

Frequently Asked Questions about the DOE Commercial Buildings Energy Asset Rating Program

DOE has received a set of questions in responses to the Request for Information (RFI) published on August 8, 2011, and a series of stakeholder outreach activities including webinars, a workshop, and focus group meetings. These queries from participating building owners and operators, realtors, municipalities, and others focused on what the asset rating program will encompass, target audiences, rating methodology, quality assurance, and the potential for additional supported options.

Frequently asked questions are presented below, by category, followed by a DOE response.

Program Overview

Q: What is the commercial building energy asset rating system envisioned by DOE?

A: DOE is establishing a national standard for a voluntary energy asset rating system, which will include a tool that can help building owners evaluate their buildings with respect to this standard. Based on the centralized energy-modeling tool, the asset rating program will evaluate the physical characteristics of the building “as built” and its overall energy efficiency independent of its occupancy and operational choices. The model will take into account the building envelope, the mechanical and electrical systems, and other major energy-using equipment that are actually built into the building. The asset rating system will identify potential opportunities for efficiency improvements and note what impact those opportunities might have on the potential asset ratings score of a building.

Q: What is DOE’s objective in creating an energy asset rating?

A: DOE’s goal in undertaking a national building asset rating is to facilitate cost-effective investment and energy efficiency in commercial buildings by providing a tool that allows building owners to benchmark their buildings against peers and other market players to understand the relative efficiency of different buildings in a way that is distinct from building operations and occupancy. The asset rating system will provide a centralized modeling tool that both reduces the implementation cost and increases the standardization compared with an approach that requires users to build their own energy models. In other words, building owners do not need to hire an expert energy modeler to perform a preliminary energy analysis and obtain an asset rating. The asset rating tool is aimed to provide value in the first step of assessing a building by identifying some possible upgrade opportunities. The asset rating system is not intended to be a replacement for a full energy audit of a building.

Q: Do you anticipate the asset rating program becoming mandatory?

A: The asset rating program is being developed by DOE as a voluntary program.

Q: Will there be enough time in the Request for Information (RFI) process to adequately consider and address all stakeholder comments?

A: DOE has conducted webinars, interviews, and focus group studies to collect market feedback. A workshop was held in Washington, D.C., on December 8 and 9, 2011, to further engage stakeholders in the program design. The asset rating program has defined reasonable goals and criteria to evaluate the quality of the product in each development phase. All project documents will be publicly available. DOE plans to launch the pilot project in spring 2012 and further test the asset rating system and tool with a diversity of commercial buildings. All commercial building stakeholders are welcome to join the pilot. This is another opportunity to provide feedback.

Q: How is the asset rating program different from ENERGY STAR Portfolio Manager?

A: Although both ENERGY STAR Portfolio Manager and the DOE asset rating program provide building energy efficiency ratings, the focuses are different. Portfolio Manager reflects the overall efficacy resulting from the system efficiency and operation and maintenance. The purpose of an asset rating is to break out the infrastructure piece so that building stakeholders can consider the as-built efficiency and operational practices separately. The asset rating takes into account only the physical assets of the building and enables building owners and operators separate out the operational aspects. This allows the comparison of building assets on an equal footing by eliminating the wide variation due to differences in operation and maintenance, plug loads, and occupant behavior. Building stakeholders can then determine whether a building is performing well because it is a high-efficiency building or because it is well managed. The asset rating tool provides more granular information, enabling building owners to target limited resources toward those areas that will produce the most efficiency improvements.

Q: How does DOE envision the commercial building energy asset rating working with ENERGY STAR Portfolio Manager?

A: The asset rating program is intended to be complementary to Portfolio Manager. Portfolio Manager compares an existing building to its peers through an analysis of that building's energy bills and operational characteristics. In any given building, a number of factors influence energy use and the outcomes measured by the energy bill. The asset rating will help segregate some of these factors—those related to the physical infrastructure of the building. The ability to see these factors in isolation enables building stakeholders to better determine whether higher-than-expected energy use is due to inefficient physical infrastructure and specific building systems or to the occupancy, operations, or other factors.

Q: What's the target cost for an owner to get rated?

A: The asset rating tool will be free for users. The only cost for a building owner will be verified data collection and input. DOE is evaluating existing credential programs that can support asset rating data verification. During the pilot project, cost information will be gathered.

Basic Metrics

Q: What metrics will be used to determine the rating?

A: DOE is considering using source energy use intensity (EUI) as the primary metric with which to generate the asset ratings. DOE is also considering the inclusion of other metrics as optional indicators, such as site energy use separated out by fuel types, greenhouse gas emissions, peak demand, energy cost, and system-level performance indicators.

Q: Will greenhouse gas emission be reflected on the rating?

A: Greenhouse gas is not used as the main metric to rate the building. It may be included as optional content.

Q: Will cost information be provided? If so, what cost metric will be used?

A: Estimated annual building energy costs and savings, based on average regional utility rate, are provided in the asset rating report. However, cost will not be used as the main metric to rate the building. The estimate of energy costs and savings cannot be compared directly with the utility bills for a building because they are based on the assumptions that the building is fully occupied, operated for a certain number of hours per week (typical operating hours for the building type), and has standard miscellaneous loads—for example, numbers of computers, numbers of vending machines. The estimated annual energy costs based on standard conditions provide an apples-to-apples comparison between buildings. DOE is considering allowing users to override standard assumptions in order to generate customized results. However, this customized result will not be included in the standard asset rating report.

Q: Will the rating system compute the asset rating with or without on-site renewable energy systems?

A: Currently, DOE does not intend to include the on-site renewable energy generation in the EUI calculation because energy efficiency is the focus of this program. However, DOE is evaluating different means to address on-site renewable energy generation.

Q: Does the asset rating include information on water use or other green building features?

A: Energy is the current focus of the DOE asset rating. Water use is not included.

Target Audience and Building Types

Q: Will the asset rating tool be free and accessible to the public?

A: Yes, DOE will provide the asset rating tool, a web-based application, free of charge. Any user can set up an account, enter the building information, and obtain a report of preliminary analysis. However, to obtain a verified asset rating, a qualified professional is needed to validate the information entered into the asset rating tool. The credential of a qualified professional is still under development.

Q: What building types will be covered by this rating scheme?

A: The rollout of the program has been organized in a phased approach, focusing first on building types that are simplest to understand and about which we have more information to establish a rating system. Phase I, which will be included in the initial rollout, includes buildings in these categories: office, educational, retail, and unrefrigerated warehouse. Phase II includes mixed-use types of buildings that incorporate Phase I uses, lodging, food service, food sales, public safety, and religious worship. Phase III buildings are either those with more complex systems or those for which we currently have a limited body of information, such as data centers, laboratories, refrigerated warehouse, health-care facilities, public assembly, and so on. DOE is also rolling out a residential asset rating system, and it remains to be determined whether multi-family residential buildings will be included in the residential asset rating system or in the commercial building energy asset rating system. Both new construction and existing space will be supported by the commercial building energy asset rating system.

Q: Will the model be expanded to include other building types as it progresses?

A: Yes, the asset rating system is intended to include the majority of types of commercial buildings. Additional building types will be added as the program develops.

Q: Is there a need to separate building types into so many phases? Won't most buildings essentially have the same types of assets?

A: To ensure a fair rating and comparison, it is necessary to evaluate buildings by use type. A main reason is that the assumed standard operations are different. For example, schools have operating schedules and miscellaneous plug loads that are very different from those of retail establishments.

Q: Are there plans for including more detailed space subtypes? There are many different kinds of office space (e.g., regular office, trading floors).

A: Not at this time, although if sufficient data exist to make detailed calculations about internal loads and operation patterns, then space subtypes could be addressed in the future.

Q: Is there a minimum size threshold for buildings that can be rated?

A: No. The goal is to make the building energy asset rating system equally applicable to small and large commercial buildings.

Q: Will asset rating apply to both new and existing buildings?

A: Asset rating will be equally applicable to both new and existing buildings. For new buildings, a design team could upload the inputs from their design parameters into the tool and receive both a rating and recommendations to make the design more energy efficient. This process would be equivalent for an existing building, except that the installed systems should be used instead of the designed systems, and performance depreciation over time will be considered.

Q: What information will be available for the public and what will be kept confidential?

A: A user of the asset rating tool may choose to make the results available to third parties. DOE has no intention at this time of disclosing to a third party any information entered into the asset rating tool that can be used to identify a building and its design features, without the consent of the owner of that information. DOE may use statistical information about large numbers of buildings in a way that does not allow third parties to identify individual buildings.

Q: Will there be varied levels of data user access?

A: Yes, the asset rating tool can potentially provide different levels of user access.

Rating Methods

Q: What components will be included in the rating?

A: The asset rating will include physical characteristics of the building as built and its overall energy efficiency, independent of occupancy and operational choices. The physical characteristics will include the building envelope, the mechanical and electrical systems, and other major energy-using equipment (e.g., a commercial kitchen in a restaurant). Miscellaneous loads (e.g., office equipment and appliances) vary with building occupancy and are therefore standardized in asset rating by building type. Installed controls such as daylighting controls and occupancy sensors, variable-frequency drives, and variable air volume terminal units will be included in asset rating. However, the control schemes of these systems will not be specifically modeled because it is based on building operational choices. A standardized control scheme will be used.

Q: Will there be an added distinction in the model to ensure a fair rating for new construction and existing building? What about historic buildings?

A: All buildings will be rated using the same method. However, different reference points will be provided for buildings of different vintages in different climate zones. For example, the reference point for a 50-year old medium-size office building in Chicago is the average energy use of medium-size office building built prior to 1980 in a cold and humid climate. In addition, the model will calculate a potential rating that incorporates the cost-effective upgrade package and considers the limitation of different construction methods. A historic building with limited potential due to its preservation requirements can be properly addressed this way. In other words, a historic building with a specific envelope type will have limited envelope upgrade option and therefore may have a lower potential rating.

Q: Will new and old buildings be rated differently?

A: To ensure accuracy and consistency, buildings constructed in different years will be scored in the same way.

Q: Will the asset rating tool account for the year that equipment is installed and for performance degradation?

A: Yes. The asset rating tool will account for year of installation by considering the expected initial equipment performance, performance degradation over time, and how much useful life (based on typical equipment lifetimes) remains for a specific piece of equipment.

Q: Will the asset rating tool account for different occupancies, building additions, and renovations?

A: The occupancy will be standard (fully occupied with normal operating hours); building additions and renovations will be included in the rating.

Q: Does the asset rating tool use a standard set of operating conditions? What are those standard operating conditions?

A: Yes, the rated building will be modeled using a standard set of operating conditions. DOE will use recognized standards such as those defined by COMNET and ASHRAE.

Q: How will building location be assessed? Does the energy model normalize weather?

A: A building will fall into a specific climate zone or weather location. The model will use normal weather condition in modeling a building's projected energy use. The rating system will normalize a building's rating to account for climatic differences.

Q: What is the basis of the software that is being used to model the building? What simulation guidelines and procedures might be proposed for the asset rating program?

A: The asset rating tool will use EnergyPlus as the centralized energy modeling engine. However, the user will never interact directly with EnergyPlus and will enter a limited set of building data into an intuitive user interface. Therefore, no specific modeling guidance will be necessary. Data collection guidance will be provided, and documentation of modeling methodology will be publicly available.

Q: Will the web-based asset rating tool perform building simulations in real time, or will it look up pre-simulated values?

A: The web-based asset rating tool will run real-time simulations.

Q: What is the minimum building level data necessary for the asset rating tool to be sufficiently robust?

A: DOE is currently evaluating the level of data necessary to provide meaningful results that will be cost effective from both a modeling standpoint for the rating system and an information-gathering data input perspective for building owners. DOE is considering two levels of data input, simple and advanced. Simple level data collection requires minimum data input and relies on an inference engine to generate energy model and provide preliminary analysis. Advanced level data collection requires verified data, with which users can receive a more accurate analysis and official asset rating and report.

Q: Has DOE developed a detailed list of what building data will need to be collected and what inputs would be provided in the web-based tool?

A: DOE is still compiling the list to ensure the information collected enables a robust analysis while maintaining a reasonable level of data collection. DOE will use a pilot test of the program to evaluate the data collection protocol.

