

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



RECIPIENT: Fraunhofer USA Center for Manufacturing Innovation

STATE: MA

PROJECT TITLE: Mass Customization of Prefabricated Panel Blocks for Deep Wall Insulation Retrofits

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002099	DE-EE0009066	GFO-0009066-003	GO9066

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.
- B5.1 Actions to conserve energy or water** (a) Actions to conserve energy or water, demonstrate potential energy or water conservation, and promote energy efficiency that would not have the potential to cause significant changes in the indoor or outdoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, manufacturers, and designers), organizations (such as utilities), and governments (such as state, local, and tribal). Covered actions include, but are not limited to weatherization (such as insulation and replacing windows and doors); programmed lowering of thermostat settings; placement of timers on hot water heaters; installation or replacement of energy efficient lighting, low-flow plumbing fixtures (such as faucets, toilets, and showerheads), heating, ventilation, and air conditioning systems, and appliances; installation of drip-irrigation systems; improvements in generator efficiency and appliance efficiency ratings; efficiency improvements for vehicles and transportation (such as fleet changeout); power storage (such as flywheels and batteries, generally less than 10 megawatt equivalent); transportation management systems (such as traffic signal control systems, car navigation, speed cameras, and automatic plate number recognition); development of energy-efficient manufacturing, industrial, or building practices; and small-scale energy efficiency and conservation research and development and small-scale pilot projects. Covered actions include building renovations or new structures, provided that they occur in a previously disturbed or developed area. Covered actions could involve commercial, residential, agricultural, academic, institutional, or industrial sectors. Covered actions do not include rulemakings, standard-settings, or proposed DOE legislation, except for those actions listed in B5.1(b) of this appendix. (b) Covered actions include rulemakings that establish energy conservation standards for consumer products and industrial equipment, provided that the actions would not: (1) have the potential to cause a significant change in manufacturing infrastructure (such as construction of new manufacturing plants with considerable associated ground disturbance); (2) involve significant unresolved conflicts concerning alternative uses of available resources (such as rare or limited raw materials); (3) have the potential to result in a significant increase in the disposal of materials posing significant risks to human health and the environment (such as RCRA hazardous wastes); or (4) have the potential to cause a significant increase in energy consumption in a state or region.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Fraunhofer USA, Inc. (Fraunhofer) for the development and deployment of a suite of deep energy retrofit (DER) solutions to low-rise residential buildings in cold, very cold, and mixed humid climates.

This project would be completed over five Budget Periods (BPs). DOE previously completed two NEPA

Determinations (ND) for this award. ND for BP1 (GFO-0009066-001: CX A9 and B3.6 issued 5/8/2020) focused on demonstrating the integrated high-performance wall retrofit process on a mockup wall and the down-selection process to move forward to BP2. ND for BP2 and BP3 (GFO-0009066-002: CX A9 and B3.6 issued 9/7/2022) focused on refinement of the wall-retrofit process testing, modeling, design, and testing of window energy management systems (WEMS). This ND covers some activities in BP4.

BP4 objectives would include further development of the novel insulated panel block (PB) wall retrofit system prototyped in Phase 1 and incorporate into an integrated DER process. Demonstration of the entire retrofit process would occur on 5 occupied 1 to 5 family buildings, selected from a list of nine potential locations outlined below.

Potential locations for DER demonstration:

1. 8 Carlford Rd., Jamaica Plain, MA 02130 - constructed in 1983 and adjacent to historic district
2. 12 Carlford Rd., Jamaica Plain, MA 02130 - constructed in 1983 and adjacent to historic district
3. 18-20 Monson St., Mattapan, MA 02126 - constructed in 1988 and adjacent to historic district
4. 108 Austin St., Worcester, MA 01609 - constructed in 1988 and in a historic district
5. 124 Canterbury St., Worcester, MA 01603 – constructed in 1900
6. 126 Canterbury St., Worcester, MA 01603 – constructed in 1900
7. 128 Canterbury St., Worcester, MA 01603 – constructed in 1900
8. 5021-5029 Chaplain Way, Pittsburgh, PA 15207 – constructed in the 1910s
9. 402-404 Winterburn Ave., Pittsburgh, PA 15207– constructed in the 1920s

Activities to be completed at demonstration locations.

1. Measurement of building dimensions and characteristics.
2. Deployment and maintenance of deep energy retrofits (exterior foam board retrofit insulation, HVAC, water-heater equipment, secondary windows, air sealing, and electric system upgrade).
3. Deployment of data acquisition and monitoring equipment.

The final 5 locations have not yet been selected at the time of this review. All potential locations would require Section 106 consultation for exterior foam board retrofit insulation installations; DOE cannot initiate consultation until those selections are made.

Budget period 4 activities include project management and reporting, augmented reality (AR) development, mechanical systems design, fenestration - window energy management system (WEMS), adaptation, retrofit process integration, deployment (including DER installation), field monitoring and evaluation, commercialization, and reporting.

WEMS secondary window prototypes would be tested in select homes. The WEMS prototypes would be installed inside, attached to brackets over existing windows. Once tested, the WEMS prototypes would easily be removed without impacting the structure or aesthetic of the home. Deployment and installation of AR and scan-to-BIM software, WEMS prototypes, pre-retrofit sensors, HVAC upgrades, water-heater equipment, air sealing, and electrical systems upgrades would be installed in the existing utility locations and would not have an impact to historical characteristics of the buildings.

Employee training, proper protective equipment, and internal safety reviews and assessments would be utilized to mitigate hazards. All project work would adhere to local, state, and federal safety regulations. DOE does not anticipate any impacts to resources of concern due to the proposed activities in BP4.

Individuals working on this project could be exposed to physical hazards. Existing corporate health and safety policies and procedures would be followed including employee training, proper protective equipment, engineering controls, and monitoring. Additional policies and procedures would be implemented as necessary if new health and safety risks are identified.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require consultation with other agencies or stakeholders.

NEPA PROVISION

DOE has made a conditional NEPA determination.

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

BP4: Tasks 4.1, 4.2, 4.3, 4.4, 4.6, 4.7, and 4.9.1

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

BP4: Task 4.8, 4.9.2, 4.10, 4.11
BP5

Notes:

Building Technologies Office (BTO)
NEPA review completed by Dustin Hill, 10/25/2024

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: 10/28/2024
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