PMC-EF2a

(2.06.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: The Dow Chemical Company **STATE:** MI

PROJECT TITLE : Scale-up of Novel Low-Cost Carbon Fibers Leading to High-Volume Commercial Launch

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000560	DE-EE0005760	GFO-0005760-001	GO5760

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.

Rational for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Dow Chemical Company to perform laboratory research and development activities to develop the manufacturing process for producing low cost carbon fibers from polyolefin precursor fiber.

Dow Chemical Company would advance carbon fiber production for the automobile industry. The scope of work includes the pilot plant scale research and development of the melt spinning of polyolefin fibers, the sulfonation-desulfonation of the fibers, carbonization of desulfonated fibers, and post treatment of the fibers at Oak Ridge National Laboratory's Carbon Fiber Technology Facility (CFTF). Two lots of 400 kg of carbon fibers would be produced, for a total of 800 kg of fibers. The fibers would be evaluated in composite test specimens and subject to quality parameters. This would include testing of the strength and stiffness, adhesion to matrix resins, physical properties of composite test specimens, durability and fastening to other materials. The work would also include a market, environmental, and energy benefit analysis and a final report on the development and commercialization of the technology.

The work would be performed in laboratories and manufacturing facilities at three locations.

Work would be performed at existing facilities and laboratories at the following locations:

Dow Chemical Company is located in an industrial, research & development complex in Midland, Michigan 48667. There are 550 buildings, 30 production plants across 1900 acres. The proposed work would be performed in Buildings 1702 and 1776.

Oak Ridge National Laboratory CFTF is a part of the research and development complex, located at 1 Bethel Valley Road, Oak Ridge, Tennessee 37831. For all work conducted at DOE laboratories, project activities may be subject to additional NEPA review by the cognizant NEPA Compliance Officer at the lab.

Ford Motor Company would perform physical property tests on the prototypes for applications in automobile manufacturing.

Dow Chemical has completed a R&D questionnaire addressing the protocols for laboratory safety, risk management, chemical handling and waste disposal. Dow complies with standard safety procedures and has appropriate safety equipment available in all laboratories. Dow has all applicable permits in place to conduct research on site. No

additional permits are needed for project activities. The laboratory general safety procedures would be followed and routine safety inspections would be performed.

All handling of hazardous materials would occur in the laboratories at Dow and would follow its hazardous material disposal practices. Employees are trained in the proper use, storage, handling and disposal of the materials and proper safety equipment would be used. Dow operates under a ten year hazardous waste operating license #MID 000 724 724, issued by the U.S. EPA. The campus has a dedicated incinerator which allows Dow to handle most waste generated on site. The incinerator is capable of removing particulate matter and reducing nitrous oxide emissions. Dow generates 12,000 tons of hazardous waste on an annual basis and the proposed project would not have a noticeable impact on the tonnage.

The melt spin line would produce small amounts of gas that would be vented to the outside. The gaseous sulfur compounds will be scrubbed from the gas stream before their release to the vent lines. The carbonization process would have nitrogen streams with low levels of water, sulfur dioxide and hydrogen sulfide and these would also be sent to the vent lines.

Dow will construct a sulfonation-desulfonation Market Development Plant at their Midland complex. The location has not been identified at this time. The plant would be constructed with funding resources outside of the DOE proposed project. This would allow for market scale development and manufacturing of carbon fibers.

Based on review of proposed project information and the above analysis, DOE has determined the research would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with the actions contained in DOE categorical exclusion A9 "Information gathering, analysis, and dissemination," and B3.6 "small-scale research and development," 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 you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

Diana Scott 9.5.2012

DOE Share: $9,000,000 (including $4,000,000 to FFRDC-ORNL)
Cost Share: $4,500,432 (including $2,000,000 in cost share provided directly to ORNL)
Total Project Cost: $13,500,432

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By Lori Gray / Lori Gray — Date: 9/5/2012

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