

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



RECIPIENT: West Virginia University Research Corporation

STATE: WV

PROJECT TITLE : Microwave Enhanced Methods and Kiln Designs for Rapid, Energy-Efficient, and Cost-Effective Thermal Processing of Solid-Oxide Electrolysis Cells

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002922	DE-EE0011320	GFO-0011320-001	GO11320

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 West Virginia University Research Corporation to design and build microwave-assisted heating kilns for calcination and sintering of solid-oxide electrolysis cell (SOEC) materials.

The proposed award activities would occur over four budget periods (BPs), with Go/No Go decision points between the BPs. Award activities would consist of data analysis, modeling, preliminary engineering/design, laboratory research, outreach, and education. West Virginia University (WVU; Morgantown, WV) would carry out modeling, laboratory-scale microwave experiments, final kiln testing, SOEC synthesis and fabrication, and microwave processing of fabricated materials. Malachite Technologies Inc. (San Francisco, CA) would assist with design, machining, building, and testing the microwave prototype kilns, as well as their operational software and shipping systems. Modeling would also be performed by University of Colorado, Boulder (Boulder, CO). Electrochemical testing of SOEC materials using the kilns fabricated in this award would take place at Nexceris (Lewis Center, OH). The H2NEW Consortium (made up of nine DOE national laboratories) would assist with electrochemical characterization of SOEC cells produced by the research team. The national laboratory(ies) where this work would occur has not yet been identified.

Diversity, equity, inclusion, and accessibility activities would include the recruitment of students underrepresented in Science, Technology, Engineering, and Mathematics (STEM) from Historically Black Colleges and Universities (HBCUs). WVU would also develop STEM modules for use in summer camps under the STEM Ambassador Program in Appalachia.

Potential hazards would include handling of metal oxides, metal salts, metal powders, and hydrogen fuel. 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. Microwave leakage would be mitigated using microwave monitors and following environmental health and safety regulations.

All project activities would be completed in existing, purpose-built facilities. No facility modifications, new permits, or licenses would be required. Kilns would be installed at WVU and Malachite Technologies. WVU may require interior laboratory rearrangement and additional power installation to accommodate the kiln prototypes.

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 06/24/2024.

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: _____


NEPA Compliance Officer

Date: 6/26/2024

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: _____

Date: _____

Field Office Manager