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# U.S. DEPARTMENT OF ENERGY
# OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
# NEPA DETERMINATION

**RECIPIENT:** Vanderbilt University **STATE:** TN

**PROJECT TITLE :** Fuel Cell Membrane-Electrode-Assemblies with Ultra-Low Pt Nanofiber Electrodes

| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
|---|---|---|---|
| DE-FOA-0001412 | DE-EE0007653 | GFO-0007653-001 | GO7653 |

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:**

**CX, EA, EIS APPENDIX AND NUMBER:**

Description:

| | |
|---|---|
| **A9 Information gathering, analysis, and dissemination** | Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.) |
| **B3.6 Small-scale research and development, laboratory operations, and pilot projects** | Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment. |

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Vanderbilt University to fabricate, characterize, and evaluate nanofiber mat electrode membrane electrode assemblies (MEAs) with highly active oxygen reduction reaction (ORR) catalysts for H2/air fuel cells, in order to overcome the shortcomings of traditional cathodes at low-precious group metal (PGM) catalyst loadings.

The proposed project would involve catalyst synthesis work at Georgia Institute of Technology, preparation of fiber mat cathodes and anodes via particle/polymer (catalyst/binder) electrospinning at Vanderbilt University, and membrane-electrode-assembly construction and testing with the nanofiber mat electrodes at Vanderbilt University and Nissan Technical Center North America. 3M Company would function as a consultant and subcontractor on the project providing ionomer binders for the electrospun mat electrodes. This project would not involve any physical modification of existing facilities or construction of new facilities.

The proposed project would involve the use and handling of industrial solvents and chemicals. All such handling would occur in-lab. All hazardous materials would be managed in accordance with federal, state, and local environmental regulations. Existing University/Corporate health and safety policies and procedures would be followed including student/employee training, the use of proper protective equipment, engineering controls, and monitoring. Hazardous wastes would be stored in OSHA approved cabinets (fire/corrosive/explosion). Disposal would be handled through an approved waste disposal company.

This project would involve the production of platinum-alloy nanoparticles, carbon nanoparticles, and metal-catalyzed perylene nanotubes. The potential risks of these materials include skin exposure, allergic reaction, dust/particulate inhalation, and flammability. Nanoparticles and nanoparticle precursors would be handled and stored in accordance with organizations requirements. All necessary training, personal protective equipment, environmental, chemical, or other hazardous precautions are mandated and in use. The nanoparticles would be disposed of in accordance with RCRA regulations.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410

(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Fuel Cell Technologies Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Chris Rowe, 10/5/2016

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: Electronically Signed By: Lori Gray /Lori Gray Date: 10/5/2016
NEPA Compliance Officer

**FIELD OFFICE MANAGER DETERMINATION**

☐ Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: _____ Date: _____
Field Office Manager