

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



RECIPIENT: University of Vermont

STATE: VT

PROJECT TITLE : Hybrid Energy System Platform for Cold Weather Climates

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-EE0010147	GFO-0010147-001	

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.

B5.15 Small-scale renewable energy research and development and pilot projects

Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to administer Congressionally Directed Spending to The University of Vermont (UVM) to support the development and use of solar research facilities for UVM researchers. The proposed project has several objectives, or "thrusts." UVM would research and develop new computational tools and designs for optimal operations of hybrid energy systems, test the tools and designs in an Accelerated Testing Laboratory (ATL) on the UVM campus, demonstrate them in the field at a Hybrid Solar Test Center (HSTC) for hybrid renewable power generation in northern climates that is co-located with an existing MW-scale power plant in Burlington, VT, and utilize the facilities to outreach to external industry and stakeholder groups.

The types of activities associated with the proposed project include outreach, education, training, data analysis, computer modeling, laboratory research, modifications of existing facilities, and the deployment, demonstration, and field testing of new tools and designs. All project activities would occur in Burlington, VT. Project locations and the activities to be performed at each are described below.

Various office and meeting spaces on UVM's main campus would be utilized for students and faculty involved in the proposed project. UVM would host computers and real-time simulators along with digital twins. The ATL is a newly built university research laboratory and would host project activities that revolve around hardware-based laboratory testing and analysis of solar panels, automated particulate and snow mitigation, batteries and inverters, and fuel cells and electrolyzers under various operating conditions. The individual hardware devices to be tested will have ratings at or below 10kVA or 10kW in the lab and operate at voltages up to 800V DC.

The proposed project is in partnership with the Burlington Electric Department (BED). The HSTC would be located at the BED McNeill Generating Station, roughly a mile from the UVM campus. UVM and the Joint Owners of McNeill Generating Facility have a recently approved interconnection study for up to 50kWdc of solar photovoltaic (PV) array. DOE is administering spending in support of an 18-kW portion of the overall permitted and racking capacity under an independent project, which was reviewed in GFO-0010141-001 (CXs A9, B5.16; 01/06/2023). A separate array

comprised of new modules and inverter would be installed and utilized under the proposed project for the purpose of establishing the HSTC, which involves the collocation of PV with additional Distributed Energy Resources (DERs).

The HSTC would occupy part of a fenced-in, 1-acre yard at the north and west end of the BED facility near a 50MW wood-burning generator. The proposed project would install DERs at the site in two phases. Phase I would focus on installing at least 5kW solar PV/inverter assets. Phase II would involve the installation of battery and fuel cell energy storage, electrolyzers, additional inverters, and automated particulate/snow mitigation technologies. The final stage of the proposed project would focus on demonstration of the installed energy assets at the HSTC, including communication, sensing and data collection, and actuation. The HSTC would require additional permitting to allow the energy storage assets, on-site hydrogen storage, and potentially a small, heated shed to house communication and computing assets. The design, planning, and permitting process for the HSTC is within the scope of the proposed project, and the project team and UVM leadership would work with the Joint Owners of McNeil Generating Facility to produce an updated interconnection study for approval prior to commencing the proposed installations.

The project would involve the use and handling of various flammable materials, including hydrogen gas (H₂ gas). All such handling would occur in-lab at the ATL and on-site at the HSTC, and UVM is dedicated to proper hazardous material handling and disposal practices. All hazardous materials would be managed in accordance with Federal, state, and local environmental regulations. The project would also include kVA-scale experiments and demonstration. Project workers would follow existing health and safety policies and procedures, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. For the HSTC site, UVM would work closely with the Joint Owners of the McNeil Generating Facility to ensure necessary training and safety agreements are in place. Quantities of H₂ gas used at the ATL would be within the scope of standard university chemistry laboratories and appropriately contained. The HSTC would run an H₂ system fed from clean electricity produced on site. Air emissions resulting from project activities would be de minimis.

Modifications of existing facilities would include the following:

- The ATL may require adaptation to satisfy kVA-scale laboratory testing and to meet required voltage-levels (e.g., 800V dc, 3-phase kVA feed/returns) and potential back-feeding of power from assets in the ATL back to the grid. This facility was purpose-built to accommodate the type of research-related adjustments being proposed, which would not involve major physical modifications. No new permits are expected to be required.
- The installation of DER equipment outdoors at the HSTC would require the conversion of an existing waste wood yard into the proposed testing facility. The surface of the approximately 1-acre yard is made of concrete. All project activities including those on adjacent staging areas would be confined to the footprint of previous ground disturbance within the BED facility. Existing roads would be used to access the project location.

According to the U.S. Fish and Wildlife Service Endangered Species Program website (IPaC), there are no federally-listed plant species expected to occur at the project area. IPaC identifies two endangered wildlife species (Northern Long-eared Bat and Monarch Butterfly) that are believed to occur in the region of the BED McNeill Generating Station; however, due to the siting elements, lack of critical habitat, and restricted footprint on previously disturbed land, DOE has determined the proposed activities would have no effect on listed species. A migratory bird nesting survey shall be completed if project activities involving ground disturbance occur between March 15 and September 15. If nests or eggs are found, the area would be cordoned off with a proper buffer until nestlings fledge. DOE does not anticipate requiring additional cultural resource surveys beyond that already planned before the proposed groundwork in accordance with local regulations. Nonetheless, if during project work cultural or archaeological artifacts are encountered, the recipient would stop the site installation immediately and inform the DOE Project Officer of the finding.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

A migratory bird nesting survey shall be completed if project activities involving ground disturbance occur between March 15 and September 15. If nests or eggs are found, the area would be cordoned off with a proper buffer until nestlings fledge.

If during project work cultural or archaeological artifacts are encountered, the recipient shall stop the site installation immediately and inform the DOE Project Officer of the finding. A Class III: Intensive Cultural Resources Inventory shall be required prior to re-commencing project work.

Notes:

Solar Energy Technologies Office (SETO)
This NEPA determination requires legal review of the tailored NEPA provision.
Review completed by Whitney Donoghue on 01/12/2023

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.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____



Andrew Montano

NEPA Compliance Officer

Date: 1/13/2023

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: _____