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## Benchmarking Commercial Building Performance:

# "Site" and "Source" Energy

Two methodologies exist to describe building energy consumption - site energy and source energy. Site energy is the energy consumed at the building location. Source energy is equal to site energy plus the energy used to produce the site energy. Site energy accounts only for the energy consumed at the building, while source energy includes the energy required to generate, transmit, and distribute the site energy to the building.

The distinction between site and source energy is important in describing the environmental and economic impacts associated with building energy performance. Site energy is a familiar and common convention used for discussing building energy consumption when multiple fuels are used in a building (e.g., electricity and natural gas), and represents a strict conversion of fuel consumption into common units - typically in terms of British Thermal Units (BTUs). As a strict physical conversion, the site energy

convention is only useful in comparing groups of buildings having the same fuel mix (e.g., a comparison of all-electric buildings, or a comparison of buildings each having a 70/30 electric/gas fuel mix). When making comparisons between groups of buildings that have varying fuel mixes - as ENERGY STAR does - the source energy convention, not the site energy convention, is a far more equitable means to assess building performance. As for the environmental comparisons, different fuel types produce differing emissions, some by as much as 3½ times more than others, when compared from a source perspective. Similarly, energy pricing can vary by as much as 4½ times among fuel types when considered from the source energy perspective. Because source energy embodies the generation, transmission, and distribution impacts associated with various fuels used at the site, it is a more accurate indicator of energy, economic, and environmental performance.

## Does Fuel Type Matter?

As a national program encouraging energy efficiency to achieve profitable pollution prevention, ENERGY STAR uses source energy as the basis for benchmarking commercial building energy performance. In assessing relative energy performance and recognizing excellence, the benchmarking system and ENERGY STAR label are designed to be fuel neutral, providing an accurate

comparative indication of the economic and environmental impacts of building energy consumption. Surveys of the commercial buildings market conducted by the US Department of Energy, as well as program studies completed by the US Environmental Protection Agency confirm that a building is no more or less likely to be ENERGY STAR based on its choice of fuel.<sup>1</sup>

*1 Hicks, Tom and von Neida, Bill, An Evaluation of America's First ENERGY STAR® Buildings: The Class of 1999, ACEEE, Commercial Buildings: Program Design, Implementation, and Evaluation, 2000.*