PMC-ND

(1.08.09.13)

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

RECIPIENT: The University of Georgia **STATE:** GA

PROJECT TITLE : The Electrical Hydrogen Sensor Technology with a Sub-minute Response Time and a Part-per-Billion Detection Limit for Hydrogen Environmental Monitoring

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002792	DE-EE0010743	GFO-0010743-001	

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.
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).
B5.15 Small-scale renewable energy research and development and pilot projects	Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to the University of Georgia (UGA) to design, fabricate, characterize, and test high-performance electrical hydrogen (H2) sensing systems for the purpose of monitoring H2 concentration in the atmosphere and quantifying the accumulated H2 leakage in H2 use/transport industries. The award aims to conduct research and development (R&D) with laboratory testing, perform sensor system integration, and complete simulated field testing of the technology.

Award activities include data analysis, computer modeling, preliminary engineering/design, laboratory research, and field testing. The award consists of two budget periods (BPs). BP1 would focus on R&D, sensor integration, and indoor testing of the sensor systems. BP2 would involve designing and testing of a prototype sensor system, including integration of the electrical sensors into a portable and field deployable package, testing the performance of the electrical sensors at an industrial test facility, and performing field validation of the technology.

UGA would utilize an existing laboratory facility for design, fabrication, and characterization activities. Southwest Research Institute (SwRI; San Antonio, TX) would perform indoor evaluation of the integrated sensor system within a temperature- and humidity-controlled laboratory. Integration of the electrical sensors into a portable and field deployable package as well as creation of a market transformation plan would occur at a Indrio Technologies Inc. manufacturing facility in Riverside, CA. Pacific Gas and Electric Company (PG&E; Winters, CA) would be responsible for testing the integrated sensor system in a controlled outdoor test setup. The outdoor tests would mimic a small-scale residential neighborhood and outdoor pipeline transmission. These efforts would require contribution from both

PG&E and SwRI at PG&E's Gas Safety Academy. Polymer synthesis, coating, and characterization for gas selectivity, sensor stability, and enhanced sensor performance would occur at the Savannah River National Laboratory in Aiken, SC. The National Renewable Energy Laboratory's (NREL's) Hydrogen Infrastructure Testing Research Facility in Golden, CO would be the site of a blind outdoor test of the integrated sensor system.

As mentioned above, outdoor testing is proposed at PG&E's Gas Safety Academy and NREL's Hydrogen Infrastructure Testing Research Facility. These outdoor tests would require that electrical sensors be installed at each of these facilities. All sensor installations would be 0.5-meter (m) x 0.5 m x 0.5 m in dimension and be temporary in nature. All facilities are preexisting purpose-built facilities for the type of work to be conducted for this award. No modifications to facilities or ground disturbing activities would occur as a result of award activities.

Award activities would involve typical hazards associated with laboratory operations and field-testing activities, including the handling and use of hazardous materials (i.e., metals, toxic and flammable gases, industrial solvents, and nanoscale materials), operation of potentially hazardous equipment, and site-specific environmental hazards. Each organization is dedicated to proper hazardous material handling and disposal practices. More specifically, nanoscale materials would only be handled by trained personnel in laboratory settings with the proper safety equipment and precautions in-place. All hazardous materials would be managed in accordance with federal, state, and local environmental regulations. Existing corporate health and safety policies and procedures would be followed to mitigate hazards to acceptable levels, including employee/student training, proper personal protective equipment, engineering controls, monitoring, and internal assessments. Mitigated hazards would pose negligible risks to the public and environment. All activities would comply with existing federal, state, and local laws and regulations.

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.

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:

Hydrogen and Fuel Cell Technologies Office
NEPA review completed by Corrin MacLuckie, 08/31/2023.

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: Electronically Signed By: Andrew Montano Date: 8/31/2023

NEPA Compliance Officer

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