

PMC-ND
(1.08.09.13)

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



RECIPIENT: Georgia Institute of Technology

STATE: GA

PROJECT TITLE: CONVERSION OF 2,3-BUTANEDIOL TO BIOJET FUEL: SCALE-UP AND TECHNOECONOMIC ANALYSIS OF ENERGY-EFFICIENT SEPARATIONS AND FERMENTATIVE DIOL PRODUCTION

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002203	DE-EE0009263	GFO-0009263-001	GO9263

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 funding to the Georgia Institute of Technology to scale-up processes for conversion of 2,3-butanediol (BDO) to kerosenic biojet fuel using novel, specialized technologies. Detailed models of BDO separation technologies would be used to develop Techno Economic Analysis and Life Cycle Analysis of these conversion processes.

Proposed project activities would include conceptual design/modeling and bench-scale operation and/or initial pilot scale operation of fermentation, chemical separation, and chemical catalysis processes starting from corn stover biomass. It would also include the synthesis of materials used for separation and catalysis and chemical analyses of the final jet fuel product. The products created using corn stover would be hydrolysate, aqueous BDO, enriched BDO, and finally, jet fuel.

Georgia Institute of Technology (GT) is the primary recipient and would oversee the project. ExxonMobil Research & Engineering (EMRE), National Renewable Energy Laboratory (NREL), and Oak Ridge National Laboratory (ORNL) are subrecipients.

NREL would acquire and process about 5 tons of corn stover into as much as 500 gallons of hydrolysate. They would ferment the hydrolysate to produce and store up to 500 gallons of aqueous BDO. 5-10 gallons of BDO would be shipped to GT and ORNL and the remainder would be stored at NREL for subsequent tasks. EMRE would synthesize and distribute materials to GT and NREL to be used in adsorption systems. ORNL and GT would conduct enrichment of aqueous BDO. Based on results of systems used to enrich BDO, stored aqueous BDO would be converted on a larger-scale adsorption system to generate approximately 25 gallons of enriched BDO at NREL. Using BDO obtained from NREL, GT would create small samples of biojet fuel, slightly less than one tablespoon each, with a total of approximately 1 quart. EMRE would conduct chemical analysis of these biojet fuel samples, including measuring physical properties such as viscosity and freezing point to assess jet fuel quality.

All work would be done in existing purpose built laboratory facilities. No facility modifications or changes in the use, mission, or operation of existing facilities would be required as part of this project. No additional permits would be required in order to conduct any of the work activities.

Project activities would involve the use and handling of hazardous chemicals and industrial machinery. Any risks associated with the handling of these materials and equipment would be mitigated through adherence to established health and safety policies and procedures. Protocols would include personnel training, the use of personal protective equipment, monitoring, oversight, and engineering controls. All waste products would be disposed of by licensed waste management service providers. Georgia Institute of Technology and its project partners would observe all applicable environmental, health, and safety laws and 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.

Notes:

Bioenergy Technologies Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Shaina Aguilar on 11/13/20.

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: **Roak Parker**

NEPA Compliance Officer

Date: **11/16/2020**

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: