PMC-ND

(1.08.09.13)

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

RECIPIENT: University of Kentucky Research Foundation **STATE:** KY

PROJECT TITLE: Robust Engineered Catalysts for the Conversion of Waste Oleaginous Biomass Feedstocks to Fuel-like Hydrocarbons via Decarboxylation/Decarbonylation

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002636	DE-EE0010447	GFO-0010447-001	GO10447

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.
B3.15 Small-scale indoor research and development projects using nanoscale materials	Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to the University of Kentucky (UK) Research Foundation to continue investigating how to efficiently upgrade a waste feedstock, consisting almost exclusively of free fatty acids (FFAs) extracted from brown grease, using decarboxylation/decarbonylation (deCOx). The award aims to synthesize an optimized engineered catalyst via laboratory techniques for the purpose of determining the industrial potential of the deCOx process when producing renewable diesel.

The types of activities associated with the award would include data analysis, computer modeling, and laboratory research. Additional award activities would include those of an intellectual, academic, and analytical nature. Such activities would support the completion of a life cycle analysis (LCA) and techno-economic analysis (TEA). The award would consist of three budget periods (BPs). BP1 would verify the results from the previous deCOx experiments (separate effort from this award) and establish baseline assumptions and performance parameters. In BP2, an engineered catalyst would be synthesized and tested with a FFA waste feedstock in a fixed-bed reactor, and the reaction products analyzed and characterized. Using data collected from the first engineered catalyst and after completion of a TEA/LCA, computer modeling, and additional laboratory experiments, an optimized engineered catalyst would be synthesized. The final BP would involve testing the optimized engineered catalyst via a fixed-bed reactor, analyzation and characterization of the reaction products, and the execution of a final TEA/LCA.

The characterization of engineered catalysts, pre-processing of waste feedstock, and the initial waste feedstock upgrading experiments as well as computational studies would occur on UK's campus in the Center for Applied Energy Research Laboratory (Lexington, KY). Clariant Corporation would utilize their manufacturing facility in Louisville, KY for the synthesis and characterization of engineered catalysts. The National Renewable Energy Laboratory (NREL; Golden, CO) would be responsible for the final waste feedstock upgrading experiments. Lastly, the completion of each TEA/LCA would be performed at Saola Energy LLC's office space in Wichita, KS. All award activities would occur in existing facilities that are purpose-built for the type of work to be conducted for this award.

Facility modifications would not be required.

Award activities would involve the handling and use of hazardous materials, including flammable gases, industrial solvents, and nanomaterials. Handling, storage, and disposal of such materials would occur within controlled settings and would follow existing policies and procedures. All handling of nanomaterials would use proper control measures such as storage in screw cap containers, staff use of proper personal protective equipment (PPE) (i.e., safety glasses and nitrile gloves), and engineering controls (i.e., fume hoods) during handling. Existing health, safety, and environmental policies and procedures would be followed at all facilities to mitigate hazards to acceptable levels and would consist of employee training, PPE, engineering controls, monitoring, and internal assessments. Mitigated hazards would pose negligible risks to the public and environment. All activities would comply with existing federal, state, and local laws and regulations.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

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.

Notes:

Bioenergy Technologies Office
NEPA review completed by Corrin MacLuckie, 05/25/2023.

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: Andrew Montano Date: 5/25/2023

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