PMC-ND
(1.08.09.13)

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

RECIPIENT: 3M Company **STATE:** MN

PROJECT TITLE : Novel ionomers and electrode structures for improved PEMFC electrode performance at low PGM loadings

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001412	DE-EE0007650	GFO-0007650-001	

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:

DOE is proposing to provide federal funding to 3M Company (3M) to develop and characterize novel electrode-specific ionomers and incorporate these into traditional and powdered nanostructured thin-film (NSTF) catalyst electrodes to improve electrode and microelectrode arrays performance and durability.

Ionomer raw material manufacturing would occur at 3M's plant in Neuss, Germany. Ionomer and NSTF synthesis would occur at the 3M Company headquarters in St. Paul, MN and the 3M Menomonie facility in Menomonie, WI respectively. Electrode fabrication (ink making, coating and drying), and fuel cell manufacture and testing would occur at the 3M Company headquarters St. Paul, MN. Additional electrode and fuel cell testing and characterization would occur at Tufts University in Medford, MA, Michigan Technological University (Michigan Tech) in Houghton, MI, and collaborating DOE Fuel Cell Consortium for Performance and Durability National Laboratories. All facilities in which this lab work would occur are purpose-built for the type of activities being proposed; therefore, no new or modified permits, construction of new facilities or physical modifications to existing facilities would occur as a result of the proposed project.

The proposed project would necessitate use and handling of various hazardous materials, including fluoropolymer, alloy materials, catalysts, platinum on carbon, nonfluorinated polymers, organic solvents, and hydrogen. All such handling would occur in-lab, and all participants have proper hazardous materials handling procedures in place. All hazardous materials would be managed in accordance with federal, state, and local environmental regulations. Non-hazardous lab waste would be disposed of according to local, state and federal regulation.

At the facility in St. Paul, 3M would use nanoscale material, including metal-catalyzed perylene nanotubes and carbon nanotubes. 3M would provide Michigan Tech thin ionomer films (< 200 nanometers) and novel catalyst layers with pore sizes on the order of 100 to 1000 nanometers. 3M would provide Tufts University with electrode materials that

contain carbon nano particles that are approximately 50 nanometers in size. All nanoscale material would be returned to 3M at the conclusion of the project. All necessary training, personal protective equipment, environmental, chemical, or other hazardous precautions are mandated and would be in use. These nanoscale materials will be disposed of in accordance with appropriate regulations.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

This activities carried out at 3M's plant in Neuss, Germany are exempt from further review under Executive Order 12114 per Section 5.1.1 of the DOE Implementation of Executive Order 12114 Environmental Effects Abroad of Major Federal Actions Final Guideline.

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.

Insert the following language in the award:

You are required to:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Hydrogen, Fuel Cells and Infrastructure Technologies Program
This NEPA determination requires a tailored NEPA provision.
Review completed by Chris Rowe, 8/4/2016

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Digitally Signed By: Kristin Kerwin Date: 8/11/2016
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