

PMC-ND

(1.08.09.13)

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

**RECIPIENT: GTI****STATE: IL****PROJECT****TITLE:**

Integration of IH2 with the Cool H2 Reformer for the Conversion of Cellulosic Biomass to Drop in Fuel

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002029	DE-EE0008919	GFO-0008919-001	GO8919

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 federal funding to Gas Technology Institute (GTI) to develop a novel technology for the conversion of cellulosic biomass into drop-in biofuels. GTI would combine two previously developed biomass and hydrocarbon processing technologies into an integrated reformer system. Specifically, GTI's Cool Reforming technology (hydrocarbon processing) and Integrated Hydrolysis and Hydroconversion (IH2) technology (biomass processing) would be combined into a single system.

The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP. This NEPA review is applicable to all project tasks except for BP1 Task 1: Initial verification: Review of work and capabilities with DOE review team. This task was completed prior to NEPA review. Accordingly, this work will not be reviewed. This is the sole task for BP1. All other task work from BP2 and BP3 will be reviewed and discussed below.

BP2:

Task 2 – Receive wood chip feed for IH2 unit: This task would consist of the procurement of biomass feedstock and feed testing using the IH2 unit. In total, approximately three (3) tons of woodchips would be procured for use in the project. Feedstock testing would be performed over a one-day period to verify that the IH2 unit is capable of processing the material.

Task 3 – Integration of the Cool Reformer skid with the IH2 system: Task work would focus on the Integration of Cool Reformer skid with IH2 system. Both of these are systems currently installed at GTI's facility in Des Plaines, IL. Additionally, a sulfur guard bed, two (2) Rapid Cycle Pressure Swing Adsorption (RCPSA) systems, two (2) compressors, and additional safety controls would be incorporated into the system. All equipment is existing and has previously been used by GTI. No new equipment would be purchased for the integration of the system.

Various minor modifications to GTI's facility would be required to accommodate the configuration/integration of existing equipment into the pilot system. These would include the establishment of new electrical connections and

rerouting piping for gas and water connections. Existing equipment would also be physically rearranged within GTI's facility. All equipment would fit within existing, dedicated laboratory space. No equipment would be installed outdoors. No ground breaking activities, construction of new facilities, or changes in the use, mission or operation of existing facilities would be required. Likewise, no modifications to or new permits/authorizations would be required.

Task 4 – Shakedown of the Cool GTL system with the IH₂ system: GTI would perform system verification and safety testing. The system would be tested to demonstrate safe, continuous operation for four (4) hours.

Task 5 – Testing of the integrated system: GTI would undertake initial performance testing. The system would be operated continuously for fifty (50) hours and approximately four (4) gallons of biofuel would be produced as part of this test run.

Task 6 – Management tasks in Budget Period 2: This would be an ongoing task throughout BP2, consisting of all work activities relating to management, coordination, and administration of the project. These would include meeting, reporting, and planning.

Task 7 – Intermediate Verification: GTI would review the status of the project in coordination with DOE.

BP3:

Task 8 – Long Term Integrated testing: The system would be operated for an additional four-hundred fifty (450) hours. Approximately 50 gallons of biofuel would be produced as part of this run. Operational data would be collected and used for data analysis related task work.

Task 9 – Engineering/Technoeconomic Analysis: Operational data generated in the previous task would be used to inform engineering design work and the completion of a technoeconomic analysis. This task would be completed by GTI's project partners KBR Wilmington (KBR).

Task 10 – Project management Budget Period 3: This would be an ongoing task throughout BP3, consisting of all work activities relating to management, coordination, and administration of the project. These would include meeting, reporting, and planning.

Task 11 – Final verification review: GTI would conduct a final project review in coordination with DOE

All project activities would be coordinated by GTI and performed at existing, purpose-built facilities. GTI would lead commissioning efforts and would develop/operate the pilot system at its laboratory facility in Des Plaines, IL. All physical testing would be performed by GTI at this location utilizing existing equipment. KBR would perform engineering and market analyses at its office facilities in Newark, DE. Work activities performed by KBR would be limited to computer-based research and development.

Project work would involve the use and handling of gas mixtures and industrial chemicals, as well as the use of machinery with moving parts. All such handling would be performed in controlled, laboratory environments. In order to mitigate against potential risks associated with the performance of project activities, GTI would adhere to established corporate health and safety policies and procedures. Protocols would include personnel training, proper protective equipment, engineering controls, monitoring, and internal assessments. GTI would perform a hazard and operability study prior to commissioning equipment. Equipment would also be outfitted with automatic shutdown controls. GTI's facility is equipped with adequate ventilation and gas leak sensors/monitoring equipment.

All hazardous waste materials, including catalysts, process water, and hydrocarbons, would be handled, stored, and disposed of properly. Process water would be chemically analyzed prior to discharge to confirm that no hazardous chemicals are present. Waste disposal would be performed by a qualified waste management company. No significant health risks are anticipated for work occurring at KBR's facilities, since KBR's role would be limited to office-based research. Nonetheless, KBR would also adhere to established corporate health and safety policies.

GTI and KBR would observe all applicable Federal, state, and local health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

[Bioenergy Technologies Office](#)

[This NEPA determination does not require a tailored NEPA provision.](#)

[Review completed by Jonathan Hartman, 05/18/2020](#)

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.

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: 5/18/2020

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: _____