

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



RECIPIENT: Braskem

STATE: PA

PROJECT TITLE : Development of Infinitely Recyclable Single-Polymer Chemistry Bio-based Multilayer Films Using Ethylene-Carbon Monoxide Copolymers

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002473	DE-EE0009948	GFO-0009948-001	

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 Braskem America to produce and evaluate multiple plastic films for food packaging applications. Braskem would focus on producing films which would be infinitely recyclable and require less energy for production.

DOE has not previously completed any NEPA Determinations (NDs) for this specific award, but DOE previously completed an ND (GFO-Single-Use-Plastic-FOA-Verification-001; A9, B3.6; 05/17/2021) for Funding Opportunity Announcement (FOA) DE-FOA-0002473. The ND for the FOA applies to initial verification activities issued under the FOA, including this award (DE-EE0009948).

The plastic films designed and produced during award activities would be multilayer, polymer films created from plant feedstocks (e.g. corn). Approximately 10kg of polymers would be produced, characterized, and used to produce plastic films. Polymers and films would be produced by Braskem (Pittsburgh, PA) and the University of Illinois at Urbana-Champaign (UIUC) (Urbana, IL). Conventional films and films produced during award activities would be characterized, evaluated, and compared to each other using conventional laboratory analytical techniques and technologies. Characterization activities would be completed by Braskem, UIUC, and Princeton University (Princeton, NJ).

Films would be used to create food pouches. While the organization responsible for producing food pouches has not been decided, such activities would only be completed by an existing organization which produces food pouches as part of their normal operations. The food pouches would be evaluated by Unilever PLC (Trumbull, CT), cleaned, and mechanically recycled. Recycled polymers would be characterized and evaluated to determine recyclability of the films used to produce the pouches. Laboratory tests would be conducted to determine how blending recycled polymers with newly synthesized polymers would affect recyclability.

All facilities at Braskem, UIUC, Princeton, and Unilever are preexisting purpose-built facilities for the type of work to be conducted for this award. Facility modifications would not be required. Award activities would involve the handling and use of hazardous materials, including industrial solvents and chemical reagents. All such handling and storage would occur within controlled laboratory settings and would follow existing policies and procedures for handling and disposal of these materials. Award activities would involve typical hazards associated with synthesis of plastics, including processes and equipment which would produce elevated levels of heat and pressure. Existing corporate and

university 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.

Additional award activities would include those of an intellectual, academic, and analytical nature. Such activities would support outreach with local schools, classroom instruction, development of educational materials, and the completion of a life cycle analysis (LCA) and techno-economic analysis (TEA).

DOE has considered potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate adverse impacts on these resources. A diversity, equity, and inclusion (DEI) plan would be implemented to encourage the inclusion of individuals from underrepresented groups in fields of science, technology, engineering, and mathematics (STEM).

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Bioenergy Technologies Office (BETO)
NEPA review completed by Dan Cahill, 7/20/2022.

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
NEPA Compliance Officer

Date: 7/20/2022

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: _____