

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



**RECIPIENT:** RedoxBlox

**STATE:** CA

**PROJECT TITLE :** Decarbonization of Steam Generation for Chemical Process Heating through Electrification and Thermochemical Energy Storage

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002804	DE-EE0010835	GFO-0010835-001	GO10835

**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.)

**B1.31 Installation or relocation of machinery and equipment**

Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

**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 RedoxBlox, Inc (RedoxBlox) with funding to design, develop, fabricate, and field test a thermochemical energy storage device. The project would also retrofit a gas-fired steam boiler at Dow Chemical's manufacturing plant (WVO) in Charleston, West Virginia with RedoxBlox's energy efficient and high energy density thermochemical energy storage technology.

Materials development, electrode development, small-scale prototyping as well as research and development activities would occur at RedoxBlox facilities in San Diego, California. Project management, large-scale prototype testing as well as research and development support would occur at RedoxBlox Offices in Bend, Oregon. Installation of the thermochemical energy storage prototype would occur at Dow Chemical's chemical production plant in South Charleston, West Virginia. Furnace design, fabrication and testing would occur at California Heating Equipment in Anaheim, California.

No hazardous materials are anticipated to be used during the execution of this project at any of the four project work locations. Construction hazards may be present at the Dow Chemical site and would be mitigated by following all relevant standards and codes in place at the local, state and federal levels. If new health or safety risks are identified, additional policies and procedures would be implemented in addition to the existing health and safety policies and procedures.

Emissions would be released during operation of the storage unit, as air would pass through to reach and heat the boiler. This discharge would be oxygen depleted air with minimal to no NOx and particulates. NOx and particulate levels that would be emitted as part of the project are not currently known, however, they would be determined ahead of the employment of the pre-demonstration unit. During unit charging, emissions characterized as being close to pure

oxygen would be released.

Physical modification of existing facilities and ground disturbing activities to accommodate installation of electrical equipment would occur as part of the project at the Dow Chemical site in West Virginia. RedoxBlox equipment and steam generation equipment would be located outdoors, and the equipment's electrical feed would go under two existing roadways to access the area. The foundation for all proposed equipment would be dug and concrete would be placed on a previously disturbed area. Existing roadways would be used to access the project location. A prototype device would be installed and operated within the RedoxBlox facility in Oregon and additional material manufacturing equipment would be installed at the California facility. No modifications to the facility would be expected to accommodate the equipment.

New permits, including building and air permits may be necessary as part of the project. Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

## NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient and must be attained before the permit-pertinent work can commence. The recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding with the permit-pertinent efforts. The recipient must receive notification of approval from the DOE. If the recipient moves forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of acquisition of any required permits, the recipient is doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

Notes:

Industrial Efficiency & Decarbonization Office  
This NEPA Determination requires a legal review of the tailored provision  
NEPA review completed by Chris Akios, 06/25/2024

## 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: Andrew Montano Date: 6/26/2024  
NEPA Compliance Officer

**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: \_\_\_\_\_ Date: \_\_\_\_\_  
Field Office Manager