PMC-ND

(1.08.09.13)

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

RECIPIENT: Ford Motor Company **STATE:** MI

PROJECT TITLE : Carbon Capture to Reach Carbon Neutral Vehicles: CO2-Derived Platform Molecules for Polyurethane Foams

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-EE0010206	GFO-0010206-001	GO10206

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.
B3.15 Small-scale indoor research and development projects using nanoscale materials	Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to the Ford Motor Company to formulate, develop, test, and perform molding trials of advanced flexible polyurethane (PU) foam used for automobiles for seating and other applications such as for crash protection and noise, vibration, and harshness (NVH) reduction. The project would be completed over three Budget Periods (BPs) with a Go/No-Go decision point between each BP. This NEPA determination is applicable to all three BPs.

Carbon dioxide (CO2) sourced polyol precursors that meet required viscosity and thermal stability metrics would be developed, optimized, and scaled-up. Material feedstock formulations/blends would be created, enhanced, and scaled up through the use of functional materials to meet automotive validation criteria. Down selection would occur to identify the final PU feedstock, of which approximately 100 kg would be produced. This would be utilized to create approximately 10 kg of flexible foam which would be applied to backing for use in the manufacture and testing of seating and NVH foam application. This would be tested according to performance specifications and to ensure it meets critical automotive requirements. Economic viability and environmental impacts of the process would be assessed through technoeconomic and lifecycle analyses and compared to those of conventional feedstock-based products.

Ford Motor Company in Dearborn, MI would perform formulation, development, and testing activities, including initial verification and end user product validation. The team at the Manufacturing Demonstration Facility at Oak Ridge National Laboratory (ORNL), Oak Ridge would develop, fabricate, and test products. They would lead much of the fundamental characterization effort for this work such as mechanical, viscoelastic, optical, chemical, density, and thermal stability testing using laboratory equipment. They would also perform the technoeconomic and lifecycle analyses. Participants at Troy Polymers, Inc., in Madison Heights, MI would evaluate synthetic routes to produce

polyols based on carbon dioxide as input material. They would synthesize and analyze polyols which would be used to produce sample PU materials.

No changes in the use, mission, or operation of existing facilities would be required as part of this project and no additional permits would be required in order to conduct any of the work activities. Project activities would involve the use and handling of hazardous materials including nanomaterials, industrial solvents, and isocyanates. Solid waste would be generated in the form of cuttings from waterjet cutting, dust from machining, and test samples. Liquid waste would be generated in the form of trace amounts of waterjet cutter spent oil, carbon dioxide sourced polyol, and diisocyanate. Any associated risks would be mitigated through adherence to established health and safety policies and procedures including employee training, the use of personal protective equipment, monitoring, oversight, and engineering controls. When handling nanomaterials, activities would include the use of a chemical fume hood, safety glasses or goggles, appropriate attire, examination gloves, and respiratory protection. All waste products would be disposed of by licensed waste management service providers. Ford Motor Company 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:

Advanced Manufacturing Office
Review completed by Shaina Aguilar on 7/18/22.

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.

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: 7/19/2022

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