

Notice of Intent No. DE-FOA-0001039
Notice of Intent to Issue
Funding Opportunity Announcement No. DE-FOA- 0001027

The Office of Energy Efficiency and Renewable Energy (EERE) intends to issue, on behalf of the Building Technologies Office (BTO), a Funding Opportunity Announcement (FOA) entitled “Building Energy Efficiency Frontiers & Incubator Technologies (BENEFIT) - 2014”.

Buildings accounted for 41% (40 quads) of the primary energy consumption in the USA in 2010, greater than that attributable to either transportation (28%) or industry (31%). This represented a cost of approximately \$400 billion in 2010 dollars. Buildings consumed 74% of the electricity generated in the USA, and 34% of the natural gas production. This led to buildings being responsible for 40% of the carbon dioxide emissions in the USA, or 7.4% of the total global carbon dioxide emissions [2011 *Buildings Energy Data Book*, available at <http://buildingsdatabook.eren.doe.gov/>]. Energy efficiency measures in the buildings sector provide a tremendous opportunity to reduce energy consumption and costs, and to reduce greenhouse gas (GHG) emissions.

The Emerging Technologies (ET) Program of the Building Technologies Office supports applied research and development for technologies and systems that contribute to building energy consumption. BTO’s goal is to deliver 50% primary energy savings in the year 2030, relative to the baseline energy consumption predicted by the *2010 Annual Energy Outlook*. The ET Program is helping to meet this goal by enabling cost-effective, energy-efficient technologies to be developed and introduced into the marketplace. The ET Program maintains support for the national laboratories in five core areas: Solid-State Lighting, HVAC (includes water heating and appliances), Sensors & Controls, Windows & Envelope, and Modeling & Tools. This FOA combines early-stage, off-roadmap topics (Incubators) with later-stage, roadmap-driven topics (Frontiers) that complement the core funding provided to the national labs and allow all interested parties, including corporations, universities, and non-profits as well as the national labs, to contribute to advancement in these technological areas. These topics are combined into this single, relatively large FOA in order to reduce administrative costs and to ensure that only the best applications are supported.

It is anticipated that the FOA may include the following Areas of Interest:

Incubators (off-roadmap):

Area of Interest 1: Open Topic for Energy Efficiency Solutions for Residential and Commercial Buildings

The Building Technologies Office seeks to develop technologies, techniques, and tools for making buildings more energy efficient. Currently supported technologies include heating, ventilating, and air conditioning (HVAC), water heating, lighting, building envelope (including windows), and sensors and controls, as well as building energy modeling. Any innovative energy-efficiency technologies, approaches, or design tools which show a clear application to

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residential and/or commercial buildings with significant primary energy savings potential that are neither (a) already supported by the BTO, or (b) described explicitly in a BTO roadmap (see http://www1.eere.energy.gov/buildings/plans_implementation_results.html, for example), are eligible to apply under this area of interest.

Area of Interest 2: Innovative Sensors & Sensor Systems

Improved sensors offer significant potential for energy savings in buildings. BTO is determined to develop open architecture sensors and sensor systems that easily share data to enable building operators and owners to cost effectively capture energy and cost savings through the use of new and existing control system applications. The objective is to take to market new sensors and sensor configurations that allow easy application to building operation, easy and open access to the data from the sensors, and novel application of sensor data to building management systems. We are particularly interested in innovative approaches that reduce the cost and power consumption for data collection of common building operation variables (temperature, pressure, relative humidity, etc.), open-source sensor packages that allow for data acquisition and transmission with increased lifespan between manual calibrations, "virtual sensors" enabled by innovative combinations of hardware and software, and easily installed "plug and play" sensor packages in which sensors would be automatically recognized by building energy management systems, in a manner similar to how conventional printers are easily recognized by an existing computer network.

Frontiers (roadmap-driven):

Area of Interest 3: Advanced Energy-Efficient Clothes Dryers

Household appliances such as clothes dryers consume substantial amounts of energy in the residential sector. Applications are sought for advanced electric energy-efficient clothes dryers (vented and ventless) to increase the Energy Factor at or exceeding the Max Tech values from DOE's recent rulemaking for clothes dryers, with amended test procedure rating (http://www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx/ruleid/54). The incremental first costs must result in a simple payback of less than 5 years over a minimum efficiency standard unit. Drying times should not increase more than 20% over baseline units and lint in the air system should be fully addressed. It is essential that proposers demonstrate knowledge of prior efforts and explain how they will overcome technical and economic barriers that have prevented successful commercialization in prior development efforts. Furthermore, concepts with measurable non-energy benefits, which are important for market success, are particularly encouraged.

Area of Interest 4: Highly Insulating Building Envelope Components

Energy losses through building envelope components are dominated by heating losses through windows by conduction and through opaque building envelope components (roofs, walls and foundations). This suggests that the building envelope components that are most impactful in terms of energy savings potential are walls and conduction through windows. Consequently, this area of interest is divided into two sub-topics: one addressing the transparent building envelope, and the other addressing the opaque building envelope.

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Subtopic 1, Visibly transparent building envelope components: The metrics and targets for this subtopic are $\geq R-7$ (residential) and $\geq R-5$ (commercial) fenestration technology with $V_T > 0.6$ for residential windows and $V_T > 0.4$ for commercial windows. The target installed cost premium is $< \$6/\text{ft}^2$ over the installed base of residential windows (R-1.61) and $< \$3/\text{ft}^2$ over the installed base of commercial windows (R-1.86). The weight and thickness of these windows must be comparable to the existing stock of windows to enable retrofits of existing buildings.

Subtopic 2, Opaque building envelope components: The metrics and targets for this subtopic are $> R-8/\text{inch}$ building envelope thermal insulation material that can be added to either the exterior or interior walls in existing buildings at $< \$0.30/\text{ft}^2$ installed cost premium, including insulation material and associated labor. Insulation materials must meet existing durability (fire, structure, moisture, acoustic code) requirements, and minimize occupant disturbance. This material must be applicable for wall insulation, but can also be applicable for other portions of the envelope.

EERE anticipates awarding multiple financial assistance awards in the form of cooperative agreements. The estimated period of performance for each award will be approximately 1 to 3 years.

This Notice is issued so that interested parties are aware of the EERE's intention to issue this FOA in the near term. All of the information contained in this Notice is subject to change. EERE will not respond to questions concerning this Notice. Once the FOA has been released, EERE will provide an avenue for potential Applicants to submit questions.

EERE plans to issue the FOA in early calendar year 2014, via the EERE Exchange website (<https://eere-exchange.energy.gov/>). If Applicants wish to receive official notifications and information from EERE regarding this FOA, they should register in EERE Exchange. When the FOA is released, applications will be accepted only through EERE Exchange.

In anticipation of the FOA being released, Applicants are advised to complete the following steps, which are **required** for application submission:

- Register and create an account in EERE Exchange at <https://eere-exchange.energy.gov/>. This account will allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission.

Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov

- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including the plus 4 extension, if applicable) at <http://fedgov.dnb.com/webform>
- Register with the System for Award Management (SAM) at <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually.

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- Register in FedConnect at <https://www.fedconnect.net/>. To create an organization account, your organization's SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf
- Register in Grants.gov to receive automatic updates when Amendments to a FOA are posted. However, please note that applications will not be accepted through Grants.gov. <http://www.grants.gov/>. All applications must be submitted through EERE Exchange.

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