

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** GE Research**STATE:** NY

PROJECT TITLE: Reduced LCoE CSP Through Utilizing Process Gas Lubricated Bearings in Oil-Free Drivetrains

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001840	DE-EE0008738	GFO-0008738-001	

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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to GE Research (GE) to research and develop lubricated gas bearing technology to serve as enablers for advanced hermetically sealed configurations in supercritical carbon dioxide (sCO₂) power cycles. The gas-lubricated bearings would be developed for use in place of oil-lubricated bearings and assessed for their potential application in concentrated solar power (CSP) applications.

The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP. BP1 would focus on development of a conceptual rotor train layout for a baseload CSP plant and selection of a rotor system. Proposed activities would include conceptual design work of the system configuration and rotor train, development of a component testing campaign, component test rig design, and component test rig assembly/commissioning. BP2 would consist of validation testing of sCO₂ design tools and computer modeling. Specific activities would include performance testing of thrust bearings in sCO₂ conditions and analysis of testing data. BP3 would involve validation testing of lubricated gas bearings to confirm that they can support the sCO₂ turbomachinery rotor and other CSP rotor train components. Activities would include gas bearings design and procurement, rotor performance testing on the gas bearing, complete turbomachinery testing, and data analysis.

All project activities would be performed by GE at its Global Research Center in Niskayuna, NY. The laboratory is an existing, purpose-built facility that regularly performs work similar in nature to that proposed as part of this project. No modifications to existing facilities, ground disturbing activities or change in the use, mission, or operation of existing facilities would be required for the work activities proposed. Likewise, no additional permits or authorizations would be required.

Laboratory testing would utilize an existing sCO₂ test loop and spin test facility at GE's research campus which have both previously undergone environmental, health and safety reviews to verify that they are in compliance with established corporate and state standards. CO₂ would be handled and transported adhering to industry best practices, and utilizing a certified CO₂ vendor. CO₂ would be stored at GE's Global Research Center using an

industry standard microbulk tank. GE would adhere to all relevant health, safety, and environmental regulations when performing project activities.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 06/13/2019

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.

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: Kristin Kerwin

NEPA Compliance Officer

Date: 6/14/2019

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: _____