



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0472-1530) University of Houston - High Performance, Low Cost Superconducting Wires and Coils for High Power Wind Generators

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Houston, TX; Round Rock, TX; Schenectady, NY; Tallahassee, FL; Golden, CO

Proposed Action Description:

Funding will support the design, fabrication, testing and analysis to further optimize the University of Houston's novel second generation (2G) high temperature superconducting (HTS) wire.

Project activities will include: (1) design and development of the 2G HTS at the University of Houston facilities and at subrecipient SuperPower's facilities in Schenectady, NY; (2) providing the 2G HTS wire to subrecipient TECO-Westinghouse for wire integration into a model superconductor generator design; (3) providing the 2G HTS wire to subrecipient Tai-Yang Research Corporation for fabrication of model HTS rotor pole windings, and (4) providing the National Renewable Energy Laboratory with analytical data to conduct LCOE model analyses.

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: 09/26/2012



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Location(s) (City/County/State): Houston, TX; Round Rock, TX; Tallahassee, FL; Golden, CO

Proposed Action Description:

Funding will support development of an "enhanced" second-generation high-temperature superconducting wire for use in superconducting generators for wind turbines that theorizes a four-fold increase in critical performance relative to the current state-of-the-art. The University of Houston's application was selected for an initial 18-month period (Phase 1) of funding. The ARPA-E Program Director may decide to negotiate and fund project activities for an additional 18-month period (Phase II) after evaluating the work performed in Phase I. ARPA-E has not obligated funds or negotiated a scope of work for Phase II at this time. Accordingly, this categorical exclusion determination form addresses only the activities that will occur in Phase I of this project.

Proposed work will consist of indoor activities to (1) quadruple the current critical performance at operating conditions of the HTS generator (i.e., 30K and 2.5T) by imposing two design changes that each theoretically double critical performance levels; and (2) proving technical feasibility of the enhanced wires by fabricating and testing two rotor coils made with the wire at the generator-operational temperature of 30K.

Design and fabrication of the proof-of-concept prototype wiring will occur at the University of Houston and SuperPower facilities on the University of Houston campus. Once fabricated, the wire will undergo proof-of-concept testing in the form of integration into rotor poles and rotor coils at the Tai-Yang facility in Tallahassee, FL and Westinghouse facility in Round Rock, TX, respectively. The National Renewable Energy Laboratory will conduct computer-based analysis and modeling at their laboratories in Golden, CO.

Categorical Exclusion(s) Applied:

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.

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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: 11/21/2011