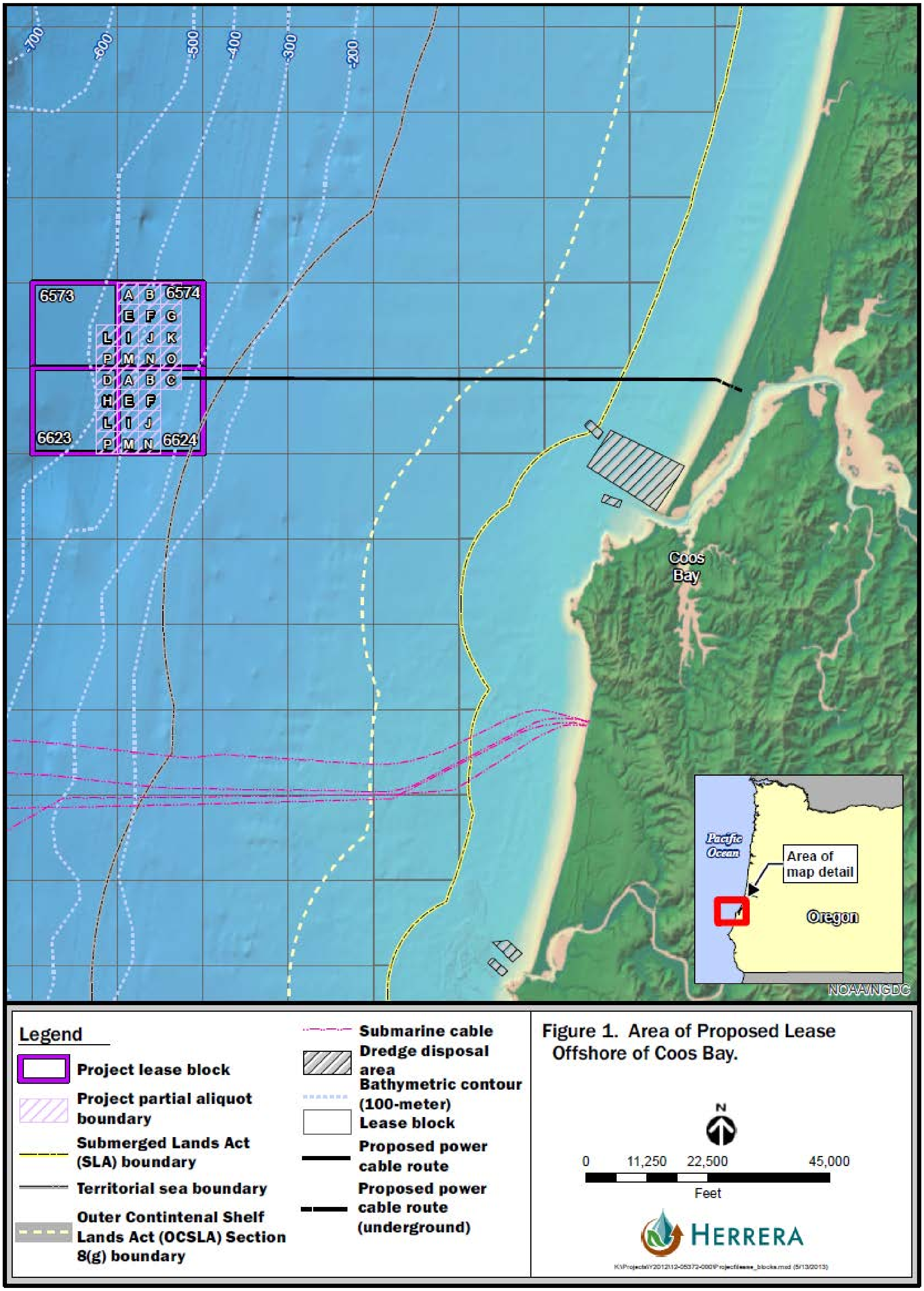

Figure 1. Area of Proposed Lease Offshore of Coos Bay.

The legal description of the proposed area for the lease is within the Coos Bay area, OCS official Protraction Diagram NK10-01, including aliquots, from the following blocks:

Table 1. OCS Lease Area Blocks

Block Number	Partial Block (Aliquot) Designation
6573	L, P
6574	A, B, C, E, F, G, I, J, K, M, N, O
6623	D, H, L, P
6624	A, B, C, E, F, I, J, M, N

A spatial file compatible with ArcGIS 9.3 (geographic information system shape files) in a geographic coordinate system (North American Datum of 1983 [NAD 83]) is included with this submittal.

The gross size of the area is 15.01 square miles (38.88 km^2). The area will be reduced in size when detailed assessments of oceanographic and seabed conditions have been undertaken. The final wind farm size is assumed to be significantly smaller; approximately 4 to 8 square miles (10-21 km^2).

A towing route from the onshore assembly site to the proposed lease area has been preliminarily identified. Following final assembly of the system in the Coos Bay harbor, WindFloat platforms will be towed by tugboat from the entry to Coos Bay west-northwest to the project site and attached to pre-laid moorings. Towing speeds are expected to be between 2 and 4 knots.

Screening Process Used To Select Site

Principle Power and its partners have executed a systematic and comprehensive effort to select the site for the WindFloat Pacific Project, including the following components, which are described in more detail below:

- An examination of wind, ocean, and sea floor resources
- An examination of environmental conditions and potential issues
- Extensive consultation with local stakeholders

Wind and Infrastructure Resources

Principle Power engaged in a lengthy process to determine the best site for its WindFloat Pacific Offshore Wind Demonstration Project. At the broadest level, when identifying a project location, Principle Power considers the market conditions and wind resource first, then grid interconnection and local infrastructure capabilities. Because of the WindFloat's flexibility in siting at a selected project location, consideration of local socioeconomic and environmental issues generally follows, though are considered no less important.

The Coos Bay location was selected after examination of other potential locations including sites near Pt. Conception in Central California and off of Humboldt County in Northern California. A National Renewable Energy Laboratory (NREL) study (NREL 2010) suggests that all three locations have strong and suitable wind resources, and market conditions in California are the highest priced on the West Coast. The existence of the Jordan Cove Energy Project (JCE) at Coos Bay and its ability to purchase power from WFP created a strong market opportunity. In addition, the electric infrastructure being developed in association with the Jordan Cove project (the natural gas fired South Dunes Power Plant) created an obvious grid interconnection opportunity. Finally, Coos Bay's history as an industrial port and the fact that the Conde McCullough Memorial Bridge, which spans the bay, is east of the port's infrastructure and planned development were viewed as beneficial. These features distinguished Coos Bay as the preferred location for the WFP project.

The existence of the outflow easement at the North Spit of Coos Bay became an ideal shore landing point for the cable for two reasons. First, the easement is already placed on charts and its existence is well known by local ocean users. While the cable coming to shore is expected to be horizontally directionally drilled, it is the intent of the project for the offshore cable to follow that easement as closely as possible. Second, the Port of Coos Bay owns the outflow pipe and easement, and once past the beach, the onshore property, which assures access for WFP transmission facilities. The easement is located within a few miles of the project's proposed interconnection point at the South Dunes Power Plant. As a result of these considerations, Principle Power sought to target sites within a radius of the outflow easement and planned shore-crossing location.

Finally, for the past year 12 to 18 months, Principle Power has engaged in discussions with fishing interests (the Southern Oregon Ocean Resource Council, or SOORC) and other relevant community entities, including the US Coast Guard, Oregon Fishermen's Cable Committee, Coos

Bay Pilots' Association, the Port of Coos Bay, and the local chapter of the Audubon Society, among others. While other sites near the proposed location were initially considered, most were eliminated after discussions with these stakeholders made it clear that they were subject to existing activity and important commercially to local fishing fleets. In March of 2013, SOORC voted unanimously to endorse a project location approximately 15 nautical miles due west of Coos Bay. This is the site that is proposed in this lease request.

Environmental Resources

Principle Power examined nautical charts featuring the project area and relied on the expertise of the Port of Coos Bay staff and consultations with local experts including representatives of the commercial fishing fleets and the US Coast Guard to determine the viability of the project area. In addition, Principle Power reviewed the Oregon Marine Maps (OCMP 2013) and Multi-Purpose Marine Cadastre (BOEM 2013) and consulted the Oregon Department of Land Conservation and Development in its decision-making. After these consultations and because of the WindFloat's ability to be secured in various water depths and sea bottom conditions, Principle Power is confident in the proposed location for the project.

Pacific Northwest National Laboratory (PNNL) examined studies of biological resources in the coastal and marine environments of northern California, Oregon, and Washington for the *Updated Summary of Knowledge: Selected Areas of the Pacific Coast* (Kaplan et al. 2010). This report also contains information on oceanography, geology, cultural, and socioeconomic resources that cover the area of interest for the seabed lease.

Drawing from the *West Coast Environmental Protocols Framework* analysis (Pacific Energy Ventures et al. 2012), Principle Power examined and identified the issues that will likely drive the environmental permitting process, and has initiated discussions with the key federal and state regulatory and resource agencies, as well as with important stakeholder groups. The highest priority environmental interactions that will drive baseline and post-installation monitoring are expected to be:

- Potential threats to soaring seabirds from the turbine blades;
- Potential for the physical presence of multiple wind platforms to affect the near field habitat and sediments, as well as the potential for the platforms to create a collision risk to marine mammals and interfere with whale migration;
- Potential effects of electromagnetic fields on elasmobranchs (sharks and rays) and on sea turtles; and
- Potential effects of lighting on birds.

Additional environmental issues that may be raised include:

- The physical presence of the device affecting the far field habitats in the region and presenting a collision risk to sea turtles, and birds;
- Potential effects of electromagnetic fields on the behavior of fish and sea turtles; and

- Potential effects of boat traffic on marine mammals during installation and maintenance operations.

Outreach, Coordination and Engagement Efforts

Principle Power has engaged with agencies (state and federal) and stakeholders regarding the development of the WFP project near Coos Bay. Because the WFP project is primarily located in federal waters, Principle Power has focused initial outreach efforts on federal agencies (U.S. Fish and Wildlife, NOAA Fisheries, U.S. Coast Guard, U.S. Army Corp of Engineers) through in-person meetings and phone calls to discuss the overall intentions of the WFP project and to receive feedback on potential permitting issues that may arise. Discussions have focused around the issues anticipated to be of concern, prior to formal federal and Oregon State permitting activities, including compliance with the National Environmental Policy Act (NEPA).

Principle Power has also contacted Oregon State agencies such as Oregon Department of Land Conservation and Development regarding the WFP project's cable routing plans and consistency and compliance with the Coastal Zone Management Act and the Oregon Territorial Sea Plan. Meetings with ODFW and the Oregon Cable Commission will be scheduled in the near future. In addition, stakeholder meetings and phone calls have been held with environmental groups, local Coos Bay economic and development groups, and fishing organizations. These engagements have primarily focused on informing stakeholder groups of the WFP project including the proposed project area, answering project-specific questions, and seeking input on areas or issues that may be of concern. A complete list of all the agencies, NGOs and community groups that have been contacted can be found in Table 2. Research results and the outcome of discussions with regulatory agencies, as well as important stakeholder groups, will be documented for the NEPA process.

Conversations held with the Coos Bay fishing community and the Southern Oregon Resource Coalition (SOORC) revealed the general location of several valued fishing areas including a Rockfish Conservation Area in proximity to the original proposed WFP project area. Based on this input, Principle Power has relocated the WFP project area further offshore, at a depth of 200 fathoms or more, and outside the Rockfish Conservation area, to respect these requests.

Table 2. Stakeholder Outreach Engagements

Government	Economic and Development	Fishing Community	Environmental Groups
BOEM	Port of Coos Bay	Fishing Community of Coos Bay	Our Oceans
U.S. Fish and Wildlife Service	South Coast Economic Development Council	Southern Oregon Ocean Resource Council (SOORC)	Audubon Society
NOAA Fisheries	Chamber of Commerce	Bandon Trawler's Association	Oceana
U.S. Coast Guard	Oregon Wave Energy Trust		National Wildlife Federation

Government	Economic and Development	Fishing Community	Environmental Groups
U.S. Army Corps of Engineers	PacifiCorp		Sierra Club
Oregon Department of Land Conservation and Development	Coos County		
Oregon Department of Energy	Coos Bay Pilots Association		
Energy Facility Siting Council			

b) General Description of Objectives and Facilities

Objectives

The objective of the WindFloat Pacific Project is the installation of five WindFloat foundations outfitted with Siemens Wind Turbine 6.0 MW direct-drive turbines, for a total installed capacity of 30 MW. The project represents a significant first step towards commercial offshore wind energy production on the West Coast of the United States and has the support of major wind energy industry leaders committed to the successful delivery of the project and future United States wind industry investments.

As a direct result of the work proposed, several of the U.S. Department of Energy (DOE) Wind and Waterpower Technologies Office's stated goals will be addressed. In addition to the normal engineering and design process for an offshore project, a full validation campaign of the integrated floating system will occur. All economic and operational projections made during the design will be tested on station in the operational phases of the project, including turbine performance, wake effects, and operations and maintenance resource requirements. Additionally, this validation work will extend to project specific infrastructure and future United States project requirements. Lastly, a significant permitting effort will be coordinated and executed as a result of the project. The learning and future opportunity to use the WindFloat technology will be a crucial asset to DOE and offshore wind developers looking to build larger commercial projects that could achieve DOE's stated energy-cost goal of 10 cents per kWh. In addition, several project-specific objectives will be realized in support of the DOE goals. Specifically, the project will address the following objectives:

- Validation of existing and identification of future West Coast infrastructure to support United States offshore wind energy development;
- In-depth study and analysis of serial production benefits of the WindFloat technology;
- Development and validation of a method for deep–water, offshore, wind resource assessment for design basis development and energy generation predictions;
- Deployment of state-of-the-art 6 MW, direct-drive wind turbines offshore;
- Offshore installation of multiple offshore wind turbines and transmission infrastructure without any offshore lifting or piling activities;
- Design and analysis of offshore maintenance and operations requirements for a floating wind turbine farm.

Power generated from the WindFloat Pacific project will be delivered to the Jordan Cove project in the Port of Coos Bay and will not be offloaded to the national electric grid.

c) General Schedule of Proposed Activities

Principle Power proposes a preliminary schedule that incorporates a development/survey stage, followed by a phased construction, delivery and assembly period, and subsequent deployment and operations phase.

Phase 1 – Development/Survey

BOEM requires submission and approval of a Construction and Operations Plan (COP) prior to construction of an offshore wind facility. The COP will include the necessary studies and supporting data required for BOEM to comply with the National Environmental Policy Act. Should BOEM determine that the proposed location is not subject to competitive interest, Principle Power will submit a departure request within sixty days as required under 30 CFR 585, and plans to submit a COP during the summer of 2014. Figure 6, following page, shows anticipated dates for preparing and delivering the OCS lease application and the COP, agency and stakeholder consultations, environmental analysis to support the NEPA process, and the NEPA process itself.

Prior to deployment of the WindFloats, Principle Power will arrange to perform a site characterization to determine precise conditions at the lease site. Oceanographic measurements including deployment of a current meter array and ADCP will yield information on the movement of water at the site. The sea bottom will be assessed using side scan and/or multi-beam sonar to gather detailed bathymetric data at the lease site and along the cable route, as well as to note hard bottom habitats (such as rocky reefs and potentially rare habitats like deep sea corals and deep sea sponges) and any potential shipwrecks or other sunken items. Areas of sediment scour or other sedimentation anomalies will be noted along the cable route during the sonar surveys. Sediment stability at the site will be assessed using acoustic sub-bottom profiling to a depth of 10 meters.

Meteorological and oceanographic data collection has begun through modeling exercises based on extrapolations from existing NOAA buoy data. In the summer of 2013, Principle Power will deploy current meters and conduct low intensity bottom condition surveys. Together, this data will be sufficient to establish the engineering design basis for the project. In 2014, Principle Power will deploy a floating LIDAR system for a limited duration (i.e. less than one year), to provide comparisons to historical data and enhance the understanding of the wind resource at the project site. This data will be correlated to LIDAR readings from an onshore deployment to generate higher certainty in expected wind resource models. Other offshore work, which may include bathymetric (sub-bottom profiling) and wildlife (birds and mammals) surveys will be conducted as needed during operational seasons in 2014 and 2015.

The Front End Engineering Design (FEED) for the project is anticipated to be complete by the end of 2014. This design will include layout, mooring and cable routing proposals that are responsive to the geophysical surveys conducted seasonally in 2013 and 2014. Detailed design, resulting in fabrication ready drawings, will begin immediately on completion of the FEED and take place during 2014 and 2015. In addition, feasibility studies for the onshore transmission facility are being conducted in 2013, and will be enhanced by design plans and interconnection requirements analyses conducted in 2014. Subsequent to these steps, long lead items will be ordered, and WindFloat construction/fabrication will begin.

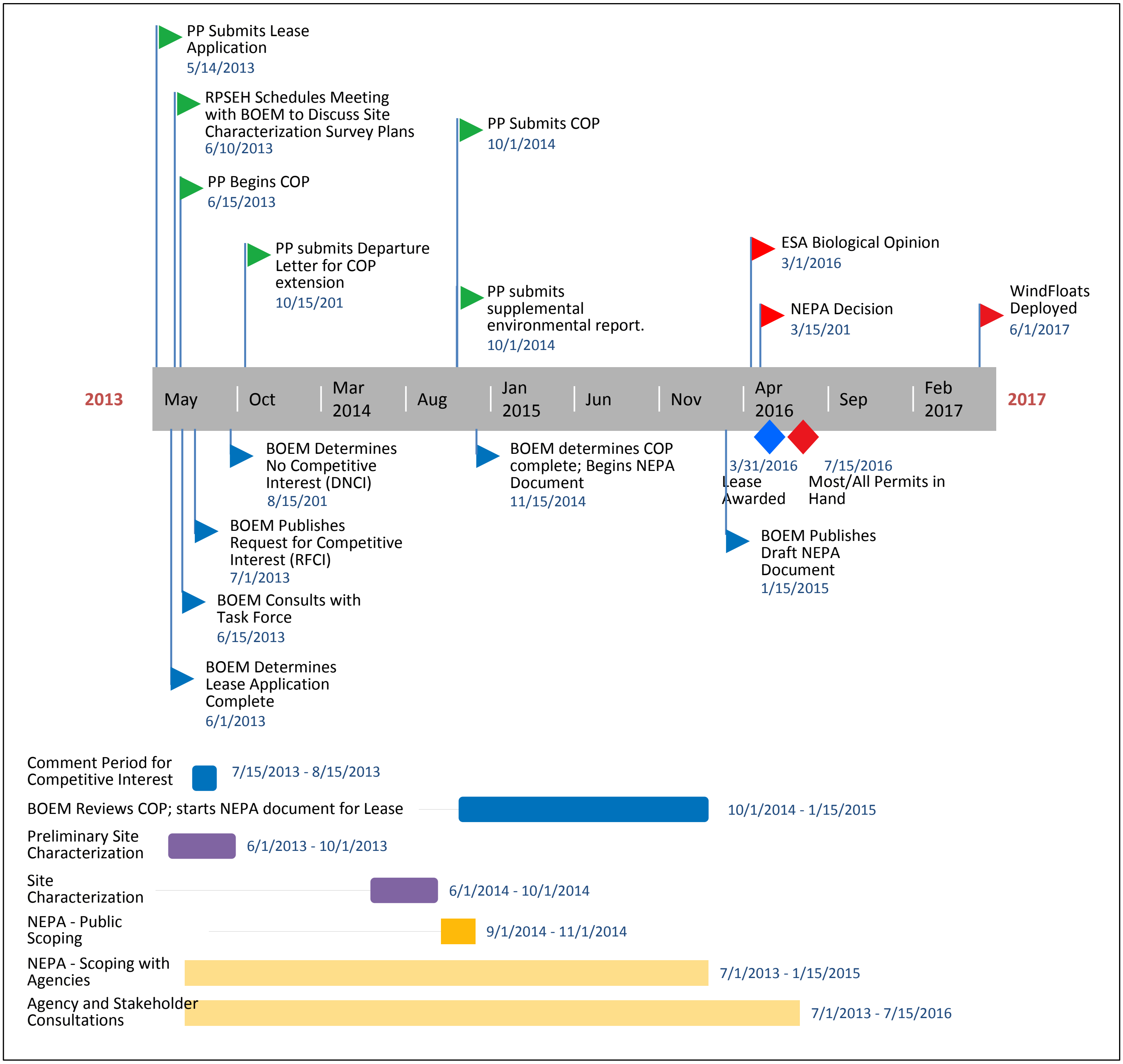

Figure 6. Proposed Timeline for Leasing, Permitting, and NEPA Compliance Activities (2013-2017), as envisioned by WFP Permitting Team

The location/facility for the construction/fabrication work will be determined through a competitive bidding process, to be completed in 2014.

Phase 2 – Construction, Delivery, and Assembly

WindFloats and component parts will be delivered to the Port of Coos Bay in 2015 and 2016. Principle Power is in discussions with the Port and other entities in Coos Bay about securing lay down and storage areas appropriate for the project. Final assembly (affixing the wind turbine apparatus; tower, hub, nacelle, blades) of the WindFloats will occur in Coos Bay facilities.

Phase 3 – Deployment

Deployments are planned to take place once all permits have been secured, in late summer 2016 and in 2017. Principle Power expects to deploy two WindFloats in 2016, and three in 2017.

Phase 4 – Operations

Full commissioning and commencement of operations is planned for the fourth quarter of 2017. The project is proposed to have a 25-year life; full decommissioning is planned for 2042.

Figure 7 below describes, at a high level, Principle Power’s general planning assumptions. Additional information can be found in Principle Power’s original proposal to DOE, included as Attachment H (please note that the schedule provided in the proposal is indicative, and has been modified since its submission).

