

PMC-EF2a

(2.04.02)

**U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION**



RECIPIENT: Gas Technology Institute

STATE: IL

PROJECT TITLE : Refinery Upgrading of Hydropyrolysis Oil from Biomass

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000686	DE-EE0005992	GFO-0005992-001	GO5992

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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.

Rational for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the Gas Technology Institute (GTI) to collaborate with various industry partners to research and develop a cost effective way to convert biomass feedstock into transportation fuels such as gasoline and diesel, by researching and analyzing the compatibility of their biomass based hydropyrolysis oil and hydrocarbon liquids with existing petroleum refineries and ethanol plants.

Utilizing GTI's hydropyrolysis process at GTI's existing IH2-50 hydropyrolysis unit pilot plant, funding would be used for small-scale research and development pilot activities including; procurement of corn stover and woody biomass feedstocks; production and analysis of small quantities of hydropyrolysis oil from each feedstock; upgrading of the hydropyrolysis oil into hydrocarbon liquids including gasoline and diesel fractions; and laboratory testing and evaluation of the hydrocarbon liquids produced from each feedstock at an industry partner's (CRI/Shell Global Solutions) existing research and development hydrotreating facility. Funding would also be used to perform desktop and computer modeling research, data collection and analysis activities including: economic and risk analyses; life cycle analysis (LCA) studies and engineering design studies of a demonstration scale and a commercial scale catalytic hydropyrolysis unit.

Through previous DOE awards, GTI received DOE funding and NEPA approvals ((DE-EE0002873 (GFO-10-270, CX A9 & B3.6, 3/11/2010; GFO-0002873-003, CX A9 & B3.6, 5/26/2011); DE-EE0004390 (GFO-0004390-001, CX B3.6, 3/22/2011)), for research and development, preliminary design, preliminary detailed engineering, pilot plant testing and commissioning activities for the IH2-50 hydropyrolysis pilot unit, as well as feedstock preparation and procurement, and final product testing and characterization activities. This NEPA determination applies to small-scale research and development pilot activities using the IH2-50 hydropyrolysis pilot unit, laboratory activities at an existing hydrotreating facility, and research, data collection and analysis activities associated with development of a cost effective way to convert biomass feedstock into transportation fuels.

Under this DOE award, GTI proposes small-scale research and development pilot activities to produce hydropyrolysis oil and hydrocarbon liquids from the biomass feedstocks. These activities would be performed with the GTI IH2-50 hydropyrolysis pilot unit, which is located within GTI's 18 acre research and development facility at 1700 South Mount Prospect Road in Des Plaines, Cook County, Illinois. GTI completed a R&D questionnaire addressing the protocols in place for laboratory safety, risk management, chemical handling and hazardous waste disposal at their research and development facility. GTI complies with standard OSHA laboratory environmental and safety procedures and is monitored by a corporate Environmental, Safety and Health administrator. All handling and disposal of gases, chemicals, effluents and hazardous wastes comply with all appropriate regulations. All standard safety equipment is in

place at the facility. The facility operates under all applicable permits to conduct laboratory research and pilot project operations, including facility wastewater pretreatment, and hazardous materials handling/disposal. GMOs would not be used during this project.

This facility is in Cook County, which is an Environmental Protection Agency (EPA) designated nonattainment area for 8-Hr. Ozone and Particulate Matter (PM) 2.5. GTI states they have an air permit for their entire facility, that they provide an annual emission report for this facility to the Illinois EPA and do not need a specific air permit for specific research and development activities. GTI expects small quantities of CO₂ and H₂S to be a by-product of the process. The CO₂ would be vented and the H₂S would be captured by a caustic scrubber. The waste from the caustic scrubber would be handled and disposed of by a licensed waste hauler in accordance with EPA Resource Conservation and Recovery Act requirements. Due to the small-scale laboratory-type activities, small amount of emissions expected, and the scrubbers in place at the laboratory, DOE has determined any increase in emissions from the proposed project would be de minimis and not have an adverse effect on air quality.

At the GTI facility in Des Plaines, ~400 liters of hydrocarbon liquids would be produced over a one year period. These hydrocarbon liquids would be shipped to GTI's industry partner, CRI/Shell Global, for further laboratory testing and evaluation. Up to four shipments, ~ 100 liters (~25 gallons), in one gallon United Nation (UN) Certified containers with appropriate labels and certificates would be shipped via air to the CRI/Shell Global facility in Bangalore, India. GTI provided the DOE with a description of their shipment process and is required to comply with all applicable regulations prior to each shipment.

CRI/Shell Global's existing laboratories are within the Shell Technology Center Bangalore (STCB) located at #143/C4, Bommasandra Industrial Area, Off Hosur Road, Anekal Taluka, Bangalore, India, 560 099. CRI/Shell Global completed a R&D questionnaire addressing the protocols in place for laboratory safety, risk management, chemical handling and hazardous waste disposal at their research and development facility. CRI/Shell Global states the laboratory environmental and safety protocols in place at the facility conform to Shell Group safety standards and practices which comply with OSHA regulations. The protocols comply with Karnataka State Pollution Control Board rules and regulations as well as India's Central Pollution Control Board and Chief Controller for Explosives rules. All standard safety equipment is in place at the facility and the facility operates under all applicable permits to conduct laboratory research and development activities. GMOs would not be used during this project.

Additional desktop and computer modeling research, data collection and analysis activities proposed under this award are administrative in nature and do not involve laboratory, demonstration or construction activities.

Based on review of the project information and the above analysis, DOE has determined the proposed small-scale research and development activities within existing research and development facilities and additional research, data collection and analysis activities would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed activities are consistent with actions contained in DOE categorical exclusions A9 "information gathering, analysis and dissemination," and B3.6 "small-scale research and development, laboratory operations and pilot projects," and are categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

Obadiah Broughton 1/4/2013

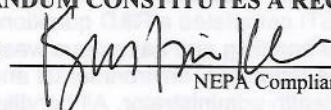
DOE funding: \$3,231,386

Cost share: \$866,125

Total Project Cost: \$4,097,511

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:


NEPA Compliance Officer

Date:

1/7/2013

FIELD OFFICE MANAGER DETERMINATION