



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0474-1592) Satcon Technology Corp. - Agile Direct Grid Connect Medium Voltage 4.7-13.8kV Power Converter for PV Applications Utilizing Advanced Wide Band Gap Devices

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Massachusetts, New Mexico, North Carolina, Pennsylvania

Proposed Action Description:

Funding will support development of an early stage prototype of a solid-state power inverter capable of converting low-voltage input power generated by utility-scale solar farms to medium voltage AC output power for transmission to the electric grid, increasing energy yield and reducing equipment costs.

Proposed work consists of indoor laboratory-based research and development (R&D) and device testing, including (1) design, fabrication, and testing of a front-end inverter and 2x2 matrix AC output converter building blocks; (2) design, fabrication, and testing of a thermal management system and integrated prototype packaging; (3) development of full power prototypes and controls of the 2x2 matrix output converter building blocks and cascaded inverter front-end; (4) single-phase implementation of medium voltage inverter power electronics; (5) testing of the thermal management system; (6) development of system failure models to perform reliability analysis, and an algorithm for detecting and tracking degradation of system components; and (7) reliability analysis through evaluation of prognostics and health monitoring (PHM) algorithms.

Indoor laboratory-based R&D and testing will be performed in dedicated laboratory and cleanroom facilities at Satcon Technology Corp. (Boston, MA), Cree Inc. (Research Triangle Park, NC), Powerex Inc. (Youngwood, PA), Midé Technology Corp. (Medford, MA), and Sandia National Laboratory (Albuquerque, NM). No R&D or testing activities will take place outside of these facilities.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 12/09/2011