

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



RECIPIENT: Binghamton University

STATE: NY

PROJECT TITLE : Machine Learning Accelerated Process Development for Scalable Manufacturing of Silica-based Glass Encapsulated Phase Change Materials Using Flow Mold Casting

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001980	DE-EE0009095	GFO-0009095-002	GO9095

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 Binghamton University for the research and development of the design, fabrication, and laboratory testing of silica-based glass encapsulated phase change materials for thermal energy storage. The three areas of focus for Budget Period 1 (BP1) would be the development of High Throughput Experimental Methods (HTEM) with data management solutions, Flow Mold Casting (FMC) of silica-based glass coated microwire feedstocks, and the development of a machine learning (ML) algorithm. Budget Period 2 (BP2) would focus on the implementation of the ML accelerated process development method for FMC of phase change materials. This NEPA determination applies to BP1 and BP2.

Proposed project activities by location are listed below:

Binghamton University, 4400 Vestal Parkway East, Binghamton, NY 13902-4400

- Design, fabrication, and laboratory testing of silica-based glass encapsulated phase change materials for thermal energy storage.

University of Wisconsin-Madison, 1415 Engineering Drive, Madison, WI 53706-1607

- Development of ML algorithms and processing of experimental data.

The project would involve the use and handling of Class 4 lasers and various hazardous materials, including salts, metals, and industrial solvents. All such use and handling would occur in controlled, purpose-built facilities, would be managed in accordance with existing safety policies, and follow federal, state, and local environmental regulations. No modifications, new permits, or change in the use, mission, or operation of any facility would be required.

Potential hazards would be mitigated through established health and safety policies and procedures of each university. Protocols would include personnel training, the use of personal protective equipment, monitoring, and engineering controls. All hazardous waste materials (including any nanoscale material produced) would be disposed of by a qualified, third-party hazardous waste disposal service provider.

DOE does not anticipate any impacts to resources of concern due to the proposed award activities.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Advanced Materials & Manufacturing Technologies Office (AMMTO)
NEPA review completed by Melissa Parker, 11/14/23

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: Casey Strickland
NEPA Compliance Officer

Date: 11/17/2023

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: _____