

PMC-ND

(1.08.09.13)

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



RECIPIENT: Maryland Energy and Sensor Technologies, LLC

STATE: MD

PROJECT TITLE: Compact Thermoelastic Cooling System

Funding Opportunity Announcement Number
DE-FOA-0001166

Procurement Instrument Number
DE-EE0007043

NEPA Control Number
GFO-0007043-001

CID Number
GO7043

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 Maryland Energy and Sensor Technologies, LLC. (MEST) to develop a compact, high-efficiency, thermoelastic cooling (TEC) system with low environmental impact and a small carbon footprint. TECs work by stretching and relaxing metal rods which creates and absorbs heat, respectively. Alternating between the two states performs the same task as a heat pump compressor. Currently, TEC requires a large mechanical loading system, which results in high materials cost. MEST would attempt to address this problem by reducing system size by a factor of 10.

Proposed project activities include completing a series of mechanical prototyping activities involving computer-aided refrigeration system design; machining of various parts made of metals and Teflon; system assembly of various machined parts, gears, tubes, pumps and motor drive; completion of system evaluations; and development of a market strategy and commercialization plan. All proposed activities consist of bench-scale laboratory work and pilot-scale manufacturing and would take place in existing laboratories. Proposed work would occur at the Prototype and Machine Shop at the University of Maryland's Department of Physics and the MEST laboratory, both in College Park, MD. All facilities comply with government safety, emergency, and hazardous waste handling/removal regulations. These facilities are designed for this type of research; therefore, no modifications or new permits, additional licenses and/or authorizations would be necessary. This project would not involve the modification of existing facilities, nor the construction of new ones. There would be no ground disturbing activities. No equipment would be installed outdoors. There would be no change in the use, mission or operation of existing facilities.

Based on a review of the project information and the above analysis, DOE has determined that the proposed project would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined that this project is consistent with actions outlined in DOE categorical exclusions A9 "Information gathering" and B3.6 "Small-scale research and development, laboratory operations, and pilot projects" and is therefore 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 you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

Buildings Technologies Office

This NEPA Determination does NOT require a tailored NEPA provision.

NEPA review completed by Logan Sholar, 5/18/15

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:



Signed By: Kristin Kerwin

A handwritten signature in blue ink, appearing to read "Kristin Kerwin".

NEPA Compliance Officer

Date: 5/19/2015

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: