

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of Arkansas**STATE:** AR

PROJECT TITLE: Multilevel Cybersecurity for Photovoltaic Systems

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002064	DE-EE0009026	GFO-0009026-001	

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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Arkansas (UA) to design, develop, and test cybersecurity software for the solar photovoltaic (PV) industry. A two-level defense would be formulated whereby inverter-level algorithms are developed to harden individual devices, then integrated with new system-level software to provide cross-layer security protection. Ultimately, a field test would be conducted based on installing a cyber-hardened prototype inverter alongside existing commercial PV inverters in order to assess the efficacy of this approach.

Activities associated with the proposed project would include data analysis, computer modeling, software development, small-scale engineering of inverter hardware, and short-term field testing. Design and assembly of prototype devices would be conducted in-lab at the UA Engineering Research Center (Fayetteville, AR). "Alpha" testing of prototypes would occur at the UA National Center for Reliable Electric Power Transmission. NCREPT was established for grid research and development (R&D) purposes and is fully equipped for the proposed activities. Additional alpha tests would be conducted at the National Renewable Energy Laboratory (NREL; Golden, CO). NREL would research and develop advanced inverter control technology, and validate results on an existing multiple-inverter testbed. GE Global Research (Niskayuna, NY) would evaluate project results, provide industry-related technical advice, and perform specialized in-lab testing to further assess the inverter software.

Field ("beta") testing would occur at an existing solar farm operated by Today's Power, Inc. (TPI; Little Rock, AR), a subsidiary of Ozarks Electric Cooperative. TPI would perform tests of the final prototype in an industry setting for the purposes of data collection. The project team would install a 125 kW PV cybersecure inverter (developed at UA) in parallel with a similarly-rated, commercially-available inverter for comparison. The prototype inverter would be custom-built, but only from a controller architecture perspective. Fabrication of power electronic hardware is beyond the scope of the proposed project, which would revise and upgrade an inverter that was previously obtained from a third-party manufacturer. The field test, once initiated, would require a few days to collect adequate performance data.

Various other academic, industry, and federal project partners would collaborate to carry out computer-based project tasks involving algorithm development and integration: The University of Georgia (Athens, GA); Texas A&M (Kingsville, TX); the University of Illinois (Chicago, IL), and; Argonne National Laboratory (Lemont, IL).

Activities at UA would involve the use and handling of electric power electronics. All such handling would occur in-lab following existing health and safety policies and procedures. All facilities in which project work would occur were designed for the respective types of research being proposed; therefore, no modifications, new equipment, or additional permits, licenses and/or authorizations would be necessary. No change in the use, mission or operation of existing facilities would arise out of this effort.

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.

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 Whitney Doss Donoghue, 2/5/2020

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: 2/6/2020

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: _____