

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



RECIPIENT: AtmosZero

STATE: CO

PROJECT TITLE: Flexible Industrial Heat Pump for Simultaneous Refrigeration and Steam Production

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002997	DE-EE0011190	GFO-0011190-001	GO11190

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 funding to AtmosZero to design, fabricate and test a develop a flexible heat pump for simultaneous refrigeration and steam production.

Design and testing of the heat pump would occur at AtmosZero headquarters and Colorado State University (CSU), both in Fort Collins, Colorado. Construction and some testing activities would occur at AtmosZero's manufacturing facility in Loveland, Colorado and field demonstration of the pilot heat pump system would occur at International Flavors and Fragrances (IFF) in Beloit, Wisconsin.

The project award would involve the use and handling of refrigerant and large, heavy components. It would also entail the routing of electrical, water and steam lines for a high temperature heat pump. Ethylene glycol would be used as a heat transfer fluid, as well as light metal working and fabrication activities by project personnel at the CSU facility. The heat pump would be tested at AtmosZero to verify proper operation and would be instrumented to detect any failures or leaks. AtmosZero personnel would be present while the heat pump is operational and would train IFF personnel on its proper operation.

The recipient/subrecipients have the appropriate certifications to handle refrigerants and all project personnel would receive safety training on proper handling and disposal of ethylene glycol. All hazardous materials and equipment would be managed in accordance with federal, state, and local environmental regulations. Existing corporate health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, monitoring, injury and illness prevention plans, chemical hygiene plans and internal assessments.

No emissions into the ambient air are expected to be generated from project activities, except at the IFF pilot demonstration location in Beloit, Wisconsin. The heat-pump boiler would comprise two refrigeration loops, one with a total charge of approximately 300-kilograms (kg) of refrigerant, and another with a total charge of approximately 200 kg of refrigerant. There is a potential for refrigerant leakage to occur at a rate of up to 1% to 5% of total refrigerant charge per year. The extent and nature of emissions associated with this project would be negligible and the IFF facility is within a US Environmental Protection Agency-designated Attainment Area.

It is anticipated that water, steam, and electrical modification would be needed to support the heat pump pilot demonstration at the IFF facility in Beloit, Wisconsin. This might include wall penetrations. In addition, a concrete pad to locate the heat pump might also be required, with a footprint of approximately 10-foot (ft) x 25 ft. The exact location of the demonstration project may be outdoors and is unknown at this time. Since the location of the concrete field pour is unknown, Subtasks 3.1.3 and 3.1.4 would require further NEPA review once the location becomes identified, and thus, these subtasks are not included in this NEPA Determination.

The project effort at IFF would require building and mechanical permits, and may also require plumbing, HVAC and electrical permits for alterations that would be required to install and operate the proposed heat pump boiler. Any and all permits required for the execution of the project at the above-referenced locations would be the responsibility of the recipient.

## NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

This NEPA determination applies to the following topic areas, budget periods and/or tasks:

Task 1 (all subtasks), Task 2 (all subtasks), and Task 3 (subtasks 3.1.1, 3.1.2, and 3.2.1 only)

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

The ND does not apply to the following topic area, budget periods, and/or tasks:

Subtask 3.1.3 and Subtask 3.1.4

Notes:

Industrial Efficiency & Decarbonization Office  
NEPA review completed by Chris Akios, 06/04/2024

## 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.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

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

NEPA Compliance Officer Signature:  \_\_\_\_\_ Date: 6/5/2024  
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