

PMC-ND
(1.08.09.13)

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



RECIPIENT: The Pennsylvania State University, University Park, PA 16802

STATE: PA

PROJECT TITLE: Novel microbial electrolysis cell design for efficient hydrogen generation from wastewaters

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002446	DE-EE0009623	GFO-0009623-001	

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.)

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 funding to the Pennsylvania State University (PSU) to develop a microbial electrolysis cell (MEC) which would produce hydrogen using wastewater as a feedstock. PSU would fabricate a prototype MEC and test the device utilizing synthetic and biomass waste streams. The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP. This ND is applicable to all three BPs.

Proposed project activities would consist of conceptual design work, data analysis/computer modeling, material characterization, component fabrication, bench-scale MEC assembly (i.e., 100 cm² cell), biomass synthesis, and performance testing.

PSU would coordinate all project activities and perform conceptual design work, data analysis, computer modeling, MEC fabrication, bacterial culturing, and performance testing at laboratory facilities at its campus in University Park, PA. PSU would synthesize artificial effluent for testing from standard laboratory chemicals. Additional effluent would be generated by the National Renewable Energy Laboratory (NREL). NREL would operate a fermentation unit at its laboratory facility in Golden, CO to synthesize biomass effluent from pre-processed biomass (e.g., corn stover). Effluent would be generated at laboratory scales (approximately 500 L of effluent over the course of the project). Island Water Technologies would also provide wastewater samples and perform conceptual design work, data analysis, and computer modeling at its research facilities in Charlottetown, Canada. No physical modifications to existing facilities, ground disturbance, or changes to the use, mission, or operation of existing facilities would be required. No additional permits or authorizations would be required.

Project work would include the use and handling of industrial chemicals and biological cultures. All such handling would occur in laboratory facilities that work with these materials as part of their regular course of business. Potential hazards would be mitigated through adherence to established institutional health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, engineering controls, and routine monitoring. Fume hoods would be used when handling chemicals, as appropriate. Biological cultures would include genetically modified strains. All biological cultures to be used would be classified as safe for Biological Safety Level 1 (BSL-1) protocols, as defined by the Center for Disease Control and Prevention. Such cultures would be handled in facilities meeting BSL-1 requirements. Biological waste would be treated prior to disposal. PSU and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

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:

Fuel Cell Technologies Office

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 08/10/2021

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:



Casey Strickland

NEPA Compliance Officer

Date: 8/11/2021

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: