U.S. Department of Energy
Categorical Exclusion Determination Form

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Proposed Action Title: Energy and Carbon Optimized Synthesis for the Bioeconomy ECOSynBio (FOA No. DE-FOA-0002387) & ECOSynBio SBIR/STTR (FOA No. DE-FOA-0002388) Programs

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): CA; CO; DE; FL; GA; IL; KY; LA; MA; MI; MN; NY; OH; OR; TN; WA; WI

Proposed Action Description:

The ECOSynBio Programs seek to develop new technologies to decarbonize biorefining processes used across the energy, transportation, and agriculture sectors. ECOSynBio teams will utilize various methods to optimize biofuel manufacturing, including, (1) carbon-optimized fermentation strains that avoid CO2 waste; (2) engineered organisms that use a mix of different sources of energy and carbon, and avoid evolving CO2; (3) biomass-derived sugar or carbon oxide gas fermentation with internal CO2 recycling; (4) cell-free carbon-optimized biocatalytic biomass conversion and/or CO2 use; and (5) cross-cutting cabron-optimized bioconversion methods that have the potential for high-impact emissions reductions. If successful, ECOSynBio technologies will enable new pathways for biofuel conversion that reduces carbon waste, prevents the loss of CO2 emissions, and maximizes the amount of renewable fuel a conversion process yields.

The ECOSynBio Program is composed of 15 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. This Determination covers 9 of the 15 projects (listed in Attachment A). All 9 projects fit within the class of actions identified under the DOE Categorical Exclusion identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

☑ The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

☑ The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: GEOFFREY GOODE Digitally signed by GEOFFREY GOODE Date: 2021.07.23 17:00:35 -04'00' Date Determined:

(This form will be locked for editing upon signature)

Attachment A: Projects in the Energy and Carbon Optimized Synthesis for the Bioeconomy, ECOSynBio (FOA No. DE-FOA-0002387) & ECOSynBio SBIR/STTR (FOA No. DE-FOA-0002388) Programs

Full Application Control Number	Lead Organization	Project Title	Categorical Exclusions
2387-1505	LANZATECH INC.	Carbon-Negative Chemical Production Platform	A9; B3.6
2387-1511	UNIVERSITY OF WISCONSIN-MADISON	Acetate as a Platform for Production of Renewable Chemicals	A9; B3.6
2387-1512	STANFORD UNIVERSITY	Disruptive Technology for Carbon Negative Commodity Biochemicals	B3.6
2387-1513	UNIVERSITY OF DELAWARE	Bioenergy production based on an engineered mixotrophic consortium for enhanced CO2 fixation	B3.6
2387-1517	UNIVERSITY OF CALIFORNIA, BERKELEY (formerly UC-DAVIS)	A Microbial Consortium Enabling Complete Feedstock Conversion	B3.6
2387-1522	UNIVERSITY OF CALIFORNIA: IRVINE	Carbon-Efficient Conversion of Carboxylic Acids to Fuels and Chemicals	B3.6
2387-1524	HARVARD COLLEGE	CIRCE: Circularizing Industries by Raising Carbon Efficiency	B3.6
2387-1534	UNIVERSITY OF MINNESOTA: TWIN CITIES	Cell-free bioelectrocatalytic platform for carbon dioxide reduction	B3.6
2387-1557	OHIO STATE UNIVERSITY: COLUMBUS CAMPUS	A Novel Integrated Fermentation Process with Engineered Microbial Consortia for Butanol Production from Lignocellulose Sugars without CO2 Emission	A9; B3.6