Building Energy Efficiency Frontiers and Incubator Technologies (BENEFIT)

Funding Opportunity Announcement: DE-FOA-0001027

Webinar 1: Feb 7, 2014

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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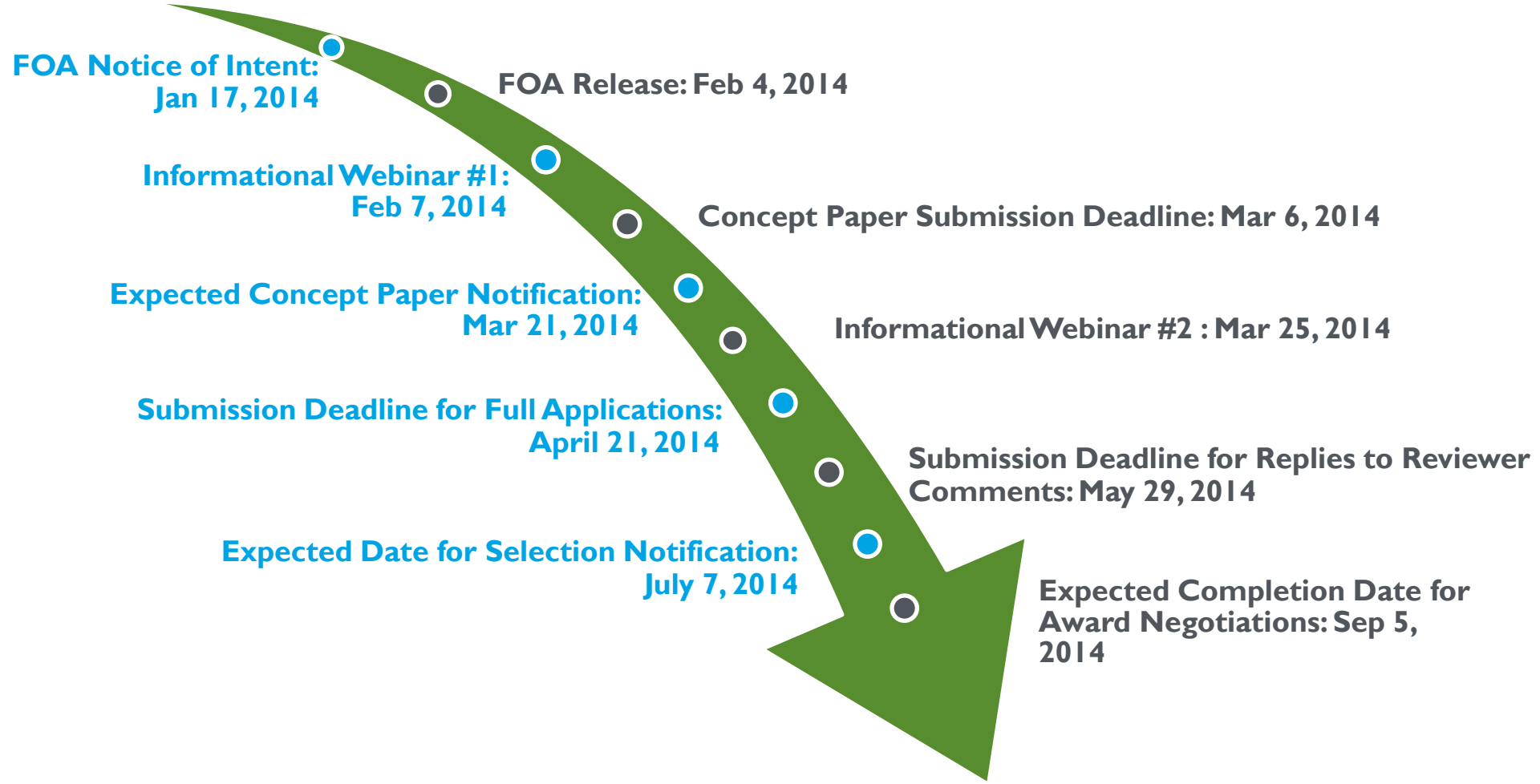
None of the information presented here is legally binding. The content included in this presentation is intended only to summarize the contents of funding opportunity DE-FOA-0001027. Any content within this presentation that appears inconsistent from the FOA language is superseded by the FOA language. All Applicants are strongly encouraged to carefully read the FOA guidelines and adhere to them. Neither the U.S. Department of Energy (DOE) nor the Federal employees associated with DOE working on this presentation shall be held liable for errors committed by applicants based on potentially incorrect or inaccurate information presented herein.

What is a Funding Opportunity Announcement?

1. Contains instructions for potential applicants;
2. Provides the objectives of the funding opportunity;
3. Outlines directions for successfully submitting the application:
   - Eligibility,
   - Required documents,
   - Technical objectives,
   - Review Criteria and scoring; and
4. Includes conditions associated with federal funding.

