

## Residential Wood Heater In-Situ Testing RFI

DATE: July 23, 2024

SUBJECT: Request for Information (RFI)

### Description

Wood is an important renewable source of fuel for residential heat, with 10% of American households (approximately 13 million) burning wood for heat and 2% using wood as their primary heat source. Although wood heaters provide a small percentage of energy used in residences in the United States, the devices are a substantial source of particulate matter emissions. These emissions contain fine particulate matter (PM) along with other pollutants, including carbon monoxide (CO), volatile organic compounds (VOCs), toxic air pollutants (e.g., benzene and formaldehyde), and black carbon. Improvements in the design and automation of wood heaters have the potential to significantly reduce emissions and increase efficiency. In addition to wood heater design, proper installation and operation also determine the level of emissions and efficiency of residential wood heaters.

As innovation has driven the improved performance of residential wood stoves, they have become more efficient and cleaner burning, as proven by laboratory certification tests. Measuring stoves' performance as they burn in residences with real user behavior (in-situ) will give more insight into the stoves' efficiency as well as the indoor and outdoor air quality. Collecting in-situ data will provide both industry and government with information to guide further innovation of cleaner and more efficient wood stoves and the best use of renewable wood feedstocks.

### Background

Since fiscal year 2019 the U. S. Department of Energy (DOE) Bioenergy Technologies Office (BETO), an element of DOE's Office of Energy Efficiency and Renewable Energy (EERE), has been the steward of funds to support the development of cleaner burning, higher efficiency residential wood heaters. These funds have supported topics in Funding Opportunity Announcements (FOA), Wood Heater Design Challenge (WHDC) competition, a FY23 Cooperative Research and Development Agreement (CRADA) call, and a series of workshops held in 2022. A recommendation from the March 2022 workshop series was to focus on the in-situ testing of wood heaters to better understand their actual performance as influenced by many factors, including but not limited to operator control, chimney design, climate, and wood

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quality. This RFI seeks further input from stakeholders to define the goals and objectives for a planned effort to collect in-situ wood heater performance data.

## **Purpose**

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on issues and considerations related to testing residential wood stoves in-situ to enable the development of cleaner, more efficient wood heaters. The planned in-situ field data collection effort will monitor wood heater performance in operation by the homeowner rather than an imposed duty cycle in a laboratory environment. EERE is specifically interested in input in identifying the most important parameters to measure, considerations of in-situ test design, data collection methods, operator behavior, and other input surrounding in-situ testing. This is solely a request for information and not a FOA. EERE is not accepting applications.

## **Disclaimer and Important Notes**

This RFI is not a Funding Opportunity Announcement; therefore, EERE is not accepting applications at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as information only. EERE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. EERE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that EERE is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind EERE to any further actions related to this topic.

## **Confidential Business Information**

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or

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hand delivery two well-marked copies: one copy of the document marked “confidential” including all the information believed to be confidential, and one copy of the document marked “non-confidential” with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

## **Evaluation and Administration by Federal and Non-Federal Personnel**

Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to EERE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.

## **Request for Information Categories and Questions**

### **Category 1: Key Metrics and Direction**

1. Please describe your top priorities for wood heater in-situ testing?
2. What are the key gaseous and particulate matter emissions to measure during in-situ testing?
3. Should thermal performance be prioritized for in-situ measurement? Please explain.
4. What should be prioritized: more intensive short-term (i.e., one heating season) data collection or longer duration testing (i.e., multiple heating seasons)?
5. How can we ensure in-situ testing is both informative and practical?
6. Should in-situ testing focus on any specific geographic regions? Please explain.

### **Category 2: In-Situ Data Considerations**

1. What existing data could help guide these field studies? Please identify any relevant air quality studies other than wood heat that should be utilized?
2. How can data best be cataloged and distributed after the testing is concluded?
3. How would you use this data to inform the development of cleaner-burning, more efficient wood heaters?

### **Category 3: In-Situ Wood Heater Testing Parameters**

1. Should air quality be measured indoors, at the chimney, and/or in the community? Please explain.

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2. What types of wood heaters (e.g., room, central furnaces, boilers) should be targeted for field studies?
3. What other parameters for wood heater design and user behavior should be considered?

**Category 4: In-Situ Wood Heater Test Methodology**

1. What instrumentation do you recommend for in-situ testing?
2. Please comment on the strengths and weaknesses of dilution vs. direct stack sampling.
3. How should homes and equipment be identified for testing? What types of different chimney designs should be tested?
4. What data should be collected about the heater and the installation?
5. What data should be collected from user operation of the heater?
6. What other components of test design should be taken into consideration?

**Request for Information Response Guidelines**

Responses to this RFI must be submitted electronically to [woodheat@ee.doe.gov](mailto:woodheat@ee.doe.gov) no later than 5:00pm (ET) on September 30, 2024. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 5 pages in length, 12 point font, 1 inch margins. Only electronic responses will be accepted.

Please identify your answers by responding to a specific question or topic if applicable. Respondents may answer as many or as few questions as they wish.

EERE will not respond to individual submissions or publish publicly a compendium of responses. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name;
- Company / institution contact;
- Contact's address, phone number, and e-mail address.

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