

PMC-ND
(1.08.09.13)

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



RECIPIENT: West Virginia University

STATE: WV

PROJECT TITLE: Intermediate Temperature Proton-Conducting Solid Oxide Electrolysis Cells with Improved Performance and Durability

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001647	DE-EE0008378	GFO-0008378-002	GO8378

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 West Virginia University (WVU) to develop an intermediate temperature ($T = 600^{\circ}\text{C}$) proton-conducting solid oxide electrolysis cell (IT H-SOEC). The cell would include a water-splitting functional layer involving a conformal coating of electro-catalyst/electrolyte matrixes. The project would also seek to identify highly active, triple-conducting electrocatalysts and to develop conformal coating methods for depositing these catalysts into composite anode functional layers.

The proposed project is divided into three Budget Periods (BPs), with a Go/No-Go decision point between each BP. A NEPA Determination was completed on 7/25/2018 for BP1 activities. At that time, BP2 and BP3 were still undergoing negotiation and consequently, did not undergo a NEPA review. BP2 and BP3 have now been negotiated and their associated activities have been finalized. This NEPA review will cover all BP2 and BP3 tasks.

Proposed project activities would include computer modeling, material synthesis (e.g. anodes, cathodes, catalyst layers, and thin films), material characterization, and deposition/thin-film coating.

All project activities would be coordinated by WVU and performed at existing, purpose-based laboratory facilities operated by WVU or its project partners. Material synthesis and characterization would be performed by WVU at its

campus in Morgantown, WV. Material deposition and electrochemical performance analysis would be performed by the Colorado School of Mines (CSM) at its campus in Golden, CO. Additional laboratory work would be performed at the national laboratory facilities of Energy Material Network partners (e.g. Idaho National Laboratory, National Renewable Energy Laboratory, Sandia National Laboratory). No physical modifications to existing facilities, construction of new facilities, ground disturbing activities, or changes to the use, mission, or operation of existing facilities would be required for any of the above activities. No additional permits, licenses, or authorizations would be required.

Industrial chemicals/solvents would be used and handled throughout the project. Risks associated with the handling of these materials would be mitigated through adherence to established university health and safety protocols. Oversight of these protocols would be managed by the Environmental, Health and Safety Office of each institution, respectively. WVU and CSM would observe all applicable Federal, state, and local health, safety and environmental regulations.

Nano-scale materials would be used and handled throughout the project. The nano-scale materials would be deposited onto the surface of material samples. Upon deposition the particles would be bound to the material samples, mitigating in this way against potential inhalation risks. Both WVU and CMS regularly work with nanomaterials. Established procedures for the handling of these materials would be adhered to.

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, 02/18/2020

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: 2/18/2020

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: _____