PMC-ND

(1.08.09.13)

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

RECIPIENT: GTI Energy **STATE:** IL

PROJECT TITLE: Omnivore Combustion System

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002997	DE-EE0011199	GFO-0011199-001	GO11199

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 funding to GTI Energy (GTI) to develop and test an industrial combustion system consisting of a fuel quality sensor, air and fuel flow control devices, and industrial burners.

A subscale combustion system would be fabricated built, and tested at GTI in Des Plaines, Illinois. The fuel quality sensors would be built and calibrated at Bright Sensors SA, Neuchâtel, Switzerland. Assembly and preliminary testing of a full-scale combustion system would take place at Honeywell Thermal Solutions, Muncie, Indiana. Testing of full-scale industrial burners and the full-scale combustion system would occur at Georgia Institute of Technology in Atlanta, Georgia. Techno-economic and lifecycle cost analysis would be conducted at Argonne National Laboratory in Lemont, Illinois. A field demonstration of the combustion system, with natural gas and hydrogen blends, would be performed in California (as currently planned) at a yet unspecified facility.

The project involves handling of flammable mixtures natural gas and hydrogen, as well as toxic blends of syngas and biogas (mixtures of CH4, CO, H2, CO2, and N2). Handling and testing with flammable fuels would occur in dedicated laboratory spaces at GTI Energy, Honeywell, Georgia Tech, and Bright Sensors. All subject facilities are built specifically to house industrial combustion experiments and sensors development and calibration. All testing and facilities are built in compliance with applicable codes and standards and operated by experienced staff with a history of successfully working with these hazards. Mitigation of project hazards would be accomplished by following applicable safety protocols and procedures, regular training, hazard assessment, engineering controls, monitoring and proper personal protective equipment. All test systems would be reviewed for their safety with internal hazard analysis, job safety analysis, having a standard operating procedure and with the hydrogen safety panel team and code compliance. Any changes to those systems would be handled through a management of change process to ensure

the changes are captured and implemented. Testing would be performed in a safe and systematic manner by developing a test plan that is reviewed by the safety and engineering team, and measurement and analysis of the test data would be performed as per the test plan. Bright sensors would perform calibration at their manufacturing facilities in Switzerland, using established industry safety and quality best practices. For the field demonstration in Budget Period 3, GTI and Honeywell would be responsible for developing, building, installing, operating, and decommissioning the combustion system. While the site is yet to be identified, a dedicated safety plan would be developed for the specific location prior to commencing any work in the field.

It is estimated that up to 920 lbms (pounds-mass) of CO2, <1 lbm NOx (as NO2), and <10 lbm CO would be emitted from award activities at the GTI location. Estimated air pollutant emissions during testing are <1 lbm NOx, 6 lbm CO, and 730 lbs (pounds). CO2 at the Honeywell location. Georgia Tech estimated emissions are up to <10 lbm of CO, <1 lbm NOx, and 1,000 lb. of CO2. For the field demonstration, up to 12 lbms of NOx would be emitted, an estimate 7000 lbm CO2, and <70 lbm of CO. The extent and nature of emissions associated with this project would be negligible.

Under Budget Periods 1 and 2, (which include Tasks 1 through 12), there would be no ground disturbing activities and no physical modification to as well as no change in the use, mission, or operation of existing facilities. The field demonstration site in California is unknown, therefore Tasks 14 through 17 under Budget Period 3 would require further NEPA review once the location becomes identified, and thus, are not included in this NEPA Determination.

Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient.

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 conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

This NEPA determination applies to the following topic areas, budget periods and/or tasks:
- Budget Periods 1 and 2 (Tasks 1 through 12)

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

The ND does not apply to the following topic area, budget periods, and/or tasks:
- Budget Period 3 (Tasks 14 through 17)

Notes:

Industrial Efficiency & Decarbonization Office
NEPA review completed by Chris Akios, 06/07/2024

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.

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."

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Andrew Montano Date: 6/7/2024

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] 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