

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** [Purdue University](#)**STATE:** IN**PROJECT TITLE:** [Modeling Feedstock Performance and Conversion Operations](#)

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
<a href="#">DE-FOA-0002029</a>	<a href="#">DE-EE0008910</a>	<a href="#">GFO-0008910-001</a>	<a href="#">GO8910</a>

**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 federal funding to Purdue University to develop methods for processing corn stover biomass into concentrated slurries. This process would be developed so as to facilitate corn stover transport as a pumped fluid, rather than as a solid material.

Purdue University and its project partners would develop rheology models (i.e. flow models) of corn stover, characterize the physical properties of corn stover particles, and define operational parameters to guide the future development of biomass feeding, liquefaction and pumping systems. Physical experiments would be performed using corn stover to assess the impact on slurry formation of varying the parameters at various points in the pretreatment process (e.g. fractionation, pelleting). Corn stover pellets would be produced and used to create slurries via liquefaction. The rheology of the resulting slurries would then be assessed through laboratory characterization.

Specific project activities would include the following:

**Task 1: Verification** – This task would consist of baseline verification activities. Purdue University and its project partners would provide DOE with data and laboratory/facilities access to demonstrate the viability of the project.

**Task 2: Corn Stover Preparation/Pelleting** – Approximately 3 bales of corn stover biomass would be processed into pellets/aggregated materials for further analysis. Work activities to be performed would include fractionation, material characterization, rheological measurements (e.g. flow analysis), and pellet formation. Biomass would be provided by Idaho National Laboratory (INL). Processing and characterization work would be performed by Purdue University, Forest Concepts, INL, and AdvancedBio.

**Task 3: Dynamic Linear Modeling (Computational Modeling of Rheology)** – Computer modeling activities would be performed to model the rheological properties (i.e. flow modeling) of material solids, pellets, and slurry formations.

All modeling under this task would be performed by Purdue University.

Task 4: Characterization of 5 Fractions of Corn Stover – This task would consist of the material characterization (e.g. compositional analysis, rheological measurements, and physical properties analysis). Experiments would be performed at 1 or 10 L scale. All characterization activities under this task would be performed by Purdue University.

Task 5: Materials Data Base – Data generated from Task 4 experiments would be used to develop a materials data base. All task work would be performed by Purdue University, with additional input/assistance from project partners, as needed.

Task 6: TEA: Techno-Economic Assessment – This Task would consist of the development of a Techno-Economic Assessment (TEA). This task would be performed by Purdue University and Argonne National Laboratory (ANL).

Task 7: TEA/LCA Analysis: This task would consist of the development of a Life-Cycle Analysis (LCA). The LCA would then be applied to the TEA developed under Task 6. This task would be performed by Purdue University and Argonne National Laboratory (ANL).

Task 8: Project Management – This task would be ongoing throughout the life of the project. It would include all activities relating to the administration and coordination of the project, including peer reviews, reporting, and meetings.

All project activities would be coordinated by Purdue University. Task work would be performed at existing, purpose-built laboratory/manufacturing facilities operated by Purdue University or its project partners. No change in the use, mission or operation of existing facilities would result from project efforts at any location. No modifications to or new permits/authorizations would be required to complete the proposed activities. Only existing equipment would be used, and no decommissioning of equipment would be necessary at the conclusion of the proposed project.

Project activities would involve the use and handling of industrial chemicals, high-powered equipment, and cutting tools. All such handling would occur in controlled, laboratory/manufacturing facilities. In order to mitigate against risks associated with the handling of these materials, Purdue University and its project partners would adhere to established corporate health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. Biomass production and processing would involve equipment that releases fine particles (e.g. wood chip dust). In order to mitigate against inhalation risks, dust control and collection system would be used for point source and general dust control. Waste water and feedstock liquor would be neutralized prior to disposal. Purdue University 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, 03/27/2020

## 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:  Casey Strickland Date: 3/30/2020  
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