

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: MEGAPRINT: Using the World's Largest 3D Printer for Precision Manufacturing of Large Modular Wind Blade Tooling

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002252	DE-EE0009401	GFO-0009401-001	

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.)

B5.15 Small-scale renewable energy research and development and pilot projects

Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to the University of Maine (UMaine) to develop an innovative Additive Manufacturing (AM) solution for fabrication of large segmented wind blade tooling in order to move away from monolithic tooling structures. The developed technology would be expected to offer faster, lower-cost, more flexible and less space-intensive blade production process configurations and reduce transportation requirements and costs. The proposed project would utilize state-of-the-art technologies developed by the project team to overcome the challenges of the scalability of the current AM process used in tool manufacturing. The project would be completed in 8 tasks, spanning two Budget Periods (BPs) with a go/no-go decision point at the end of the first BP.

The objectives of the proposed project are to: 1. Develop specifications for segmented additive-manufactured wind blade tooling 2. Develop recyclable cellulose-filled thermoplastics for tooling segments 3. Scale up technology for additive manufacturing of heating elements 4. Perform structural design and toolpath optimization for modular tooling 5. Develop and validate mold segment joining methods 6. Demonstrate fabrication of two full scale mold segments 7. Demonstrate fabrication of 34.4m mid-span portion of an SGRE blade 8. Provide techno-economic analysis of blade manufacturing time and cost savings. The project would not include field testing or other field work. All work would be completed in existing facilities where no modifications are required to support the proposed work.

At the Advanced Structures and Composites Center, UMaine would complete extrusion compounding of engineered materials, 3D printing of cellulose-filled thermoplastic tooling pieces, assembly of segmented tool in steel frame, fabrication (by TPI technicians) of wind blade demonstration part and the associated engineering. Oak Ridge National Lab would develop, fabricate and test a bench scale wire coextrusion system for automated manufacture of mold heating elements. Siemens Gamesa Renewable Energy and TPI Composites would complete engineering and design. Ingersoll Machine Tools, Inc. would develop, fabricate and test a system for automated manufacture of mold heating elements. And, Techmer PM would complete the extrusion compounding of engineered materials.

The project would entail the development of a new custom machinery module for heating wire coextrusion, to be integrated into an Ingersoll MasterPrint machine. Machine building and operation involves common industrial safety hazards. The work would be performed by qualified staff at Ingersoll, ORNL and UMaine, each of which has robust safety programs meeting all applicable workplace safety regulations. The compounding of thermoplastic materials filled with cellulose will be performed at UMaine in labs which are well ventilated to ensure employee health and safety. Material compounding will be performed in production quantities at Techmer PM's existing compounding facility in Clinton, TN. This production facility has engineered environmental and safety controls which ensure that all processes are conducted in compliance with all applicable environmental, emissions, and worker safety regulations.

DOE does not anticipate that this project would result in adverse impacts to any resources of concern. 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:

[Advanced Manufacturing Office](#)

This NEPA Determination does not require a tailored NEPA provision.

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: Kristin Kerwin

NEPA Compliance Officer

Date: 7/19/2021

FIELD OFFICE MANAGER DETERMINATION

- 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: _____
Field Office Manager

Date: _____