

Energy Use in Office Buildings

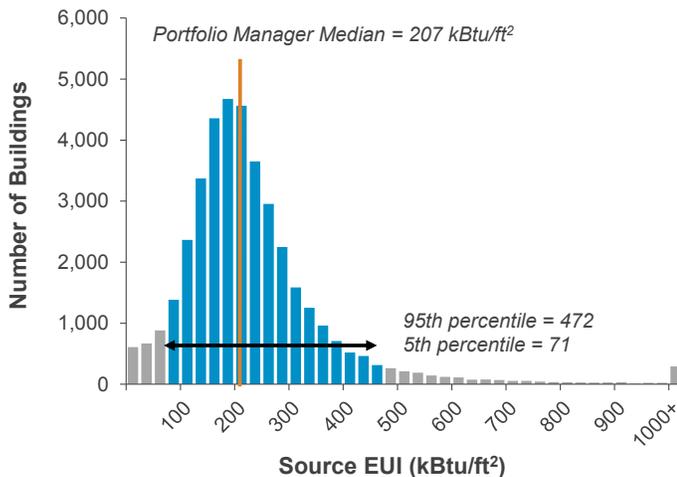
Office Buildings Using Portfolio Manager

- 57,247 Properties
- 9.5 Billion ft²
- Average ENERGY STAR Score **62**

The U.S. Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager is changing the way organizations track and manage energy. Because of this widespread market adoption, EPA has prepared the DataTrends series to examine benchmarking and trends in energy and water consumption in Portfolio Manager. To learn more, visit www.energystar.gov/DataTrends.

What is a typical operating profile?

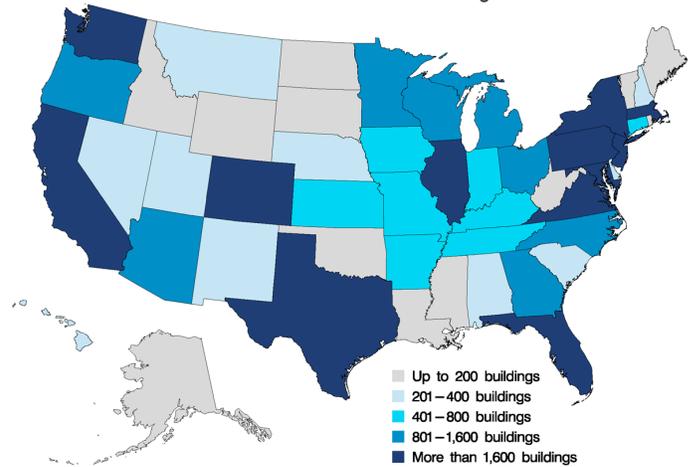
Energy use intensity (EUI) ranges from less than 100 to more than 1,000 kBtu/ft² across all office buildings, with those at the 95th percentile using almost 7 times the energy of those at the 5th percentile. The distribution has a negative skew, which means the most energy intensive buildings are much further away from the median than the most efficient. Buildings may use more or less energy for many reasons, including variable equipment efficiency and energy management practices, as well as variations in climate and business activities.



The median office building in Portfolio Manager is approximately 70,000 square feet and operates 60 hours per week. But the typical building use patterns observed in Portfolio Manager vary just as much as energy. As you can see, there are offices of all shapes and sizes benchmarking in Portfolio Manager.

