PMC-ND
(1.08.09.13)

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

RECIPIENT: Echogen Power Systems (DE), Inc. **STATE:** OH

PROJECT TITLE: sCO2 power cycle with integrated thermochemical energy storage using an MgO-based sCO2 sorbent in direct contact with working fluid, 1640-1548

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001640	DE-EE0008126	GFO-0008126-001	

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:

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 Echogen Power Systems (EPS) to design and develop a low-cost high-temperature thermochemical energy storage (TCES) system, and demonstrate the TCES in a prototype-scale operating supercritical CO2 test loop.

The proposed project would involve data analysis, computer modeling, preliminary design and engineering, and laboratory scale research and development. Associated activities would include: the production and testing of magnesium oxide-based (MgO) sorbent materials in a laboratory reactor; the fabrication of a prototype-scale thermochemical energy storage reactor; modifications to an existing supercritical carbon dioxide (CO2) test loop to support the integrated prototype; and testing of the prototype system and materials. Data analysis/modeling, design work, fabrication of the prototype reactor, engineering of test loop equipment, and testing activities would occur at the EPS research facility in Akron, OH. Development, production, and testing of MgO materials would be undertaken by subrecipient Southern Research at their laboratory in Durham, NC.

All project-related work would take place indoors within previously established facilities that were purpose-built for the type of activities being proposed. No change in the use, mission, or operation of existing facilities would arise out of this effort. The facilities have all applicable permits in place, and would not need additional permits for the proposed activities.

The proposed project would not involve the use of hazardous materials. Laboratory work involving potential hazards such as hot surfaces, compressed gas, and electrical equipment would be conducted following existing corporate health and safety practices including proper employee training. Standard amounts of non-hazardous miscellaneous office/lab waste generated by the proposed project would not require any special siting or major expansion of waste storage, disposal, or treatment actions/facilities. At the conclusion of the proposed project, equipment and materials would either be recycled or remain in-lab for future research. Seal leakage and intentional venting of some of the CO2 (not a regulated pollutant) used by the proposed project would occur, but releases would be relatively minor and of limited duration.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 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 :

Solar Energy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 08/25/2017

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 8/30/2017
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