

PMC-ND

(1.08.09.13)

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

RECIPIENT: [Cummins Inc.](#)STATE: [IN](#)

PROJECT TITLE: [Cummins PEM Fuel Cell System for Heavy Duty Applications](#)

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
<a href="#">DE-FOA-0002229</a>	<a href="#">DE-EE0009247</a>	<a href="#">GFO-0009247-001</a>	<a href="#">G09247</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.

**B3.15 Small-scale indoor research and development projects using nanoscale materials** 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 funding to Cummins Inc. to design, develop, and test a new modular polymer electrolyte membrane fuel cell (PEMFC) stack to power heavy duty (HD) applications. The stack would be designed to run at high pressure and tolerate high temperatures during peak power excursions. The project would be completed over two Budget Periods (BPs) with a Go/No-Go Decision Point between the two BPs.

Proposed project activities would include research, computer modeling, design and fabrication of improved membrane electrode assembly (MEA) and bipolar plates (BPP), assembly of a fuel cell short stack, and testing of a full HD fuel cell system.

The project would begin by making enhancements to fuel cell stack components. A durable MEA with increased utilization of metal catalyst that can operate at high temperatures would be developed along with a process to manufacture these at a high volume. Improvements would be made to the design of BPPs and to the stack design in order to function under high pressure and temperature and at high efficiency and low cost. These would include improvements to the material selection, molding process, and post-molding fabrication steps.

New stacks would be designed and demonstrated and new BPPs would be scaled up from the current baseline. An HD short stack of up to 4 cells would be built and tested for meeting production and cost targets, efficiency, and durability. A full HD system would be developed, which would include all components in the fuel cell system, to predict performance and define the component specifications. It would be tested at a 100kW test station.

Cummins, Inc. would oversee the project. At Cummins Technical Center in Columbus, Indiana, the design, computer modeling, cell testing, and short stack testing would take place. Hydrogenics in Mississauga, Ontario would perform

detailed mechanical design of the bipolar plate and 100 kW fuel cell stack, electrode selection and high temperature MEA prototyping, high volume MEA roll-to-roll production study, 1 kW short stack procurement, build and pressure test, and 100 kW stack build and performance test. Mechanical and electrical infrastructure may be added to connect the 100kW test station. Any permits needed for electrical infrastructure additions would be obtained prior to work commencing. Argonne National Laboratory (ANL) in Lemont, Illinois would conduct research and analytical activities.

Project activities would involve the use and handling of hazardous chemicals and nanoscale materials. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include engineering controls, appropriate venting, fire prevention, and the use of personal protective equipment. The use of nanoscale materials would occur at Hydrogenics where they would be anchored to larger carbon supports and used in well ventilated areas or while wearing a respirator. All waste products would be disposed of by licensed waste management service providers. Cummins, Inc. and its project partners would observe all applicable Federal, state and local environmental, health, and safety laws and 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:

Hydrogen and Fuel Cell Technologies Office  
This NEPA determination does not require a tailored NEPA provision.  
Review completed by Shaina Aguilar on 1/6/2021.

## 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.

DOE has determined that work to be carried out outside of the United States, its territories and possessions is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

The proposed action is categorically excluded from further NEPA review.

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

NEPA Compliance Officer Signature:

 Electronically Signed By: Casey Strickland

NEPA Compliance Officer

Date: 1/8/2021

## 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: \_\_\_\_\_  
Field Office Manager

Date: \_\_\_\_\_