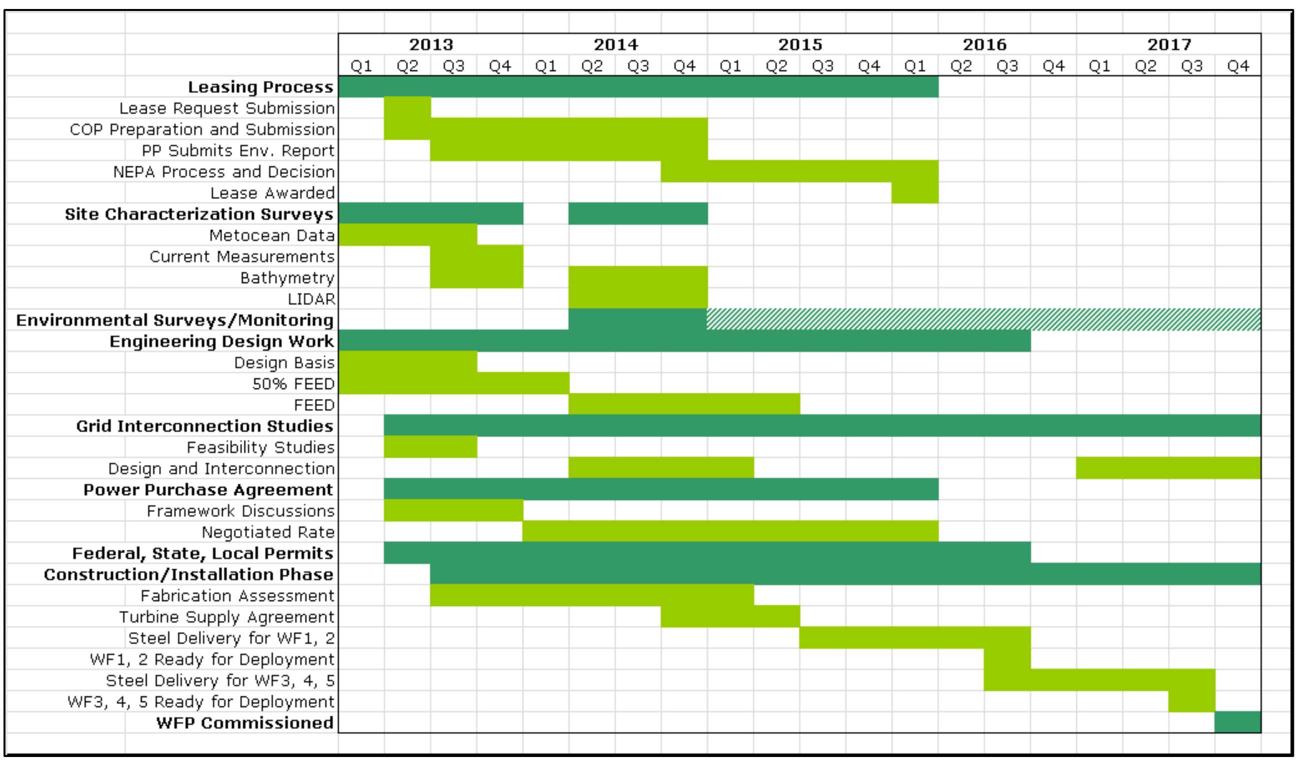

Figure 7. Summary Schedule of Proposed Activities

d) <u>Renewable Energy Resource and Environmental Conditions in Area of Interest</u>

Energy Resource

The offshore wind resources of the United States were first estimated by the National Renewable Energy Lab (NREL) in 2003 (Musial and Butterfield 2004). Since then, updated offshore wind mapping projects (e.g., Elliott and Schwartz 2006) are gradually being completed. Data are limited for Oregon (only 50 m map wind speed data is available). Therefore, the 90 m wind speeds were calculated using a power law wind speed shear exponent of 0.11 (Elliott et al. 1987). This exponent value was chosen based on the validation experience with the updated offshore wind maps and because other analyses of offshore wind resources indicate that the shear exponent is most often in the range from 0.08 to 0.14 for the offshore regions of the United States. The wind speeds at 90 m were about 6.5 percent higher than the 50 m wind speeds using the 0.11 shear exponent (NREL 2010). Table 3 and Figure 8 show the estimated wind speeds at different distances from shore based on these calculations.

Prior to design and coupled numerical modeling of global system response and motions, a suitable dataset of wind and wave data is required. The dataset will be compiled from existing historical sources as well as project-specific measurements. Statistical analyses will yield extreme events for both wind and wave criteria to be used in the project design basis and engineering.

Modeling of the metocean conditions will utilize the Weather Research and Forecasting (WRF) model. Boundary and initial conditions for the preliminary and hindcast simulations will be obtained from the global National Centers for Environmental Prediction and National Center for Atmospheric Research (NCEP/NCAR) Reanalysis. Results from metocean modeling will be analyzed and compiled into a metocean design basis. The lack of available routine above-surface wind observations in the project area severely limits the ability to validate hindcast model results. In addition, a sufficient dataset is required for performance prediction and future project finance opportunities. Thus, as part of the project's metocean modeling effort, WindFloat Pacific proposes a dual- or multi-Doppler LIDAR field campaign in order to make comprehensive measurements of winds in the near-shore and offshore regimes.

Detailed wind resources will be characterized using shore-based scanning LIDAR.

The Construction and Operations Plan (COP) will include the results of site characterization surveys and describe all the activities associated with installation and operation of the wind farm, maintenance, and decommissioning. The activities associated with siting, installing, operating, and removing the WindFloat system will be integrated in time and space with potential environmental effects, ensuring that the federal and state permitting processes accurately reflect the activities and potential risks in a realistic manner.

Table 3. Oregon Offshore Wind Resource by Wind Speed Interval, Water Depth, and Distance from Shore within 50 nm of Shore

	Distance from Shore								
	0 - 3			3 - 12			12 - 50		
Depth Category	**Shallow (0 - 30 m)**	**Transitional (30 - 60 m)**	**Deep (> 60 m)**	**Shallow (0 - 30 m)**	**Transitional (30 - 60 m)**	**Deep (> 60 m)**	**Shallow (0 - 30 m)**	**Transitional (30 - 60 m)**	**Deep (> 60 m)**
90 m Wind Speed Interval (m/s)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)
7.0 - 7.5	356 (1,779)	21 (103)	0 (0)	1 (4)	9 (46)	1 (6)	0 (0)	0 (0)	0 (0)
7.5 - 8.0	523 (2,615)	319 (1,596)	38 (188)	46 (232)	232 (1,159)	335 (1,675)	0 (0)	0 (0)	0 (0)
8.0 - 8.5	198 (991)	277 (1,385)	7 (33)	19 (95)	596 (2,978)	2,558 (12,792)	0 (0)	0 (0)	4,989 (24,947)
8.5 - 9.0	64 (320)	99 (494)	1 (3)	0 (0)	108 (540)	1,967 (9,836)	0 (0)	46 (228)	11,640 (58,201)
9.0 - 9.5	64 (321)	55 (277)	39 (193)	0 (0)	33 (163)	615 (3,074)	0 (0)	0 (0)	6,588 (32,941)
9.5 - 10.0	47 (237)	80 (402)	15 (73)	0 (0)	34 (169)	635 (3,173)	0 (0)	0 (0)	5,255 (26,273)
>10.0	0 (1)	19 (97)	33 (166)	0 (0)	18 (91)	1,369 (6,843)	0 (0)	0 (0)	4,546 (22,730)
Total >7.0	1,253 (6,264)	871 (4,354)	131 (656)	66 (332)	1,029 (5,146)	7,480 (37,399)	0 (0)	46 (228)	33,019 (165,093)

nm = nautical miles
m = meters
m/s = meters per second
km2 = square kilometers
MW = megawatts

Source: NREL 2010

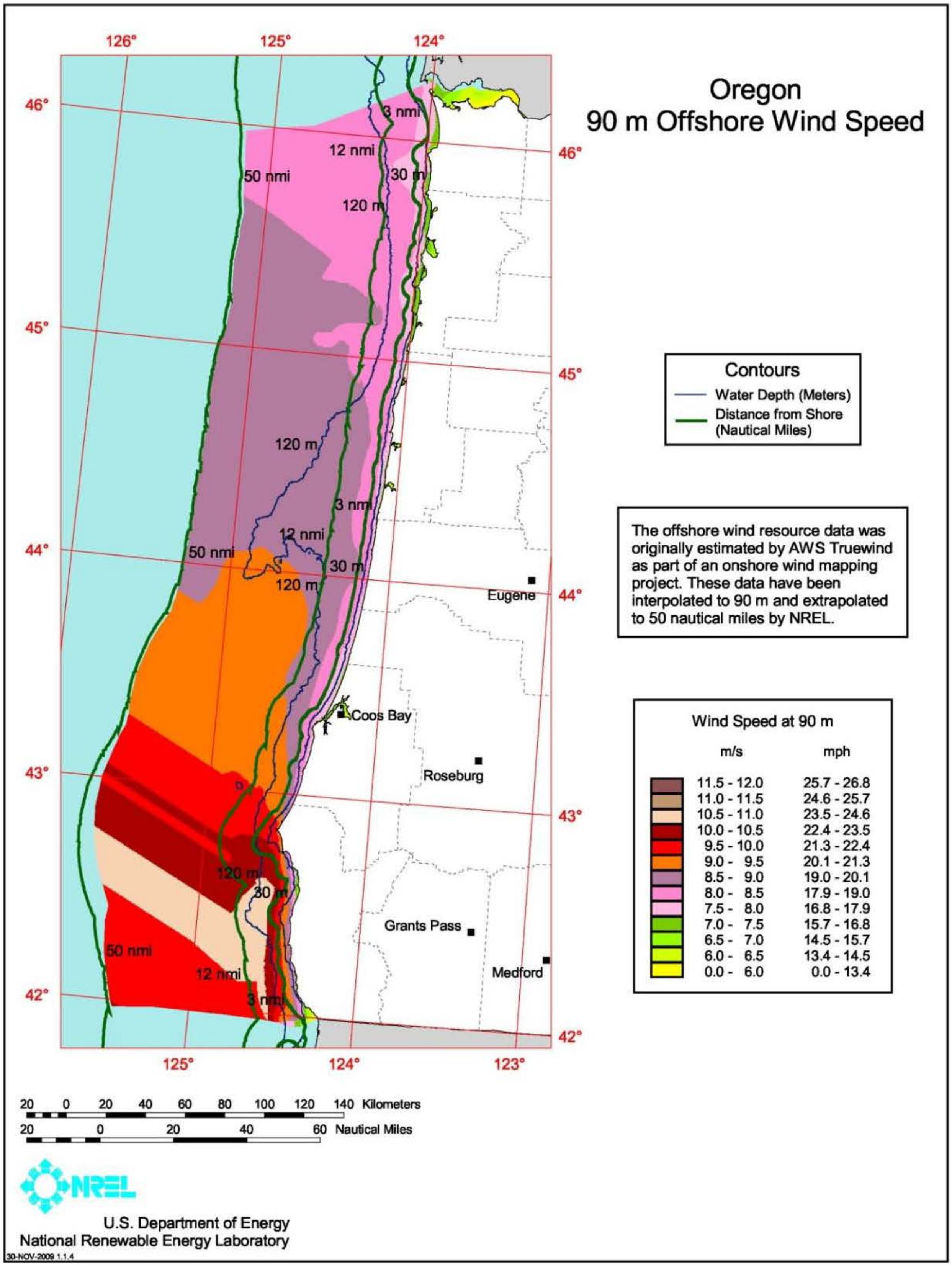

Figure 8. Oregon 90 m Offshore Wind Speed (NREL 2010)