Schedule



*Questions to: benefitfoa@go.doe.gov

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Funding Opportunity

Summary

- $14 million available
- 4 topics, of which 2 are Incubators (off-roadmap) and 2 are Frontiers (roadmap-driven)
- Mandatory concept papers, followed by full applications
- Cooperative Agreements with substantial involvement between EERE and Recipient
- 20% cost share, but reduced to 10% for universities, nonprofits, FFRDCs, and local governments
- Incubators: DOE total of ≤ $1 million, up to two years
- Frontiers: DOE total of ≤ $ 2 million, up to three years

Main Objectives

Reduce primary energy consumption in USA buildings (residential and commercial) through

Incubators:

- Open topic for concepts with technical potential ≥ 0.25 Quads of primary energy savings per year
- Innovative sensors and sensor systems

Frontiers:

- Advanced energy efficient clothes dryers (electric and gas)
- Highly insulating building envelope components (visible and opaque)

Metrics and Performance Targets

Incubators

- Not on current roadmaps or Multi-Year Program Plan (MYPP)
- Substantial primary energy savings opportunity
- Metrics are used to compare applications, but no targets are specified
- May influence future program directions

Frontiers

- Driven by roadmaps, MYPP, or other documents
- Both metrics and targets (performance and cost) are specified

Incubators: Topic 1 Open Topic for Energy Efficiency Solutions for Residential and Commercial Buildings

- Any innovative energy-efficiency technologies, approaches, or design tools which show a clear application to buildings, with significant primary energy savings potential, that are neither (a) already supported by BTO or (b) described explicitly in a BTO roadmap, are eligible

Metrics:

- Annual technical potential primary energy savings ≥ 0.25 Quads
- Simple payback
- See Appendix F in the FOA

Technical Potential Primary Energy Savings for Topic 1

$$\left[\begin{array}{c}\text{Primary Energy Savings}\\ \text{Technical Potential}\\ (\text{TBtu})\end{array}\right] = \left[\begin{array}{c}\%\ \text{Energy Savings}\\ \text{Over Typical New}\\ \text{Technology}\end{array}\right] \times \left[\begin{array}{c}\text{Energy Market}\\ \text{Size}\\ (\text{TBtu})\end{array}\right]$$

For the "Energy Market Size (TBtu)," you can use the Building Technologies Office Market Definition Calculator (next slide).

Example Market Size Calculation for Residential Heating (New)

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Market Definition Calculator

Please use this form to define a market for your proposal and follow the guidelines suggested in Appendix F of the BENEFIT FOA. In order to complete this form, please insert '0' or '1' for all applicable market segments below, and total market size will be calculated in a green colored box below.

Title: Residential Heating (New)

Total Market Size:* 1384 TBTUs

Comments:
For all climate zones and technology types, the total market for new residential heating is 1384 TBtus.

*Total market size is defined for the year 2030 and based on Annual Energy Outlook 2010 reference case.

Space Air Conditioning and Heating

Market

Residential	1
Commercial	0
Heating	1
Cooling	0
Pre-2010	0
New	1

Component

Attic	1
Walls	1
Basement	1
Infiltration	1
Doors	1
Window-C	1
Window-SHG	1
Internal	1

Climate Zone

Climate Zone 1	1
Climate Zone 2	1
Climate Zone 3	1
Climate Zone 4	1
Climate Zone 5	1

Technology Type

Air-Source Heat Pump	1
Ground-Source Heat Pump	1
Furnace / RTU	1
Boiler / Centrifugal Chiller	1
Sectional Heating; Residential A/C	1
Electric Radiator; Wall or Window A/C	1
Other (recip., screw, scroll compressor)	1

Incubators: Topic 2 Innovative Sensors & Sensor Systems

- The successful applicant will develop open-source hardware sensing solutions for buildings in one of three sub-topic areas specifically tailored to small and medium buildings to advance opportunities for energy efficiency in this sector.

Sub-Topic Areas:

- Application of new sensor nodes (e.g. temperature, vibration, flow, position and other sensing devices) from differing technology sectors applied to building applications for solutions in sensing and monitoring (e.g., application of automotive sensors to buildings' Indoor Air Quality (IAQ) solutions and equipment operations);

Incubators: Topic 2 Sub-Topic Areas (continued)

- Sensor packages comprised of combinations of sensor nodes, power, logic, and communication configurations to sense building system states, energy usage, environmental conditions and communicate the data/information.
- Virtual, proxy, or other inferential sensing and monitoring solutions for building applications (e.g., detecting individual equipment states/characteristics utilizing a network of low-cost sensors and post processing the data to infer equipment status and performance of a larger system). Virtual, proxy, and other inferential sensors have to generate an equivalent value to a traditional sensor given the application. Furthermore, virtual, proxy, and other inferential sensors have to yield valuable information that is actionable for building operations.

