

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Northeastern University**STATE:** MA

PROJECT TITLE: Developing Platinum Group Metal-Free Catalysts for Oxygen Reduction Reaction in Acid: Beyond the Single Metal Site

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001874	DE-EE0008416	GFO-0008416-001	GO8416

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), 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 Northeastern University (NEU) to develop and synthesize M(x)-N-C catalysts with multiple metal center sites for use in automotive and stationary polymer electrolyte membrane fuel cells. Dual ion beam-assisted deposition (IBAD) would be applied for room temperature synthesis of M(x)-N-C catalysts with active site densification. IBAD and electrospinning would be used for electrode fabrication. This project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Proposed project activities include synthesis of test batches of novel platinum group metal (PGM)-free catalysts, thermal treatment of catalysts, fabrication of electrodes and membrane-electrode assemblies, material characterization, completion of X-ray absorption spectroscopy experiments, computer modeling, electrode fabrication optimization, and electrode testing in half-cell and full-cell environments. Experimental research would be completed at NEU's Center for Renewable Energy Technology in Boston, MA. X-ray absorption spectroscopy experiments would be performed at Brookhaven National Laboratory (Upton, NY), or another similar national light source facility. Computer modeling of fuel-cell architectures and performance would be completed at the Lawrence Berkeley National Laboratory (LBNL) in Berkeley, CA. Additional project work may be conducted at other national laboratories that form part of DOE's Energy Materials Network consortium.

All project activities would be completed in existing, purpose-built laboratory facilities that regularly perform work similar in nature to that proposed as part of this project's scope. No modifications to existing facilities would be required for this project. Additional permits, licenses or authorizations would not need to be secured.

Project work would involve the use and handling of small quantities of hazardous materials, including powders, corrosive acids, catalyst materials, compressed gases and organic/inorganic solvents. Any risks associated with the handling of these materials would be mitigated through employee training, the use of personal protective equipment (PPE), engineering controls, monitoring, and internal assessments. Synthesized catalysts may contain small quantities of micro- and nano-powders. Chemical fume hoods would be used when handling these materials in order to mitigate against inhalation risks. Phosphoric acid waste and materials contaminated with phosphoric acid would be generated. NEU would follow established protocols to handle and dispose of the waste, utilizing a certified waste disposal company. NEU and its project partners would observe all Federal, state and local health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

Notes:

Fuel Cell Technologies Office

This NEPA determination requires a tailored NEPA provision.

Review completed by Jonathan Hartman, 12/14/2018

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) 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 proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action 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.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:



Casey Strickland

NEPA Compliance Officer

Date: 12/17/2018

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

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

Field Office Manager's Signature: _____
Field Office Manager

Date: _____