

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



RECIPIENT: Marquis R & D Energy LLC

STATE: IL

PROJECT TITLE: CARBON REFINING: CORN ETHANOL 2.0

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002638	DE-EE0010468	GFO-0010468-001	GO10468

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.)

B5.15 Small-scale renewable energy research and development and pilot projects

Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Marquis R&D Energy LLC (Marquis) to assemble and operate a gas fermentation pilot plant at an existing Marquis ethanol production facility in Hennepin, IL. The award aims to produce ethanol from the waste carbon dioxide (CO₂) produced during the existing facility's corn fermentation process as well as produce hydrogen (H₂) from electrolysis.

The award consists of three budget periods (BPs). BP1 consists of award verification activities. BP2 would focus on pilot design, process integration, construction of necessary infrastructure, and installation of the pilot plant. The operation of the pilot plant as well as process control and optimization, and decommissioning activities would occur during BP3.

LanzaTech Global Inc. (Skokie, IL) would be responsible for designing and engineering activities as well as the coordination of the transport, installation, integration, and operation of the gas fermentation pilot plant. The pilot plant is existing and currently in operation at the Advanced Energy Research Facility in Edmonton, AB, Canada where it would be decommissioned, packaged, and transported to the Marquis ethanol production facility.

The installation of the gas fermentation pilot plant would involve the installation of multiple skid units outdoors and would require the pouring of an 86.3-foot (ft) by 32.8 ft concrete pad within an existing compacted gravel area that was used as a laydown area during the construction of the ethanol facility. This area is currently used for vehicular parking. Additionally, the pilot plant would require modifications to the existing ethanol production facility. These modifications consist of the installation of all necessary tie-ins from the existing facility to the pilot plant. This includes routing the CO₂ feed from a compressor in addition to routing water, cooling water, chilled water, hydrogen, nitrogen, instrument air, and liquid and gaseous wastes. The award would utilize existing pipe racks as much as possible and install temporary pipe racks as necessary. All equipment installations and facility modifications are temporary and would occur within the existing footprint of the ethanol production facility. No change in the use, mission, or operation of the existing facility would occur as a result of the award.

Award activities would require an air permit be obtained to allow an additional mode of operation where a slip stream of CO₂ from the ethanol facility's fermentation scrubbers can be routed to the pilot plant. The air permit would include any emissions points from the pilot plant. It is anticipated that gaseous streams generated from the pilot plant be controlled by a temporary flare. Additionally, the Marquis Energy-Illinois Stormwater Pollution Prevention Plan for Industrial Activities would be updated to include the pilot plant operations. These permits need to be obtained before construction and operation of the pilot plant.

Award activities would involve typical hazards associated with the use and handling of flammable and toxic gases, use and handling of hazardous chemicals, and hazards related to noise from rotating equipment. Existing health, safety, and environmental policies and procedures would be followed to mitigate hazards to acceptable levels, including a Process Safety Management Program, fixed gas monitors with fail-safe interlocks and audible alarms, administrative controls, proper personal protective equipment, training, and engineering controls. Mitigated hazards would pose negligible risks to the public and environment. All activities would comply with existing federal, state, and local laws and regulations. Additionally, the award would involve the use of genetically engineered microorganisms. Any cultures generated throughout the project would be mixed with a detergent (Virkon) under aerobic conditions to lyse cells and would be disposed of in a non-hazardous liquid waste stream. These precautions would ensure live bacteria would not be introduced into a public waste stream.

DOE completed Section 106 of the National Historic Preservation Act (NHPA) consultation with the Illinois State Historic Preservation Office (SHPO). A letter of concurrence (LOC) was received from the Illinois SHPO on 1/14/2024 stating a finding of “no historic properties are affected.” Per the LOC, Section 106 of the NHPA requirements for the award have been satisfied.

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 aside from consultation already mentioned.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

No construction work may occur until all appropriate permits have been obtained/approved.

Notes:

Bioenergy Technologies Office
NEPA review completed by Corrin MacLuckie, 1/18/2024.

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: 1/19/2024
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: _____ Date: _____
Field Office Manager