PMC-ND
(1.08.09.13)

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

RECIPIENT: The Trustees of Princeton University **STATE:** NJ

PROJECT TITLE: Membrane Dehumidification as Facade-integrated Building Screens for Latent Cooling

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002099	DE-EE0009061	GFO-0009061-001	GO9061

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.)
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 Princeton University to design, model, and develop a membrane in the form of a screen that could be mounted on a building façade in humid climates in order to reduce the relative humidity indoors. As air passes through the screen, water would be separated from the air, allowing fresh air to pass through.

The project would consist of 2 Budget Periods, separated by a Go/No-Go Decision Point. There would be a down-select process in which DOE would have the option to select this project to continue into Budget Period 2. This review is for Budget Period 1, which includes tasks 1, 2, and 3. If, after the down-select process, the project is selected by DOE to continue, the recipient would go through an application process in which all applicable information relating to Budget Period 2 activities would be submitted for NEPA review.

Budget Period 1 would consist of the design of dozens of screen prototypes using either desiccants or vacuum to pull moisture and test the screen to evaluate for airflow and effectiveness of reducing humidity. These screens would all be on the scale of centimeters. Three to four multi-module small prototypes would then be developed and tested before building the full scale prototype that would be used if the project proceeds to Budget Period 2. Proposed project activities include modeling, research, design, and fabrication of the model screen system.

Princeton University would oversee the project; subrecipients would be Harvard University, Massachusetts Institute of Technology (MIT), Transsolar Inc, AIL Research, and National Renewable Energy Laboratory (NREL). Princeton would develop, fabricate, assemble, and test the desiccant screen. Harvard University would design and fabricate screen materials in university laboratories and conduct material characterization and external flow analysis on sample screens. Princeton and Harvard would focus on small scale module evaluations and benchmarking. MIT would perform modeling and validation of computational simulations. Transsolar Inc. would perform research, data analysis, feasibility studies, and modeling. AIL Research has a laboratory and machine shop in which they would fabricate liquid desiccants and mass exchangers for test prototypes. NREL would perform experiments on screens, testing for characteristics such as airflow and moisture removal.

Project activities would involve the use and handling of chemicals and electrically powered equipment. Princeton University and its project partners would observe all applicable environmental, health, and safety laws and regulations in place at each institution regarding proper PPE and the use and disposal procedures for chemicals. All electrically

powered tools and fabrication devices would only be used by properly trained personnel who would follow institutional guidelines.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a conditional NEPA determination.

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

All Budget Period 1 Tasks and Sub-tasks

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

All Budget Period 2 Tasks and Sub-tasks

Notes:

Bioenergy Technology Office
This NEPA determination does require a tailored NEPA provision.
Review completed by Shaina Aguilar on 6/29/20.

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: Electronically Signed By: Casey Strickland Date: 6/30/2020

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