Benchmarking by State

Number of Office Buildings

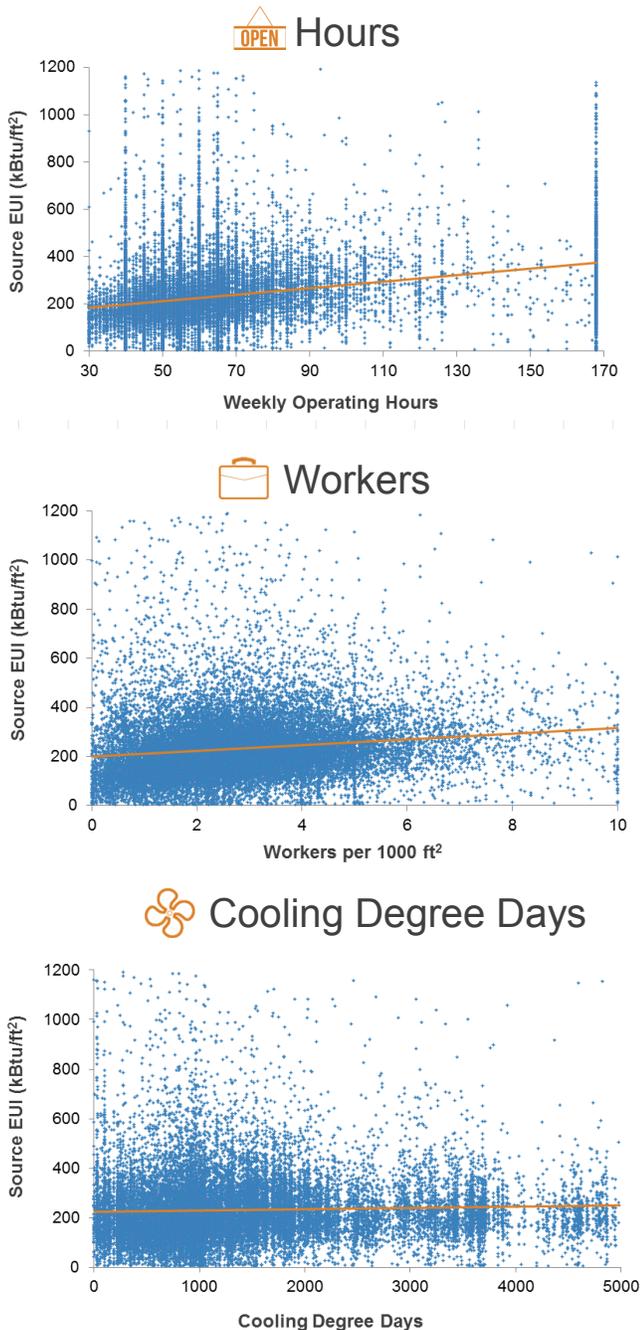


Building Characteristic	5th percentile	Median	95th percentile
Square Feet	7,215	69,635	549,681
Operating Hours	40	60	120
Workers per 1000 ft ²	0.7	2.4	5.6
Computers per 1000 ft ²	0.6	2.5	6.5
Heating Degree Days	965	4,221	6,799
Cooling Degree Days	154	1,114	3,671

What is Source Energy? Source energy is the amount of raw fuel required to operate your building. In addition to what you use on-site, source energy includes losses from generation, transmission, and distribution of energy. Source energy enables the most complete and equitable energy assessment. Learn more at: www.energystar.gov/SourceEnergy.

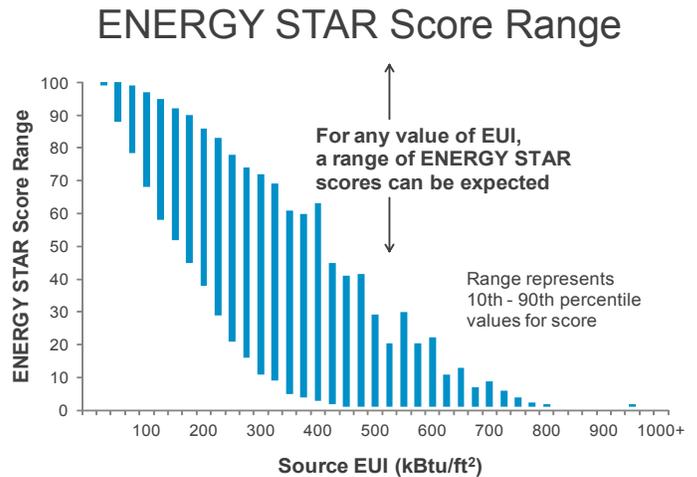
What characteristics affect energy use?

Business activity and climate are often correlated with energy consumption. For example, offices that are open longer hours, have more workers per square foot, and/or experience more cooling degree days (CDD) use more energy, on average. The orange trend line in the graphs below is the steepest for hours, meaning that hours has a stronger effect on energy than CDD or Workers. While these trends hold true on average, two buildings with the same hours could have very different energy, as shown by the range in the blue dots. Similar trends can be seen for other indicators of business activity, such as number of computers.

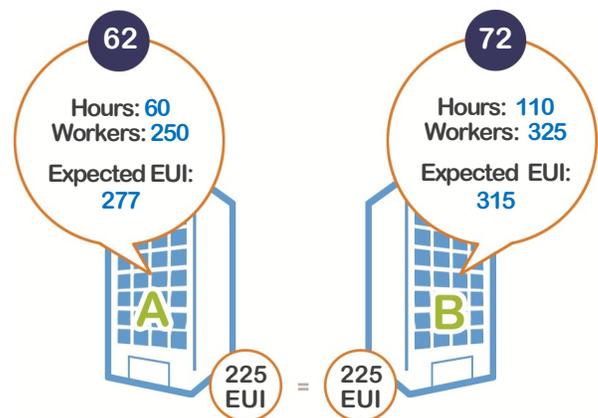


How does EPA's ENERGY STAR score vary with energy use?

EPA's ENERGY STAR score normalizes for the effects of operation. While buildings with lower EUI generally earn higher scores on the 1-100 scale, an individual building's result depends on its business activities. For any given EUI, a range of scores is possible.



Let's look at two office buildings, Office A and Office B. They have the same EUI of 225 kBtu per square foot, and are identical except that Office B is open longer hours and has more workers per square foot. Because Office B has more intensive activities, it is expected to have a higher EUI than Office A, based on ENERGY STAR scoring models. Since Office B is *expected* to use more energy, but *actually* uses the same energy, it earns a higher score.



Note: Number and floor area of buildings benchmarked includes cumulative data through 2011. Analysis of energy use and business activity includes buildings benchmarked between 2006 and 2012. The data is self reported and has been filtered to exclude outliers, incomplete records, and test facilities. Portfolio Manager is not a randomly selected sample and is not the basis of the ENERGY STAR score. To learn more, visit: www.energystar.gov/DataTrends.