Environmental Resources

Marine geology

The Coos Bay basin occupies the shelf and upper slope of the central Oregon continental margin between Heceta Bank and Coquille Bank (from about latitude 43° to 44°15'N). The continental shelf in this area ranges in breadth from 12 to 16 miles (20 to 25 km) off Cape Arago and Coquille Point, to a maximum of nearly 43 miles (70 km) at Heceta Bank. The most prominent features of this shelf segment are Heceta and Coquille banks, which are exposed bedrock highs on the outer shelf with about 160 feet (50 m) of sea-floor relief. The shelf break occurs at a depth of about 460 feet (140 m), and is best defined in the vicinity of the banks. The continental slope has a northward trend in this region and ranges in breadth from 22 miles (35 km) seaward of Heceta and Coquille banks to 34 to 46 miles (55 to 75 km) in the area between the banks. It has a margin-average declivity of 2°- 4°, is steepest in the vicinity of the banks, and slopes westward to depths of 9,850 to 10,200 feet (3,000 to 3,100 m) in the Cascadia Basin. The lower part of the slope is conspicuously steep; declivities of 7°-14° are common between depths of 6,500 and 9,850 feet (2,000 and 3,000 m). The proposed WindFloat project site falls on the less steep portions of the slope; bottom slope is believed to be close to 2°. Large canyons do not cut the continental slope off central Oregon, although smaller submarine valleys and gullies are numerous (Clarke et al. 1985).

Surficial sediments on the continental shelf consist of clean and well-sorted fine to very fine sand along the inner continental shelf seaward to a depth of 160 to 330 feet (50 to 100 m). Mixing by benthic organisms of river-supplied mud with relict and modern sand results in large areas of mud and muddy sand over much of the middle and outer shelf. Rocky outcroppings occur off of Cape Arago and Coquille Point (Clarke et al. 1985; NWFSC et al. 2012).

Marine biological resources (avian resources, benthic habitat, coral reefs, fish species and Essential Fish Habitat, marine mammals, listed threatened and endangered species)

<u>Threatened and endangered species</u>

A number of species that are listed as threatened or endangered under the federal Endangered Species Act are known to occur or may occur in the project area. Listed species and designated Critical Habitat are under the jurisdiction of either the USFWS or NOAA Fisheries. Tables 4 and 5 show federally listed threatened and endangered species that occur or may occur in Coos County.

Table 4. Threatened and Endangered Species for Coos County under USFWS Jurisdiction

Species	Scientific Name	Status	Range
Marbled murrelet	*Brachyramphus marmoratus*	Critical Habitat Threatened	Known to occur in California, Oregon, Washington. Critical Habitat designated in Coos County.
Western snowy (coastal) plover	*Charadrius alexandrinus nivosus*	Critical Habitat Threatened	Known or believed to occur in California, Oregon, Washington. Critical Habitat designated in Coos

Species	Scientific Name	Status	Range
			County.
Short-tailed albatross	*Phoebastria albatrus*	Endangered	Known to or is believed to occur in Alaska, California, Hawaii, Oregon, Washington.
Northern spotted owl	*Strix occidentalis caurina*	Critical Habitat Threatened	Known to or is believed to occur in California, Oregon, Washington. Critical Habitat designated in Coos County.
Loggerhead sea turtle	*Caretta caretta*	Endangered	See below
Green sea turtle	*Chelonia mydas*	Threatened	See below
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	See below
Olive (=Pacific) ridley sea turtle	*Lepidochelys olivacea*	Threatened	See below

Source: USFWS 2013

Table 5. Endangered and Threatened Species under NOAA Fisheries Jurisdiction

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Marine Mammals					
Blue whale	*Balaenoptera musculus*	Endangered	n/a	final	In the North Pacific Ocean, the blue whale's range extends from Kamchatka to southern Japan in the west and from the Gulf of Alaska and California south to Costa Rica in the east. They occur primarily south of the Aleutian Islands and the Bering Sea.
Fin whale	*Balaenoptera physalus*	Endangered	n/a	final	Fin whales are found in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes, and less commonly in the tropics.
Gray whale, Western North Pacific DPS	*Eschrichtius robustus*	Endangered	n/a	n/a	Gray whales are found mainly in shallow coastal waters in the North Pacific Ocean. The Oregon coast is part of the Eastern North Pacific gray whale migratory route between Baja California and the Arctic.
Humpback whale	*Megaptera novaeangliae*	Endangered	n/a	final	Humpback whales live in all major oceans from the equator to sub-polar latitudes.
Right whale, North Pacific original listing as "northern right whale"	*Eubalaena japonica*	Endangered	Final	no	North Pacific right whales inhabit the Pacific Ocean, particularly between 20° and 60° latitude. Sightings have been reported as far south as central Baja California in the eastern North Pacific
Sea Turtles Note: USFWS has lead responsibility on nesting beaches, NMFS in marine waters					
Loggerhead turtle, North Pacific Ocean DPS	*Caretta caretta*	Endangered	n/a	n/a	In the eastern Pacific, loggerheads have been reported as far north as Alaska, and as far south as Chile. In the U.S., occasional sightings are reported from the coasts of Washington and Oregon, but most records are of juveniles off the coast of California.

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Leatherback turtle	*Dermochelys coriacea*	Endangered	Final	final	Leatherbacks are commonly known as pelagic (open ocean) animals, but they also forage in coastal waters. In fact, leatherbacks are the most migratory and wide ranging of sea turtle species.
Green turtle	*Chelonia mydas*	Threatened	Final	final	In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska, but most commonly occur from San Diego south.
olive ridley turtle	*Lepidochelys olivacea*	Threatened	n/a	final	This species does not nest in the United States, but during feeding migrations, olive ridley turtles nesting in the East Pacific may disperse into waters off the US Pacific coast as far north as Oregon.
Marine and Anadromous Fish					
Coho salmon, Oregon Coast ESU	*Oncorhynchus kisutch*	Threatened	Final	no	
Coho salmon, Southern Oregon/ Northern California Coasts ESU	*Oncorhynchus kisutch*	Threatened	Final	in process	The species was historically distributed throughout the North Pacific Ocean from central California to Point Hope, Alaska, through the Aleutian Islands, and from the Anadyr River, Russia, south to Hokkaido, Japan. Coho probably inhabited most coastal streams in Washington, Oregon, and central and northern California.
Green sturgeon, Southern DPS	*Acipenser medirostris*	Threatened	Final. All marine waters within the Oregon Territorial Sea and out to 110 meters depth in federally managed waters, plus some estuaries along the Oregon coast, are designated as critical habitat.	in process	The green sturgeon ranges from Mexico to at least Alaska in marine waters, and is observed in bays and estuaries up and down the west coast of North America

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Marine Invertebrates					
Black abalone	*Haliotis cracherodii*	Endangered	Final. approximately 360 square kilometers of rocky intertidal and subtidal habitat within five segments of the California coast between the Del Mar Landing Ecological Reserve to the Palos Verdes Peninsula, as well as on the Farallon Islands, Año Nuevo Island, San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, Santa Barbara Island, and Santa Catalina Island.	Final	Black abalone range from about Point Arena, CA, to Bahia Tortugas and Isla Guadalupe, Mexico. Black abalone are rare north of San Francisco and south of Punta Eugenia, though unconfirmed sightings have been reported as far north as Coos Bay, OR.

Source: NOAA Fisheries 2013.

Avian resources

The Oregon coast supports many seabird species, including albatross, shearwaters, petrels, puffins, cormorants, common murre, and auklets that nest on offshore rocks and cliff faces. Many of these seabirds live their lives entirely at sea except during the breeding season when offshore rocks and remote cliffs are used for breeding, laying and incubating eggs, and feeding and rearing chicks (Oceana 2011; USFWS 2008). There are numerous sea bird colonies on Cape Arago and along the shores of Coos Bay (NWFSC et al. 2013). There are relatively few data on bird populations 15 miles off the coast of Coos Bay, in the vicinity of the proposed development site.

Several species of bats occur in Coos County. To date no studies have been done on bats' use of the ocean areas off the Oregon coast. A study in Sweden showed that many species of bats hunt for insects in offshore areas. They have also been found to use offshore turbines for roosting (Ahlen et al. 2007). Bat studies on the west coast indicate that bats may use the offshore areas when an offshore location (such as an island) guides them. (Tenaza 1966; Cryan & Brown 2007).

Benthic habitat

The Oregon coast primarily is an exposed, high energy environment, so most soft–bottom, subtidal areas are sandy. Mud can be a more pronounced bottom type in areas receiving less energy from water movement (i.e., isolated and sheltered embayments) and in deeper waters. Subtidal, soft-bottom habitats are diverse, as a result of distinct organism assemblages that are influenced by differences in substrate type (sand versus mud), organic content, and bottom depth. The distribution and relative abundance of these ecotypes are not yet well described for Oregon (ODFW 2006). The proposed project site is located on the continental slope; although the bottom sediments will not be well characterized until site characterization surveys are completed, the bottom is likely to consist of fine-grained well sorted sediments.

Species associated with soft–bottom, subtidal habitats provide a spectrum of ecosystem services. Most widespread but least apparent would be nutrient cycling by deposit feeders and microbes living within the sediments. Emergent species, such as sea pens, in more quiet areas are understood to provide structural habitat used by the young of commercially valuable fish species (ODFW 2006). Benthic invertebrates, including corals, sea pens, and gorgonians, are mapped in the project vicinity (NWFSC and OSU 2013).

Soft-bottom communities are commonly named or described based on the species or species groups that are most apparent. Most of these communities are dominated by burrowing invertebrates such as polychaete worms, but other organisms, such as crustaceans, echinoderms, and mollusks, may be locally abundant. Common organisms on the sediment surface can include species of shrimp, crabs, snails, bivalves, sea cucumbers, and sand dollars. Dungeness crabs are important components of sandy-bottom communities and are found both on the surface and buried in the sand. Sea pens are common on more muddy bottoms. Common fish in soft-bottom areas include several species of flatfish, important forage species such as sand lance, and the burrowing sandfish (ODFW 2006). The distance from shore of the project site is expected to correspond to a decrease in the density of benthic community resources as the flow of primary production (food source) decreases.

