



U.S. Department of Energy Categorical Exclusion Determination Form

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Proposed Action Title: (0474-1526) Transphorm Inc. - Four Quadrant GaN Switch Enabled Three Phase Grid-Tied Microinverters

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Goleta, CA; Petaluma, CA; Santa Barbara, CA

Proposed Action Description:

Funding will support development and testing of a high-efficiency, three-phase microinverter that can be integrated into photovoltaic (PV) solar panels for reliable power transfer from solar panels to the grid through a novel four quadrant switch architecture that enables a single semiconductor to switch voltage and current in both directions.

Proposed work consists of indoor, laboratory-based research and development (R&D) and rooftop alpha testing of grid-tied PV panels, including (1) simulation and breadboard testing of the novel inverter topology, (2) design, fabrication, and testing of the new four quadrant switch technology as a single planar device, (3) assembly, testing, and optimization of the prototype microinverter, and (4) rooftop alpha testing of 100 functional prototype units integrated into PV solar modules tied to the grid through a 3-phase 480 volt connection.

Indoor, laboratory-based R&D will be performed in dedicated laboratory facilities at Transphorm Inc. (Goleta, CA) and University of California Santa Babara (Santa Barbara, CA). Rooftop alpha testing with PV panels will occur at the headquarters of Enphase Energy Inc. (Petaluma, CA). During the third year of the project period, additional alpha field tests may be performed by Enphase Energy at rented, offsite test facilities. At this time, offsite testing facilities have not been identified. Accordingly, this determination covers only alpha testing of the microinverter technology at Enphase Energy's headquarters facility.

Categorical Exclusion(s) Applied:

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

B5.16 - Solar photovoltaic systems

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: 12/12/2011