

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of California Irvine**STATE:** CA

PROJECT TITLE: Solid Oxide Electrolysis Cells (SOEC) Integrated with Direct Reduced Iron (DRI) Plants for Producing Green Steel

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002229	DE-EE-0009249	GFO-0009249-001	

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 University of California Irvine (UCI) to develop and test a novel solid oxide fuel cell device for use in the production of direct reduced iron (DRI). A prototype system would be developed which would interface a Solid Oxide Electrolysis Cell (SOEC) system with a computer-based setup designed to simulate a traditional DRI furnace. The project would be completed over three Budget Periods (BPs) with a Go/No-Go Decision Point in between each BP.

Proposed project activities would include system design and development, computer modeling, data analysis, SOEC component fabrication, system assembly, performance testing, and techno-economic analysis. UCI would oversee and coordinate all project activities. All project work would be performed at existing, purpose-built laboratory and/or manufacturing facilities. Computer modeling and design work would be performed by UCI at its campus in Irvine, CA. Prototype development, SOEC component fabrication, and physical testing would be performed by project partners FuelCell Energy and Versa Power Systems at a manufacturing facility operated by FuelCell Energy in Danbury, Connecticut. FuelCell Energy fabricates and tests SOEC components and associated equipment as part of its routine course of business at this location. Additional computer analysis and design work would be performed by project partners Hatch Associates Consultants, Inc. (Pittsburgh, PA), Laboratorio Energia Ambiente Piacenza (Piacenza, Italy), and Politecnico di Milano (Milan, Italy). Project activities at these locations would be limited to computer-based analysis.

Hardware-in-the-loop (HIL) development would include the installation and testing of hardware at FuelCell Energy's facility in Danbury, Connecticut. The hardware would consist of a SOEC system and sensor equipment housed within an enclosure measuring approximately 5m x 2m x 3m. This unit would be connected to a DRI simulator. The DRI simulator would consist of a computer system used for process simulations, gas controls/lines, and gas sampling units. The DRI simulator would be housed on a test stand measuring approximately 3m x 2m x 1m. Both the SOEC system and DRI simulator test stand would be assembled for testing within existing laboratory space. No ground breaking activities, facility modifications, or changes to the use, mission, or operation of existing facilities would be required as part of this project. No additional permits or authorizations would be required.

Project work would include the use and handling of reactive gases and laboratory equipment operating at elevated temperatures/pressures. All such handling would be performed at facilities that regularly perform laboratory-based research and/or manufacturing as part of their regular course of business. In order to mitigate potential risks,

established health and safety policies and procedures would be adhered to. Protocols would include personnel training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. Hazardous substances would be disposed of properly in accordance with established waste management policies. UCI and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

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, 11/16/2020

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.

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: 11/17/2020

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: _____