

Energy Use in K-12 Schools

K-12 Schools Using Portfolio Manager

51,500 Properties

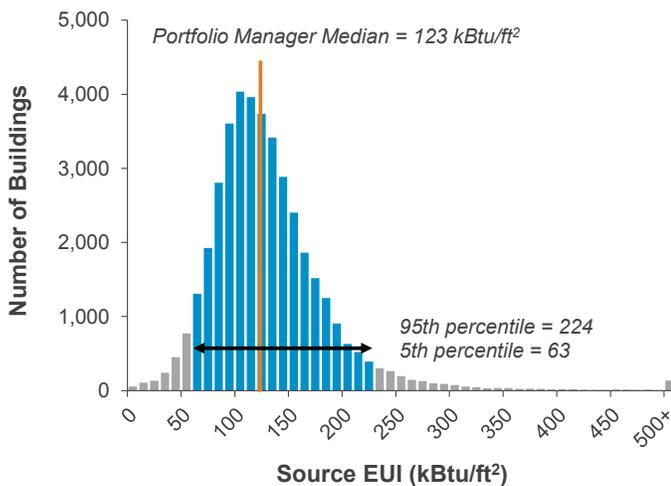
5.4 Billion ft²

64 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?

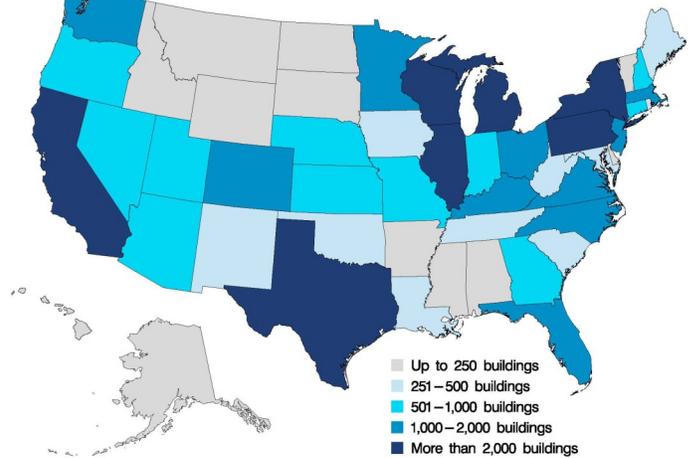
Energy use intensity (EUI) ranges from less than 50 to more than 500 kBtu/ft² across all K-12 School buildings, with those at the 95th percentile using almost 4 times the energy of those at the 5th percentile. The distribution has a negative skew, which means the most energy intensive buildings are much 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 building activities.



The median K-12 School building in Portfolio Manager is approximately 75,000 square feet and has just over 2 computers per thousand square feet. But the typical building use patterns observed in Portfolio Manager vary just as much as energy. As you can see, there are K-12 Schools of all shapes and sizes benchmarking in Portfolio Manager.

Benchmarking by State

Number of K-12 School Buildings

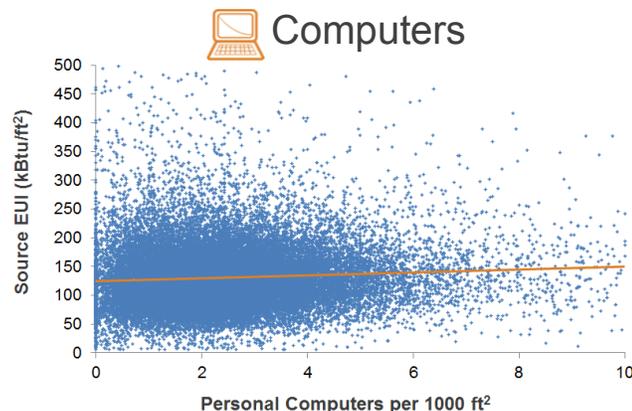
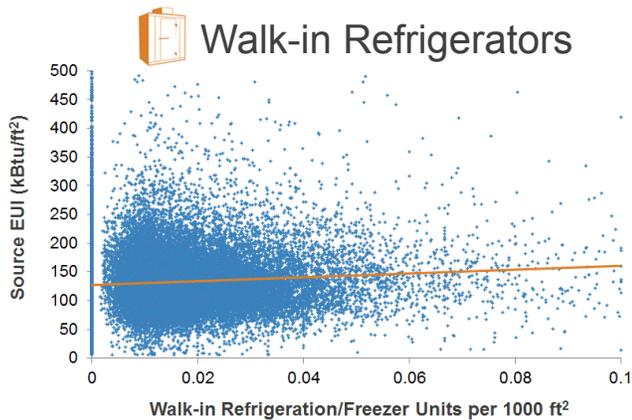
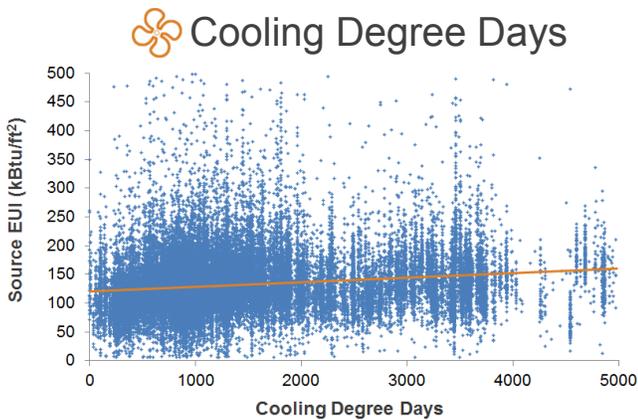


