PMC-ND
(1.08.09.13)

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

RECIPIENT: The University of Alabama **STATE:** AL

PROJECT TITLE: IoT Based Comfort Control and Fault Diagnostics System (i-COMFORT) for Energy Efficient Residential Houses

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001824	DE-EE0008694	GFO-0008694-001	GO8694

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 University of Alabama (UA) to develop and test an Internet of Things (IoT) Based Comfort Control and Fault Diagnostics System for energy efficient residential homes. A prototype system would be developed, evaluated and tested using laboratory-based residential homes. The project would be divided into three Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

Proposed project activities for BP1 would include development of Intellectual Property Management and Research Plans, as well as the development of a distributed monitoring network (e.g. wireless temperature, humidity and air flow sensors, as well as a local hub for IoT-based actuation devices with cloud interface capabilities). BP2 activities would include forecasting model development (e.g. energy, indoor thermal environmental, and occupant comfort modeling), computer simulation analysis, development of automated fault detection and diagnostics (AFDD) strategies (e.g. duct leakage, heat pumps), and development of a machine-learning based adaptive control framework. BP3 activities would consist of system-level controlled laboratory testing, market analysis and commercialization plan development, outreach/engagement with potential commercial stakeholders, and engagement with Building America partners/stakeholders.

All project activities would be completed by UA, or its project partners Drexel University and Clemson University. System development, computer modeling and analysis would be completed at existing, purpose-built facilities in Tuscaloosa, AL, Philadelphia, PA and Clemson, SC. Laboratory testing of the proposed system would be performed using existing residential homes at the Pacific Northwest National Laboratory (PNNL) in Richland, WA. The residential homes are un-occupied residences that are used for energy research as part of PNNL's "Lab Homes" project. No change in the use, mission, or operation of existing facilities would be required as part of this project. Similarly, no additional permits would be required in order to conduct any of the work activities.

Project activities would primarily consist of software development, with little hardware development or installation. Accordingly, health and safety risks associated with this project are minimal. Nonetheless, UA and its project

partners would observe all relevant local, state and Federal health, safety, and environmental regulations. Laboratory work would be performed adhering to established health and safety protocols, including the use of property safety equipment, monitoring, and the provision of relevant safety training.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assisstance agreement:

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.

Notes:

Building Technologies Office
This NEPA determination requires a tailored NEPA provision.
Review completed by Jonathan Hartman on 3/13/2019

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: Casey Strickland Date: 3/14/2019

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