Incubators: Topic 2 Metrics

- **Interoperability** – the solutions must work within existing control solutions (and not be proprietary).
- **Scalability** – the solutions must be able to scale into production and scale into a building (and not be custom, one-off solutions).
- **Deploy-ability** – the solutions must be self-starting and not require on-going commissioning or maintenance (and not need calibrating with third-party equipment).
- **Availability** – the solutions must be "open" in terms of their communication standards (and not custom and proprietary).
- **Affordability** – the solutions must be low in cost of manufacturing, installation, and ongoing operation.

Frontiers: Topic 3 Advanced Energy-Efficient Clothes Dryers

- Applications are sought for advanced 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.

Metrics:

Energy Factor (EF, in lb/kWh) equal to or greater than Max Tech values from DOE's recent rulemaking for clothes dryers
Simple payback of less than 5 years over a minimum efficiency standard unit
Drying times should not increase more than 20% over baseline units; compatibility with clothes washers
Lint in the air system should be fully addressed and interactions with heat exchangers fully addressed
Demonstrate knowledge of prior efforts and explain how past technical and economic barriers will be overcome
Any measurable non-EF benefits

Frontiers: Topic 4 Highly Insulating Building Envelope Components

- Topic 4 is divided into two sub-topics, both focused on highly insulating building envelope components for retrofitting existing buildings in both the residential and commercial sectors: visibly transparent (or fenestration) and opaque building envelope components

Metrics:

Market	Performance (R Value)	Installed Cost Premium ($/ft^2)	Visible Transmission (V_T)	Simple Payback (years)
Subtopic 1: Visibly transparent building envelope components (fenestration)				
Residential	≥ 7	≤ 6	≥ 0.6	≤ 5
Commercial	≥ 5	≤ 3	≥ 0.4	≤ 9.5
Subtopic 2: Opaque building envelope components				
Residential and Commercial	≥ R8/inch	≤ 0.3	N/A	≤ 10

Required Concept Paper Submittals

Cover Page

(1 page max)

- Topic Area Number, Project Title, Lead Organization, Organization Type, Anticipated Project Budget, Principal Investigator, Team Members, and Key Participants; Abstract

Technology Description

(3 pages max)

- Introduction
- Impact of the Proposed Technology/Approach Relative to State-of-the-Art
- Overall Scientific and Technical Merit

Concept Papers: Technical Review Criteria

Criterion 1: Impact of the Proposed Technology Relative to State of the Art (50%)

This criterion involves consideration of the following factors:

- Method used to identify current state of the art technology
- If technical success is achieved, the proposed idea would significantly improve technical and economic performance relative to the state of the art.

Criterion 2: Overall Scientific and Technical Merit (50%)

This criterion involves consideration of the following factors:

- The proposed technology is unique and innovative; and
- The proposed approach is without major technical flaws.

Outcome will be a nonbinding “Encourage” or “Discourage” recommendation to submit a full application.

Program Policy Factors

- The degree to which the proposed project, including proposed cost shares, optimizes the use of available EERE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to commercialize energy or related technologies;
- Technical, market, organizational, and environmental risks associated with the project;
- Whether the proposed project is likely to lead to increased employment and manufacturing in the United States;
- Whether the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty;
- The degree to which the proposed project directly addresses EERE's statutory mission and strategic goals;
- For applications submitted to Topics 1 and 2 (the Incubator topics), the likelihood that the successful completion of the proposed project would result in a technology or solution that could be incorporated into the BTO multi-year program plan.

Cost Share

1. Must be eligible under the award conditions;
2. Verifiable from the recipient's records;
3. Not included as contributions for any other federally-assisted project or program;
4. Necessary and reasonable for proper and efficient accomplishment of project or program objectives; and
5. Allowable under the cost principles applicable to the type of entity incurring the cost.

See Appendix B

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Key Points

We recommend that you-

- Double check your entries in EERE Exchange
  - Submissions could be deemed non-compliant due to an incorrect entry
- Make sure you hit the submit button
- Follow formatting criteria and page lengths stated in the FOA
- Use the tables provided in the FOA to help construct a compliant application
- Submit 48 hours before the due date
  - Avoid last-minute rush with EERE Exchange

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Logistics

Data Produced Under the Award

- The Government normally retains unlimited rights to technical data produced under Government financial assistance awards, including the right to distribute to the public.
- "Protected data" may be protected from public disclosure for up to 5 years.
- Invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

Annual Compliance Audits

- For-profit prime recipients: an annual compliance audit by an independent auditor may be required if expenditures of Federal funds > $500,000 during a fiscal year
- Other recipients: A-133 audit is required if expenditures of Federal funds > $500,000 in a fiscal year

- Submit Questions to *benefitfoa@go.doe.gov*
- Answers posted at https://EERE-Exchange.energy.gov , DE-FOA-0001027