PMC-ND
(1.08.09.13)

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

RECIPIENT: The University of Tennessee **STATE:** TN

PROJECT TITLE: Condensed Phase Catalysis Technology for Fuels and Carbon Products

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001637	DE-EE0008353	GFO-0008353-001	GO8353

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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Tennessee (UT) to develop and demonstrate an integrated biorefinery process design that combines the production of liquid fuels and renewable chemicals in order to maximize biomass use.

The proposed project involves preliminary design validation. All processes would be integrated in research laboratory settings and tested under simulated refinery conditions. Associated activities would involve bench-scale deconstruction and fractionation of commercially-available hardwood, softwood, and grass biomass samples into high purity streams of their three main components (cellulose, hemicellulose, and lignin), which would then be further refined into various prototype products. Biomass size reduction, chemical analysis of biomass and lignin, and the conversion of lignin into carbonized foam materials would take place at the UT Institute for Agriculture, Center for Renewable Carbon in Knoxville, TN. Catalytic conversion of lignocellulosic biomass into chemicals and liquid fuels, plus the design, testing, and optimization of new catalysts, would be performed at the University of Wisconsin (UW) in Madison, WI. Fractionation of lignocellulosic biomass in addition to the production and purification of cellulose, furfural, and lignin would be conducted by Glucan Biorenewables located at the UW Research Park. All facilities in which project work would occur are designed for these types of activities; therefore, no modifications or new permits, additional licenses and/or authorizations would be necessary.

Approximate quantities of materials that would be used and produced by the proposed laboratory activities are as follows. UT would process 5 kg of each biomass type (based on current project plans, these would include switchgrass, hybrid poplar, and yellow pine) and produce 100 g of carbon-based materials. Subrecipients would each utilize 1-5 kg of the lignocellulosic biomass feedstocks being studied, producing 1-5 kg of chemicals and liquid fuels (UW) and 1-5 kg of cellulose, furfural, and lignin (Glucan Biorenewables). Minor amounts of volatile emissions from biomass pyrolysis (on the order of 200 g total over the project duration) and particulate dust from biomass size reduction would be properly controlled within dedicated labs equipped with fume hoods. Liquid waste is not expected to exceed 5 L per day of dilute aqueous streams (containing <1000 ppm of organic material) that may be disposed of via existing sink/sewer systems. Other non-hazardous waste generated by the proposed project would be limited to standard quantities of laboratory disposable supplies.

The proposed project would also use small amounts of various hazardous materials including acids, organic solvents, and solid catalysts. Some of the solid catalysts have characteristics that are considered nanoscale, although the forms

in which they would be used pose minimal inhalation risk. All such handling of hazardous and nanoscale materials would occur in controlled laboratory environments by trained personnel following established university regulations and procedures for this type of work. Solvents used would be recycled within the process, and any remaining hazardous waste streams containing acid would be properly neutralized and disposed of via existing services in-place at these university facilities, in accordance with all applicable federal, state, and local environmental regulations.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is 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 the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 7/19/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 7/19/2018

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager