[6450-01-P]

DEPARTMENT OF ENERGY

Building Technologies Office Prioritization Tool

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Request for information (RFI).

SUMMARY: The U.S. Department of Energy's (DOE) Building Technologies Office (BTO) developed the Prioritization Tool to improve its programmatic decision-making. The tool provides an objective framework for most energy-saving measures and scenarios, as well as methodology, comparing long-term benefits and end-user costs applied to various markets, end-uses, and lifetimes. Currently, BTO seeks comments and information related to the Prioritization Tool that improves the tool's accuracy and applicability for technology planning within BTO. Specifically, this notice solicits comments and information on data, assumptions and outputs of various energy efficiency technologies and activities analyzed by the Prioritization Tool.

DATES: Responses to this RFI must be submitted electronically to BTO_P_Tool_RFI@go.doe.gov no later than 5:00 pm (EST) on December 24, 2013.

FOR FURTHER INFORMATION CONTACT: Mr. Patrick Phelan, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE 2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 287-1906. E-mail: patrick.phelan@ee.doe.gov

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Background

A. Program Overview

The U.S. Department of Energy (DOE) Building Technologies Office (BTO) focuses on three key areas in order to develop innovative and cost-effective energy saving solutions:

- Supporting research and development of high impact building technologies
- Accelerating market penetration of technologies that will save the country energy by assisting to overcome key market barriers

- Organizing and facilitating enforcement of minimum efficiency standards and building codes to ensure energy savings within buildings.

BTO has developed a new technology prioritization framework to provide analytical support for its programmatic decision-making in order to further accelerate the transformation of the U.S. building energy efficiency sector.

B. Prioritization Tool Description

The tool was designed to inform programmatic decision-making and facilitate the setting of programmatic goals. It also allows the evaluation of "what if" scenarios when pursuing potential competing energy efficiency measures, and it ultimately helps the BTO to create Funding Opportunity Announcements (FOAs) objectives. Currently, the tool contains data on over 500 energy efficiency measures along with their markets. It has the capability to perform extensive analyses using established methodology for calculating energy savings potential and the costs of conserved energy associated with each measure.

The Prioritization Tool enables open and objective comparison of hundreds of technology and market-based investment opportunities available to BTO. The energy efficiency measures identified in the tool cover a spectrum of market opportunities, including residential and commercial buildings, new and existing buildings, as well as industrial and outdoor applications. Most of the measures considered fall within one of BTO's main focus areas in building energy end-use sectors:

- Heating, ventilation and air-conditioning (HVAC)

- Water heating
- Appliances
- Lighting
- Windows
- Envelope: insulation and roofing
- Sensors and controls
- Miscellaneous electric loads

The tool strives to be comprehensive by including most known energy efficiency measures proven to save energy; laboratory-demonstrated, field-tested, analytically derived (with peer review) savings, and inclusive by integrating inputs from hundreds of sources and expert reviews.

While BTO has identified over five hundred energy efficiency measures, it chose to narrow the scope of analysis to focus on the most promising measures that have the greatest potential for energy savings across the United States. By excluding measures based on the following predefined criteria, BTO has created a portfolio consisting of 261 measures which, by using the Prioritization Tool, were subsequently subjected to a more extensive quantitative analysis to assure only the highest impact measures are the focus of further effort. The approach was first for BTO to focus on technologies which had the highest data quality (i.e., where peer-reviewed energy efficiency and cost data are available in published reports or from technology experts). Then, measures were excluded from further analysis if they:

- Offered low energy savings potential (less than 100 TBtu in the year 2030);

- Involved fuel switching (unless the analysis team deemed a technology as important to assess);
- Had one or more significant market barriers;
- Were deemed impractical by the analysis team;
- Were already included in the Annual Energy Outlook (AEO) 2010 baseline, which takes into account known technologies, technological and demographic trends, and current laws and regulations.

These criteria were considered as general guidelines; exceptions for certain promising or cost effective measures were made on a case-by-case basis based on expert analysis. Finally, BTO analyzed and prioritized, both individually and in the context of the full portfolio of measures, all 261 measures having relatively high energy savings potential and significant ability to compete in the market place.

C. Methodology

The BTO Prioritization Tool uses established methodologies to evaluate under a variety of scenarios the incremental lifetime costs of a measure's energy savings potential. The tool calculates potential savings at the national or regional level and compares the results to a business-as-usual baseline defined in the U.S. Energy Information Administration's (EIA) Annual Energy Outlook 2010 (AEO).[1] The following scenarios are used for the prioritization analysis and represent potential annual energy savings associated for each measure:

[1] http://www.eia.gov/oiaf/aeo/pdf/0383(2010).pdf. The AEO provides annual projections through the year 2035 of national equipment stock and energy consumption based on end-use, type of fuel, geographic region, and type of building or home.

- *Technical Potential* is the annual energy savings achieved by instant replacement of all technically suitable existing stock in 2010 and beyond with the proposed measure, regardless of cost. Although the technical potential cannot be realized, it provides an upper bound to the maximum energy savings that can be achieved by the proposed measure assuming instant and complete market adoption of the technology.
- *Maximum Adoption Potential* is the total annual savings based on deployment of the evaluated measure given 100% market penetration for all end-of-life or accelerated replacements and new purchases or new construction installations. The entire existing stock is replaced at an accelerated schedule for cases when a retrofit opportunity is cost effective, which means the present value of the energy savings of other efficiency measures exceeds the full, installed cost of the evaluated efficiency measure. Therefore, it becomes economically rational to replace all of the currently deployed stock immediately with the efficiency measure. This scenario corresponds to the least expensive means to deploy a given efficiency measure into the marketplace. This potential is also referred to as Unstaged Maximum Adoption Potential.
- *Staged Maximum Adoption Potential* adjusts the savings of the Maximum Adoption Potential to avoid double-counting energy savings for measures with overlapping markets within a given portfolio. For example, the installation of compact fluorescent light bulbs would reduce the potential energy savings from light-emitting diodes (LEDs). The savings of the lowest-cost measures are accounted for first.
- *Adoption-Based Potential* uses the Bass diffusion model2[2] to represent a more realistic potential impact on energy savings in the marketplace. This scenario allows simulation of

[2] Bass, F.M., 1969, "A New Product Growth Model for Consumer Durables," Management Science, Vol. 15, pp. 215-227

the DOE programs' impact on measure diffusion and assumes that research and development and deployment activities would accelerate market introduction. It also allows for evaluation of standards by replacing all purchased stock with the technology being evaluated once a standard is set in place. For this RFI, outputs from this scenario are not available but will be addressed in future publications.

For the unstaged and staged *Maximum Adoption Potential* scenarios, the tool also calculates the levelized cost of conserved energy (CCE), which is an annualized value of discounted costs and benefits of each measure. More specifically, the CCE allows comparison of end-user costs per unit of conserved energy for each measure. The end-user cost refers to the difference in capital, operations, and maintenance costs between the measure being analyzed and a typical baseline, adjusted for potential cost differences resulting from the variation in lifetimes between the proposed measure and the baseline. CCE is used during staging analysis, which involves adjusting the energy savings of each measure by taking into account competition for savings within the same or overlapping markets, and allocating savings within specific markets to measures with the lowest unstaged CCE first. Consequently, the staged CCE is calculated based on adjusted staged savings. Hence the staged CCE is defined as the annualized value of discounted cost per unit of conserved energy after staging of energy savings for each measure. Results are presented for both unstaged and staged scenarios by graphing unstaged or staged CCE versus unstaged or staged *Maximum Adoption Potential* savings, respectively.

For further overview, discussion and examples of how the Prioritization Tool analyses are conducted, please view the video presentation at http://media.navigant.com/videotest/EN_DOEWebex_VID_0913.html. For more detailed description and discussion of the methodologies underlying the BTO Prioritization Tool's

analytical capabilities, as well as its outputs, caveats, and functions, refer to the National Renewable Energy Laboratory (NREL) Technical Report: NREL/TP-6A20-54799, available at http://www.nrel.gov/docs/fy12osti/54799.pdf.

D. Inputs and Outputs

DOE seeks comments and information on measure inputs and assumptions used by the BTO Prioritization Tool as well as the outputs generated by the tool. The details of the inputs and outputs for the defined portfolio of 261 measures are provided in the spreadsheet, available at https://eere-exchange.energy.gov/Default.aspx?Search=prioritization%20tool&SearchType=#FoaIdc83baeea-4a16-48fa-a123-7c03796b503b and titled: RFI attachments_v11. The spreadsheet is divided into eight energy end-uses: heating, ventilation and air-conditioning (HVAC), water heating, envelope, windows, appliances, sensors and controls, lighting, and miscellaneous electric loads (MELs). Information on each end-use is presented in two tabs: an input tab that contains relevant input information on each measure and an output tab that contains the analytical results for the year 2030. The inputs include data, calculations and assumptions based on the sources listed for each energy efficiency measure. More specifically, the inputs include a description of each measure, targeted market sector, typical technology life expectancy, energy consumption, and installed costs for both the baseline and high-efficiency measures. It also includes the percentage energy savings and cost premium of an efficient measure compared to the baseline measure. DOE also seeks comments and information with regard to the tool's outputs, which include estimated *Technical Potential* energy savings, *Unstaged Maximum Adoption Potential* savings, unstaged cost of conserved energy (CCE), *Staged Maximum Adoption Potential* savings, and

staged CCE for each measure in the year 2030. Each column of the spreadsheet referenced above contains specific input or output data, and is annotated with a comment box that further explains the data in that column. For further information on the Prioritization Tool's individual measure inputs, refer to its notes and references columns. For further information on the tool's outputs, refer to NREL TP 6A20-54799 and the BTO video presentation, which can be found at links referenced above.

II. Purpose

The purpose of this RFI is to solicit comments and information from industry, academia, research laboratories, government agencies, and other stakeholders on input and output data for all measures evaluated in the tool. DOE seeks data on new measures that may be missing from the tool or measures that have not been evaluated but have potential for significant national energy savings. This is solely a request for information and not a Funding Opportunity Announcement (FOA). EERE is not accepting applications for funding related to this RFI at this time.

III. Disclaimer and Important Notes

This RFI is not a Funding Opportunity Announcement (FOA); 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. In accordance with the Federal Acquisition Regulations, 48 CFR 15.201(e), responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. EERE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that DOE 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.

IV. Proprietary Information

Because information received in response to this RFI may be used to structure future programs and FOAs and/or otherwise be made available to the public, **respondents are strongly advised to NOT include any information in their responses that might be considered business sensitive, proprietary, or otherwise confidential.** If, however, a respondent chooses to submit

business sensitive, proprietary, or otherwise confidential information, it must be clearly and conspicuously marked as such in the response.

Responses containing confidential, proprietary, or privileged information must be conspicuously marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Federal Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

If your response contains confidential, proprietary, or privileged information, you must include a cover sheet marked as follows identifying the specific pages containing confidential, proprietary, or privileged information:

> **Notice of Restriction on Disclosure and Use of Data:**
>
> Pages [list applicable pages] of this response may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for the purposes described in this RFI: DE-FOA-0001024. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

In addition, (1) the header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: “Contains Confidential, Proprietary, or

Privileged Information Exempt from Public Disclosure" and (2) every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

V. 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 DOE 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.

VI. Request for Information Categories and Questions

DOE requests that manufacturers, utilities, research organizations, state and municipal energy programs, and other stakeholders submit their comments and additional information on the Prioritization Tool's inputs and outputs for measures as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Only electronic responses will be accepted. 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, nor does it provide an

advantage to future Funding Opportunity Announcements. Respondents are requested to provide the following information in their response to this RFI:

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

DOE invites comments and information from respondents on all of the input and output data that are provided in the spreadsheet (https://eere-exchange.energy.gov/Default.aspx?Search=prioritization%20tool&SearchType=#FoaIdc83baeea-4a16-48fa-a123-7c03796b503b), as well as any of the elements previously discussed or additional issues the respondent deems important. Use the following email address: BTO_P_Tool_RFI@go.doe.gov. Additional high-quality data sources and references are needed to evaluate any other possible initiatives to expand the portfolio and help identify the most promising cost-effective energy reduction measures for buildings. Specifically, DOE is requesting comment and information on the following topics:

A. Category 1: Information on BTO Prioritization Tool's inputs

Please provide your comments on the accuracy of the inputs of the Prioritization Tool, listed in the input tab for each energy end-use field in the spreadsheet (https://eere-exchange.energy.gov/Default.aspx?Search=prioritization%20tool&SearchType=#FoaIdc83baeea-4a16-48fa-a123-7c03796b503b). These inputs include the measure's description, targeted market sector, technology typical life expectancy, energy consumption and installed cost for both

baseline and efficient measures, and/or percentage energy savings and cost premium of an efficient measure compared to the baseline measure.

B. Category 2: Additional information on BTO Prioritization Tool's inputs

Please provide additional up-to-date, peer-reviewed and published information, studies, and reports on any of the inputs of the evaluated energy efficiency measures.

C. Category 3: BTO Prioritization Tool's generated outputs

Please provide your comments on the perceived accuracy of the tool's generated outputs listed in the spreadsheet, whether as a whole for the entire portfolio of measures or in part for each measure. Specifically, these outputs include: *Technical Potential*; *Unstaged Maximum Adoption Potential*, unstaged CCE; *Staged Maximum Adoption Potential*, and staged CCE.

D. Category 4: Information on absent buildings-related energy efficiency measures that may enhance the tool or measures that are listed but were excluded from analysis

Please provide any up-to-date, peer-reviewed and published information, studies and reports on buildings-related energy efficiency measures missing from the tool or measures that are listed but were excluded from analysis due to a lack of reliable peer-reviewed, published data. While only a couple hundred measures are included in the final analysis, hundreds of others are available for analysis and can be viewed in the tab called "Excluded Measures" in the spreadsheet referenced above. For each measure, DOE is specifically interested in information

on measure description, its incremental cost and energy savings over its baseline technology, life expectancy, and a description of the market to which the measure can be applied.

E. Category 5: Benefits or risks of using the BTO Prioritization Tool

What are potential or perceived benefits or risks of using the BTO Prioritization Tool to inform decision-making within BTO?

F. Category 6: Public access to the BTO Prioritization Tool

What is the perceived value in the BTO Prioritization Tool models and analysis, and interest in having public access to the BTO Prioritization Tool? If the BTO Prioritization Tool is to be made publically available, what format is preferred (e.g., real-time online execution, downloadable Excel file, downloadable non-Excel file, etc.)? An example of a similar publically available software tool is the *System Advisor Model* for renewable energy systems (https://sam.nrel.gov/).

Issued in Washington, DC, on November 13, 2013.

Roland J. Risser
Director
Building Technologies Office
Energy Efficiency and Renewable Energy

[FR Doc. 2013-27941 Filed 11/20/2013 at 8:45 am; Publication Date: 11/21/2013]