Building Characteristic	5th percentile	Median	95th percentile
Square Feet	22,912	74,671	282,507
Computers per 1000 ft ²	0.57	2.11	4.99
Walk-in Refrigeration Units per 1000 ft ²	0.00	0.01	0.04
Cooking?	--	80% say yes	--
Open Weekends?	--	24% say yes	--
High School?	--	18% say yes	--
Heating Degree Days	971	4,627	7,035
Cooling Degree Days	262	1,152	3,595

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?

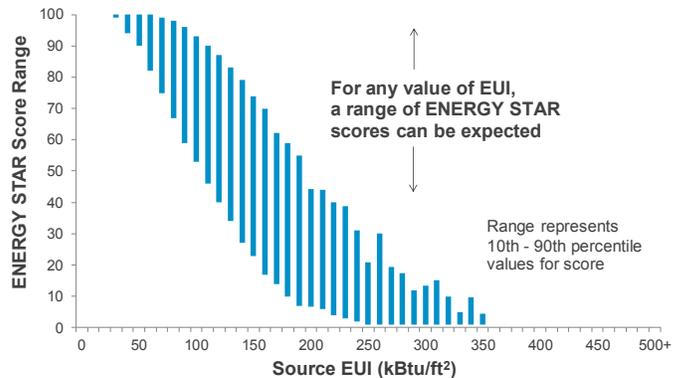
Building activity and climate are often correlated with energy consumption. For example, schools that experience more cooling degree days (CDD), have more walk-in refrigerators (a measure of cafeteria activity), or more computers per square foot use more energy, on average. The orange trend line in the graphs below is the steepest for CDD, meaning CDD has a stronger effect on energy than refrigerators or computers. While these trends hold true on average, two buildings with the same CDD could have very different energy, as shown by the range in the blue dots. Similar trends can be seen for other indicators of building activity. For example, energy use is higher for high schools than elementary schools.



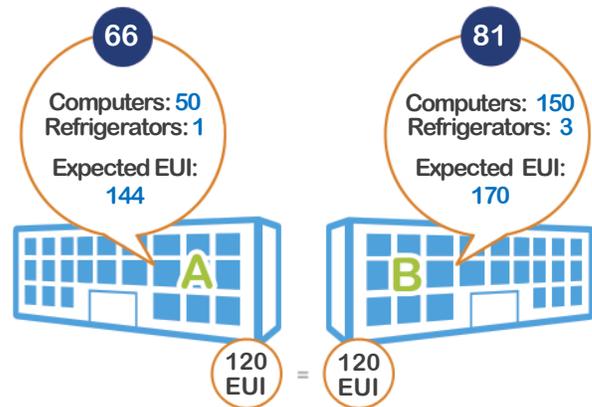
How does EPA's ENERGY STAR score vary with energy use?

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 activities. For any given EUI, a range of scores is possible.

ENERGY STAR Score Range



Let's look at two K-12 School buildings, School A and School B. They have the same EUI of 120 kBtu per square foot, and are identical except that School B has more computers and walk-in refrigeration units per square foot. Because School B has more intensive activities, it is expected to have a higher EUI than School A, based on ENERGY STAR scoring models. Since School 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 building 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.