

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



**RECIPIENT:** University of California Riverside

**STATE:** CA

**PROJECT TITLE:** Scale-up Demonstration of Hybrid Catalytic Biorefining of Biomass to Sustainable Aviation and Marine Fuels

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-002638	DE-EE0010455	GFO-0010455-001	

**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 California, Riverside (UCR) to design and test laboratory equipment for biomass liquefaction using co-solvent enhanced lignocellulosic fractionation (CELf) technology. The award aims to generate high-quality intermediates via Athermic Oxygen Removal (AOR) and heavy fuel oil (HFO) blending with CELf lignin for the successful conversion into aviation and marine fuels, respectively.

Award activities include data analysis, computer modeling, preliminary engineering/design, laboratory research, and modifications to existing facilities. 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 consists of three Budget Periods (BPs). BP1 would involve initial verification activities with DOE to confirm benchmark data. The design, procurement, permitting, installation, and initial testing of CELf technology would occur in BP2. BP3 would focus on validation and optimization activities aimed at improving yields of aviation fuels and marine fuel blending targets.

UCR would be responsible for the design, procurement, installation, and testing of equipment associated with the CELf technology including a 320-liter Hastelloy reactor vessel, 70 kilowatt (kW) closed-loop thermal oil heater, a 50-kW closed-loop water chiller, a solvent recovery system, an acid/base delivery system, and a hydraulic press. These activities as well as TEA/LCA of a hypothetical production plant would occur at their off-campus research center, the College of Engineering Center for Environmental Research and Technology (CE-CERT) in Riverside, CA. The University of Tennessee, Knoxville (UTK; Knoxville, TN) would perform fractionation and blending of CELf lignin with HFO at a dedicated laboratory facility. Hydrodeoxygenation of CELf lignin using a AOR catalyst would occur at the College of Environmental Science and Forestry laboratory of the State University of New York (SUNY) in Syracuse, NY.

Facility modifications to a room in UCR's CE-CERT are required for CELf biomass liquefaction activities. Modifications include the installation of heating and cooling equipment for the primary reactor vessel and associated upgrading of the electrical system. These modifications require a new site permit and would involve drafting of structural, electrical, mechanical, and plumbing drawings. The heater and chiller are mobile units and are non-structural. The reactor would be installed to an existing structural scaffold inside the room and would not require additional permits. All facility modifications would occur indoors and not result in any ground disturbance. Additionally,

a new gas chromatograph-mass spectrometer would be installed in SUNY's laboratory facility. No facility modifications or ground disturbing activities are associated with SUNY or UTK.

Award activities would involve typical hazards associated with the use and handling of hazardous materials, including industrial solvents, corrosive acids, caustic bases, HFO, and metal catalysts. All such handling would occur in-lab. Each facility associated with award activities is dedicated to proper hazardous material handling and disposal practices and would be managed in accordance with federal, state, and local environmental regulations. Existing university environmental, health, and safety policies and procedures would be followed to mitigate hazards to acceptable levels, including employee training, proper personal protective equipment, 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. 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).

## 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.

The proposed action is categorically excluded from further NEPA review.

## SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:



Signed By: Andrew Montano

NEPA Compliance Officer

Date:

8/9/2023

## 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: \_\_\_\_\_