

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



**RECIPIENT:** Ionomr Innovations, Inc.

**STATE:** NY

**PROJECT TITLE:** Advanced hydrocarbon proton exchange ionomer and membrane scale-up and electrode optimization for heavy duty fuel cells

<b>Notice of Funding Opportunity Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA0002922	DE-EE0011345	GFO-0011345-001	GO11345

**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:

<b>A9 Information gathering, analysis, and dissemination</b>	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.)
<b>A11 Technical advice and assistance to organizations</b>	Technical advice and planning assistance to international, national, state, and local organizations.
<b>B1.31 Installation or relocation of machinery and equipment</b>	Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.
<b>B3.15 Small-scale indoor research and development projects using nanoscale materials</b>	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 Ionomr Innovations, Inc. (Ionomr) in Vancouver, British Columbia, Canada for the advancement of hydrocarbon proton exchange ionomer and membrane scale-up and electrode optimization for heavy duty fuel cells. The proposed project includes optimization of hydrocarbon ionomer synthesis and membrane manufacturing processes, fabrication of fluorine-free reinforced membrane, development of fluorine-free catalyst layers, fabrication of perfluorinated-free catalyst coated membranes (CCMs), and validation of performance and durability.

Ionomer and membrane manufacturing would occur at Ionomr sites in Rochester, New York and/or Boston, Massachusetts. Fabrication of fluorine-free reinforced membrane would be conducted by Ionomr and Johnson Matthey in Vancouver, Canada and Reading, England, respectively. Development of fluorine-free catalyst layers would be led by University of California Irvine and Johnson Matthey in Irvine, California and Reading, England, respectively. Fabrication of CCMs would be conducted by Johnson Matthey and University of California Irvine at their respective sites. Coating activities and polymer production would occur at leased space at Kodak in Rochester, New York. Validation testing would be conducted by Plug Power in Lathan, New York.

Various hazardous materials and chemicals would be utilized for polymer synthesis and membrane coating, as part of this award, including H<sub>2</sub>SO<sub>4</sub> (4 Liters, L), Acetic anhydride (4 L), and HCl (4 L). Solvents utilized for polymer synthesis would include Methylene chloride (2-3 L), dichloroethane (1-2 L), and propylene carbonate(3-5L). Flammable solvents that would be utilized for membrane coating include alcohols, ketones, and glycol ethers, totaling less than 50 gallons over the project's duration. The project would involve the use and handling of nanoparticles, solvents, acids and basis, compressed gases. Handling of all hazardous materials would occur in a laboratory setting and all workers would

perform proper hazardous material handling and disposal practices that are in accordance with federal, state, and local environmental regulations. Proper employee training, protective equipment, monitoring, and internal assessments would be conducted throughout the project.

Direct emissions from the laboratory and manufacturing process at the Ionmr sites in Rochester, New York and/or Boston, Massachusetts would include the evaporation of <10 gallons (estimate) of organic solvents and 15,000 cubic feet of non-toxic laboratory gases (N2 and Argon). Some emissions would be released as a result of heating the ovens and operating the test stands at the Ionmr site in Vancouver, Canada and to dry the CCMs at the Johnson Matthey location in Reading, England. Award efforts at Plug Power in Lathan, New York would involve the testing of equipment and would lead to a change in emissions from the facilities as a result of the project. Solvent usage would occur at the Irvine, California site and would be performed under a fume hood. Emissions associated with this project would be considered negligible.

A conference room at the Ionmr site in Rochester, New York would be converted to serve as a membrane inspection space as part of the project. This would require the clean-up, renovation, and installation of equipment. As new tenets at Ionmr's Boston, Massachusetts site, they would be required to obtain a certificate of occupancy permit from the Boston Fire Department. No other changes to any of the other facilities would occur as part of this award.

Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on other resources, including those of an ecological, 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 Cells Technologies Office  
NEPA review completed by Chris Akios, 06/07/2024, Updated on 11/5/2024

## 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.

DOE has determined that work to be carried out outside of the United States, its territories and possessions is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

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: Andrew Montano

NEPA Compliance Officer

Date: 6/10/2024

**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: \_\_\_\_\_