



U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0674-1610) TVN Systems, Inc. - Hydrogen/Bromine Electrical Energy Storage System

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): TVN Systems, Inc. (Lawrence, KS); Vanderbilt University (Nashville, TN); University of Kansas (Lawrence, KS)

Proposed Action Description:

Funding will support efforts to develop a cost-effective hydrogen-bromine flow battery that utilizes advanced membrane materials, unique catalysts, a novel shunt current protection system, and advanced cell and system designs. Proposed work will consist of: (1) synthesizing active and stable Rhodium-sulfur based electro-catalytic materials for hydrogen reactions; (2) fabricating and testing nanofiber composite membranes; (3) conducting material evaluation and performance characterization using a single cell setup; (4) designing, testing, and evaluating a shunt current protection system; (5) optimizing and synthesizing Rhodium-sulfur based electro-catalytic materials for hydrogen and bromine electrodes; (6) characterizing, optimizing, and fabricating nanofiber composite membranes for full cell tests; (7) designing, developing, and testing a 3-cell stack; and (8) designing, constructing, and testing a module stack. In addition, TVN will conduct technology-to-market activities, including development of a technology-to-market plan, cost modeling and planning, and commercialization outreach activities. All project tasks will be performed on a small-scale, pilot basis in dedicated university and industrial laboratory and office facilities for a period of up to 24 months.

Project tasks will be conducted by TVN Systems, Inc., and its partners Vanderbilt University and University of Kansas, in dedicated industrial and university laboratory and office facilities at TVN Systems, Inc. (Lawrence, KS), Vanderbilt University (Nashville, TN), and University of Kansas (Lawrence, KS).

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.

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: 09/06/2012