

## Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Feasibility Study for Renewable Energy Technologies in Alaska Offshore Waters (AK-21-x07)
Administered by	Alaska Regional Office
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Procurement Type(s)	Interagency Agreement
Conducting Organization(s)	National Renewable Energy Laboratory (NREL)
Total BOEM Cost	\$425,000
Performance Period	FY 2022–2024
Final Report Due	September 2024
Date Revised	February 23, 2023
Problem	The Energy Policy Act of 2005, Section 388, delegated regulatory authority to BOEM over renewable energy resources on the U.S. OCS, but the current BOEM program does not cover renewable energy in Alaska. Information about renewable energy resources on the OCS is needed to inform decisions and understand potential environmental impacts.
Intervention	This study will conduct a literature synthesis and focus group discussions to compile descriptive and spatial information about renewable energy potential on the Alaska OCS and recommend environmental research needed to support development. The study would also address economic feasibility.
Comparison	The study will assess potential for wind, ocean thermal, ocean wave, tidal, and ocean current energy for Alaska.
Outcome	This study will enable more informed decisions about the characteristics of a renewables program on the Alaska OCS. Future renewable energy projects have the potential to make substantial contributions to the state’s and nation’s energy portfolios.
Context	All renewable energy potential for the Alaska OCS would be considered.

**BOEM Information Need(s):** The development of a renewable energy program in Alaska would support current priorities identified in Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, by advancing innovation, exploration, and development of renewable energy resources. There are likely many areas in the Alaska OCS appropriate for potential renewable energy development. The need to compile and document information to guide and support renewable energy development is a high priority for BOEM. This study will provide information for development of a program and recommendations for research to support future regulatory decisions and the National Environmental Policy Act (NEPA) analyses required to develop renewable energy, including effects from habitat and landscape alteration; social, cultural, and economic impacts; and cumulative effects.

**Background:** A recent report recognized that the coastline and extensive EEZ of the United States contain vast untapped renewable energy sources in the forms of wave, tidal, wind, and thermal energy to help power the Nation (NSTC 2018). Aligning energy innovation with emerging developments in ocean science, security, and maritime technology could provide dynamic opportunities to further drive coastal economic development. Exploring potential renewable energy sources is a research priority identified in the report for the next decade. The proposed study would move BOEM toward achieving this goal in the Alaska OCS.

To better prioritize where studies of key resources should be conducted, geospatial analyses are needed to identify the most likely areas of OCS renewable energy development in the near term and where more detailed environmental studies are needed for the longer term (Michel et al. 2007). The U.S. Department of Energy recently assessed offshore wind energy potential for Alaska; however, the study did not address economic feasibility or environmental impacts (Doubrawa et al. 2017). A number of management strategies are being used or developed to address siting, permitting, monitoring, and mitigating the effects of renewables development to help facilitate permitting while protecting marine resources (Copping et al. 2020).

**Objectives:**

- Understand the potential for offshore renewable energy in the Alaska OCS.
- Identify areas and sources of high potential for developing renewable energy.
- Assess the economic feasibility of renewable energy development.
- Identify management strategies needed to expand BOEM’s Renewable Energy Program to the Alaska OCS.
- Identify preliminary research priorities and environmental data needs for NEPA analyses.

**Methods:** Researchers will conduct a literature review and synthesis, compiling all available information about offshore renewable energy potential on the Alaska OCS. Work will focus on identifying areas most attractive for leasing and developing a georeferenced database and maps to depict spatial information, including suitable areas for renewables development and environmental characteristics that make these areas suitable. Energy potential will be defined to include what is producible with current technologies or those that may be realistically developed within fifteen years. Focus group discussions with industry experts, utilities, and state and local governments to assess economic feasibility will consider feasibility under different scenarios, including annual changes in high potential sources; changing climatic conditions; varying levels of infrastructure and port capacity; transport of materials and equipment to remote sites; and reasonably foreseeable technological advancements in energy capture, storage, and transport.

**Specific Research Question(s):**

1. What is the offshore, renewable energy potential on the Alaska OCS, and which types of technology are most feasible and practicable?
2. What are the primary environmental considerations related to renewable energy?
3. Where are the areas most attractive for leasing and what makes these areas suitable?
4. Is it economically feasible to recover this energy with current or anticipated future technologies?

5. If a renewable energy program is technically and economically feasible, what strategies should BOEM take to effectively design environmental studies to provide baseline data needed for a ocean energy renewable program?
6. If a renewable energy program is not practical at this time, under what conditions could it be more viable, and what indicators may demonstrate a need to consider a renewables program in the future?

**Current Status:** Ongoing, analysis underway.

**Publications Completed:** N/A

**Affiliated WWW Sites:** <http://www.boem.gov/akstudies/>

**References:**

- Copping, A.E., Hemery, L.G., Overhus, D.M., Garavelli, L., Freeman, M.C., Whiting, J.M., Gorton, A.M., Farr, H.K., Rose, D.J., and Tugade, L.G. 2020. Potential Environmental Effects of Marine Renewable Energy Development—The State of the Science. *Journal of Marine Science and Engineering*, 8(11): 879. <https://doi.org/10.3390/jmse8110879>.
- Doubrawa, P., Scott, G., Musial, W., Kilcher, L., Draxl, C., and Lantz, E. 2017. Offshore Wind Energy Resource Assessment for Alaska. NREL/TP-5000-70553. Golden, CO: U.S. Department of Energy, National Renewable Energy Laboratory, 29 pp. <https://www.nrel.gov/docs/fy18osti/70553.pdf>.
- Michel, J., Dunagan, H., Boring, C., Healy, E., Evans, W., Dean, J.M., McGillis, A. and Hain, J. 2007. Worldwide Synthesis and Analysis of Existing Information Regarding Environmental Effects of Alternative Energy Uses on the Outer Continental Shelf. MMS OCS Report 2007-038. Herndon, VA: U.S. Department of the Interior, Minerals Management Service, 254 pp.
- NSTC (National Science and Technology Council). 2018. Science and Technology for America’s Oceans; A Decadal Vision. Executive Office of the President of the United States, 55 pp.