Energy Use in Offices

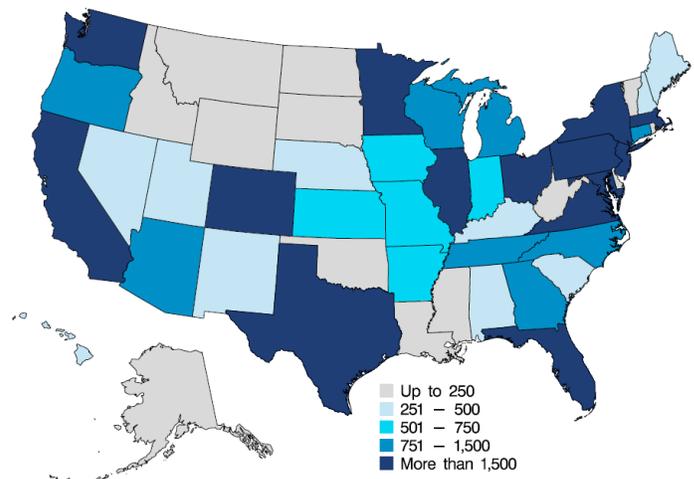## Offices Using Portfolio Manager

60,848 Properties

8.7 Billion ft²
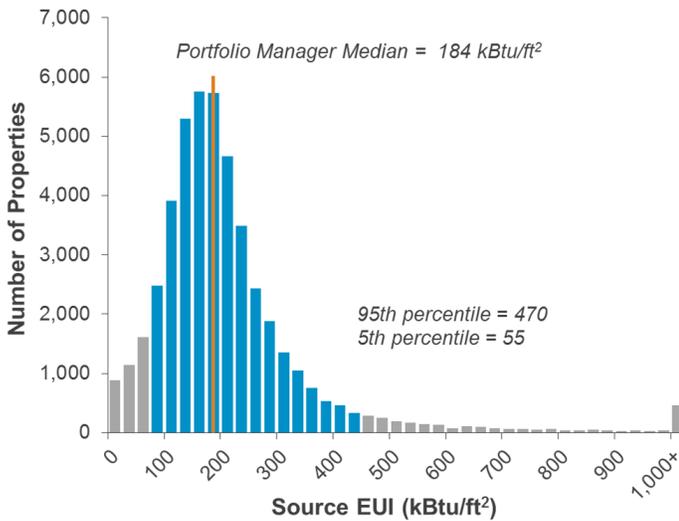
63 Average ENERGY STAR Score

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 offices, with those at the 95th percentile using almost 9 times the energy of those at the 5th percentile. The distribution has a negative skew, which means the most energy intensive properties are further away from the median than the most efficient. Properties 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.

Benchmarking by State
Number of Offices

Up to 250
251 — 500
501 — 750
751 — 1,500
More than 1,500

Portfolio Manager Median = 184 kBtu/ft²

95th percentile = 470
5th percentile = 55

Number of Properties — Source EUI (kBtu/ft²)

The median office in Portfolio Manager is about 63,000 square feet and operates 60 hours per week. But the typical property 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.

Property Characteristic	Range of Values		
	5th percentile	Median	95th percentile
Square Feet	7,381	63,463	522,173
Operating Hours	40	60	105
Workers per 1,000 ft²	0.6	2.3	5.5
Computers per 1,000 ft²	0.6	2.3	6.5
Heating Degree Days	738	4,215	7,360
Cooling Degree Days	124	1,108	3,643

What is Source Energy? Source energy is the amount of raw fuel required to operate your property. 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.
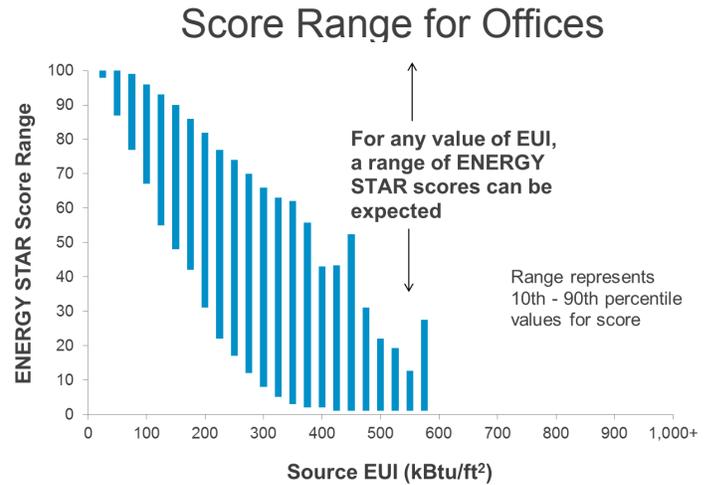
What characteristics affect energy use in offices?

