PMC-ND

(1.08.09.13)

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



STATE: L

### **RECIPIENT:** University of Illinois at Urbana-Champaign

**PROJECT TITLE:** Mitigating Greenhouse Gas Emissions: Advancing Sustainable Nitrogen Removal through Ammonia Ion-Exchange and Electrolysis Technologies

Notice of Funding Opportunity Number	Procurement Instrument Number	NEPA Control Number	<b>CID</b> Number
DE-FOA-0003206	DE-EE0011620	GFO-0011620-001	

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.)
B1.31 Installation or relocation of machinery and equipment	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.
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 the University of Illinois at Urbana-Champaign (UIUC) for the design, development, fabrication, and testing of ammonia ion-exchange and electrolysis technologies as well as chemical production of sodium hydroxide testing.

The laboratory development of an ammonia electrolysis catalysts, chemical production analysis and ion exchange testing would occur at UIUCs facility in Champaign, IL. Design and optimization for hydroxide production would occur at Stanford University in Stanford, CA. Technoeconomic and life-cycle analyses would be performed at Colorado State University in Fort Collins, CO. Stakeholder and community engagement planning would occur at Visage Energy in Culver City, CA. Field testing of the equipment would occur at the Urbana Champaign Sanitary District (UCSD) in Urbana, IL. Personnel support and laboratory work for the project, including testing pilot site samples would occur at the US Army Corps of Engineers (USACE) Construction Engineering Research Laboratory in Champaign, IL. Research, optimization and electrolyzer fabrications would occur at Current Water Technologies in Guelph, Ontario, Canada.

Hazardous materials associated with the project would include catalyst metals and solvents for synthesis, the accumulation of harmful gases, (e.g., hydrogen, carbon monoxide and hydrogen sulfide), and exposure to municipal wastewater. All hazardous materials would be managed in accordance with federal, state, and local environmental regulations and project-related facilities would follow existing health and safety policies and procedures. Employee training and proper protective equipment would be used in laboratory and field environments. During installation of the pilot unit at the host site, all electrical connections and installations would be reviewed by a UIUC electrician and an electrician from UCSD to reduce hazard risk. Adequate ventilation would be provided in containerized units, and electrolyzer gases would be vented outside of the container. Hydrogen, carbon monoxide, and hydrogen sulfide

sensors would be installed in areas around the equipment producing these gases to reduce risk of accumulation. The project site would be reviewed annually by the UIUC Division of Research Safety for compliance with university safety protocol.

The project would include laboratory modifications to provide sufficient physical space for performing award-related research activities. There would be some modifications to plumbing and electrical connections required to integrate the containerized ammonia ion-exchange-electrolysis unit delivered to the host site by USACE. The proposed field experiments would take place within the existing footprint at UIUC's facilities. The field experiments performed at this location would involve the movement of containerized units to the site. The containerized units would sit on a current concrete pad and no earthwork modifications are proposed. None of the project activities are expected to require applying for new or modified permits, licenses, or authorizations.

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 that would be considered significant or require DOE to consult with other agencies or stakeholders.

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.

#### NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Industrial Efficiency & Decarbonization Office NEPA review completed by Chris Akios, 11/08/2024

#### 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:

Signed By: Andrew Montano

Date: 11/8/2024

NEPA Compliance Officer

## 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: