

New Facility to Shed Light on Offshore Wind Resource

Highlights in
Research & Development

Chesapeake Light Tower facility will gather key data for unlocking the nation's vast offshore wind resource.

According to the National Offshore Wind Strategy published by the U.S. Department of Energy (DOE) in 2011, the nation's offshore wind resource could supply 54 gigawatts of generating capacity by 2030. However, to tap into that potential, more data on the nature of offshore wind resources and the ocean environment is needed.

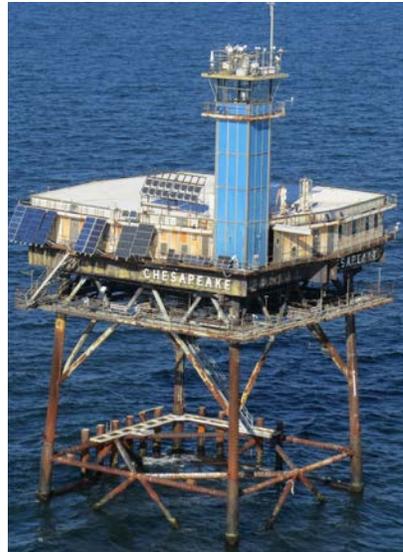
An opportunity to address this need was created recently when the DOE Wind and Water Power Technologies Office took custody of the Chesapeake Light Tower from the U.S. Coast Guard. The tower, which is located off the coast of Virginia near the mouth of the Chesapeake Bay, will be used as a Reference Facility for Offshore Renewable Energy (RFORE). The National Renewable Energy Laboratory (NREL) and Pacific Northwest National Laboratory (PNNL) will work together with DOE to establish the RFORE.

Initially, the RFORE will be upgraded with a tower equipped to conduct meteorological and oceanographic research for the development of offshore wind energy technologies. The tower will be used to collect wind speed and direction data at various heights above sea level, as well as measurements relevant for the research community such as temperature profiles for atmospheric stability, water vapor (moisture profiles), turbulence, 2D wave spectra, and ocean surface temperature.

NREL will be the lead laboratory for the repair, upgrade, and operation of the facility. Upgrades will include installation of a meteorological tower and a data acquisition system that will record and deliver datasets to shore. PNNL will support DOE in developing the RFORE research agenda, instrumentation specifications, and a data management system. Data collected from the RFORE will be made available to user groups such as developers, researchers, and the offshore wind and marine and hydrokinetic industries. DOE will also convene a science advisory board for independent expert advice on the research agenda and RFORE capabilities.

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Reference: "New Research Facility to Remove Hurdles to Offshore Wind and Water Power Development." (2012). *Wind Energy Program Newsletter*. Wind and Water Power Technologies Office, U.S. Department of Energy. Fourth Quarter 2012 Ed.



As a pre-existing structure in a location with excellent offshore wind resources, the Chesapeake Light Tower provides a cost-effective alternative to building a new platform large enough to support an 80- to 100-meter-tall meteorological tower. Photo by Rick Driscoll, NREL 25660

Key Research Results

Achievement

In partnership with PNNL, NREL will establish a Reference Facility for Offshore Renewable Energy (RFORE) at the Chesapeake Light Tower off the coast of Virginia. The RFORE will acquire data to increase understanding of the nature of offshore wind and water resources.

Key Result

Data collected from the RFORE will be made available to developers, researchers, and the offshore wind and marine and hydrokinetic industries for the development of offshore wind energy technologies.

Potential Impact

Data provided by the RFORE will increase the understanding of offshore wind resources and the ocean environment, which will help enhance the opportunity for offshore wind power development by providing industry with a better estimate of the power-generating potential. This will ultimately contribute to increased deployment and reduced costs of offshore wind technologies.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

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NREL/FS-5000-58250 | May 2013

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