

**BEFORE THE OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
UNITED STATES DEPARTMENT OF ENERGY
WASHINGTON, D.C.**

**Energy Efficiency and Renewable Energy
Commercial Building Asset Rating Program Request for Information (RFI)**

Docket Number EERE-2011-BT-NOA-0049

Comments of the American Public Gas Association

The American Public Gas Association (APGA) provides the following information to assist the Department of Energy (DOE or Department) in its effort to develop a voluntary National Asset Rating Program for Commercial Buildings (AR Program).

The American Public Gas Association is the national, non-profit association of publicly-owned natural gas distribution systems. APGA was formed in 1961 as a non-profit, non-partisan organization, and currently has approximately 700 members in 36 states. Overall, there are approximately 1,000 municipally-owned systems in the U.S. serving more than five million customers. Publicly-owned gas systems are not-for-profit retail distribution entities that are owned by, and accountable to, the citizens they serve. They include municipal gas distribution systems, public utility districts, county districts, and other public agencies that have natural gas distribution facilities.

Basic Metrics - It is essential to use a technically defensible source energy metric rather than site energy or energy cost to accurately and equitably evaluate the impact of commercial building designs, technology choices, fuel selection, and energy efficiency improvements on the nation's overall primary energy use. Source energy is the key metric to support DOE's goal for the AR Program to reduce national consumption of primary energy resources. It is also essential to use a technically defensible metric to reduce global greenhouse gas (GHG) emissions, another goal of the AR Program. A technically defensible GHG emissions metric based on source energy consumption by primary fuel type is necessary to supplement source energy to help meet environmental objectives beyond energy efficiency. Fortunately, technically defensible source energy and GHG emissions methodologies are readily available based on government data sources already identified and selected by DOE and EPA for other rulemaking and programs.

DOE recognizes site energy cannot serve as the basis for asset ratings and energy efficiency programs when the goal is to reduce consumption of primary energy resources attributable to the design and operation of the building. Site measurement methods—a calculation of the energy consumed by an appliance at the end-use point (in the building)—do not properly or equitably account for the total energy consumed when more than one energy source is used in an appliance (such as a gas furnace or boiler) or when comparing the consumption of different fuels that can be used for the same application (such as water heating or combined heat and power). In addition, site measurement does not account for the energy lost and GHG emissions created throughout the extraction, processing, transportation, conversion, and distribution of energy to the building.

Unlike site energy metrics, full-fuel-cycle measurement of the energy consumption of appliances and the overall building from the point of extraction to the point of use does account for energy losses that occur (e.g., in the production of natural gas or in the generation of electricity). Focusing on site energy efficiency alone perversely incentivizes the decision maker to choose the less expensive qualifying technology and inadvertently promotes fuel switching in the design decision away from more full-fuel-cycle energy efficient and lower CO₂e emitting technologies. Standards and initiatives that focus on site energy create and maintain an unfair and unearned market advantage to qualifying technologies such as electric resistance water heating that are lower cost/lower full-fuel-cycle efficient and higher CO₂e emitting. This is a key reason USGBC, EPA, ASHRAE, and ICC have all chosen to use a source energy-based single reference building similar to the methodology proposed by DOE for commercial buildings. Source energy methodology is used by USGBC in its LEED for Existing Buildings rating system <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=221>, by ASHRAE in its BEQ Labeling Program <http://www.buildingeq.com/index.php/resources>, <http://www.buildingeq.com/files/ABELFAQ.pdf>, by EPA in its Energy Star Buildings program http://www.energystar.gov/ia/business/evaluate_performance/site_source.pdf http://www.energystar.gov/ia/business/evaluate_performance/General_Overview_tech_methodology.pdf http://www.energystar.gov/ia/business/tools_resources/new_bldg_design/2003_CBECSPerformanceTargetsTable.pdf http://www.energystar.gov/ia/business/evaluate_performance/Emissions_Supporting_Doc.pdf, and by ICC in International Green Construction Code Public Version 2.0 <http://www.iccsafe.org/cs/IGCC/Pages/IGCCDownloadV2.aspx>.

DOE's planned use of source energy use intensity correctly implements a critical single reference building methodology that establishes fixed reference baseline building performance requirements BEFORE making the technology and energy choices for the proposed building. A single reference building methodology is necessary for equitable implementation of energy cost, full-fuel-cycle energy consumption, or GHG emission compliance requirements. A single reference design methodology creates a level playing field for all technology and fuel choices and provides equitable treatment of advanced renewable, waste heat recovery, hybrid, and multi-fuel technology options. It is especially important for equitable and consistent evaluation of combined heat and power systems.

DOE's proposed use of a source energy methodology supports DOE's two goals: reducing national consumption of primary energy resources and, at the same time, reducing the nation's greenhouse gas (GHG) emissions. (See RFI page 48155: "The Department plans to use source energy with a national source-to-site conversion factor as the basic metric because source energy can most accurately represent total energy use of a building and the related environmental impacts." "Using source energy metric requires the use of a conversion factor to convert site electricity use to a source equivalent, which would allow consumers to more equitably consider all fuel types and the environmental consequences of electricity generation.")

