U.S. Department of Energy
Categorical Exclusion Determination Form

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Proposed Action Title: Saving Energy Nationwide in Structures with Occupancy Recognition (SENSOR) (FOA No. DE-FOA-0001737) & SENSOR SBIR/STTR (FOA No. DE-FOA-0001738) Programs

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): AL, CA, CO, CT, IA, IN, MA, MD, MN, MT, NC, NJ, NM, NY, PA, TN, TX, WA, WI

Proposed Action Description:

The SENSOR/SENSOR SBIR/STTR Program (hereinafter "Program") seek to fund the development of technologies to enable user-transparent sensor systems that accurately quantify human presence, to dramatically reduce energy use in commercial and residential buildings. If successful, technologies developed under this Program could reduce energy used by heating, ventilation, and air conditioning (HVAC) systems by 30% in both residential and commercial buildings. If widely adopted, the resulting technologies could result in savings of 2-4 quadrillion BTU (quads) across the U.S. power system.

The Program is composed of 15 small-scale research and development projects that will be conducted by universities, non-profit entities, for-profit entities, and federal laboratories. All 15 projects (listed in Attachment A) are covered by this Determination and fit within the class of actions identified under the DOE Categorical Exclusion identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

☑ The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

☑ The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: [signature] Date Determined: 04/02/2018

(This form will be locked for editing upon signature)

Attachment A: Projects in the SENSOR (FOA No. DE-FOA-0001737) & SENSOR SBIR/STTR (FOA No. DE-FOA-0001738) Programs

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
Boston University (1737-1527)	Scalable, Dual-Mode Occupancy Sensing for Commercial Venues	B3.6
Cornell University (1737-1514)	Indoor Occupant Counting and CO2 Monitoring Based on RF Backscattering	B3.6
Duke University (1737-1583)	Detecting Human Presence Using Dynamic Metasurface Antennas	B3.6
Endeveo, Inc. (1738-1519)	Hotspot Enable Accurate Determination of Common Area Occupancy Using Network Tools (HEADCOUNT)	B3.6
Iowa State University (1737-1524)	Simulation, Challenge Testing & Validation of Occupancy Recognition & CO2 Technologies	A9; B3.6
Matrix Sensors, Inc. (1738-1540)	A Stable, Low Cost, Low Power CO2 Sensor for Demand Controlled Ventilation	B3.6
N5 Sensors, Inc. (1738-1524)	A Digital System-On-Chip CO2 Sensor	B3.6
Purdue University (1737-1556)	Building-Integrated Microscale Sensors for CO_2-Level Monitoring	B3.6
Rensselaer Polytechnic Institute (1737-1536)	Integrated Spatial, Spectral and Temporal Optical Reflectance System for Precision Occupancy and Location Sensing to Improve Building Energy Efficiency	B3.6
Scanalytics, Inc. (1738-1514)	Floor Sensors for Occupancy Counting in Commercial Buildings	B3.6
Stony Brook University (1737-1539)	SLEEPIR – Synchronized, Low-energy, Electronically-chopped PIR Sensor for Occupancy Detection	B3.6
Syracuse University (1737-1570)	MicroCam: A Low Power and Privacy Preserving Multi-Modal Platform for Occupancy Detection and Counting	B3.6

Attachment A: Projects in the SENSOR (FOA No. DE-FOA-0001737) & SENSOR SBIR/STTR (FOA No. DE-FOA-0001738) Programs

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
University of Colorado – Boulder (1737-1528)	Battery-Free RFID Sensor Network and Spatiotemporal Pattern Network Based Data Fusion System for Human Presence Sensing	B3.6
University of Alabama (1737-1529)	Quantification of HVAC Energy Savings for Occupancy Sensing in Buildings through An Innovative Testing Methodology	A9; B3.6
United Technologies Research Center (1737-1501)	PEOPLE: Platform to Estimate Occupancy and Presence for Low Energy buildings (P.400.0506)	B3.6