

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



RECIPIENT: University of Utah

STATE: UT

PROJECT TITLE: Entrained-Flow Biomass Gasification with Syngas Fermentation for Production of Sustainable Aviation Fuels

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002638	DE-EE0010453	GFO-0010453-001	

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 University of Utah (U of U) to further establish and test a technology that would create synthesis gas suitable for production of sustainable aviation fuel via fermentation. The proposed technology would create the synthesis gas from woody and agricultural biomasses and wet waste from wastewater treatment via laboratory gasification processes. Award activities involve a combination of experimental tests, reactor and process modeling, and feasibility studies.

Award activities include education, data analysis, computer modeling, preliminary engineering/design, and laboratory research. Additional award activities would include those of an intellectual, academic, and analytical nature. Such activities would support the completion of a techno-economic analysis (TEA) and life cycle analysis (LCA). The award consists of three Budget Periods (BPs). BP1 would involve verification activities to certify data and performance metrics, establish benchmark and baseline targets, and confirm project details. The first samples of bioliquid would be produced, first slurries created and evaluated, and initial gasification tests started in BP2. Additionally, the reactor model, TEA framework, and baseline LCA model would be developed in BP2. BP3 would focus on the optimization and preparation for future scale-up. The physical activities include long-term gasification tests, design and construction of a syngas conditioning system, and improvement and employment of the models developed in BP2 to predict costs and environmental performance of the proposed technology.

U of U would be responsible for the mixing of liquid feedstocks, gasification of feedstocks, and testing of gasification performance using laboratory techniques in an off-campus laboratory in Salt Lake City, UT. At their existing Research & Development (R&D) facility, Ensyn Technologies, Inc. (Ensyn; Renfrew, Ontario, Canada) would prepare the biomass-based pyrolysis liquid for use in the gasification process. Linde Inc (Tonawanda, NY) would perform TEA and scale-up deployment analysis activities. Guidance on syngas quality and technology development would be provided by LanzaTech (Skokie, IL). Lastly, the Pacific Northwest National Laboratory would perform TEA/LCA activities in Richland, WA. All facilities are preexisting purpose-built facilities for the type of work to be conducted for this award. Facility modifications would not be required.

Award activities would involve typical hazards associated with high pressure, high temperature, carbon monoxide, and other hazardous components and chemicals. The system at U of U is enclosed, and the risks are contained within the operating vessels. All research activities require the proper safeguards including personal protective equipment, specific operating procedures and checklists, system monitors, and emergency equipment. All employees, including

students, must undergo safety training. At Ensyn's R&D facility, all activities are subjected to review and compliance with worker safety and environmental regulations. Any risk to the public would be associated with failure of operations which would be mitigated by regular inspections, proper procedures, worker training, and safeguards on equipment. Existing health, safety, and environmental policies and procedures would be followed at all facilities associated with the award to mitigate hazards to acceptable levels. 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. A diversity, equity, and inclusion (DEI) plan would be implemented to encourage the inclusion of individuals from underrepresented groups in fields of science, technology, engineering, and mathematics (STEM).

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, 08/09/2023.

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.

DOE has determined that work to be carried out outside of the United States, its territories and possessions is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

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: 8/9/2023

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: _____
Field Office Manager

Date: _____