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 lines in the graphs below are steeper for hours and workers, meaning that these characteristics have a stronger effect on energy than CDD. While these trends hold true on average, two properties 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.

Operating Hours
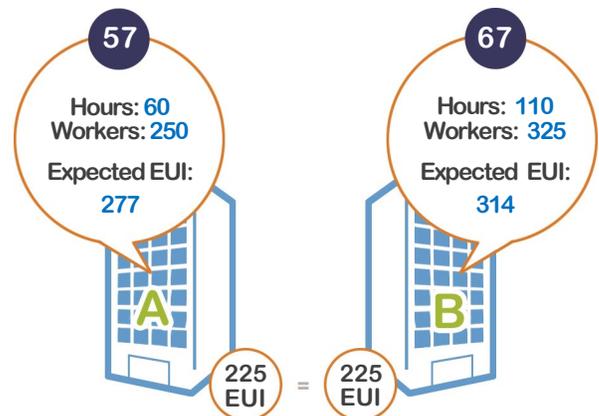

Workers

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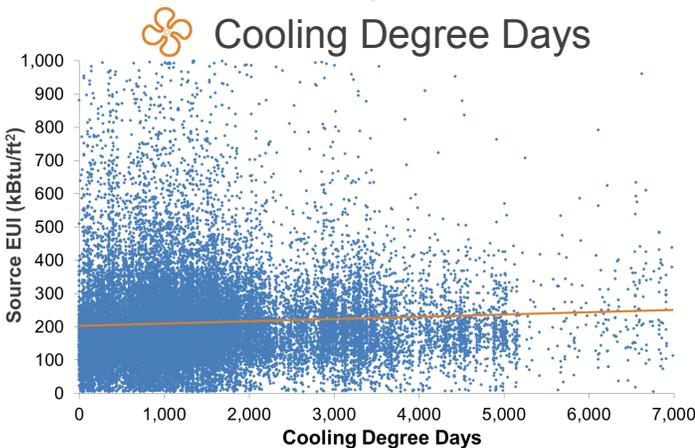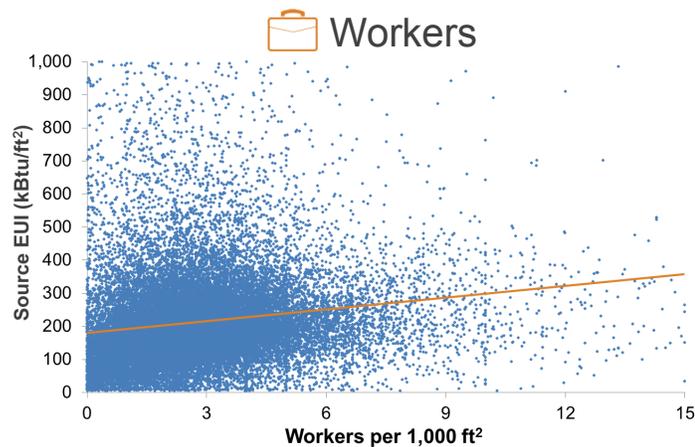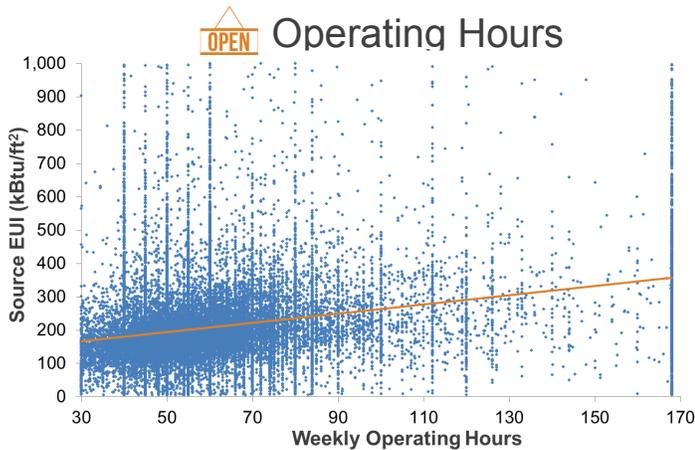
How does EPA's ENERGY STAR score vary with energy use?

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

Score Range for Offices

For any value of EUI, a range of ENERGY STAR scores can be expected

Range represents 10th - 90th percentile values for score

Let's look at two offices, 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.

57

Hours: **60**
Workers: **250**

Expected EUI: **277**

A

225 EUI

67

Hours: **110**
Workers: **325**

Expected EUI: **314**

B

225 EUI

Note: Total number and floor area of properties benchmarked reflects cumulative data through 2013. Analysis of energy use and operational characteristics includes 46,306 properties benchmarked in the most recent 5 years. 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.

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