

PMC-ND  
(1.08.09.13)

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



RECIPIENT: Rice University

STATE: Mult

PROJECT  
 TITLE : Flexible carbon conductors for lightweight motors and generators

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0001467	DE-EE0007865	GFO-0007865-001	

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:

<b>A9 Information gathering, analysis, and dissemination</b>	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.)
<b>B3.6 Small-scale research and development, laboratory operations, and pilot projects</b>	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.
<b>B3.15 Small-scale indoor research and development projects using nanoscale materials</b>	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 federal funding to Rice University to develop a new carbon nanotube (CNT) conductor technology intended to increase motor efficiency.

The proposed project activities include the design and building of two lab-scale growth reactor systems for the fabrication of carbon nanotubes. The reactors would be optimized and the carbon nanotube characterized. The carbon nanotubes produced would then be dissolved to make carbon nanotube solution for fiber spinning. The carbon nanotube fibers would then be characterized and insulated. Design, development, and fabrication activities would occur at research facilities at The University of Maryland in College Park, MD; Rice University in Houston, TX; and The University of Houston (DexMat) in Houston, TX. Carbon nanotubes and carbon nanotube fibers would be tested at Rice University and University of Maryland. All research, development and testing activities would take place in existing facilities designed for this type of research; therefore, no new construction, modifications to existing or new permits, or additional licenses and/or authorizations would be necessary.

Work to be performed at the University of Maryland and Rice University regarding the installation and use of the small- and medium-scale growth reactor systems, would involve the use of a high-temperature reactor, reactive gases, chemicals, and solvents such as ethanol. Additionally, the work relative to fiber spinning at Rice University and DexMat would involve the use of chlorosulfonic acid as the solvent for carbon nanotubes as well as organic solvents like acetone and ether. These chemicals present potential health and safety risks to the public or project workers. To mitigate these risks, project participants from University of Maryland will work with the Department of Environmental Safety, Sustainability and Risk at the University of Maryland; participants from DexMat will work with the Environmental Health & Life Safety at the University of Houston; and participants from Rice will work with the Office of Environmental Health and Safety at Rice University. Appropriate safety trainings will be provided by the relevant department prior to performing the proposed work. Other controls to mitigate risks would include adherence to the

laboratory's Chemical Hygiene Plan, proper chemical storage and engineering controls.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of 10 CFR 1021 subpart B 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.

Review completed by Rebecca McCord, 02/20/2017

#### SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: \_\_\_\_\_

 Electronically Signed By

Casey Strickland

NEPA Compliance Officer

Date: 2/27/2017

#### 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: \_\_\_\_\_