ENERGY STAR® Portfolio Manager™

DataTrends

Energy Use Benchmarking

Buildings Benchmarking in Portfolio Manager

267,016 Properties

28.2 Billion ft²

40% Market Penetration

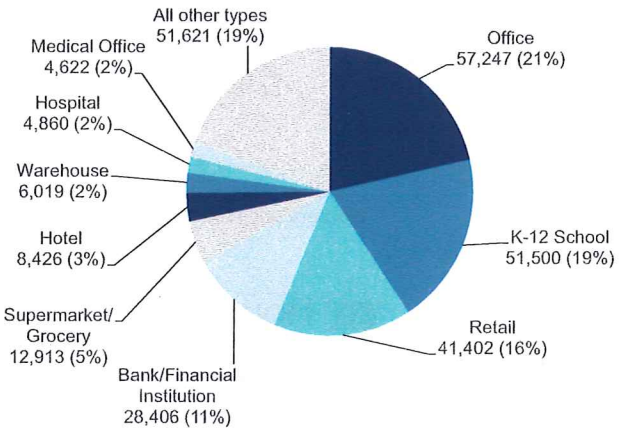
The U.S. Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager is changing the way organizations track and manage energy. As of December 2011, organizations have used Portfolio Manager to track and manage the energy use of over 260,000 buildings across all 50 states, representing over 28 billion square feet (nearly 40% of the commercial market). 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.

Who is benchmarking?

Many different types of organizations use Portfolio Manager to benchmark the energy use of their buildings. Office, K-12 School, and Retail buildings are the most prevalent, accounting for close to 60% of those benchmarked, followed by Bank/Financial buildings. In the chart below, "All other types" includes multifamily buildings, colleges, malls, fire stations, and many more.

Benchmarking by Building Type

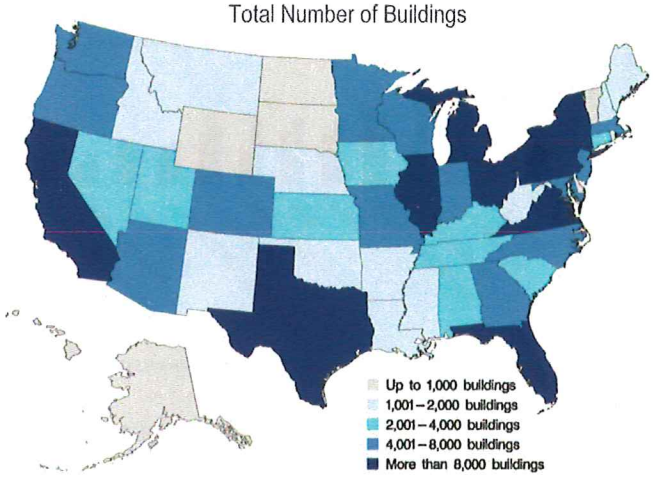
Number of Buildings



The number of buildings benchmarked in Portfolio Manager has grown dramatically over the past 10 years, almost doubling just since 2009. These buildings range widely on just about any measure, including size, location, age, building activity, and energy consumption.

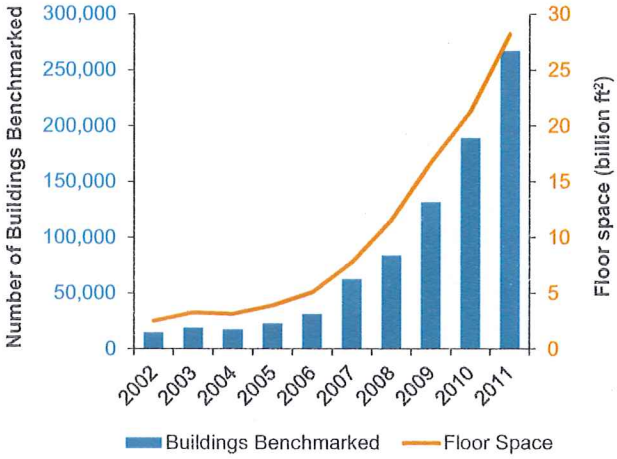
Benchmarking by State

Total Number of Buildings



Growth in Benchmarking

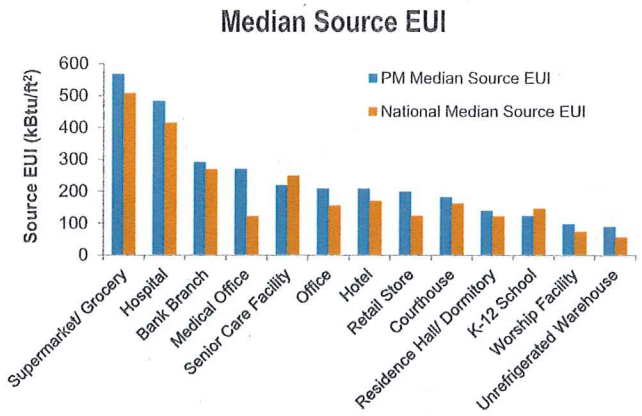
Total Number of Buildings



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.*

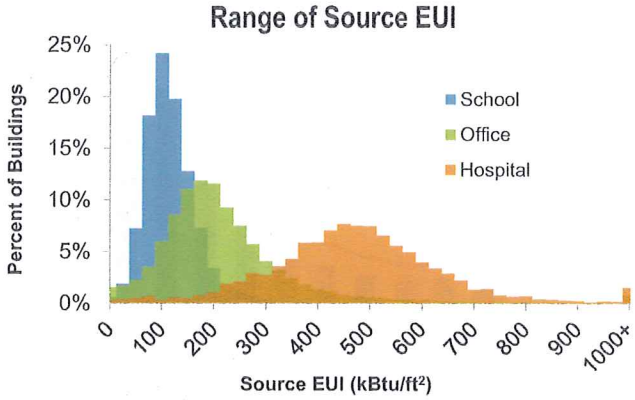
How does energy use vary among buildings?

Energy use intensity (EUI) varies widely among buildings. One of the key contributing factors is building activity. Supermarkets have relatively high EUI due to refrigeration loads, while warehouses, with less equipment and fewer workers, tend to have low EUI. The median EUIs in Portfolio Manager are similar to the median EUIs derived from the Department of Energy's nationally representative Commercial Building Energy Consumption Survey (CBECS), which forms the basis of most of the ENERGY STAR energy performance scales. These scales produce a 1-to-100 peer group comparison, accounting for differences in climate and business activities.



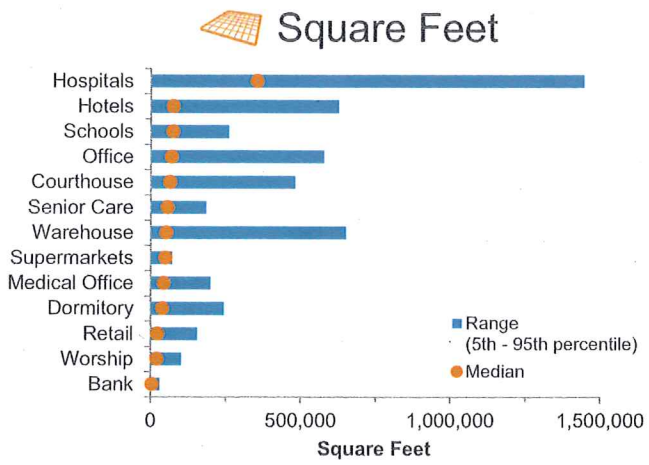
Some building types excluded due to inadequate data and/or EUI values beyond this range

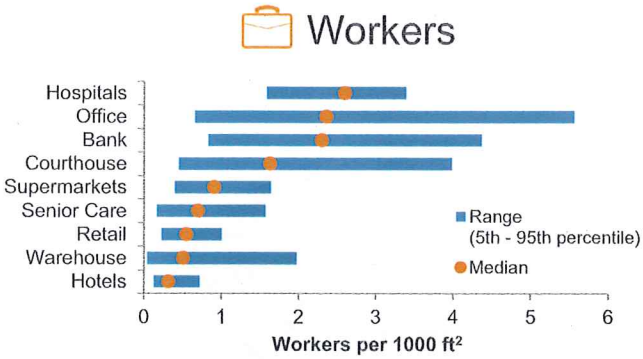
Each median represents the value in the middle of a distribution, but the full range of energy use within each property type can be much larger, as shown in the figure below for School, Office, and Hospital. Hospitals have the highest median of these three, and also the largest range. The EUI values for Office and School are less widely distributed.

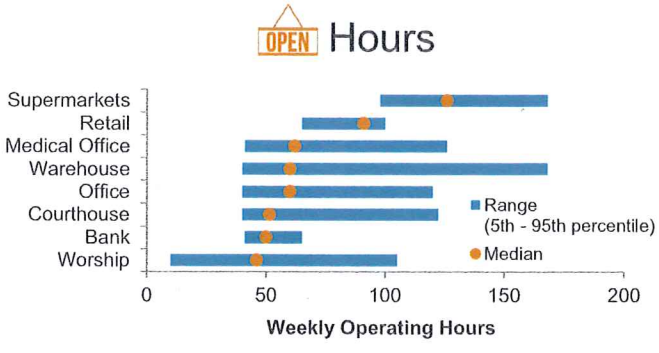


How do size and business activity vary by building type?

There is a wide variation in operating characteristics among property types benchmarking in Portfolio Manager. The graphs below illustrate the variation in size, worker density, and operating hours. These figures show the difference not only in median values, but also in the range. For example, Hotels and Retail stores have a much smaller number of workers on average than Offices *and* the range in their values is smaller.







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.

EPA United States Environmental Protection Agency

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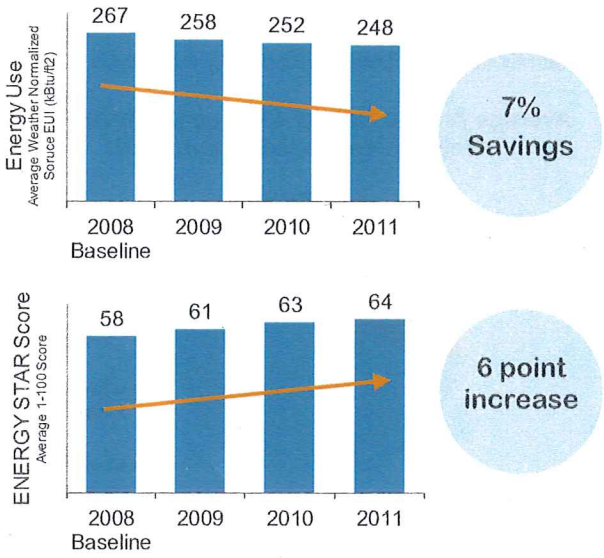
Benchmarking and Energy Savings

Do buildings that consistently benchmark energy performance save energy? The answer is yes, based on the large number of buildings using the U.S. Environmental Protection Agency's (EPA's) ENERGY STAR Portfolio Manager to track and manage energy use. Over 35,000 buildings entered complete energy data in Portfolio Manager and received ENERGY STAR scores for 2008 through 2011, which represents three years of change from a 2008 baseline. These buildings realized savings every year, as measured by average weather-normalized energy use intensity and the ENERGY STAR score, which accounts for business activity. Their average annual savings is 2.4%, with a total savings of 7.0% and score increase of 6 points over the period of analysis.

Which buildings experienced the greatest savings?

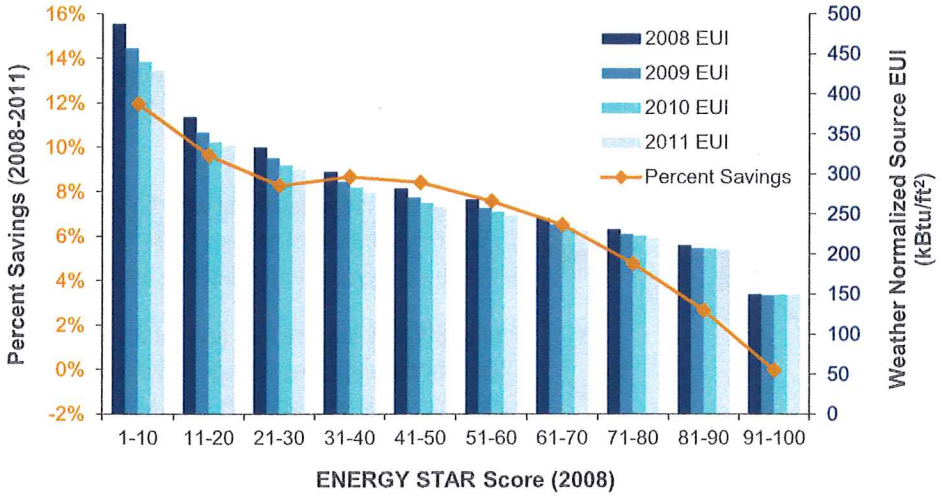
Buildings that start with lower ENERGY STAR scores and higher energy use achieve the greatest savings. In fact, buildings starting with below average energy efficiency in 2008 (i.e., score under 50) saved twice as much energy as those starting above average.

Energy Savings in Portfolio Manager



7% average energy savings and 6 point ENERGY STAR score increase among Portfolio Manager buildings

Savings Vary with ENERGY STAR Score



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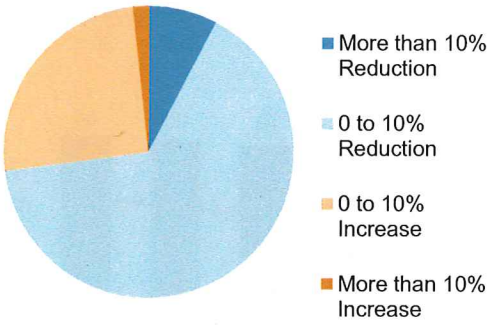
What is the ENERGY STAR score?
The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency, as compared with similar buildings nationwide. The score adjusts for climate and business activity. Learn more: www.energystar.gov/benchmark.

How do savings levels vary among buildings?

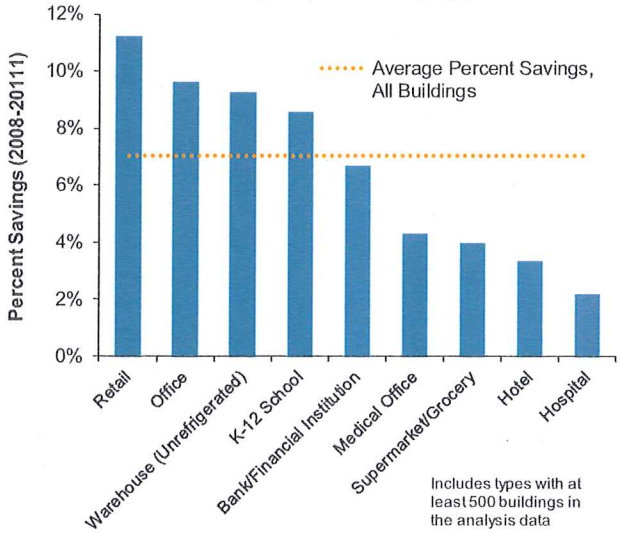
Over 70% of the buildings (25,926) reduced their energy consumption, as shown in blue below. Close to 90% of these experienced average annual reductions in the range of 0 to 10%. A smaller number of buildings experienced average annual reductions greater than 10%, which may be expected with large scale energy efficiency investments. This suggests that slow and steady improvements over time are typical of buildings that consistently track and benchmark energy consumption.

Average Annual Energy Change (2008-2011) in Weather Normalized Source EUI



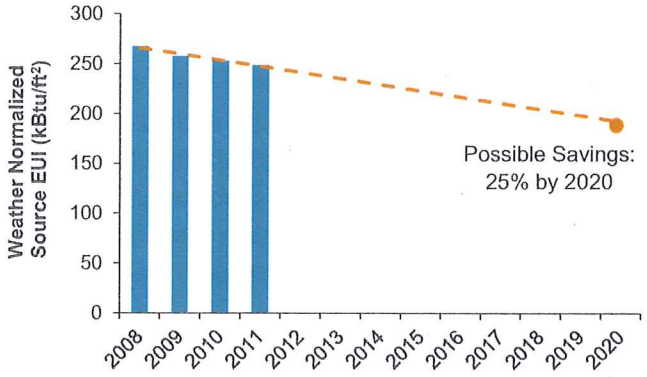
Energy savings were experienced by all building types. Among those with above average savings are Retail, Office, and K-12 School, the sectors with the most buildings benchmarking in Portfolio Manager. These buildings represent over 60% of the buildings benchmarking consistently from 2008-2011.

Savings by Building Type



What are the potential energy savings over time?

Organizations benchmarking consistently in Portfolio Manager have achieved average energy savings of 2.4% per year, and an average increase in ENERGY STAR score of 2 points per year in their buildings. If all buildings in the U.S. followed a similar trend, over 18 million metric tons of carbon dioxide equivalents could be saved each year. Through 2020, the total savings could be approximately 25%.



What is the financial value of benchmarking?

The financial value of benchmarking can be expressed in terms that are meaningful to each building sector. A savings of 2.4% for three consecutive years is equivalent to the following:

For a 500,000 square foot office building:
Cumulative energy cost savings of $120,000
Increase in asset value of over $1 million

For a medium box retailer with 500 stores:
Cumulative energy cost savings of $2.5 million
Increase in sales of 0.89%

For a full service hotel chain with 100 properties:
Cumulative energy cost savings of $4.1 million
Increase in revenue per available room of $1.41

For an 800,000 square foot school district:
Cumulative energy cost savings of $140,000
Salary of 1.2 full time teachers each year

Note: *This analysis represents buildings benchmarking consistently from 2008 through 2011. 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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