

PMC-ND

(1.08.09.13)

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



RECIPIENT: University of Michigan

STATE: MI

PROJECT TITLE: Robust and Spectrally-Selective Aerogels for Solar Receivers

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001840	DE-EE0008526	GFO-0008526-001	GO8526

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.

B3.15 Small-scale indoor research and development projects using nanoscale materials Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to University of Michigan (UM) to develop thermally-stable aerogels for integration into concentrated solar power (CSP) receivers. The aerogels would be developed to efficiently capture sunlight and convert it into high-grade heat, enabling receiver operation at elevated temperatures and under low solar concentration. The project would be completed over a single Budget Period.

Proposed project activities would include computer modeling, development of a lab-scale platform for measurement of heat losses from aerogels, aerogel development and synthesis, material characterization, performance testing, and cost modeling. All project activities would be completed at existing, purpose-built laboratory facilities at UM's campus in Ann Arbor, MI. Synthesis/characterization of aerogels and data analysis would be completed at the Lenert Laboratory in UM's North Campus Research Complex. Laboratory-scale characterization would be performed at the Lurie Nanofabrication Facility. Both facilities regularly conduct work similar in nature to that proposed as part of the project's scope of work. No change in the use, mission or operation of existing facilities would be required, nor would any additional permits or authorizations be needed.

The project would involve the use and handling of various hazardous materials, including solvents, acids, bases, precursors. All such handling would occur indoors, in supervised laboratory settings. Any risks associated with the completion of project activities or handling of project materials would be mitigated through adherence to established

health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. UM maintains a Resource Conservation and Recovery Act (RCRA) Large Quantity Generator Permit for the management and storage of chemicals and waste. UM would work with qualified hazardous waste transporters for the disposal of any hazardous waste produced as a result of this project. UM would observe all applicable Federal, State and local health, safety and environmental regulations.

The aerogels that would be fabricated as part of this project would include nanoporous silica, which can present an inhalation risk in powder form. Most nanomaterials handled throughout the project would be suspended in liquid solutions or in an aerogel monolith form, and would present a very low inhalation risk. Nonetheless, to mitigate against this potential hazard, all nanomaterial synthesis would be performed under fume hoods which are regularly tested for compliance. Upon completion of project activities, nanomaterials would be treated as hazardous materials and stored/labelled accordingly. They would be disposed of by a qualified Environmental, Health and Safety specialist, as a concentrated aqueous solution, thereby mitigating any inhalation risks at the time of disposal.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 01/29/2019

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: 1/30/2019

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: _____