

Environmental Studies Program: Ongoing Study

Study Area(s): Southern California

Administered By: Pacific OCS Region

Title: Scenarios for Offshore Renewable Energy along the Central California Coast (NSL #PC-16-01)

BOEM Information Need(s) to be Addressed: Understanding potential renewable energy development scenarios off California will aid BOEM in planning for leasing decisions, site and impact characterization, identification of cooperating agencies, and stakeholder outreach. This study will provide a foundation for the analysis required to prepare for future marine renewable energy development along the central coast of California through: 1) an understanding of the regional need for power generation; 2) delineation of feasible scenarios of offshore wind and wave energy projects for a specific planning area; 3) consideration of compatible activities that may be proposed with an offshore renewable energy project, such as desalination; and 4) the ability to understand, evaluate, predict, and monitor potential adverse impacts from offshore energy.

Total BOEM Cost: \$399,999

Period of Performance: FY 2016–2019

Conducting Organization(s): California Polytechnic State University, San Luis Obispo

Principal Investigator(s): [Dr. Benjamin Ruttenberg](#)

BOEM Contact(s): [Susan Zaleski](#)

Description:

Background: California formally legislated through SB 350 (the Clean Energy and Pollution Reduction Act of 2015) the requirement that 50% of all electricity generated and sold come from renewable energy sources by December 31, 2030. California's ambitious plans for renewable energy and the untapped wind and wave resources off the coast of central California make this an ideal study area. The need for renewable energy sources in California will continue to grow as traditional sources of energy phase out of the power supply equation.

Researchers will determine information needs and evaluate scenarios, tradeoffs, and generating capacity of various facilities as well as information needed to conduct environmental reviews. The central coast of California (Morro Bay area to Point Conception, a span of ~120 km) is an ideal, real-world location for the aforementioned analysis for a number of reasons: (1) low-cost grid interconnection options, (2) strong commercial interest in developing offshore renewable energy facilities, (3) significant wave and wind resources in the region, and (4) offshore bathymetry is well suited for facility deployment.

Objectives: The study objectives are:

1. To delineate and communicate feasible scenarios of offshore renewable energy facilities with the capacity to hook into existing coastal grid connections. Scenarios should primarily focus on wind energy, but may also include the potential for wave energy, or other offshore hybrid facilities.
2. To identify information and resources needed to evaluate and predict the impacts of potential proposals for offshore energy and/or other hybrid projects (e.g., desalinization). Potentially collect new data as needed to meet information needs for evaluating and predicting impacts.
3. The study may also assess the capacity of using hybrid facilities in the offshore environment [e.g., those facilities able to switch strategically between power generation (during high power demand periods – daytime) and desalination (during low-demand – night) for meeting regional power and freshwater demands].
4. Identify, analyze, and potentially collect information at locations outside the study area to compare with potential projects within the study area. They may include, but are not limited to, site facilities, surrogates (similar impact to a renewable project), and resource-specific (e.g., birds) information.

Methods: An interdisciplinary team will be formed to execute this study. Engineers will evaluate the potential offshore renewable energy technologies, economists will quantify financial costs and benefits of these technologies, and marine ecologists, social scientists, and ecological modelers will determine what information is needed to evaluate the environmental and social suitability and tradeoffs of specific proposals.

To achieve Objectives 1 and 2, engineers, physical oceanographers, and economists will work collaboratively to provide quantitative estimates of the generating capacity of various facilities, the percent capacity under which they may operate given the developable wind and wave fields in federal waters along the central coast, and the costs of implementation and value of the resulting electricity and water.

For Objective 3, marine scientists will collaborate with engineers, oceanographers, and economists to identify information needed to evaluate the ecological and social suitability of specific offshore energy proposals. Key information will include spatial data on the distribution of habitat, biological resources associated with those habitats, spatial information on existing ocean uses, and identification of potential stakeholders and their attitudes and opinions. The work will focus on identifying information needed rather than generating new information, but it will gather relevant existing datasets.

Current Status: The BOEM-California Polytechnic State University cooperative agreement was awarded September 13, 2016. Wind data analysis and planning are ongoing. Environmental data is under review. PIs are analyzing the potential offshore power out.

Final Report Due: August 30, 2019

Publications Completed: None

Affiliated WWW Sites: <https://marinecadastre.gov/epis/#/search/study/100172>

Revised Date: July 13, 2018