PMC-ND
(1.08.09.13)

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

RECIPIENT: University of Washington **STATE:** WA

PROJECT TITLE: Scalable Control Architecture for 100% PV Penetration with Grid Forming Inverters

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002064	DE-EE0009025	GFO-0009025-001	GO9025

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 funding to University of Washington (UW) to design, develop, and test the integration of grid-forming (GFM) inverters into solar photovoltaic (PV) applications. Control software would be developed for the GFM inverters and associated system-level hardware. The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Proposed project activities would include computer modeling/simulations, software development, power electronics hardware assembly, controller/hardware integration, and validation testing (e.g. integration testing, performance testing). UW's goal throughout the project would be to research and simulate the large-scale integration of GFM inverters and controllers into utility-scale grid architecture. UW would research deployment scenarios via laboratory-scale research, as well as a small-scale rooftop demonstration, both of which will be discussed further ahead.

During BP1 and BP2 three-phase and single-phase inverters would be used for controller testing. The three-phase inverter boards would be developed based on existing design specifications and manufactured by a qualified printed circuit board fabrication facility. UW and its project partner University of Minnesota (UMN) would then complete additional assembly-work on the boards (e.g. adding connectors and soldering), prior to using these for controller testing. The single-phase inverters that would be used for testing would consist of existing commercial inverters manufactured by project partner, Enphase Energy.

During BP3, performance demonstrations would be performed on the rooftop of laboratory facilities operated by Enphase Energy. The performance demonstrations would utilize an existing, grid-connected solar PV system, with all of the requisite inverters and associated components already in place. Modifications for the testing would be limited to the control software used by the system. No hardware would be modified for the performance demonstration. The performance demonstrations would not require any modifications to the existing grid connection, as the inverters would be introducing approximately the same amount of power as would be introduced into the grid under normal operations.

All project activities would be coordinated by UW and performed at existing, purpose-built facilities operated by UW or its project partners. Design, computer modeling, and hardware/software development would be performed at the campuses of UW (Seattle, WA) and UMN (Minneapolis, MN). Computer modeling and software development would be performed at the campus of University of Illinois at Urbana-Champaign (UIUC). Software development, controller/hardware integration, and rooftop testing would be performed at the laboratory facilities of Enphase Energy (Austin, TX). Additional computer modeling would be performed by the Electric Power Research Institute ('EPRI' – Knoxville, TN). No construction of new facilities, ground disturbing activities, or any changes to the use, mission, or operation of existing facilities would be required. Likewise, no additional permits or authorizations would be required for the performance of project activities.

Project work would including the use and handling of high-powered electrical equipment and work on rooftops. Risks associated with the completion of these tasks would be mitigated through adherence to established health and safety policies and procedures. Protocols would include personnel training, observance of lockout/tagout procedures, the use of personal protective equipment, and project monitoring. UW and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

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 Jonathan Hartman, 01/15/2020

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 Date: 1/16/2020

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager