

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Indiana University**STATE:** IN

**PROJECT TITLE:** Mesoporous Carbon-based PGMfree Catalyst Cathodes

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0001874	DE-EE0008417	GFO-0008417-001	GO8417

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 Indiana University (IU) to design and develop mesoporous platinum group metal free (PGM-free) cathodes for use in proton-exchange membrane fuel cells (PEMFCs). The project would be performed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Proposed project activities for BP1 would include development of a mesoporous carbon based PGM-free catalyst, material characterization/analysis, optimization of synthetic chemistry, catalyst synthesis and optimization, and catalyst functionalization. BP2 activities would include fabrication/assembly of PGM-free catalyst membrane electrode assemblies (MEAs), characterization of the catalyst layer/catalyst coated membrane structure, and a cost evaluation of small-scale and commercial-scale production.

Membrane electrode assembly and cathode fabrication and testing would be completed by IU at its Purdue University campus in Indianapolis, IN. Catalyst development would be performed by the State University of New York at Buffalo (SUNY Buffalo) at its primary campus in Buffalo, NY. Testing of large scale MEAs, catalyst testing, and cost analysis would be completed by United Technologies Research Center (UTRC) at its laboratory facility in Hartford, CT. Additional laboratory work may be completed in coordination with ElectroCat national laboratory partners.

All project work would be completed by Indiana University and its project partners at existing, purpose-built laboratory facilities. Facilities in which project work would be performed regularly complete work similar in nature to that included in the scope of this project. No change in the use, mission or operation of existing facilities would be required. Likewise, no new permits, licenses, or authorizations would be required to perform project activities.

The project would involve the use and handling of gases, industrial chemicals, and organic solvents. All such handling would occur indoors, in laboratory settings. Any risks associated with the handling of these materials would be mitigated through adherence to established safety policies and procedures. Protocols would include personnel training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. All facilities in which work would be carried out also have hazardous waste removal protocols in place that comply with government standards. IU and its project partners would adhere to all relevant Federal, state, and local health, safety and environmental regulations when completing project work.

Throughout the project, nanoscale materials would be used and handled, including nanocarbon black and platinum on carbon catalysts. All handling of these materials would take place under fume hoods. Research personnel would wear personal protective equipment, including masks, goggles and disposable laboratory coats, in order to prevent inhalation of nanoparticles or skin contact.

#### NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Fuel Cell Technologies Office

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 11/19/2018

#### 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: 11/19/2018

#### 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: \_\_\_\_\_