



U.S. Department of Energy

Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0472-1572) Virginia Commonwealth University - Discovery and Design of Novel Permanent Magnets Using Non-strategic Elements Having Secure Supply Chains

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Richmond, VA; La Jolla, CA; Brookhaven, NY; Boston, MA; Rochester, NY

Proposed Action Description:

Funding will support development of permanent magnets made of compacted cobalt carbide nanoparticles for use in hybrid and electric vehicle motors, wind turbine generators, and energy storage systems. Virginia Commonwealth University's (VCU's) application was selected for an initial 18-month period (Phase I) 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 addresses only the activities that will occur in Phase I of this project.

Proposed work will consist of (1) computer modeling of the performance characteristics of cobalt carbide nanoparticles at the VCU campus in Richmond, VA; (2) in-situ analysis of cobalt carbide synthesis to determine reaction kinetics and optimize reaction conditions at the University of California - San Diego campus in La Jolla, CA and National Synchrotron Light Source - Brookhaven National Laboratory facility in Brookhaven, NY; (3) small-scale synthesis of cobalt carbide nanoparticles via a batch process at the Northeastern University (NEU) campus in Boston, MA; (4) small-scale synthesis of cobalt carbide nanoparticles via a continuous flow process at the VCU campus in Richmond, VA; and (4) compaction studies to determine effective techniques and materials (binders) for creating permanent magnets made of cobalt carbide nanoparticles at the NEU campus in Boston, MA and Arnold Magnetic Technologies Corp. facility in Rochester, NY. All project work will take place at indoor computing and laboratory facilities.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

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

B3.15 - Small-scale indoor research and development projects using nanoscale materials

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: 12/05/2011