Rating Scales

Q: What scale is DOE considering?

A: No final decision has been made at this point. DOE is considering various ways to construct a scale on which to place the rating. One option is a numeric scale reflecting the actual physical units similar to the way we use miles per gallon for automobiles; for buildings, this could be thousands of British thermal units per square foot per year (kBtu/ft²/yr). Another option is to use a technical or interval scale that directly converts kBtu/ft² into 1–100 points and that is not population weighted as is a statistical scale. At this point, the scale has not been finalized. Ultimately, the goal is to provide a common scale with a conversion methodology for different building types and

climate zones. The scale should effectively reflect high-efficiency and low-efficiency buildings and their improvement over time.

Q: If a 100-point scale is used, what will the two extremes of the scale represent?

A: DOE is considering whether to be consistent either with ENERGY STAR Portfolio Manager (where the higher the rating, the more efficient the building) or, alternatively, with something like the zEPI scale proposed by COMNET (where 0 represents high efficiency—nearing zero net energy—and 100 represents the average or baseline building performance). The basis for choosing any scale is energy use intensity or kBtu/ft². DOE is considering using zero energy as one extreme of the scale to develop a fixed goal.

Q: Will there be a reference point such as a baseline building?

A: No comparator building or baseline building is needed to calculate the asset rating because a candidate building will be evaluated using a pre-defined fixed scale. The average energy use of a specific building type in a specific location will be developed as a reference point to help stakeholders understand how a building is compared with similar buildings in the region. However, this reference point does not affect the candidate building's rating.

Q: Is CBECS used to as a baseline for the rating scale?

A: Asset rating will be independent of the CBECS data because it will evaluate a building on its own merits rather than against a population of other buildings. DOE will use CBECS and other building database only to ensure that the developed rating scale can truly reflect the efficiency distribution of current building stock. Both high-efficiency and low-efficiency buildings should be effectively evaluated.

Q: Will the rating adjust over time or with technological advances?

A: DOE intends to use a rating system that will allow a building to maintain its rating for at least 5 years if the building is maintained and does not undergo significant infrastructure changes. A building rating will be changed only if an energy efficiency upgrade is implemented.

Q: How will the model deal with mixed-use properties? For example, server rooms or trading floors as part of an overall office building?

A: Mixed-use types of buildings that incorporate Phase I and Phase II use types will be included in the Phase II rollout. Those with either more complex systems or those for which we currently have a limited body of information (such as data centers, laboratories, refrigerated warehouses, and health-care facilities) will be included in the Phase III rollout. DOE is still investigating appropriate methods to analyze mixed-use buildings. It is anticipated that the different uses would be divided on the basis of square footage, and a weighted average EUI for the entire building would be generated and rated. Another approach is to rate the different uses separately and to use a prorated rating based on the square footage of each use type as an overall rating. DOE is also considering weighting the overall energy use intensity based on the energy use of each use type rather than its floor area.

Q: Will there be a method to provide a system-level rating?

A: DOE is considering providing both a whole-building rating and system-level ratings for lighting, cooling, heating systems, building envelope, and other systems.

Q: Can you directly compare the kBtu/ft² value provided by the asset rating tool to the kBtu number derived from ENERGY STAR Portfolio Manager?

A: The kBtu/ft² provided by the asset rating tool is modeled energy use under a standard operating condition; the kBtu/ft² derived from Portfolio Manager is measured energy use under a specific operating condition. Therefore, these energy use intensity values are not directly comparable. DOE is working with EPA to develop means to help building stakeholders effectively use the information from the asset rating tool and Portfolio Manager and make meaningful and consistent comparisons.

Identified Opportunities for Energy Efficiency Improvements

Q: How will the recommendations be determined for energy-efficient measures (EEMs)?

A: Potential EEMs will be considered iteratively—alone and in combination—to develop a cost-effective package of potential measures. Interactive effects between measures will be considered. Only those EEMs found to be life-cycle cost effective as defined in the government standard building life-cycle cost approach will be suggested to a user.

Q: How will the asset rating ensure the recommendations provide useful guidance and keep up with technological advances?