Reefs

Rocky reef habitat is designated as a Habitat Area of Particular Concern by the National Marine Fisheries Service (NMFS) for its importance as Essential Fish Habitat and its rarity, sensitivity, and/ or vulnerability (Oceana 2011). A large rocky reef is located southwest of Cape Arago, and a smaller rocky reef is approximately 10 km (6 miles) west of Coos Bay (NWFSC and OSU. 2013).

Ecotypes of rocky subtidal habitats include:

- Shallow rocky reefs [less than 80 feet (25 meter depth)] with kelp beds,
- Shallow rocky reefs [less than 80 feet (25 meter depth)] without kelp beds,
- Deep rocky reefs [less than 80 feet (25 meter depth)], and
- Subtidal artificial substrate (Oceana 2011).

Subtidal rocky reefs are known for their abundant and diverse biological communities. Habitat-forming organisms, such as kelp or large invertebrates, grow attached to the reef substrate, providing additional structures and types of microhabitats used by reef species. Biological communities using reefs include algae and other marine plants, attached and mobile invertebrates, fish, marine mammals, and sea birds. Many reefs have extensive growths of attached invertebrates, often covering nearly every square inch of rock surface. Common types of organisms include sponges, anemones, barnacles, bryozoans, tunicates, and coldwater corals. The rocks, algae, and attached invertebrates provide homes for a variety of mobile invertebrates such as crabs, snails, sea stars, urchins, brittle stars, nudibranchs, chitons, and worms. Free-swimming invertebrates, such as shrimps, and drifting (planktonic) invertebrates also are common on reefs. Reef fish include the more familiar types such as rockfish, perch, lingcod, and greenlings, and a large variety of smaller sculpins, gunnels, poachers, and blennies, among others. Many fish species are entirely dependent on reefs for parts of their life cycle, while others are visitors. Common visitors include herring, smelt, sharks, ratfish, and salmon. Marine mammals, especially seals and sea lions, and seabirds often feed on the abundant fish and invertebrates on rocky reefs. The offshore rocks and islands associated with Oregon's nearshore reefs provide important seal and sea lion haulout and pupping areas, and support the largest seabird nesting colonies on the US West Coast (ODFW 2006).

There are no documented rocky reefs on the project site; the site characterization will confirm this finding. If rocky reefs are found on the site, the placement of the project anchoring system will be carefully sited to avoid damage to these habitats.

Fish species and Essential Fish Habitat

Highly migratory and schooling species are typical of the waters and biological communities living in the water column over the continental shelf. Many species of sharks, salmon, sturgeon and forage fish (such as herring, anchovies, and sardines) travel and forage within this habitat. This habitat is also very important to many fish and invertebrate species during their juvenile and larval life history stages (ODFW 2006). Salmon range from more than 1,000 miles (1,600 km) inland to thousands of miles out at sea. In estuaries and marine areas, salmon habitat extends from the shoreline to the 200-mile limit of the exclusive economic zone and beyond (PFMC 2012).

Essential Fish Habitat (EFH) (Magnuson-Stevens Act §3(10) for groundfish is designated along the entire continental shelf in the project vicinity and includes all waters from the high tide line (and parts of estuaries) to 1,914 fathoms (3,500 meters) in depth. The rocky reef southwest of Cape Arago and the smaller reef due west of Coos Bay are designated as Habitat Areas of Particular Concern. These are discrete subsets of EFH that provide extremely important ecological functions or are especially vulnerable to degradation (BOEM 2013).

The coastal pelagic species (CPS) fishery includes four finfish (Pacific sardine, Pacific [chub] mackerel, northern anchovy, and jack mackerel), and market squid. CPS finfish generally live nearer to the surface than the sea floor. The definition of EFH for CPS is based on the temperature range where they are found and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. The EFH for CPS also takes into account where these species have been found in the past and where they may be found in the future (PFMC 2012). The east-west boundary of CPS EFH includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the limits of the exclusive economic zone (the 200-mile limit) and above the thermocline where sea surface temperatures range between 10° and 26° C (PFMC 2012).

Defining EFH for highly mobile species such as tuna, swordfish, and sharks is a challenging task as these species range widely in the ocean, both in terms of area and depth. Highly migratory species are usually not associated with the features that are typically considered fish habitat (such as seagrass beds, rocky bottoms, or estuaries). Their habitat may be defined by temperature ranges, salinity, oxygen levels, currents, shelf edges, and seamounts (PFMC 2012).

Skates

Several species of skates live in Oregon coastal include the big skate, black skate, longnose skate, and sandpaper skate (ODFW 2011). There are no rays living in the cold waters of the North Pacific.

Marine mammals

At least 29 different species of marine mammals occur in Oregon coast waters, including many whales, dolphins, and porpoises. However, the most commonly seen marine mammals, and those that most often come into conflict with sport and commercial fishing activities, are the pinnipeds, - seals and sea lions (ODFW 2011).

Four species of pinnipeds frequent Oregon’s rocky islands and protected shores for breeding and/or resting. These include California sea lions (haulout only), Pacific harbor seals, Steller sea lions, and the northernmost breeding colony of northern elephant seals at Shell Island off Cape Arago (Oceana 2011).

The deep waters of the offshore wind site proposed for WindFloat Pacific are beyond the common hunting grounds of most cetaceans and pinniped species living off the Oregon coast.

However, large migratory whales such as grays, humpbacks, blues and sei whales may be present in offshore waters seasonally.

Physical oceanography and meteorology

The general ocean circulation along the Oregon and Washington coasts can be described by the California Current System, which comprises the California Current, the Davidson Current, and the California Undercurrent. The California Current is a surface current that flows toward the equator along the entire West Coast of the United States between the shelf break and 540 nautical miles (1,000 km) offshore. The Davidson Current is a seasonal surface current that manifests itself as a poleward-flowing countercurrent to the California Current during the fall and winter months over the continental slope and shelf. The California Undercurrent is a poleward subsurface flow that follows the continental slope. Since currents are strongly influenced by wind-stress, demonstrating a seasonal variability. During the spring/summer, strong upwelling-favorable winds drive the currents toward the equator along the California and Oregon coasts while flow is driven by a sea surface pressure gradient toward the equator off the Washington coast (Kaplan et al. 2010). The result is high production of phytoplankton from April through September fueled by a nearly continuous supply of nutrients and concomitant high biomass of zooplankton during summer (NWFSC 2013). During the winter months off the California and Oregon coasts, the upwelling-favorable winds "relax." and allow a sea surface pressure gradient to drive the flow toward the poles (Kaplan et al. 2010).

During spring and summer, mean winds off the Oregon coast are strongly influenced by the North Pacific High and directed southward. During fall and winter, mean winds are weakly southward along the southern Oregon coast (Kaplan et al. 2010). Episodic phenomenon such as the Pacific Decadal Oscillation and ENSO can interrupt and/or intensify currents and upwelling (Kaplan et al. 2010).

The coastal zone is characterized by wet winters, relatively dry summers, and mild temperatures throughout the year. Occasional strong winds strike the Oregon Coast, usually in advance of winter storms. Wind speeds can exceed hurricane force. Such events are typically short-lived, lasting less than one day. Areas along the coast can receive upwards of 200 inches of rain annually, most of which falls from October to March (Taylor et al. undated).

Geology – terrestrial

No onshore areas would be included in the area requested for lease. The following description of terrestrial geology is included only for background information.

The North Spit of Coos Bay lies directly east of the proposed lease area. Transmission cables for the proposed WindFloat project would be installed along the ocean floor, come ashore at a point on the west side North Spit, then extend across the spit to end at a power substation to be constructed on the east side of the North Spit.

The geology of the North Spit is mainly deflation plain and beach sand. The sand has been stabilized in areas where vegetation, both native and non-native, thrives. The sand is unstable in non-vegetated areas (Oberrecht, undated). A deflation plain lies inland of the sand dunes. The foredune blocks the inland migration of sand, causing the interior dunes to consume themselves and a deflation plain to form. The deflation plain is caused by the removal of loose sand to the point that the summer groundwater table is reached. As the sand is saturated, it becomes more resistant to wind erosion, i.e. becomes more stable, and vegetation begins to grow (BLM 2006).

Air quality

The Oregon Coast enjoys good air quality due to the proximity to the ocean, lack of large pollution producers, and prevailing winds. Oregon Department of Environmental Quality does not maintain any air quality monitoring stations in Coos Bay. Little is known about the air quality in the open ocean at the proposed lease site; no known sources of contamination are likely to degrade air quality in the area.

Air quality indices (AQIs) are numbers used by government agencies to characterize the quality of the air at a given location. As the AQI increases, an increasingly large percentage of the population is likely to experience increasingly severe adverse health effects. Air quality index values are divided into ranges, and each range is assigned a descriptor and a color code. Standardized public health advisories are associated with each AQI range. The AQI for Coos Bay in 2011 showed that no air pollutants were rated as unhealthy or hazardous. Levels of ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and PM10 (particles of 10 micrometers or less) were rated “good.” Levels of PM2.5 (particles of 2.5 micrometers or less) were “moderate” (Homefacts 2013).

Water quality

Pollutants

Some major types of marine pollutants that have been the focus of recent research in the north Pacific Ocean are oil, sewage, garbage, chemicals, radioactive waste, thermal pollution, and eutrophication. No data on these pollutants were found for the offshore project vicinity. There are few direct emissions of industrial material directly into the marine environment because much of the Oregon coastline is relatively unpopulated, so that few metals and organic contaminants are delivered to the coastal ocean.

The Oregon Department of Environmental Quality partners with the Oregon Department of Human Services to monitor the waters along Oregon's coastline for enterococcus bacteria, which indicates the presence of other harmful microbes. Only one of the beaches in the project vicinity, Bassedorf Beach, just south of the entrance to Coos Bay, had samples that exceeded US Environmental Protection Agency (US EPA) standards (Oregon Coastal Atlas 2013).

Water column characteristics

An assessment of the status of the ecological condition of soft sediment habitats and overlying waters along the western United States continental shelf, between the target depths of 30 and 120 m (10 and 40 feet), was conducted during June 2003. The assessment included vertical water-column profiles of conductivity, temperature, chlorophyll a concentration, transmissivity, dissolved oxygen, and depth. Results showed that surface salinity was generally less than 33 practical salinity units (psu) to the north of Cape Blanco, Oregon, and greater than 33 psu to the south of Cape Blanco. Mean surface water temperature of Oregon marine waters was approximately 53 F (12°C). The range of dissolved oxygen concentrations in the surface waters of the West Coast shelf (data available for 140 stations) was 4.1 milligrams per liter (mg/L) to 13.3 mg/L. US EPA proposed that a dissolved oxygen value below 2.3 mg/L is harmful to the survival and growth of marine animals (Nelson et al. 2008). The characteristics of the open ocean area of the proposed project are expected to be similar to those seen at the deeper site examined.

Noise and visual resources

Natural noise sources in the offshore and onshore areas include wind, waves, birds, and other wildlife. Human-caused noise sources offshore include ship motors and horns and aircraft. Onshore noise sources include motor vehicles, aircraft, construction equipment, and industrial activity.

