PMC-ND
(1.08.09.13)

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

RECIPIENT: University of Wisconsin-Madison **STATE:** WI

PROJECT TITLE: Designing Recyclable Biomass-Based Polyesters

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002245	DE-EE0009305	GFO-0009305-001	

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 University of Wisconsin-Madison (UW-Madison) to fabricate and test novel biomass-based polyesters for packaging applications. The polyesters would be designed to be biodegradable, chemically recyclable, and would have improved mechanical/thermal properties, as compared to polymers currently used in commercial packaging.

Proposed project activities would consist of computer modeling/analysis, material synthesis, material characterization, test sample processing, and material recycling process development. Various polyester input materials would be synthesized, as well as the biomass-based polyesters themselves. Input materials to be produced would include monomers, polymers, and catalysts. Polyesters would be synthesized with between 50 – 100% biomass content. All materials synthesis would occur at laboratory scales of less than 5 kg. UW-Madison (Madison, WI), the National Renewable Energy Laboratory ('NREL' – Golden, CO), the University of Oklahoma ('OU' – Norman, OK), and Colorado State University ('CSU' – Fort Collins, CO) would all perform material synthesis at their respective laboratory facilities.

Material characterization would consist of various measurements of the polyesters and input materials. Properties to be measured would include biodegradability, thermal resistance, and mechanical resistance, among others. Data collected would then be used to develop predictive software for material analysis. Material characterization would be performed by UW-Madison, NREL, OU, CSU, Pyran (Madison, WI), and the Amcor Innovation Center (Neenah, WI) at their respective laboratory facilities.

Test sample processing would consist of the processing of the polyester input materials into thin films and coatings. Previously synthesized input materials would be used for test sample processing. Test sample processing would be performed by the Stora Enso Biomaterials Innovation Centre at its laboratory facility in Nacka, Sweden.

No physical modifications to existing facilities, ground disturbance, or changes to the use, mission, or operations of existing facilities would be required. No permits or authorizations would be required.

Project work would involve the use and handling of reactive chemicals, flammable materials, and equipment operating at high pressures and temperatures. All such handling would occur in controlled laboratory environments that perform analytical chemistry as part of their regular course of business. To mitigate potential hazards, UW-Madison and its

project partners would adhere to established institutional health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, engineering controls, and monitoring. Flammable materials would be stored in appropriate flammable cabinets. Chemical reactions would be performed under flume hoods when applicable. All waste materials would be disposed of by qualified waste management service providers. UW-Madison and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

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
This NEPA determination does not require a tailored NEPA provision.
Review completed by Jonathan Hartman, 05/25/2021

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: Roak Parker Date: 5/26/2021
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