

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



**RECIPIENT:** The Rector and Visitors of the University of Virginia

**STATE:** VA

**PROJECT TITLE :** Low Temperature CO<sub>2</sub> Methanation for Biogas-to-Renewable Natural Gas Conversion via Advanced Ni-Based Catalysts

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002396	DE-EE0009772	GFO-0009772-001	G09772

**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 Virginia (UVA) to develop a low-temperature process using nickel catalysts to convert carbon dioxide found in biogas to methane; producing a quality renewable natural gas (RNG) ready for pipeline injection.

DOE has not previously completed any NDs for this specific award, but DOE previously completed an ND (FOA-0002396-001; A9, B3.6; 5/20/2021) for Funding Opportunity Announcement (FOA) DE-FOA-0002396. The ND for the FOA applies to initial verification activities for awards issued under the FOA, including this award (DE-EE0009772). Initial verification activities for this award would include evaluating available data to establish baseline performance metrics and evaluating data that would be integrated into subsequent design activities.

This award would be completed over three Budget Periods (BPs), with go/no-go decisions after each period. Award activities include verification, establishing performance benchmarks using nickel (Ni) nanoparticle catalyst and biogas, an iterative catalyst synthesis process, characterization activities, testing, modeling, fabrication of a scaled-up reactor integrated with the developed Ni catalyst, demonstration and reporting. Testing would utilize approximately 12 compressed cylinders of biogases to inform development of the catalysts. Biogas would be compressed and bottled into cylinders at the City of Longmont's municipal wastewater treatment and resource recovery facility (Longmont facility) (Longmont, CO) and the South Platte Renew wastewater treatment facility (South Platte facility) (Englewood, CO). A preexisting gas compressor is available for filling gas cylinders at the Longmont facility. A new, mobile gas compressor would be commissioned at the South Platte facility to facilitate compressing and filling gas cylinders.

The National Renewable Energy Laboratory (NREL) and UVA laboratories are purpose-built settings that support the type of work to be conducted in this award. The activities proposed at the Longmont and South Platte facilities are currently in practice as commercial operations. No ground disturbance or facility modifications would be required.

Effluent gas emissions(e.g. mixtures of biogas, methane, CO<sub>2</sub>, Hydrogen, CO, and inert gases) may be emitted as a result of testing activities in NREL and UVA laboratories. Emissions would be vented through laboratory local exhaust ventilation systems at a rate that would be negligible to air quality standards. Testing activities proposed at the Longmont facility would not create new emissions not already emitted at the facility from commercial operations. Compression and bottling of biogas at the Longmont and South Platte facilities is an existing commercial practice at both facilities. Award activities would involve the handling and use of laboratory-scale quantities of hazardous

materials used in catalyst synthesis in controlled laboratory settings (e.g. nickel, zinc, nickel copper, nickel cobalt, nanoparticles, cerium oxide, titanium oxide, or other metal oxides). All activities using nanoscale materials would be conducted in controlled laboratory settings, and would be handled using proper engineering controls until adhered to surface materials or dissolved in solvents. All handling and storage of hazardous materials would follow existing policies and procedures for storage, handling and disposal of these materials. Existing government, university and corporate health, safety and environmental policies and procedures would be followed at all facilities, including personnel training, proper personal protective equipment (PPE), engineering controls, monitoring, and internal assessments.

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 (BETO)  
NEPA review completed by Amy Lukens, 3/30/2022.

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



Casey Strickland

NEPA Compliance Officer

Date: 3/31/2022

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