Visual resources for the coastal area inshore of the proposed project site include scenic views from popular viewpoints near Coos Bay including Shore Acres State Park, with a fully enclosed observation building, and Cape Arago State Park. These and other public parks on Cape Arago are popular sites for observing scenery, whales, seals, other marine life, and birds. Natural elements of the viewscape include the rocky shoreline, offshore rock outcroppings, and the open ocean. Oregon Dunes National Recreation Area, north of Coos Bay, is also a popular spot for sightseeing and wildlife viewing. Views from the recreation area include rolling sand dunes, the open ocean, and Coast Range mountains in the distance. Ship traffic, including tugboats, cargo vessels, fishing boats, and tourist ships, is commonly observed from vantage points along the shore. Lights from ships and navigation buoys are visible at night.

The scenery along the coast is spectacular, so oceanfront viewsheds may be highly sensitive to visual changes offshore. In addition, seaside residents would potentially be very sensitive to changes visible from the shore; hence viewsheds from seaside residences are of particular concern in analyzing potential visual impacts of offshore energy structures (Norman et al. 2006).

Marine transportation and commerce

Coos Bay Harbor supports a large array of commercial vessel traffic. Commercial traffic includes barge traffic and deep-draft vessels transporting logs and wood chips. The US Coast Guard, the marine exchanges (that coordinate and represent commercial shipping), harbor safety committees, and port operators are stakeholders with regard to marine transport (Industrial Economics, Inc. 2012; Kaplan et al 2010).

The Port of Coos Bay is the smallest of the three main ports in the Pacific Northwest, with between 5 and 8 commercial vessels per month. The other main ports are Seattle, Washington (with 250 to 300 commercial vessels per month) and Astoria, Oregon (with 130 to 150 commercial vessels per month) (Industrial Economics, Inc. 2012).

Commercial vessels operate in a highly organized fashion when entering and exiting ports, and generally travel in straight lines between two points when operating outside of a port. Tankers generally travel parallel to the coast at a distance of approximately 50 nm (92 km), while large container ships operate approximately 25 nm (46 km) offshore. Smaller container ships travel at a distance of approximately 5 to 10 nm (9 to 18 km) from shore. Tugs and barges operate within negotiated towboat lanes, which, in the summer, are generally 4 to 10 nm (7 to 18 km) offshore in Oregon. During other times of year, the lanes are generally 4 to 6 nm offshore. Most commercial vessels are equipped with technology (e.g., Automatic Identification System) to aid in avoiding conflicts (Industrial Economics, Inc. 2012).

There is a designated commercial shipping lane in the vicinity of the proposed lease blocks, connecting the port of Coos Bay to the north-south shipping lane approximately 50 nm (90 km) offshore. In addition, there is a year-round tugboat tow lane running north-south approximately 8 nm (15 km) offshore and another tow lane approximately 25 nm (46 km) offshore. There are several interconnecting routes closer to shore (OCMP 2013).

The primary transportation routes off Oregon for the Trans-Alaskan Pipeline Trade that affect the Oregon Coast are between Prince William Sound, Alaska, and Richmond, California. The routes for major shipping traffic keep the crude-oil-laden super tankers 50 to 60 nm off shore. This distance minimizes coastal effects from a catastrophic spill. Refined product is transported in barges and small tankers that travel close to the shoreline, as do cargo vessels with bunker fuels while in transit of the coast (Northwest Area Committee 2004).

Military and Coast Guard operations

The ocean area along the entire Oregon and Washington coastlines is designated as a Navy Operation Area, used by the Navy Fleet Forces- Third Fleet for training and weapons systems testing (BOEM 2013). Areas of operation do not typically encompass the entire operational area of the joint force commander, but they are large enough for component commanders to accomplish their missions and protect their forces. Military activities can be quite varied but normally consist of various air-to-air, air-to-surface, and surface-to-surface naval fleet training, submarine and antisubmarine training, and air force exercises (Kaplan et al. 2010).

There has been a Coast Guard Station in Coos Bay for over 100 years. During the summer months, Station Coos Bay operates Search & Rescue Detachment (SARDET) Coquille River, a seasonal detachment located in Bandon, Oregon (USCG 2013). Coast Guard Cutter ORCAS, a 110-foot patrol boat, has been stationed in Coos Bay, Oregon, since 1989 when it replaced the Cutter Pulaski. Typical missions while underway include: Living Marine Resources Enforcement, Law Enforcement, Search and Rescue, and Homeland Security (USCG 2013).Other Coast Guard activities include servicing and discrepancy response for lights, ranges, unlit and lighted buoys, day beacons, small boat warning signs and lighthouses (USCG 2013).

Airspace utilization – civilian and military

Coos Bay and surrounding communities are served by Southwest Oregon Regional Airport in North Bend, Oregon. Southwest Oregon Regional Airport is open for public use and provides facilities for commercial, general aviation, cargo, and military air traffic. Commercial flights are provided by United Airlines and Sea Port Airlines. Local airspace surrounding the airport is designated as Class D Airspace. The airspace consists of the immediate airspace within a horizontal radius of 5 miles (8 km) from the surface up to an altitude of 2,500 feet (806 m). Class D airspace provides air traffic control service for aircraft on the airport surface and in the airspace immediately surrounding the airport to control air traffic flow. Air traffic control services typically provided at a Class D airport is via a control tower. Both the City of North Bend and Coos County currently have airspace protection ordinances in place, which are established as the Airport Overlay Zone (Ord. 1952 § 1(4), 2006) in Chapter 18 of the North Bend Municipal Code, and the Air Surface Protection Area [Ord. 93 § 3.20.1, 1987] in the Coos Bay Municipal Code (RS&H 2012).

A military aviation warning areas exists off the Oregon coast over the proposed project area. (BOEM 2013).

Commercial and recreational fishing

Commercial fishing is an important element of Oregon's economy. Most commercial fishing enterprises in Oregon are small businesses (Industrial Economics, Inc. 2012.) The harvest value of Oregon onshore landings in recent years went from $105.1 million in 2010 to a 23-year high of $145.5 million in 2011. Oregon harvest value in recent years is usually dominated by the Dungeness crab fishery, which accounts for about 40 percent of the onshore landing total value. The second highest contributing fishery harvest value is usually the non-whiting groundfish fishery, followed by pink shrimp. The albacore tuna fishery is especially important as a substitute and opportunity fishery when the highly variable salmon fishery has downturns. The major regional fishing centers in Oregon are Astoria, Newport, and Charleston (located just west of Coos Bay). Revenue from the port of Charleston accounted for approximately 20 percent of the overall revenue from ocean catch (ODFW 2012).

Research conducted for the *Identification of Outer Continental Shelf Renewable Energy Space-Use Conflicts and Analysis of Potential Mitigation Measures* (Industrial Economics, Inc. 2012.) focused on eight target commercial species: tuna, salmon, crab, shrimp, two groundfish (sablefish [black cod] and halibut), other groundfish, and spot prawns. Table 6 shows the typical distances from shore and/or depths for each fishery.

Table 6. Depths and Distances from Shore for Oregon Commercial Fisheries

Fishery	Commercial	Charter	Recreational
Tuna	Generally near surface, 30 nm or more from shore at 50 to 100 fathoms up to 500 to 2,000 fathoms	Out to 20 to 50 nm (within a 70- to 80-mile radius of port)	Typically 30 to 50 nm (within a 70- to 80-mile radius of port)
Salmon	Breakers to 200 fathoms; sometimes up to 650 fathoms	Breakers to 50 fathoms; 20+/- nm to high spots	Breakers to 50 fathoms; usually stay within 20 nm
Crab	Breakers to 130 fathoms and up to 700 fathoms in some years; around tops of canyons, high spots	Often inside of bays and estuaries; in the ocean out to 20 to 70 fathoms	In Washington, 80 to 90 percent in bays and estuaries; in Oregon and Washington ocean, typically out to about 20 fathoms
Shrimp	30 to 150 fathoms; 90 percent in 60 to 140 fathoms; muddy, soft, flat bottom	n/a	n/a

Fishery	Commercial	Charter	Recreational
Groundfish	Breakers to 400 to 700 fathoms; 1,200 fathoms for midwater, but nets are not this deep	Bottom fishing very important; within 5 nm or 40 fathoms (within 30-mile radius of port); look for reefs and high spots	Within 5 nm or 40 fathoms (further if closures were lifted; typically within 30-mile radius of port); mostly in pockets of high relief habitat
Black Cod	100 to 500/650 fathoms	Bottom fishing very important; within 5 nm or 40 fathoms (within 30-mile radius of port); look for reefs and high spots	Typically bycatch when fishing for halibut
Halibut	22 nm at 100 to 125 fathoms	Very valuable fishery; within 40 to 100 fathoms; focus on sand or gravel habitat	Within 40 to 100 fathoms; focus on sand or gravel habitat

Source: Industrial Economics, Inc. 2012

Charleston is a premier sports fishing harbor and one of the state's busiest commercial fishing ports. The primary commercial fishing activity off Coos Bay/Charleston is groundfish trawl, shrimp trawl, Dungeness crab (pot; mostly in state territorial sea), albacore tuna, sablefish (longline and pot), salmon troll, nearshore (hook and line) and groundfish (personal communication, Maggie Sommer, Marine Technical & Data Services Section Leader Oregon Department of Fish and Wildlife, March 12, 2013). The top fishery group coming into the port of Coos Bay based on economic value is the crab fishery (OCMP 2013).

Charter fishing businesses offer overnight trips as well as day trips. Charter operations are dependent on access to particular habitats for some target species (e.g., rocky structures and reefs for bottom fishing, sandy or muddy bottom for crabbing) and on particular water column and current conditions for others (e.g., salmon and tuna) (Industrial Economics, Inc. 2012.).

Recreational boaters (many of whom are also recreational fishermen) travel anywhere from 3 to 40 nm (75 km) from shore. Table 5 lists the general locations of recreational fisheries in the Oregon. The information for recreational fisheries was drawn from guided conversations with stakeholders conducted for a study by Industrial Economics, Inc. (2012).

The primary recreational fishing off Coos Bay/Charleston is private and charter fleet activity targeting salmon, tuna, halibut, groundfish, and crab (the last two primarily in state waters) (personal communication, Maggie Sommer, Marine Technical & Data Services Section Leader Oregon Department of Fish and Wildlife, March 12, 2013). Survey data from recreational fishing vessels out of Coos Bay estuary at the Charleston waterfront indicates that Dungeness crab is 45 percent of the catch, followed by black rockfish (35 percent), blue rockfish (6.9 percent), albacore (4.1 percent) and minor amounts of kelp greenling, yellowtail rockfish, Pacific halibut, copper rockfish, and vermillion rockfish (PSMFC 2012).

