PMC-ND
(1.08.09.13)

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

RECIPIENT: Purdue University **STATE:** IN

PROJECT TITLE: Robust High Temperature Heat Exchangers

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001697	DE-EE0008369	GFO-0008369-001	

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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 federal funding to Purdue University (PU) to design, fabricate, and test high-performance, compact, ceramic/metal ("cermet") based heat exchangers capable of reliable and effective heat transfer from molten chloride salt to a supercritical carbon dioxide (sCO2) based fluid, in support of a scalable liquid phase pathway for developing concentrated solar power (CSP).

The proposed project involves data analysis, computer modeling, and the preliminary design and engineering of optimized CSP system components that would be fabricated at small scale then tested for corrosion resistance/performance. Activities would be performed within purpose-built research laboratories at PU in addition to facilities at the Massachusetts Institute of Technology (MIT) and Vacuum Processing Engineering, Inc. (VPE). Design, development, fabrication, and testing of cermet heat exchangers would occur at PU in Lafayette, IN. Additional design, fabrication, and testing would occur at VPE in Sacramento, CA. Activities occurring at MIT in Cambridge, MA would be limited to desktop-based design and computer simulation.

Heat exchanger testing at Oak Ridge National Laboratory or the National Renewable Energy Laboratory may pursued at the end of the proposed project. Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements. Work funded under this award would include the development of protocols for future manufacturing and integration with outside facilities, but actual fabrication at this scale nor installation at other facilities beyond the aforementioned DOE laboratories are not within the currently defined scope of the proposed project as detailed in the Statement of Project Objectives. Further NEPA review will be required if the recipient proposes to ship, test and/or install the prototype equipment at any other location.

The project would involve the use and handling of various hazardous materials, including metals and industrial solvents. All such handling would occur in-lab following existing university and corporate health and safety policies

and procedures, such as employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Hazardous materials would be managed in accordance with all applicable Federal, state, and local environmental regulations. Laboratory activities would not exceed the scope of standard, established operations at the proposed project locations in terms of the types and quantities of materials/chemicals used and disposed of; no siting or expansion of waste storage, disposal, recovery, or treatment actions/facilities would be required. No change in the use, mission, or operation of existing facilities would arise out of this effort. The facilities in which project work would occur have all applicable permits in place, and would not need additional permits for the proposed activities.

Based on the review of the proposal, DOE has determined that the proposal fits within the class of action(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Further NEPA review will be required if the recipient proposes to ship, test and/or install the prototype equipment at any other location. If the recipient proposes to ship, test and/or install any equipment at a location not covered by this NEPA Determination (GFO-0008369-001), then information must be submitted to the DOE Project Officer for appropriate review under NEPA before commencing such activities.

Note to Specialist :

Solar Energy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 8/17/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 8/20/2018

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

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

Field Office Manager's Signature: _____ Date: _____

Field Office Manager