



Applying the Pareto Principle to Maximize Building Energy Performance

Remember in school when we all had to learn about the Pareto Principle? It was named after the Italian economist Vilfredo Pareto, who observed that 80 percent of income in Italy was received by 20 percent of the Italian population. The assumption is that most of the results in any situation are determined by a small number of causes. By the numbers, it means that 80 percent of your outcomes come from 20 percent of your inputs.

The Pareto Principle has become a popular business maxim and been used to describe everything from work, business and personal life. For example, in business, 20 percent of employees are responsible for 80 percent of a company's revenue. These are not hard rules. Every company will not produce an exact ratio of 80/20, but the chances are favorable that many key metrics for a business will include a minority that creates a majority.

80% of potential energy savings can be found in 20% of buildings

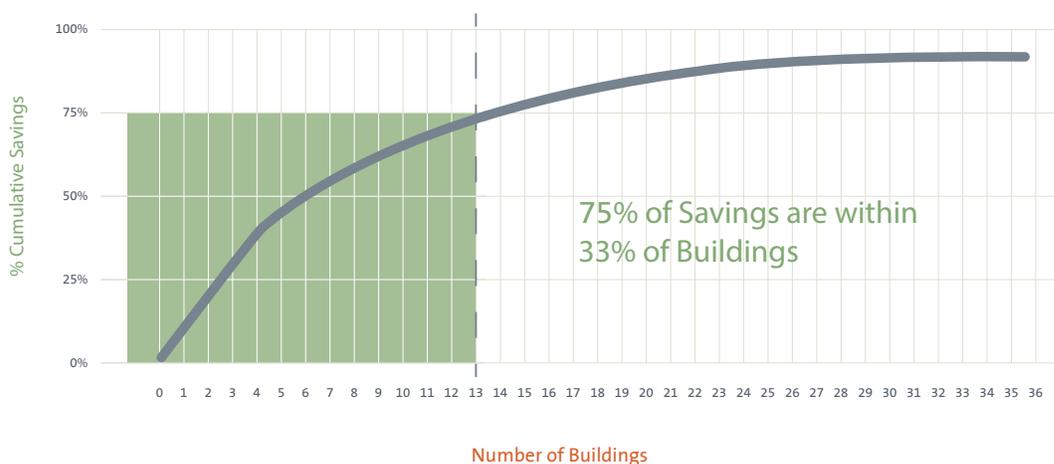


Using B3 Benchmarking to find the ideal 80/20 ratio

For those who manage large portfolios of buildings, such as colleges and universities, state and local governments or real estate investment trusts, finding the 80/20 ratio is essential to maximize building energy performance. Focus on the 20 percent of buildings that have the greatest potential to save energy and ignore the other 80 percent of buildings that only provide marginal gains in efficiency. Facility managers could spend time working on the 20 percent of buildings that can be improved significantly through recommissioning or energy audits and leave the other 80 percent of buildings for another day. Through our B3 Benchmarking platform, we've consistently found that 70-80 percent of the savings can be found in 20-30 percent of buildings within a managed portfolio.

As one example, in analyzing 49 buildings at a New York college, B3 Benchmarking found that 75 percent of the energy savings potential for the entire campus could be achieved by focusing resources on only 13 (33 percent) buildings. Identifying and focusing on these 13 specific buildings avoided auditing and studying 966,262 square feet of space. If we assume it costs 10 cents per square foot for a Level I energy audit, that is \$97,000-worth of avoided auditing costs and countless hours of administrative time. This money can then be spent on the 13 buildings for a significantly greater return on investment for the campus.

B3 Benchmarking Cumulative Savings



Finding the Savings Potential for Building Types

One of the key elements of the benchmarking process is its ability to calculate savings potential for specific buildings. Buildings are all unique, which means a science building will inherently consume more energy than a classroom. Stack ranking a building portfolio by annual energy costs will not reveal the ideal 80/20 distribution because buildings that consume more energy, such as science buildings, often appear at the top of the list. However, that science building may be performing excellently for a building of its type. Additionally, ranking buildings by other common methods, such as EUI or square footage, is not an accurate indicator of buildings' savings potential either.

Rather than simply looking at past energy costs, EUI or size, one needs to be able to compare the actual building performance with a building-specific indicator to understand true savings potential. B3 Benchmarking does this by using energy models. To calculate savings potential, B3 Benchmarking automatically creates an energy model of the specific building to predict expected energy consumption if it were just built to today's energy code. Actual energy consumption is compared to this expected energy consumption based off the energy code to produce the building's savings potential. This process produces building specific energy savings potential. Those buildings that are using more energy than the energy code expects yield the highest return on investment to improve energy performance.

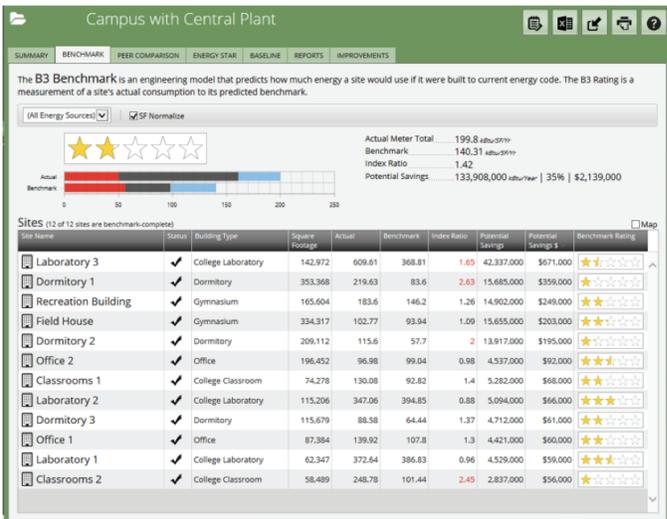


B3 Benchmarking

Comparison between actual energy use versus expected energy use for an office building

The example to the left illustrates a comparison between actual energy use versus expected energy use for an office building with a data center. The stacked bar chart represents actual energy consumption, and the yellow line represents where the building is expected to perform if it were to meet today's energy code. The difference between actual energy use and expected code-based energy performance represents the savings potential for the building—about \$259,000 for the year.

Performing this benchmarking analysis for each and every building and resorting the portfolio by savings potential is essential to find the 80/20 ratio. When stack ranking buildings by savings potential—rather than actual energy use—a more accurate picture of which buildings have the greatest potential to reduce energy costs is developed. In the example to the left, B3 Benchmarking identified five specific buildings across the portfolio that account for 78 percent of the \$2.1 million savings potential for this college campus. Focusing efforts to improve these five buildings will yield the greatest return on investment.



B3 Benchmarking

Identification of buildings that have the greatest potential to reduce energy costs

Identify and Focus on Savings Potential

B3 Benchmarking helps those responsible for managing a building portfolio identify and focus on buildings that will produce the greatest savings. Additionally, it helps track the savings going forward to maintain the improvements over time. By collecting readily available building information for all buildings and utilizing B3 Benchmarking to analyze and sort by savings potential to a smaller population, owners and facility managers can focus their time and resources on the buildings that have the greatest potential for energy savings. We have seen this proven time and again, whether you are responsible for a college campus, a suite of office buildings, a school district or a municipality—remember Pareto is always right!

For more information about B3 Benchmarking visit www.theweidtgroup.com/b3benchmarking