PMC-ND
(1.08.09.13)

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

RECIPIENT: Technology Holding LLC **STATE:** UT

PROJECT TITLE: Novel Method for Biomass Conversion to Renewable Jet Fuel Blend

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001926	DE-EE0008504	GFO-0008504-001	GO8504

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 Technology Holding LLC to optimize fermentation and catalysis processes to produce jet fuel and isoprene from biomass hydrolysate. The fermentation and catalysis technologies used would be matured from technology readiness level (TRL) 3 to TRL5. Catalysts previously developed by the team, would also be optimized for conversion of isoprene to dimer products. The project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point between each BP.

Proposed project activities would include:
• Strain engineering of E. Coli bacteria (e.g. genetic manipulations and directed evolution);
• Master cell banking of the isoprene production strain;
• Bioreactor optimization for isoprene production;
• Fermentations (14 L and 100 L batches);
• Catalyst development and optimization for the conversion of isoprene to dimer products;
• Characterization of dimer products as a blend for jet fuel;
• Jet fuel production (approximately 100 gallons);
• Techno-economic analysis.

All project activities would be performed by Technology Holding and its project partners at existing, purpose-built laboratory facilities that regularly conduct work similar in nature to that included in the scope of this project. No change in the use, mission or operation of existing facilities would be required. Technology Holding would carry out both 14 L and 100 L fermentations, as well as catalyst development, at its research and development facility in West Valley City, UT. Utah State University would run fermentations to produce jet fuel at its Synthetic Bio- manufacturing Facility in North Logan, UT. Princeton University would conduct data analysis and design, synthesis, and testing of catalysts at the Frick Chemistry Laboratory at Princeton's main campus in Princeton, NJ. The Naval Air Warfare Center, Weapons Division (NAVAIR) would perform data analysis, product characterization, and development of catalytic testing methods at its laboratory in China Lake, CA.

Fermentations would be performed using biomass hydrolysate as feedstock. Various materials, including industrial solvents and gases would also be used throughout the project. Genetic modifications would include the use of a non-pathogenic, industrially available strain of E. Coli. Pertinent safety procedures would be followed when handling this bacteria, including the use of a separate working area and disposal by a licensed third-party company. All handling of project materials would take place indoors, in laboratory environments. Risks associated with the project would be mitigated through adherence to established health and safety policies and procedures. Protocols would include employee training, the use of proper protective equipment, engineering controls, monitoring, and internal assessments. Technology Holding and its project partners would adhere to all Federal, state, and local health, safety, and environmental regulations.

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.

Include the following condition in the financial assisstance agreement:

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.

Notes:

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 11/26/2018

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: Casey Strickland Date: 12/6/2018

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