U.S. Department of Energy
Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0471-1563) University of South Florida - Development of a Low Cost Thermal Energy Storage System Using Phase Change Materials with Enhanced Radiation Heat Transfer

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Tampa, FL

Proposed Action Description:
Funding will support development of low cost, industrially scalable capsules containing high-temperature phase change materials (PCMs) for use in thermal energy storage (TES) systems to enable continuous power supply from concentrated solar thermal and nuclear power plants. No nuclear research and development activities will take place under this project. ARPA-E has undertaken a review of the work to be performed under Phase I of the project, which consists of computer design and laboratory-based materials synthesis, characterization, and testing. ARPA-E has not undertaken a review of the work to be performed under Phase II of the project, which involves modifying a manufacturing line at an industrial facility and small-scale production activities. Accordingly, this categorical exclusion determination form addresses only the activities that will occur in Phase I of the project.

Proposed work will consist of (1) laboratory-based, small-scale synthesis of PCMs and capsules; (2) laboratory-based testing, characterization, and optimization of PCMs and capsules; and (3) computer-based design of a coating process for industrial fabrication of capsules and a TES system for future field demonstrations at a 1-MW power generation facility.

All proposed work will take place at the University of South Florida (USF) Clean Energy Research Center in Tampa, FL.

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: 11/29/2011