Historic and cultural resources

The Coos Bay watershed was originally inhabited by the ancestors of the modern day Confederated Tribes of Coos, Lower Umpqua, and Siuslaw, and the Coquille Indian Tribe. The area is Oregon's largest coastal estuary and has provided natural resources to local inhabitants for centuries. Coastal tribes lived in permanent villages, usually at the mouths of rivers, where food, firewood, and fresh water were abundant (Beckham 1991). They obtained much of their food, including shellfish, mollusks, and fish, in the intertidal zone. Over time, thick middens of broken shell, cracked rock, charcoal, and other debris built up; these make it possible for archaeologists to identify early village sites. Men hunted waterfowl on bays and coastal lakes; mammals were also hunted for food and fur. Women gathered a variety of berries and camas in coastal areas as well as in the uplands of the Coast Range, where seasonal camps were established (Beckham 1991).

The Oregon State Historic Preservation Office (SHPO) maintains a database of known cultural or archaeological sites. Historic sites (eligible listed and unlisted) along the coast north and south of Coos Bay include:

- Camp Castaway - Charleston vicinity, Coos County
- Bal'diyaka Cemetery - Coos, Lower Umpqua, Siuslaw Indian Cemetery
- Cape Arago Lighthouse
- Simpson Estate - Shore Acres State Park
- Cape Arago State Park
- Squaw Island (At Sunset Bay) – natural feature (OPRD 2013)

The National Oceanic and Atmospheric Administration's (NOAA) Office of Coast Survey charts known shipwrecks and other navigational obstructions through the Automated Wreck and Obstruction System (AWOIS). Shipwrecks near Coos Bay include:

- Columbia - sunk 2/17/24 north of Coos Bay entrance
- C.A. Smit – cargo ship sunk 12/16/23 north of Coos Bay entrance
- Chinook – sunk at Coos Head (no date available)
- Arago – sunk approximately 3 nm off the coast south of Cape Arago (no date available)
- Brush – cargo ship sunk 4/26/23 approximately 5 nm off Cape Arago
- Y M S 133 – mine layer sunk 2/20/43 approximately 11 nm northwest of the Coos Bay entrance

(BOEM 2013; NOAA 2013)

Tourism and recreation

The Coos Bay shoreline offers a variety of outdoor activities including fishing, clamming, wildlife, bird watching, sea lion and whale watching, tours, cycling, and off-road vehicle rides in the dunes. State parks include Sunset Bay, Shore Acres, and Cape Arago located southwest of Coos Bay. Sunset Bay State Park has a small, protected bay that is suitable for swimming, which is unusual for the Oregon coast. Divers, surfers, and boaters also enjoy the warm bay waters. Cape Arago State Park, located on a narrow coastal promontory, is a popular place for viewing Oregon's sea stacks and marine mammals such as seals, sea lions, and whales. Shore Acres State Park has a fully enclosed observation building on a scenic bluff offering ocean views and whale watching (Essentix, undated). Oregon Dunes National Recreation Area, managed by the Suislaw National Forest, is located north of Coos Bay. It is a popular area for off-road vehicle riding, hiking, paddling, wildlife viewing, camping, picnicking, sand play, and beach access.

Whale watching charters are offered by several companies operating out of Coos Bay and Charleston during the gray whale northern migration in early spring. Eco tours for viewing other marine life are offered in the near-shore area along the coast. In addition, whale-watching flights are offered out of Coos Bay.

Socioeconomics and environmental justice

According to data from the Oregon Employment Department (OLMIS 2013), the unemployment rate in Coos County, as of January 2013, was 10.5 percent, while that of Oregon, as a whole, was 8.4 percent. Total nonfarm employment in the County was 20,940 in January 2013, down by 0.9 percent from January 2012. Over the same time period, total nonfarm employment in the state of Oregon increased by 1.2 percent. The 2010 US Census reports median household income in 2009 at $37,491, and the poverty rate at 16.4 percent (Oregon Demographics 2012).

The largest industry sectors in Coos County, based on 2011 data, are: Government; Trade, Transportation, and Utilities; and Leisure and Hospitality followed by Education and Health Services; Professional and Business Services; and Manufacturing (OLMIS 2013).

The 2010 US Census reports the population of Coos County as 63,043. The median age was 47.3 years; 18.9 percent of the population was under the age of 18, and 21.4 percent of the population was over 65. Race and ethnic groups are reported as shown in Table 7.

Table 7. Coos County Race/Ethnic Groups, 2010

Race/Ethnic Group	Population	Percent of Population
Non-Hispanic		
White	54,820	87.0 %
Black	234	0.4%
American Indian	1,467	2.3%
Asian	644	1.0%
Pacific Islander	104	0.2%
Some Other Race	75	0.1%

Race/Ethnic Group	Population	Percent of Population
Two or More Races	2,308	3.7%
Hispanic	3,391	5.4%

Source: Census 2010, as cited in Oregon Demographics 2012

Public services, infrastructure, and utilities

Coos Bay is accessible via air, sea, and road. The North Bend Airport, Newport Municipal Airport, and Portland International Airport are used for air transportation. The major road connecting Coos Bay to nearby communities is US Highway 101. Two bus companies operate in Coos Bay: Greyhound and Porter Stage. While there is commercial freight rail service to Coos Bay, the closest passenger service is provided by Amtrak located in Eugene, Oregon (Norman et al. 2006).

The Oregon International Port of Coos Bay manages the Charleston Marina Complex, which is in the port district of Coos Bay Harbor. The marina supports most recreational and commercial fishing. The majority of the commercial fishing vessels, approximately 95 to 99 percent, moor in Charleston, which provides approximately 550 moorages (Norman et al. 2006).

Coos Bay School District #9 supports 7 public schools (CBD9 2013). Southwestern Oregon Community College is in Coos Bay. University of Oregon is the nearest university and is in Eugene, Oregon.

Water is supplied to local residents by the Coos Bay-North Bend Water Board. Verizon Communications provides telephone communications, and electric power is administered by Pacific Power.

Public safety is provided by the Coos Bay Police Department. The Coos Bay Fire Department responds to fire and safety calls from three distinct fire stations. Local hospitals include the Bay Area Hospital in Coos Bay and the Coquille Valley Hospital in Coquille, Oregon (Norman et al. 2006).

Offshore utility infrastructure includes a natural gas well approximately 9 nm (17 km) southwest of Cape Arago, operated by Shell Oil Company, and four east-west submarine cables approximately 3 nm (6 km) south of Cape Arago (BOEM 2013).

Natural hazards, hazardous materials, offshore dump sites, unexploded ordinance and artificial reefs

The primary natural hazards that could affect Coos County include coastal erosion, drought, earthquake, flood, landslide, tsunami, wildfire, and wind storms. Coastal erosion occurs throughout the year, but is accelerated during the winter months when storms increase the rate of erosion. Winter wind storms can also cause heavy damage on shore to buildings, utilities, and transportation systems. Riverine flooding occurs frequently in Coos County. Coos County has not experienced any major earthquake events in recent human history. Tsunamis can result from either local earthquake events or distant earthquake events. There have been three tsunamis in recorded history in Coos Bay, in 1946, 1964 (OPDR 2010), and 2011 (Vattiat 2011).

Potential geologic hazards to offshore development include groups of short north- to northwest-trending faults between Cape Arago and Heceta Bank. Seismic activity appears to be low within the offshore basin area; however, a significant possibility exists of damage from tsunamis, sea-floor mass movement, and liquefaction resulting from earthquakes in adjacent regions, notably the northern California continental margin. Unstable sea-floor conditions resulting from recent subaqueous slides and flows appear to be uncommon, although the presence of locally steep slopes and thick accumulations of unconsolidated sediment with unknown engineering characteristics make site-specific studies of sea-floor stability advisable. Buried zones as large as 73 square miles (190 square kilometers [km2]) in area and 6 to 8 feet (2.0 to 2.5 m) thick of disrupted and rotated acoustic reflectors appear to record episodes of seafloor failure during Pleistocene low stands of sea level. Several folds showing sea-floor relief reflect tectonic instability of the modern upper continental slope along the west margin of the basin. Acoustic anomalies suggestive of shallow gas accumulations cover areas of as much as 5 square miles (12 km^2), and combined geophysical and geochemical evidence indicate that gas is being vented at the sea floor in two localities. At one locality, 1.5 miles (2.5 km) west of Cape Arago, samples contained high methane concentrations and equivocal indications of thermogenic hydrocarbon gas. Reduction of the bearing strength of the enclosing sediment by such gas accumulations enhances the possibility of failure; if these accumulations are of thermogenic origin, they may reflect an overpressured zone at depth (Clarke et al. 1985).

Potential manmade hazards include dredge material disposal sites, unexploded ordnance, artificial reefs, and shipwrecks. There is a dredge material disposal site north of the entrance to Coos Bay harbor. It is adjacent to shore and extends out to approximately 3.5 miles (5.5 km) offshore (OCMP 2013). There is no known unexploded ordnance in the project vicinity. However the unexploded ordnance data is not complete. The presence and locations of the unexploded ordnance have been derived from graphical representations recorded on NOAA Raster Navigation Charts (BOEM 2013). There are no known artificial reefs in the project vicinity. Likewise, this is not a complete data set. The presence and location of the artificial reefs have been derived from multiple state websites (BOEM 2013). There are two shipwrecks near shore, one at Coos Head and one north of the entrance to Coos Harbor. Two other shipwrecks are located off the coast, as described above under Historic and cultural resources.

Onshore hazards include multiple hazardous material sites registered in and around Coos Bay under the US EPA reporting requirements. The identified sites include multiple toxic release sites, hazardous waste sites, water discharges, and brownfields around Coos Bay and Charleston (US EPA 2013).

e) Conformance with State and Local Energy Planning Initiatives

Oregon is a leader in advancing renewable energy development through policy mechanisms, incentives, and research and development support, particularly true for renewable ocean energy—wave power and offshore wind. The WindFloat Pacific demonstration project will qualify for the OR renewable portfolio standard (RPS) and is aligned with recent investments through the Oregon Innovation Council, Oregon State University, the Oregon Department of Energy, and the U.S. Department of Energy to develop a new industry around ocean renewables. The project will benefit from recent changes to the Oregon Territorial Sea Plan and ongoing collaboration between state and federal agencies to address planning, siting, and regulating offshore wind and wave power. Oregon State policy support for renewable ocean energy has been justified by its potential benefits, which include development of a new high technology industry and the addition of predictable renewable generation to help firm the western half of Oregon's power grid. Key coordination and standards include:

- **Oregon Renewable Portfolio Standard:** In 2007, Oregon enacted Senate Bill 838 requiring utilities to deliver a percentage of their electricity from qualifying renewable sources by 2025. Portfolio standards are 25% for large utilities, 10% for smaller utilities, and 5% for the smallest utilities. Wind power is eligible for RPS credit and offshore wind represents an area of future potential growth to meet RPS needs.

- **Oregon Territorial Sea Plan and State/Federal Coordination:** Oregon recently updated its Territorial Sea Plan to incorporate considerations for siting and regulating ocean renewable energy. While the TSP jurisdiction extends only to the extent of OR state waters (three nautical miles from shore), the plan provides a strong mechanism for coordination between OR and the Bureau of Ocean Energy Management (BOEM), which regulates offshore renewable energy development in federal waters beyond the three-mile limit. Oregon/BOEM coordination is also ongoing through the BOEM/OR Renewable Energy Task Force, which will play a role in evaluating ocean renewable energy projects.