A: The asset rating tool will consider the limitation of the existing building construction, account for the system performance depreciation over time, and perform life-cycle cost analysis. All these capabilities will help ensure that the identified opportunities are practical. The modeling tool and EEM library will be maintained to keep up with the technological advances. The update of the EEM library may affect the results of the EEM recommendations but does not change a building's asset rating.

Q: What information will be included in the asset rating report?

A: DOE is considering include the following information in the asset rating report:

- Basic building information, including property address, year built, climate zone, building type, year issued
- Source energy use intensity and the corresponding rating score
- The potential source energy use and rating that could be achieved if the building makes identified upgrades
- The energy savings associated with that upgrade and potentially cost savings based on average energy cost
- Reference points to help users understand how their building score compares to current codes or another chosen reference point on a scale
- Energy use breakdown by system category
- System-level ratings
- Identified improvement opportunities.

Q: Will there be an offset for passive design elements?

A: Passive design elements will be considered on their own merit rather than specifically as a “passive element.” For example, window shading is a passive feature and, when analyzed in the tool, if the shading reduces the total energy consumption of a building, it will be reflected in a better building asset rating. Some more complicated building geometry elements used in passive design may not be available in the first iteration of the tool.

Quality Assurance

Q: How does DOE maintain quality control for the asset rating tool?

A: First, the energy modeling approach is centralized real-time simulation. Although users will gather and enter the data to the website, the modeling itself will be standardized. Second, the asset rating tool will use an established and standardized methodology for data collection to ensure consistency with other systems. The user interface will include automated checks and provide a warning if entered data appears incorrect or incomplete. Third, the asset rating program will include a full range of technical support. All of the documentation for the asset rating tool will be available online, allowing for transparency, and will include a complete user manual, data input checklist, and set of frequently asked questions.

Q: How will you ensure accuracy and consistency of input and output?

A: DOE is considering different approaches to quality assurance, which include requiring submissions from a qualified professional in order to receive a verified rating. The output is generated through a centralized modeling tool, which ensures the consistency and replicability of the results.

Q: How detailed do you anticipate the input requirements will be?

A: The level of detail is a tradeoff between cost and accuracy. A low number of inputs minimizes the effort required to collect data. However, using a larger number of inputs can increase accuracy. DOE's objective is to find the amount of detail that provides a reasonable balance between accuracy and data collection cost. The tool will contain clear and consistent definitions of the data requirements and basis of measurement. Ultimately, the asset rating tool is not intended to be a replacement for a full energy audit of a building, which would entail detailed calibration, complex analysis, and onsite visits.

Q: What type of training or credentials will be required of the qualified professionals? Will third-party verification be used to issue an asset rating?

A: DOE is still evaluating different credential programs. The key validation for asset rating is on the data collection and input because the rating is created through a centralized modeling tool. In this case, an independent third party may or may not be needed. DOE does not intend to create an entirely new credential program for asset rating but will develop selecting criteria and training materials.

Potential for Additional Supported Options

Q: Will there be an ability to link the asset rating tool with third-party applications?

A: Yes. The intent is for third-party applications to link with the asset rating tool. DOE envisions the potential for an application programming interface (API) or other means to enable third parties to build applications that will exchange data with the asset rating tool.

Q: Will you be able to upload data that has already been collected by ENERGY STAR Portfolio Manager?

A: Yes. DOE's objective is for a building owner to be able to export relevant information from one to the other.

Q: How will the asset rating system respond to localized requirements and opportunities? Will there be features of the system to allow for state/local flexibility?

A: DOE recognizes that some users may wish to compare buildings to a locally-specific population of peers or to incorporate the asset rating into other programs. DOE is interested in understanding these customization needs and will consider working with interested stakeholders on a case-by-case basis.

Q: Will the asset rating tool allow for comparisons to local code or other user-defined reference points?

A: The asset rating tool is being designed to allow for third-party applications to interface with the system. Third party applications could be developed to provide users of the tool with comparisons to local codes or other user-defined reference points.

Q: Will education and training be incorporated as part of the rollout?

A: Yes, DOE will provide education and training materials for data collection, how to use the asset rating tool, and how to interpret the asset rating report.