

PMC-ND  
(1.08.09.13)

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



**RECIPIENT:** UNIVERSITY OF MARYLAND

**STATE:** MD

**PROJECT TITLE** Compact and Low-cost Microinverter for Residential Systems  
:

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0001740	DE-EE0008350	GFO-0008350-001	G08350

**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 funding to the University of Maryland (UMD) to design, develop and test novel residential photovoltaic (PV) microinverters that would incorporate gallium nitride (GaN) semiconductors into the system design, as well as an improved circuit topology. The microinverter would be rated at a higher output power to correspond with anticipated developments in PV module power ratings in the coming years.

The proposed project would encompass data analysis, computer modeling, preliminary engineering and design, and laboratory scale research and development. A microinverter prototype would also be fabricated and tested in controlled laboratory settings. Proposed project activities would include data collection and analysis (e.g. circuit analysis, reliability analysis), component modeling and simulation, system design and component selection, prototype assembly, component testing (e.g. electrical testing, thermal testing), and compliance testing. Task 8 in Budget Period 3 would include field testing to be conducted by a subrecipient which would be selected at a later date. This task is subject to further NEPA review by DOE once sufficient information is available to complete a meaningful review.

All activities would be performed in existing, purpose-built laboratory facilities that have previously conducted work similar in nature to that proposed as part of this award. UMD would carry out all its laboratory activities at campus facilities owned and operated by UMD at its primary campus in College Park, MD, including the Maryland Power Electronic Laboratory and the Center for Advanced Life Cycle Engineering. Additional analysis, design, fabrication and testing would be conducted by Washington State University at its Power Electronics and Energy Research Laboratory (Vancouver, WA). Additional analysis, design, fabrication and testing would also be performed by the as-yet selected subrecipient throughout Tasks 1-7. These work activities would be permissible provided that all work would be conducted at an existing, purpose built facility. No change in the use, mission, or operation of existing facilities would result from any of the proposed project activities. Neither UMD nor any of its project partners would need to obtain any additional permits in order to realize the work activities proposed as part of this award.

Potential health and safety hazards would primarily consist of risks associated with the handling of power electronic circuits (e.g. electrical shocks and burns). These dangers would be mitigated by the internal health and safety policies and procedures put in place by UMD and its project partners. These include health and safety training for all personnel, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. UMD and its project partners would also adhere to all local, State and Federal environmental and waste management policies.

Based on the review of the proposal, DOE has determined the following Tasks 1-7 in Budget Periods 1-3 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 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. Tasks 1-7 in Budget Periods 1-3 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/NNSA providing either a NEPA clearance or a final NEPA decision regarding the project.

Prohibited actions include:

**Task 8: Field Trials and Data Collection**

This restriction does not preclude you from:

**Task 1: Circuit Analyses, Loss Calculation, Modeling and Simulation, and Component Selection**

**Task 2: Auxiliary Power Supply Design and Generate NGM Schematic**

**Task 3: Component Placement, Thermal Simulation, Reliability Analysis, and Layout Design**

**Task 4: Building Prototype, Electrical Testing and Verification Plan, and Design Performance Analysis**

**Task 5: Thermal Interface and Potting Material Analysis, Enclosure Design and Prototyping**

**Task 6: Enclosure Thermal and Electrical Testing**

**Task 7: Project Metric Evaluation, Environmental Testing, Safety Regulation and EMI Demonstrations**

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.

Note to Specialist :

**Solar Energy Technologies Office**

**This NEPA determination requires a tailored NEPA Provision.**

**NEPA review completed by Jonathan Hartman, 07/02/2018**

#### SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: \_\_\_\_\_

  
NEPA Compliance Officer

Date: 7/3/2018

#### 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: \_\_\_\_\_