

PMC-ND

(1.08.09.13)

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

**RECIPIENT:**Portland State University**STATE:** OR

PROJECT TITLE
 : Enhanced convection for higher module and system efficiency

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA- 0001654	DE-EE0008168	GFO-0008168-001	

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 Portland State University to develop new solar photovoltaic (PV) modules and solar system-scale designs that promote a reduction in the operating temperature of the solar PV panels, leading to a boost in the annual energy yield by at least 5%.

Proposed project activities would include computer modeling, lab testing, techno-economic assessments and field testing of new modules and design parameters.

Research and wind tunnel testing would take place in dedicated labs on campus at Portland State University in Portland, OR. Research and computer modeling would be completed at the University of Utah in Salt Lake City, UT. The National Renewable Energy Laboratory in Golden, CO would support further research, lab testing and techno-economic assessments. The facilities in which this work would occur are purpose-built for the type of activities being proposed; therefore, no adverse impacts to sensitive resources are expected as a result of the proposed project. No change in the use, mission or operation of existing facilities would arise out of this effort.

Field testing of modules would be performed at two third-party sites at the end of Budget Period 2. These sites have yet to be selected; therefore, meaningful review of field testing activities cannot be completed at this time. This NEPA determination applies only to Tasks 1-4.1 as described in the Statement of Project Objectives and further NEPA review is required before the recipient may begin work on Task 4.2.

The proposed project would involve the use of lasers. All users would be trained by other lab members, would be required to complete a laser safety course, and would be required to use safety glasses at all times when operating the laser. Such handling and use would occur in dedicated laboratory facilities equipped with industry standard safety equipment. There is no expectation of waste generation associated with this 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.

Based on the review of the proposal, DOE has determined that Tasks 1-4.1 fit within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR

1021.410(2)) related to these tasks 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. Tasks 1-4.1 of this proposal are categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a conditional NEPA determination for this award, and funding for certain tasks under this award is contingent upon the final NEPA determination.

Insert the following language in the award:

You are restricted from taking any action using federal funds, which would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE/NSA providing either a NEPA clearance or a final NEPA decision regarding the project.

Prohibited actions include:

Task 4.2 Full scale validation of numerics and model experiments outcomes

This restriction does not preclude you from:

Task 1.1 Convection heat transfer coefficient on a solar module

Task 1.2 Coupling of NREL's solar module thermal model with the UU atmospheric large-eddy simulation model

Task 2.0 Preparation for full-scale validation of numeric and model experiments outcomes

Task 2.1 Innovative solar-system configuration for enhanced heat dissipation

Task 2.2 Refinements of the new solar-system designs

Task 3.1 Design of solar module vortex generators

Task 3.2 Design of solar farm macro-scale flow deflectors

Task 4.1 Techno-economic analysis of the new solar module and system designs

If you move forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, you are 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:

Additional DOE NEPA review is required prior to initiating Task 4.2: Full scale validation of numerics and model experiments outcomes. The recipient is required to submit an Environmental Questionnaire (EQ-1) when sufficient detail is available about the proposed field test locations for DOE to conduct a meaningful NEPA review.

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.

Note to Specialist :

Solar Energy Technologies Office

This NEPA determination requires a tailored NEPA provision.

Review completed by Rebecca McCord 08/22/2017.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

Electronically
Signed By: Kristin Kerwin

NEPA Compliance Officer

Date: 8/22/2017

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: _____

Field Office Manager

Date: _____