DOE is interested in compatibility between the new voluntary AR Program and the existing voluntary Operational Rating Program using the Portfolio Manager (PM) methodology. The PM conversion factors represent EPA's selected source energy boundary condition for fuels. It incorporates transmission, delivery, and production losses, but does not include extraction or processing losses, and is therefore not the same as full-fuel-cycle energy. To provide the most technically defensible consistent boundary condition for different fuel and technology choices, the AR Program should use the full-fuel-cycle metric

implemented by DOE in its Policy for Adopting Full-Fuel-Cycle Analyses into Energy Conservation Standards Program, published August 18, 2011.

National, Regional, and Marginal Source Energy Factors - Using government data sources, full-fuel-cycle energy efficiency factors and carbon emission factors can be calculated locally, regionally, and nationally. National average factors would be consistent with prior DOE and EPA methodology and protocols. The consistency provided by use of national average factors sends a strong signal regarding energy efficiency and its impact on GHG emissions, and does not reward or penalize a building based on its location.

However, national average data may distort the source energy impact of specific building improvements and equipment choices in different regions, especially for electricity. Use of regional values has the potential to more accurately reflect the actual source energy use and environmental impact of the building design and usage pre-retrofit, and the choice of appliance and fuel when making retrofit decisions. For example, replacing an electric resistance water heater with an equivalent gas-fired appliance may have greater source energy and environmental benefit, and thus a higher priority, in a region dominated by coal-based electricity than in a region that includes more hydroelectric power. That said, the use of regional average factors may not accurately reflect the impact of incremental investment and energy consumption decisions at the margin.

Another option to consider is use of marginal gas or marginal coal generation factors for source energy and GHG emission calculations to provide more accurate information regarding the potential reduction in primary energy use and carbon emissions associated with a retrofit.

For Asset Rating purposes (e.g., rating the building as is), average factors, either national or regional, may provide good information. For incremental investment decisions that change the building's consumption (e.g., retrofit programs), marginal factors may provide better consumer information.

For comparison, regional factors (eGRID subregions) are used by EPA in its greenhouse gas inventory and tracking emissions calculation methodology in Portfolio Manager and by the IGCC for source energy and GHG emission factors.

For all primary energy forms other than electricity, national average values for pre-combustion factors should be adequate for both inventory and retrofit program purposes because the majority of losses occur in extraction, processing, and distribution, with only 1% average loss in the long distance transmission pipelines. Although regional or marginal electricity mixes would require additional information to calculate the source energy conversion factor, existing tools such as SEEAT can be used to perform the required calculations quickly and transparently.

Rating Methods - The recommended asset rating relies on modeling tools. Unfortunately, the modeling tools for residential applications have a high degree of uncertainty and can provide misleading results depending on analyst skills and as-constructed assumptions. While an operational rating includes the impact of occupant behavior, a key technical advantage is the use of actual data instead of modeled

values, and it would be a good option for inventory purposes. An operational rating is also more consistent with the use of total source energy as the scale. For retrofit decisions, the operational rating may not provide sufficient information for comparing alternative investment options and their marginal impact on the total source energy consumption. It might need to be supplemented by either assumed or known behavior impacts to ensure that the projected savings match the actual savings.

With either a modeling values or actual data, APGA is concerned over how data will be used to drive the Asset Rating. Actual costs associated with utility bills should not be used since they are variable depending on the cost of natural gas. AR studies should be linked to Therms or CCFs used to provide a true perspective to the energy consumed by a commercial property.

Scales and Reference Points - The use of total source energy as the rating scale provides a strong signal to the market that there is a real energy impact of larger buildings, no matter how hard they try to be efficient. By using that scale, there is no confusion about the building's impact on the nation's primary energy consumption. It is simple, elegant, technically correct, and the most meaningful scale to achieve DOE's two primary AR Program goals: reduce the nation's primary energy consumption and reduce GHG emissions related to commercial buildings.

Other Questions/Concerns - Once an AR study is done and improvements are accomplished to improve the energy consumption of a commercial building, would another complete AR study be required to update the national data base? How would a commercial property owner obtain a change to the AR data base after improvements are made? Without this being defined, the current owner's property valuation is placed at risk if the updated information is not made available. Is there any consideration to including the improvements conducted by the current owner after the AR rating is calculated without a complete AR study to update the information?

Open release of utility bill information to conduct Asset Rating studies was not addressed in the RFI. Is the assumption of the DOE that all utility bill information must be made available to subject matter experts or potential buyers for commercial properties? A federal mandate to this effect should be included in the proposed program. APGA members do not release utility bill information on a property without owner approval. Or, unique to Florida, the information is requested by a citizen either verbally or in writing as a public records request under the Florida-In-the-Sunshine Act.

The RFI does not speak to an effort to integrate Asset Rating results in the Multiple Listing Service standards used by the Realtor[®] community impacting the value of the program. Integration into MLS, appears critical to the value of generating AR results.

Publishing AR information would ultimately impact the appraised value of the property if a low AR rating is documented. This will create concern for current commercial building owners across America as an infringement upon the free market system.