PMC-ND
(1.08.09.13)

U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION

RECIPIENT: University of Maine **STATE:** ME

PROJECT TITLE: Research and Development of Additive Materials for Marine Energy Systems

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002234	DE-EE0009448	GFO-0009448-001	

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
B3.6 Small-scale research and development, laboratory operations, and pilot projects	Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to the University of Maine (UMaine) to develop rapid design/build/test protocols of wave energy conversion (WEC) systems for use in specific wave environments and to develop additive manufacturing techniques (specifically 3D printing) to produce model scale to full-size components for wave energy conversion (WEC) systems.

Project activities would include data collection and analysis, computer modeling and simulations, rebuilding or refurbishing existing pilot scale WECs, design and fabrication of pilot scale and full scale WEC components using additive manufacturing, and lab-based performance testing.

Data would be gathered from buoys currently permitted and deployed at the Castine Scaled Ocean Test Site (CSOTS) and used to characterize the specific wave environment at that location. This data would then be used to modify designs of three previously developed WECs (Oscilla Power suspended ring mass or float, Resolute Marine wave paddle, and the CalWave point absorber float) for the specific wave environment. The three companies, with design help from UMaine, would refurbish or rebuild existing small scale model WECs and ship them to UMaine for basin testing. These devices would be approximately 2 meters x 1 meter x 2 meters and weigh less than 100 kg each.

CSOTS conditions would be then replicated in the W2 (Wind/Wave) Basin at the UMaine Advanced Structures and Composites Center (ASCC) where the three different WEC prototypes would be tested. Results would be analyzed to further improve the design of these WECs, to identify which components within each WEC are suitable for manufacture with additive materials, and to identify which additive materials would be appropriate for each WEC and for use in the marine environment.

These components would be designed and fabricated by UMaine. The scale model WECs would then be rebuilt utilizing the new components and then tested in the W2 Basin. Performance changes of the original and redesigned WEC systems would be compared to understand how fabrication changes alter performance.

Finally, after analyzing results of which components were determined to optimize performance at small scale testing, structural components for an ocean scale size WEC based on the Oscilla Power design would be constructed. These components would be approximately 5 meters x 3 meters x 1 meter and weigh less than 3 metric tons. These components would then undergo structural tests only, not tests in the wave basin.

The National Renewable Energy Laboratory in Golden, CO would develop cost and performance metrics for wave energy converters evaluated in the scale model test campaign and evaluate the novel large scale additive materials components for ocean scale WECs.

Project work would be performed at existing, purpose-built laboratory facilities. No ocean testing of WECS or components would be part of this project. UMaine would coordinate all project activities. No changes in the use, mission, or operation of existing facilities would be required as part of this project and no additional permits would be required in order to conduct any of the work activities.

Project activities include fabrication and building of WECs and would involve the use and handling of various hazardous materials, including metals, wet concrete, bio-cellulose reinforced materials, and industrial solvents and the use of laboratory scale equipment. UMaine and project partners Oscilla Power, Resolute Marine, and Calwave Power Technologies would adhere to existing university and corporate health and safety standards. Risks associated with the handling of hazardous materials would be mitigated through adherence to established hazardous material handling and disposal practices.

Additional hazards would involve moving heavy loads, working over a pool of water, and potentially working underwater. These hazard would be mitigated through training, extensive safety measures, and standard operating procedures in accordance with local, state, and federal environmental regulations. All lab personnel working in the wave basin would be trained to safely work around the pool and only trained divers would enter the pool water. All waste products would be disposed of by licensed waste management service providers. University of Maine and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Water Power Technologies Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Shaina Aguilar on 6/4/21.

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Roak Parker Date: 6/9/2021

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] Field Office Manager review not required
- [ ] Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager