

FMC-ND

(1.08.09.13)

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



RECIPIENT: Ohio University

STATE: OH

PROJECT TITLE : Biomass Electrochemical Reactor for Upgrading Biorefinery Waste to Industrial Chemicals and Hydrogen

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001085	DE-EE0007105	GFO-0007105-001	GO7105

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 federal funding to Ohio University to develop an electrochemical reactor to convert lignin-rich biorefinery waste streams to bio-based phenol substitutes suitable for use in green resins with co-production of hydrogen. The proposed project would also develop detailed techno-economic analyses to integrate the electrochemical reactor into the biorefinery concept.

The proposed project activities would include design and synthesis of titanium oxide (TiO₂) supported Nickel-Cobalt (Ni-Co) and Ni-Co electrocatalysts for the electrochemical oxidation of lignin to industrial chemicals. Electrochemical oxidation experiments would be performed in alkaline solutions, and oxidation products would be identified by analytical methods. A continuous-flow, lab-scale electrochemical reactor would be designed and constructed. The reactor would fit on a standard lab bench and would not require any modifications to the facility. Product streams would be analyzed for their utility in industrial processes, and process flow sheets would be developed integrating the electrochemical process into the biorefinery concept. Research and development activities would take place at the Center for Electrochemical Engineering Research and the Department of Chemistry at Ohio University, and at Hexion, Inc.'s Technology Center in Louisville, KY.

The project would involve the use and handling of various hazardous materials, including metals, organic solvents like chloroform, and alkaline solutions in the amounts of tens of kilograms, along with 5,000 liters of metal salts. An equivalent amount of oxidation products would be stored at the Center for Electrochemical Engineering Research and disposed of by the chemical waste disposal team at Ohio University. All such handling would occur in-lab, and personnel would use proper handling and disposal practices. All hazardous materials would be managed in accordance with federal, state, and local environmental regulations. Existing health and safety policies and procedures would be followed including employee training (i.e., standard Chemical Hygiene Safety Training and additional lab-specific training), proper protective equipment, controls and monitoring, and internal assessments. The work planned under this effort would not require the physical modification of any facilities and as such would not disturb any ground. The proposed project would not require any change in the use, mission or operation of the existing facilities. The facilities are designed for this type of research; therefore, no modifications or new permits, additional licenses and/or authorizations would be necessary as a result of the proposed project.

Based on review of the project information and the above analysis, DOE has determined the proposed project would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with actions contained in DOE categorical exclusion A9 "information gathering, analysis and dissemination," and B3.6 "small-scale research and development, laboratory operations and pilot projects" and 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.

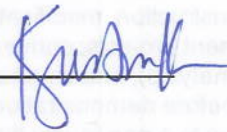
Note to Specialist :

Bioenergy Technologies Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Logan Sholar on 1/28/2016

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

 Electronically Signed By: Kristin Kerwin
NEPA Compliance Officer



Date: 1/28/2016

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: _____

Field Office Manager

Date: _____