

PMC-ND
(1.08.09.13)

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



RECIPIENT: Iowa State University of Science and Technology

STATE: IA

PROJECT TITLE : An open-source framework for the computational analysis and design of autothermal chemical processes

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001465	DE-EE0008326	GFO-0008326-001	GO8326

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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 Iowa State University (ISU) to analyze and model chemical reactions and mechanisms associated with autothermal pyrolysis of biomass feedstocks. Based on its analysis ISU would also develop computational tools to enable the scale-up and optimization of the pyrolysis process.

Proposed project activities would include data analysis, computer modeling of chemical reactions (e.g. biomass devolatilization, char combustion, gas-phase kinetic modeling), model testing through computer fluid dynamics simulations and data comparisons, and validation experiments using laboratory-scale fluidized reactor systems. All project activities would take place at existing university offices and laboratories at the ISU campus in Ames, Iowa. No change in the use, mission, or operation of existing facilities would arise out of these efforts.

Biomass analysis and experimentation would use red oak and corn stover as feedstock in quantities under 50kg. Laboratory facilities where these tests would be conducted are dedicated biorenewables research facilities that regularly conduct testing of this nature. Likewise, the feedstock materials are regularly used and produced at these facilities.

The proposed validation experiments would involve the use of various industrial chemicals and solvents, including dilute sulfuric acid, ethanol, methanol, and tetrahydrofuran, as well as inert and flammable gases, including nitrogen, hydrogen and methane. Bio-oil derived from the pyrolysis process would also contain compounds including phenol, carboxylic acids, furans, aldehydes and ketones. Any potential hazards presented by the use of these materials would be addressed through adherence to ISU laboratory safety procedures and policies and Occupational Safety and Health Administration guidelines. Additionally, all facilities in which laboratory work would occur follow established chemical management and waste disposal methods in accordance with pertinent Federal, State, and local environmental regulations. ISU would not need to seek out any additional permits in order to carry out the proposed project activities.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410 (2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the

proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Advanced Manufacturing Office
This NEPA determination does not require a tailored NEPA Provision
NEPA review completed by Jonathan Hartman, 5/14/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Electronically Signed By: Casey Strickland Date: 5/14/2018
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____
Field Office Manager