



# U.S. Department of Energy Categorical Exclusion Determination Form



Program or Field Office: Office of Energy Efficiency and Renewable Energy:  
Phase III Xlerator Program

Funding Opportunity Number DE-FOA-0000397

Applicant Name: Arkansas Power Electronics International, Inc

Location: Fayetteville, AR

Project Title Commercialization of SiC Power Modules for High  
Performance Energy Applications

Proposed Action or Project Description American Recovery and Reinvestment Act:

Over the past ten years, Arkansas Power Electronics International, Inc., (APEI, Inc.) has been developing advanced next generation power electronics capabilities through the design and implementation of silicon carbide (SiC) based systems and platforms. Silicon carbide, with its capability to reduce electrical energy waste by more than 90% and simultaneously reduce power electronics system size and weights by up to an order of magnitude is poised to completely revolutionize the power electronics industry and reduce our dependence on foreign energy. In Phase I, APEI, Inc. proved the feasibility of a very high temperature SiC 3 kW power electronic inverter demonstrating a volume reduction of 85% when compared to state-of-the-art commercially available 3kW Si-based inverters. In Phase II APEI, Inc. developed a SiC 10 kW solar inverter demonstrating a greater than 70% power loss reduction in comparison with silicon systems. An additional configuration of the SiC system was able to operate at high temperatures reducing the volume by 70% and reducing the power loss by more than 50% when compared to the silicon system. In this Phase III project, APEI, Inc. proposes to build Class 1000 clean room production and manufacturing facilities to take its SiC power modules to market; APEI, Inc. would qualify and perform highly accelerated life-time testing on production level prototypes; optimize and qualify the manufacturing facility product process lines; develop product data sheets; and commercially release the SiC power module products.

Conditions: None

Categorical Exclusion(s) Applied: B3.6, B5.1

\*-For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, see Subpart D of 10 CFR 10 21

This action would not: threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders; require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities; disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or adversely affect environmentally sensitive resources (including but not limited to those listed in paragraph B.(4)) of Appendix B to Subpart D of 10 CFR 1021). Furthermore, there are no extraordinary circumstances related to this action that may affect the significance of the environmental effects of the action; this action is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

Based on my review of information conveyed to me and in my possession (or attached) concerning 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.

ORO NEPA Compliance Officer

**James L. Elmore**

Date Determined: 9/17/2010