

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



RECIPIENT: Vanderbilt University

STATE: TN

PROJECT TITLE: Composite PEMs from Electrospun Crosslinkable Poly(Phenylene Sulfonic Acid)s

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001874	DE-EE0008435	GFO-0008435-001	

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.

B3.15 Small-scale indoor research and development projects using nanoscale materials Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Vanderbilt University (Penn Vanderbilt) to design, fabricate and a novel, highly conductive, non-perfluorosulfonic acid (PFSA) fuel cell membrane enabling operation at low relative humidity. Both a membrane and a proton-conducting ionomer would be synthesized as part of the proposed project. Membrane electrode assemblies would be fabricated with selected membrane samples and tested in an H₂/air fuel cell.

Proposed project activities include the synthesis, optimization and testing of the membrane electrode assembly's (MEA) component parts, including a crosslinkable poly(phenylene sulfonic acid) (cPPSA), a proton-conducting ionomer, and a robust poly(phenyl sulfone). The MEA would then be fabricated from the optimized components and tested for performance measurements in an H₂/Air fuel cell.

All project activities would be performed at an existing, purpose-built laboratory setting at Vanderbilt's main campus in Nashville, TN. No modifications to existing facilities would be required for this project. No new permits, license, or authorizations would be required to conduct project activities.

Various concentrated acids and flammable solvents would be handled as part of this project. All such handling would occur in-lab. Vanderbilt would adhere to its established health and safety policies and procedures in order to mitigate any risks associated with the project. Protocols would include health and safety training, the use of proper protective equipment, engineering controls, monitoring, and internal assessments. All organic solvent vapors would be vented through a fume hood installed in the laboratory. Project activities would include the fabrication of sub-micron diameter polymer fibers (200 nm-1000 nm). All fibers would be greater than the 100 nm limit (limit below which a particle can enter through a surgical mask). These fibers would be generated inside enclosures isolated from the laboratory environment.

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 Jonathan Hartman, 10/11/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:

 Electronically Signed By: Kristin Kerwin
NEPA Compliance Officer

Date: 10/11/2018

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: _____

Field Office Manager

Date: _____