

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



**RECIPIENT:** University of Connecticut

**STATE:** CT

**PROJECT TITLE :** Proactive: Predictive Community Outage Preparedness and Active Last Mile Visibility Feedback Autonomous Restoration

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002597	DE-EE0010422	GFO-0010422-001	GO10422

**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 the University of Connecticut (UConn) to design and test an autonomous grid restoration solution on a Parkville neighborhood microgrid (Hartford, CT) for the purpose of reaching community energy resilience with solar photovoltaics (PVs) and other distributed energy resources (DERs). Award activities aim to decrease grid restoration occurrences and response times and improve grid visibility with the use of UConn's existing granular circuit level outage prediction system (OPM), a proposed game theoretical learning model, out-of-band sensors, and communication networks.

Award activities would focus primarily on the creation of a predictive community outage preparedness and active last mile visibility feedback (PROACTIVE) technology. The types of activities associated with the award would include data analysis, computer modeling, preliminary engineering/design, laboratory research (consisting of hardware-in-loop (HIL) performance simulations), and field testing of the proposed technology. The award would consist of three Budget Periods (BPs). BP1 and BP2 would focus on design and laboratory testing of the PROACTIVE technology. Field testing of the technology would be completed in BP3. This NEPA Determination reviews activities associated with BP1, BP2, and BP3 Task 7 only, herein referred to as proposed activities. Further NEPA review would be required for BP3 Task 8 once field demonstration activities are fully defined. More specifically, field demonstration site selections for the installation of 10 units of 330W solar PV panels and a 113kwh battery energy storage system (BESS) would be finalized during BP3 Task 7. Physical installations of equipment followed by field testing would occur during BP3 Task 8.

Computer simulations using the OPM tool, data analytics, and HIL simulations would occur on UConn's campus (Storrs, CT). UConn would utilize their existing simulation testbed to perform the HIL simulations. Award activities would result in minor modifications to the testbed in an indoor laboratory environment. The National Renewable Energy Laboratory (NREL; Golden, CO) would design and perform simulations on a game theoretical learning model to predict emergency resource distribution, in addition to, an autonomous restoration tool that would optimize DER usage following an outage event. An interface design that would integrate out-of-band sensors and communication network data for improved grid visibility would be undertaken by CableLabs (Louisville, CO). Data analytic activities would be completed by Utilidata, Inc. (Providence, RI) by incorporating their smart AI chip sensors into the autonomous restoration tool within a laboratory setting.

The proposed activities would not involve outdoor deployment of equipment, construction of new facilities, or the

modification of existing facilities. Additional permits, licenses, or authorizations are not required for work to be performed during the proposed activities. Project work would be performed at pre-existing facilities that are purpose-built to accommodate the type of laboratory research and testing to be conducted for BP1, BP2, and BP3 Task 7. No change in the use or mission of existing facilities would arise out of the proposed activities.

Proposed activities would involve typical hazards associated with working on electrical equipment. Existing health, safety, and environmental policies and procedures would be followed to mitigate hazards to acceptable levels. All activities would comply with existing federal, state, and local laws and regulations.

DOE has considered the scale, duration, and nature of the proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders. A diversity, equity, and inclusion (DEI) plan would be implemented to encourage the inclusion of individuals from underrepresented groups in fields of science, technology, engineering, and mathematics (STEM).

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

## NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

[Budget Period 1, Budget Period 2, and Budget Period 3 Task 7](#)

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

[Budget Period 3 Task 8](#)

Notes:

[Solar Energy Technologies Office \(SETO\)](#)  
[NEPA review completed by Corrin MacLuckie, 04/18/2023](#)

## 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.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

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

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

 Electronically  
Signed By: Andrew Montano

NEPA Compliance Officer

Date: 4/18/2023

**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: \_\_\_\_\_