

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Syndem LLC**STATE:** IL

**PROJECT TITLE:** Autonomous Grid-forming Inverters Enabled by Always-on Universal Droop Control without External Communication or Phase-Locked Loops

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002064	DE-EE0009030	GFO-0009030-001	GO9030

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 Syndem, LLC to develop an autonomous grid-forming inverter and study the scalability of the new product through an experimental research platform for the testing and validation of next-generation power electronic devices and software.

Activities associated with the proposed project would include the design, development, laboratory validation, real-time simulation, and field testing of advanced grid-forming inverter technologies. Design and development activities would occur at the Recipient's headquarter office (Chicago, IL). Validation of control algorithms would be conducted on an existing lab-scale 8-node testbed in a mechanical engineering research facility at Texas Tech University (TTU; Lubbock, TX). Real-time software simulations for a modeled 120-inverter, 1200-node system in addition to field testing of the developed control technology on an established microgrid testbed would occur at the Global Laboratory for Energy Asset Management and Manufacturing (GLEAMM; Lubbock, TX). GLEAMM is owned by TTU and located at the Reese Technology Center, an extensive renewable energy business and research park.

Field testing would involve minor modifications to the microgrid testbed. Three of five currently installed 30 kW grid-following PV inverters would be replaced with ten 3 kW and ten 6 kW grid-forming inverters manufactured and supplied by Syndem. The existing PV panels associated with the system would remain in place after being rewired and connected to the new inverters. A shed would be installed on a small area of previously developed land adjacent to the system to house the equipment and auxiliary devices within an environmentally-controlled space. Proposed work would not involve any new ground disturbance.

Proposed development and testing activities would generate minimal amounts of non-hazardous packing materials, which would be recycled via standard university waste management programs. The project would not involve the use of any hazardous materials. All work would occur exclusively at research facilities that were purpose-built for the type of activities being proposed; therefore, no new permits, additional licenses and/or authorizations would be necessary. No change in the use, mission or operation of existing facilities would arise out of this effort. After the

conclusion of the proposed project, installed equipment would be properly decommissioned following existing policies regarding use of the GLEAMM testbed, which was designed to accommodate such modifications for ongoing research purposes.

## 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, 1/16/2020

## 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: 1/16/2020

## 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: \_\_\_\_\_