- **Investing in Renewable Ocean Energy:** Since 2007, the Oregon Innovation Council has invested $4.2 million in the Oregon Wave Energy Trust, a collaborative non-profit tasked with the sustainable development of wave energy off Oregon's coast. This initial investment has attracted an additional $10 million in federal and industry funds. Oregon State University leads the Northwest National Marine Renewable Energy Center and is in the process of permitting and developing the Pacific Marine Energy Center test facility for renewable ocean energy devices. While much of this investment has focused on wave energy, the emerging offshore wind industry will benefit greatly from crosscutting research, improved industrial capacity, regulatory coordination, and ongoing relationships with coastal stakeholders and communities.

f) <u>Documentation of Lessee Qualifications</u>

Legal Qualifications

With headquarters in Seattle, Washington Principle Power is a Nevada corporation and is authorized under the operating rules of its business to hold and operate leases, right-of-way grants, or right-of-use and easement grants for activities that produce, or support production, transportation or transmission of, energy from sources other than oil and gas, on the Outer Continental Shelf (OCS), and right-of-use and easement grants for the alternate use of OCS facilities for energy or marine related activities.

Appendix A includes copies of Principle Power's secretary's certification of the above, and exhibits reflecting the company's Amended and Restated Bylaws and a complete copy of resolutions adopted at the March 11, 2011 meeting of the Board of Directors which confers signing authority to the General Counsel of the company. In addition, the officers of the company are identified.

Technical Capability

Principle Power is the winner of a $4M financial assistance award from the US Department of Energy. Because of cost share requirements, the budget for the first year's activities is $5.7 M, and includes milestones related to engineering, permitting and development. The development of the proposal required significant contributions from Principle Power and the other members of the project team. The qualifications and roles of the team are described below. Principle Power's full proposal is included as Appendix H of this document.

The project team's experience spans industries from high-tech manufacturing to offshore construction and oil and gas. The proposed project will leverage the collective know-how of these industry professionals and pair them with lessons learned from Principle Power's full-scale prototype project, which was installed off the coast of Portugal in 2011. Please see Appendix I for an overview of this installation.

Principle Power and partners are committed to the success of the project. Individual organizational staffing levels and resources will be allocated to meet project needs and will not be split across multiple projects. This is further validated through a basic budget analysis (per budget period/ per organization), which yields a maximum resource loading of 14 full-time staff for any one organization.

***Principle Power* –** Owner of the WindFloat technology and only one of two companies worldwide with a successful track record for deployment and operation of a multi-megawatt floating wind turbine. A comprehensive description of Principle Power's experience deploying its prototype off of Portugal is included in Appendix I. This description addresses the engineering, permitting and financing aspects of that project.

Principle Power will lead the proposed WindFloat Pacific project and will provide project management, engineering, operational and health and safety services to the project. Principle Power is a project management, design and engineering firm, whose business model entails the sale of WindFloats in offshore wind markets around the world.

***Houston Offshore Engineering* –** Houston Offshore Engineering is a provider of engineering services to support offshore oil and gas and renewables developments with specialty in deep-water projects. Houston Offshore Engineering was founded in 2004, and staff members have played key roles for the engineering and/or delivery of a variety of offshore facilities worldwide for nearly 20 years. This highly experienced team is uniquely qualified to perform conceptual studies through detailed design, produce fabrication drawings, and provide construction support. Houston Offshore Engineering will assist the Principle Power engineering team and supplement the already considerable knowledge base available to the project. Houston Offshore Engineering participated in a similar collaborative capacity with Principle Power engineering in the full-scale WindFloat prototype project.

***International Port of Coos Bay* –** Deep-water port in southern Oregon that is currently developing critical infrastructure in support of the Jordan Cove Energy Project. Further development funds have been allocated to the creation of a multi-purpose berth that will serve as an ideal load-out and shore-based service facility for WindFloat units.

***Pacific Northwest National Laboratory* –** Pacific Northwest National Laboratory is one of ten DOE national laboratories managed by DOE's Office of Science. Pacific Northwest National Laboratory leads the identification and risk-based assessment of environmental effects of ocean energy development and offers significant resources in the study of atmospheric sciences. Pacific Northwest National Laboratory will take on a lead role in permitting activities and metocean resource assessment and definition.

***National Renewable Energy Lab (NREL)* –** NREL is the only national laboratory solely dedicated to advancing renewable energy and energy efficiency technologies from concept to commercial application. NREL has over 20 years of experience in the wind industry relative to wind turbine design, power prediction, and wind resource assessment. NREL’s participation in Principle Power’s prototype project offers keen third-party knowledge of the offshore system proposed. NREL will support the project on wind resource characterization, wake/performance modeling, and techno economic analysis.

***Siemens Wind Power* –** Siemens Wind Power is a leading supplier of wind power solutions for onshore, offshore and coastal sites, with an innovative 6 MW direct drive machine currently undergoing prototyping and commercially available in 2014. In 2011, Siemens introduced the new its new wind turbine with a power rating of 6.0 MW available with rotor diameters of 120 and 154 meters. Based on Siemens Direct Drive technology, the 6.0 MW turbines have 50 percent fewer moving parts than comparable geared machines and a tower head mass of less than 350 tons. As of January 2012, Siemens Wind Power has installed more than 9,800 wind turbines with a cumulative installed capacity of 13,700 MW. Siemens will provide support services to the project engineering team relative to the turbine. A detailed turbine supply agreement and scope will be developed during budget period 2 in anticipation of a construction ready project outcome.

***MacArtney Underwater Technology Group (MAC)* –** MAC is a global supplier of underwater technology specializing in design, manufacture, sales, and service of a wide range of systems to offshore operators and the renewable energy sector. MAC will have primary responsibility for offshore grid and interconnection design. MAC also participated in the full-scale prototype project and has an intimate understanding of the needs of the WindFloat.

RPS Evans Hamilton **–** Established in 1971, RPS Evans Hamilton are survey and site characterization consultants with a wealth of experience to draw upon including specialized personnel with many years of knowledge in oceanography as well engineering, mechanical and marine disciplines. RPS Evans Hamilton will act as the primary initial site survey and offshore site characterization investigator. The company has locations in Houston, Texas; Seattle, Washington; and Charleston, South Carolina.

Herrera Environmental Consultants (Herrera) **–** Established in 1980, Herrera's interdisciplinary teams of scientists, engineers, planners, and regulatory specialists provide scientifically defensible and realistic solutions to complex resource challenges facing businesses, municipalities, utilities, and government agencies. Herrera has the specific expertise necessary to address key challenges facing ocean energy development and is experienced with marine environmental compliance. Herrera offers complete permitting, planning, and environmental services to support energy developments.

Forristall Ocean Engineering **–** George Forristall, the principal of Forristall Ocean Engineering is well known amongst the oil and gas industry for over 30 years of work specific to the generation of project metocean design basis. Forristall Ocean Engineering will assist Principle Power and Pacific Northwest National Laboratory with both the metocean and project design basis to be defined for the WindFloat Pacific project.

American Bureau of Shipping **–** American Bureau of Shipping is one of the foremost classification societies of offshore floating structures (semi-submersible and spar) and third-party overseer on the WindFloat Prototype design, construction, and installation. American Bureau of Shipping provided the first classification services to the offshore industry in 1958 and has remained at the forefront of setting industry standards and technical guidance ever since. Currently, American Bureau of Shipping is the world leader in classification of offshore structures including TLP's, SEMI's, Spars and FPSO's. American Bureau of Shipping has in recent years spent considerable effort on floating offshore wind turbine technologies, both in regard to research and project participation including certification of Principle Power's full-scale prototype WindFloat.

Det Norske Veritas **–** Det Norske Veritas is an independent foundation charged with safeguarding life, property, and the environment, with specific expertise in offshore turbine certification and structures. Det Norske Veritas has committed to re-certification of the SWT 6.0 for use on the WindFloat foundation for the project. Det Norske Veritas has had a long-standing relationship as a key certification provider to Siemens Wind Power and is currently involved with the Siemens offshore wind turbines as well as their new "direct drive" development. Furthermore, Det Norske Veritas worked on previous Principle Power projects inclusive of the 2 MW prototype to develop a turbine load model in FAST. In 2009, Det Norske Veritas issued the industry's first Guideline for Offshore Floating Wind Turbine Structures.

Holland & Hart LLP **-** Holland & Hart is a leading national law firm, with particular experience in energy and natural resources on public lands. The firm has supported energy developers with renewable conventional energy leasing on federal, state and private lands, development of transmission, pipeline and other infrastructure, and all forms of permitting and NEPA reviews. Holland & Hart serves as US counsel to Principle Power.

Financial Capability

Principle Power is one of seven winners of a $4M financial assistance award from the US Department of Energy designed to deploy Advanced Offshore Wind Technology Demonstration Projects. These funds, in addition to approximately $1.7M in cost share contributions from Principle Power and project partners, account for and are sufficient for initial project activities. This is the first phase (Budget Period 1) of a potential $51 M in total project funding from the USDOE.

In the spring of 2014, DOE will make a 'down-select' decision, by which the agency will select three projects from the original seven for continued funding in Budget Period 2. DOE plans to support each of these projects with an additional $6M (in the form of an amended financial assistance award); there will be a 20% cost share requirement. Funding for Budget Period 1 and 2 are sufficient for Principle Power to move forward with the lease request.

Should Principle Power be successful in meeting project milestones in Budget Period 2, the project will then have access to an additional $40M of federal funding, with a 50% cost share requirement. Subject to Congressional appropriations, $13.3 M will be made available in Budget Periods 3, 4 and 5. In total, these federal contributions effectively reduce the capital requirements for the project by $51M. As Principle Power is not, and does not intend to be, a project owner, an outside developer/project owner will meet the balance of the project's budget.

Experience with Similar Project

In the period from 2009 to 2011, Principle Power was successful in raising over $25M for the engineering design, fabrication and installation of its prototype WindFloat off the coast of Portugal. Funding for the project came from the Portuguese government and from a joint venture, called WindPlus, that was established to sponsor the prototype deployment and engage in other development activities featuring the WindFloat in Portuguese waters. In addition to Principle Power, members of the joint venture include Energias du Portugal (EDP – one of the world's largest wind energy operators), Repsol (Spanish oil company), A. Silva Matos (Portuguese manufacturer/fabricator), Vestas (wind turbine OEM) and government innovation funds. A total of four contracts were awarded for project implementation:

- A turbine supply contract including engineering, procurement, installation was awarded to Vestas;
- A turbine operation and maintenance contract was awarded to Vestas;
- A Turnkey contract for the WindFloat system, including hull, mooring and electrical cable design, procurement, fabrication, installation was awarded to Principle Power;
- A WindFloat operation and maintenance contract was awarded to Principle Power.

Additional details about this project can be found in Appendix I.

There have been no bankruptcies or other adverse financial proceedings against Principle Power over the last five years.

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