

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



RECIPIENT: 3M Company

STATE: MN

PROJECT TITLE : Durable, High Specific Power Integrated Oxygen Evolution Reaction Catalyst/Electrodes for Proton Exchange Membrane Water Electrolyzers

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002922	DE-EE0011321	GFO-0011321-001	GO11321

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.)

B3.15 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).

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 3M Company to develop ultra-low Iridium loading and ultra-durable oxygen evolution reaction powder catalysts for proton exchange membrane water electrolyzers (PEMWE) to enhance their durability and efficiency.

Award activities would be completed over two Budget Periods (BPs) with a Go/No-Go decision point between the BPs. Award activities would include laboratory-scale research, analyses, material synthesis, electrochemical characterization, modeling, and membrane electrode assembly performance and durability testing. 3M Company (St. Paul, MN) would carry out in-lab testing, material development, and process development. Giner, Inc. (Newton, MA) would assist with in-lab testing as well. Modeling work would be performed by Purdue University (West Lafayette, IN). Carnegie Mellon University (Pittsburgh, PA) would fabricate electrode inks and electrodes, as well as performing PEMWE testing and diagnostics, nano-scale x-ray computed tomography, and electron microscopy. Northwestern University (Evanston, IL) would provide catalyst synthesis, electrochemical analysis, and materials characterization.

Diversity, equity, inclusion, and accessibility award activities would include using Minority Business specific suppliers, engaging historically underrepresented populations in Science, Technology, Engineering, and Mathematics, creating internships for students from diverse backgrounds through university partnerships, and hosting career events for women and girls at Northwestern University.

All project activities would be completed in existing, purpose-built facilities. No facility modifications, new permits, or licenses would be required. Potential hazards would include handling of catalytic nanoparticles, coating solvents, acid polymers, alcohol solvents, polymer electrolyte solutions, metal precursors, flammable solvents, and hydrogen gas. All such handling would occur in-lab and would follow all applicable health and safety regulations. All hazardous materials and waste would be managed in accordance with federal, state, and local environmental regulations. All nanoparticles would be handled in metal-based thin films bound to an electrode so there would be no risk of inhalation. Protective

eyewear and gloves would be used while handling nanomaterials. Nano-scale x-ray computed tomography technicians would be required to pass a radiation safety course given by the facility's environmental health and safety department.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Hydrogen and Fuel Cell Technologies Office (HFTO)
NEPA review completed by Alex Colling on 06/25/2024.

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: _____

Electronically
Signed By: **Melissa Parker**

NEPA Compliance Officer

Date: 6/27/2024

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: _____