

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



RECIPIENT: Trillium Renewable Chemicals

STATE: TN

PROJECT TITLE : Sustainable Manufacturing of Acrylonitrile

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-EE0010208	DE-EE0010208	GFO-0010208-001	

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 Trillium Renewable Chemicals to design, construct, commission, and operate a system to convert plant-based feedstocks (glycerol) into bio-based acrylonitrile (bio-ACN). Carbon fiber would be produced from the bio-ACN and characterized. The project would be completed over two Budget Periods (BPs) with a Go/No-Go decision point between each BP. This NEPA determination is applicable to both BPs.

A novel purification process would be designed and optimized. A pilot-scale plant that would convert glycerol to bio-ACN would be designed, constructed, and evaluated. Bio-ACN and spun carbon fibers would be produced, and their composition would be compared to ACN derived from fossil feedstocks. An engineering design of a full-scale plant would be completed. Lifecycle assessments (LCA) and techno-economic analyses (TEA) of the bio-ACN process would be conducted throughout.

Proposed project activities by location are listed below:

Trillium Renewable Chemicals – Knoxville, TN; Minneapolis, MN; Madison, AL

- Project management and overall technical oversight

Koch Modular – Paramus, NJ

- Engineering designs

MATRIC – South Charleston, WV

- Design, build, construct, and operate integrated pilot plant demonstration for producing bio-ACN from glycerol

Solvay Carbon Fibers R&I – Piedmont, SC

- Process validation and confirmation that the bio-ACN is capable of producing polyacrylonitrile precursor of equivalent specifications at lab scale. The polymer would then be processed into fiber and evaluated for conversion capability to

carbon fiber with related data analysis and assessment of the polymer and fiber properties.

Solvay Technology Solutions – Stamford, CT

- Analysis and evaluation of bio-ACN fabrication and the intermediates

Solvay Composite Materials – Wrexham, Wales

- LCA of the bio-ACN process.

Project activities would occur in facilities that are purpose-built for the type of work being proposed. No changes in the use, mission, or operation of existing facilities would be required as part of this project. The facility has all applicable permits in place. Based on current test plans, it is anticipated that emissions would be minimal and laboratory scale and would fall within permit allowances. Participants would confirm existing water and air permits are sufficient. If not, a mitigation plan would be developed (e.g., apply for additional permits and/or change scope).

Project activities would involve the use and handling of machinery and various toxic and hazardous chemicals. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures, including employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. All waste products would be disposed of by licensed waste management service providers. Trillium and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Advanced Manufacturing Office
Review completed by Shaina Aguilar on 8/16/22.

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: **Casey Strickland**

NEPA Compliance Officer

Date: 8/22/2022

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: _____