

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: Operational Integration and Scalable Deployment of Microgrid Control Algorithms into Nanogrid Inverter+PV+Storage Applications

SECTION B. Project Description and Purpose:

Inergy Holdings, LLC (IH or Inergy) headquartered in Pocatello, Idaho, is a revolutionary, world-renowned, portable solar energy company focused on providing the world with affordable solar energy solutions. The project associated with this TCF, and outlined in the Work Plan will produce new controller algorithms and technology for use in the industry's first multi-use-case, microcontroller-based nanogrid controller (NC) for portable, high power density inverter+battery+solar generating systems, and subsequently revolutionize the portable power generator market. Although there are existing consumer and commercial solutions that offer on- and off-grid power management in utility scale and fixed installations (e.g., DMS, microgrid controller), the integration of a "smart" NC controls architecture/chip to ultraportable Home Base inverter generators (HBs) creates a transformative technology that makes a modular building block for nanogrid applications that can be both grid-interactive and portable/islanded.

This project intends to enhance, modify, and include power-sharing and storage/load management features from novel two-stage, predictive and real-time adjustable microgrid control algorithms developed by a systems integration group at the Idaho National Laboratory (INL), and commercially deploy them by embedding them into a microcomputer/controller-based NC. The microcontroller-embedded NC will be integrated into a modular home solar generator product/platform from Inergy, to enhance its integration, control, distributed storage/energy management, and on/off-grid operational capabilities. Such integration will help enable up to 256 solar+storage generators to operate in parallel in the form of a small-scale integrated grid (nanogrid) and make the generators smarter and capable of storage and energy management, power sharing and balancing, peak shaving, and load shifting/shaping. Smart generators will enhance the use of distributed solar/wind and support their increased integration in electric grids of all sizes. The end result will elevate the existing HB product above the market of "dumb" generators by providing a processor-based platform to enable integration, control, distributed energy management, communication, and parallel operations of interconnected HBs.

Programming and development work on this project will occur in INL and Inergy office spaces, and in the INL Microgrid Laboratory at the Energy Storage Laboratory (IF-685). Any other hardware utilized such as the solar/battery inverters will be produced and supplied by Inergy for testing and validation purposes. Testing will occur in Inergy laboratory/testing locations in Pocatello, ID and in Orem, UT.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

N/A

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

N/A

Generating and Managing Waste

The activity will generate industrial waste in the form of paper, cardboard. etc.

Releasing Contaminants

N/A

Using, Reusing, and Conserving Natural Resources

Waste will be diverted from the landfill to the extent possible.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

DOE-ID NEPA CX DETERMINATION
Idaho National Laboratory

require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References:

10 CFR 1021, Appendix B, B3.6, "Small-scale research and development, laboratory operations, and pilot projects"

Justification:

The proposed R&D activities are consistent with CX B3.6 "Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); 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 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;"

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on: 10/05/2020