

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



RECIPIENT: NexTech Materials, Ltd. dba Nexceris

STATE: OH

PROJECT TITLE : Low-Cost Manufacturing of High Temperature Electrolysis Stacks

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002446	DE-EE0009621	GFO-0009621-001	

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 Nexceris for research and development that would improve performance and reduce the manufacturing costs of high temperature electrolysis (HTE) cells and stacks. Cell design, electrode material selection, and manufacturing methods would all be analyzed and improved in order to reduce cell cost and elicit higher performance. This project would take place over three years and three budget periods, with each budget period (BP) lasting one year and a Go/No-go Decision Point in between each BP.

The majority of the proposed project activities would take place at Nexceris in Lewis Center, OH. This would include the manufacturing and testing of solid oxide electrolysis cells, as well as the fabrication and testing of planar solid oxide electrolysis stacks. Idaho National Laboratory (INL) in Idaho Falls, ID would also complete third-party testing at different intervals throughout the project. Strategic Analysis, Inc. (SA) in Arlington, VA would complete cost analyses of the current- and future-state HTC stacks manufactured by Nexceris.

The proposed project activities would commence with a cost analysis done by SA of Nexceris' current-state cell and stack designs using DOE recognized cost estimation approaches in order to establish a baseline. Concurrently, Nexceris would engage in several cell performance enhancement and cost reduction initiatives, focusing on reducing the amount of solar cells needed for hydrogen production. Additionally, HTE stacks would be built by Nexceris and delivered to INL for long-term testing, including assessments of performance and durability of the baseline stack and new stacks near the end of each BP. Next, project activities would comprise work to reduce the cell thickness of Nexceris' FlexCell, to reduce the cost of collector fabrication by introducing automation, and to reduce the number of stack repeat components. SA would update the cell and stack manufacturing cost analyses midway through the project. INL would assess performance and durability of mid-size stacks and full-scale stacks built in the middle and final stages of the project. Lastly, hotbox testing and large area cell fabrication testing would be done on large-area stacks. At the end of all the testing, a final cell and stack manufacturing cost analysis would be performed by SA.

The project would involve the use and handling of various hazardous materials, including oxides, acids, bases, salts, and solvents. Hazardous waste would include nickel oxide containing waste and barium oxide containing waste. Testing of cells and stacks would involve the release of CO₂, xylene, propanol, and hydrogen emissions from Nexceris and hydrogen from INL. All emissions would be heavily diluted with air and vented to the outside. All hazardous materials at INL and Nexceris would be managed in accordance with Federal, state, and local environmental regulations. Existing policies and procedures would be followed, including employee training, proper protective

equipment, engineering controls, monitoring, and internal assessments. All hazardous wastes would be separated and kept in appropriate containers until collected by a certified hazardous waste disposal facility.

No physical modification of existing facilities or construction of new facilities, ground disturbing activities, changes in facility use, or installation of equipment outdoors would occur throughout the duration of this project. No new permits, licenses, or authorizations would be needed.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Hydrogen and Fuel Cell Technologies Office (HFTO)
This NEPA determination does not require a tailored NEPA provision.
Review completed by Alex Colling on 01/20/21.

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: 1/24/2022

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: