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



RECIPIENT: NSF FREEDM Systems Center at NC State University

STATE: NC

PROJECT TITLE : Development of an Innovative Plug and Play PV Electric System

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000653	DE-EE-0006036	GFO-0006036-001	

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 North Carolina State University (NCSU) to research, develop and design ways to reduce the installed cost of residential solar photovoltaic (PV) systems by developing "Plug and Play" solar PV systems. The proposed "Plug and Play" systems would set up quickly and connect to the power grid easily, while still meeting building and electrical codes, thus reducing installation time and costs. Funding would be used to develop a conceptual design, vetting and demonstration to ensure the system performs as designed and is simple and safe to install.

This award would transpire over five Budget Periods. DOE completed a previous NEPA review for Budget Period 1 (GFO-0006036-001 CX A9, B3.6 1/24/2013) which included activities such as information gathering, analysis, computer modeling, materials testing, preliminary prototype solar PV system design, and prototype solar PV system fabrication and testing. This NEPA determination applies to Budget Period 2 tasks to propose and develop a PnP PV electrical system that would require no inspection or permitting while cost effectively achieving high electric energy efficiency.

The proposed project would take place at a dedicated university laboratory facility and a dedicated university outreach and testing facility.

University Laboratory Facility:

- NCSU FREEDM Systems Center in the Keystone Science Center at 1791 Varsity Drive, Suite 100, Raleigh, North Carolina 27606

University Outreach and Testing Facility:

- North Carolina Solar Center at 1101 Gorman Street, Raleigh, North Carolina 27606

At the laboratory facility, activities would include the design and construction of power electronics, automation electronics, interconnection hardware and a 1 to 2 kilowatt "Plug and Play" PV Electric System Prototype. At the outreach and testing facility, activities would include outreach and meetings with the Authorities Having Jurisdiction (AHJ) and Utility Representatives, codes and standards analysis and a PV system installation demonstration on the site's existing two story test-roof. The roof installation would be conducted by qualified professionals using proper

safety equipment.

NCSU completed an R&D questionnaire addressing the protocols for laboratory, facility and site safety, risk management and waste disposal. The laboratory and facility comply with standard safety procedures and all processes and procedures are monitored by the Environmental Health and Safety staff. The laboratory and facility have all applicable permits in place and would not need additional permits for the proposed activities. All handling and disposal of gases, chemicals, wastes and liquid effluents comply with appropriate regulations. The laboratory and facility are research, testing and demonstration facilities focusing on renewable energy technologies and are currently used for activities similar to the proposed activities. All existing facilities used for this project would function as they were originally intended and would not be modified in any way.

Upon conclusion of project activities, all constructed prototypes, equipment, and unused materials will remain in NCSU facilities for demonstration, education and further development purposes. All project activities will be carried out in NCSU renewable energy and electrical system development facilities that will continue operation long after the conclusion of this project.

Based on review of the project information and the above analysis, DOE has determined the research, development and testing activities associated with development of a reduced installation cost "Plug and Play" solar PV system would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with actions contained in DOE categorical exclusion A9 "information gathering, analysis and dissemination" and B3.6 "small-scale research and development, laboratory operations and pilot projects" and is 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:
Budget Period 3-5 Activities.

This restriction does not preclude you from:
Budget Period 1 and 2 Activities.

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 :

May Mock 03/31/2014
This NEPA determination requires a tailored NEPA provision.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____  Signed By: Kristin Kerwin _____ Date: 4/1/2014
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.