PMC-ND

(1.08.09.13)

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

RECIPIENT: SkyNRG Americas **STATE:** OR

PROJECT TITLE : Landfill Biogas to Sustainable Aviation Fuel (SAF)

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002396	DE-EE0009762	GFO-0009762-001	

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 SkyNRG Americas to complete baseline verification of a conversion pathway that produces aviation biofuel from landfill biogas (LFG). SkyNRG would also develop plans for a facility capable of implementing the LFG-biofuel conversion pathway at demonstration-scale. If the award were to proceed to Phase 2 (Phase 1 and 2 are described further below) the demonstration-scale biofuel production plant would be constructed and operated to demonstrate commercial viability.

Activities would be completed over two phases of work: (Phase 1) initial verification and design basis, and (Phase 2) detailed design, fabrication, and operation of the demonstration-scale plant. A downselect review would be completed near the end of Phase 1 activities, after which DOE would issue a decision regarding continuation into Phase 2. DOE previously completed a NEPA Determination (ND) for this award's Funding Opportunity Announcement (FOA) (FOA-0002396-001; CX: A9, B3.6; 05/20/2021) which only applies to initial verification activities for all awards issued under the FOA (DE-FOA-0002396). This ND will serve as a review of Phase 1 activities ND FOA-0002396-001 did not apply to. This ND does not apply to Phase 2 activities.

Early award activities would involve the conversion of LFG to biofuel. This would be accomplished in four general steps: LFG collection, conversion of LFG to hydrocarbon broth, ethanol recovery from the broth, and ethanol conversion to aviation biofuel.

Approximately 240,000 standard cubic feet (scf) of raw LFG would be collected and compressed at Modern Landfill (Youngstown, NY). Compression and bottling equipment would pair with preexisting purpose-built LFG collection facilities and equipment. LFG would be analyzed during collection and compression. Compressed LFG would be transported to Linde, Inc. (Tonawanda, NY) with trailers designed for transporting compressed gases.

At Linde, LFG would be converted into syngas, which would immediately be subjected to syngas fermentation to produce a hydrocarbon broth. This would be accomplished by coupling Linde's hot oxygen burner (HOB) technology with LanzaTech's preexisting pilot-scale skid capable of producing hydrocarbon broth via gas fermentation. Operation of the coupled systems would occur for approximately fifteen days. The resulting broth would be stored in 20L carboys which would be frozen and packaged prior to transport. Frozen broth would be transported to LanzaTech (Skokie, IL) for ethanol recovery in laboratory facilities.

After recovering ethanol from the hydrocarbon broth, approximately 500 mL of the ethanol would be transported to the Pacific Northwest National Laboratory (PNNL) (Richland, WA). PNNL would convert the ethanol to aviation biofuel in their laboratory facilities.

To complete conversion activities at Linde, approximately 96,000 scf of oxygen would be consumed. Approximate gas emissions would include 240,000 scf of carbon dioxide, 8 scf of carbon monoxide, and 6 scf of hydrogen.

Facility planning activities would begin after completion of LFG-biofuel conversion activities. Planning activities would include information gathering, analysis, document preparation, and preliminary engineering and design activities. These activities would address key prerequisites such as regulatory approvals, environmental planning, basic design plans, risk mitigation plans, project management plans, business plans, facility site requirements, site selection, life cycle analysis (LCA), technoeconomic analysis (TEA), financial requirements, and negotiating and finalizing agreements with third parties.

All facilities at Modern Landfill, Linde, LanzaTech, and PNNL are preexisting purpose-built facilities for the type of work to be conducted for this award. Facility modifications would include pipe installations at Linde. Piping would be installed to connect the LFG source to the HOB (outdoors), the HOB to the LanzaTech pilot skid (indoors), and the pilot skid to a vent stack (outdoors). Linde personnel would install the piping following preexisting safety protocols. Facility modifications would not be required for any other facility. Activities at Linde would occur indoors and outdoors but all activities would happen within controlled settings on Linde property. Outdoor activity locations would be surrounded with barricades, and the Linde property is surrounded by a security perimeter fence.

Award activities would involve the handling and use of hazardous materials, including biofuels, hazardous chemicals, pressurized gases, and flammable gases. All such handling and storage would follow existing policies and procedures for handling and disposal of these materials. Safety reviews would be conducted before transporting hazardous materials or operating of any equipment involved with the LFG-biofuel conversion pathway. Additional hazards would include the operation of machinery, exposure to hot surfaces, and noise exposure. Gas fermentation activities would involve the use of microorganisms. All organisms used for this award would fall under the lowest risk categories concerning individual and public health as described by federal agencies, i.e. Biosafety Level 1 (BSL-1) or Risk Group 1 (RG1). Existing corporate and government 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.

Include the following condition in the financial assisstance agreement:

Any work to be conducted under Phase 2 would require additional NEPA review, whether as part of this award or another award.

Notes:

Bioenergy Technologies Office (BETO)
This NEPA determination requires legal review of the tailored NEPA provision.
NEPA review completed by Dan Cahill, 2/25/2022.

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: Electronically Signed By: Casey Strickland Date: 3/1/2022

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] 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: _____ Date: _____

Field Office Manager