

PMC-ND
(1.08.09.13)

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

**RECIPIENT:**Brayton Energy LLC**STATE:** NH**PROJECT TITLE:** Generation 3 Concentrating Solar Power Systems

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001697	DE-EE0008368	GFO-0008368-001	

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 Brayton Energy to design a commercial-scale gas-phase Concentrating Solar Power (CSP) solution that would be developed and demonstrated via a subscale test facility. The megawatt-scale demonstration system would absorb concentrated solar energy from a heliostat field and deliver it into thermal energy storage integrated with a high-efficiency supercritical carbon dioxide power cycle.

The proposed project is organized into three Phases and five Budget Periods (BP). Phase 1/BP1 would involve the development of a preliminary system design. This initial phase of the proposed project would determine expected performance of the system in various operating modes using both desktop-based analytical methods and small-scale laboratory experimentation. No outdoor work to include construction activities or site development are planned during this phase. Component fabrication, validation testing, and more detailed facility design and modeling would occur during Phase 2/BP2. Test facility construction and field testing would occur during Phase 3/BPs 3-5. Until such time as Phase 1/BP1 design work advances, there is not sufficient information available to review proposed tasks in subsequent phases of the project. Therefore this NEPA Determination is only to review Phase 1/BP1. Phase 2/BP2 funding will be restricted pending the result of a Go/No-Go decision from the Solar Energy Technologies Office; further NEPA review will be required if the project receives approval to move forward into Phase 2/BP2. Following Phase 2/BP2 there will be a competitive down-select; further NEPA review will again be required if the project is selected for Phase 3/BPs 3-5 funding.

Activities associated with Phase 1/BP1 would include project management, data analysis, computer modeling, and the fabrication and testing of laboratory-scale prototypes of a solar receiver, gas circulator, thermal energy storage system, and heat exchangers. Phase 1/BP1 activities would take place entirely within existing office space and research laboratories as follows: Overall program management plus the design, development, and testing of prototypes would occur at Brayton Energy in Hampton, NH. Additional solar field prototyping and the development of various system designs would be undertaken at the National Renewable Energy Lab in Golden, CO. Heat

exchanger component testing would be performed by Echogen Power Systems in Akron, OH. Circulator design would be carried out by Solex Thermal Science in Calgary, AB, Canada. The facilities in which project work would occur were purpose-built for the types of activities being proposed; therefore, no modifications or new permits, additional licenses and/or authorizations would be necessary for Phase 1/BP1 work. No change in the use, mission or operation of existing facilities would arise out of these efforts.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

The project would involve the use and handling of various hazardous materials including metals and industrial solvents. All such handling would occur entirely in properly equipped laboratories. Project participants are trained in applicable health and safety policies and procedures, and would wear personal protective equipment including latex gloves, face masks, eye protection and ear protection where applicable. No public access is allowed in these laboratories or workspaces; no members of the public would be at risk for contact with materials used by the proposed project. Hazardous materials would be managed in accordance with all applicable Federal, state, and local environmental regulations. Phase 1/BP1 work would not require the use or disposal of substantial amounts of water or chemicals; types and quantities would not exceed those employed in standard operations at these facilities. An estimated five thousand pounds of metal would be used for prototyping at Brayton and NREL, respectively. Steel and any other scrap metal generated by the proposed project would be repurposed or recycled.

Based on the review of the proposal, DOE has determined all Phase 1/Budget Period 1 Tasks and Subtasks fit within the class of action(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. All Phase 1/Budget Period 1 Tasks and Subtasks are categorically excluded from further NEPA review. Further, DOE has determined that the work to be carried out at Solex Thermal Science 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."

NEPA PROVISION

DOE has made a conditional NEPA determination for this award, and funding for certain tasks under this award is contingent upon the final NEPA determination.

Insert the following language in the award:

You are restricted from taking any action using federal funds, which would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE/NNSA providing either a NEPA clearance or a final NEPA decision regarding the project.

Prohibited actions include:

All Tasks and Subtasks of Phase 2/Budget Period 2 and Phase 3/Budget Periods 3-5.

This restriction does not preclude you from:

All Tasks and Subtasks of Phase 1/Budget Period 1.

If you move forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, you are doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Solar Energy Technologies Office

This NEPA determination requires a tailored NEPA Provision.

NEPA review completed by Whitney Doss, 8/15/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____



Casey Strickland

NEPA Compliance Officer

Date: 8/16/2018

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: _____