

Increasing Hospital Energy Performance with Energy Star®

a report by

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The question of how you know where you are going, unless you know where you have been is powerful. What lies at the heart of this question is the belief that you must track how far you have come in order to know how far you have left to go. In facility management, measuring progress is sometimes easier said than done. Not only is a baseline needed to benchmark from, but a clear destination is also needed. Historically, healthcare engineers in the US and abroad have not had an easy way to gauge the energy performance of their hospitals, or for that matter a destination to shoot for. This changed in 2001.

For the past decade, thousands of hospitals, schools, hotels and other organisations have partnered with the US Environmental Protection Agency's (EPA's) voluntary Energy Star® programme to demonstrate environmental leadership and adopt best energy management practices that produce twice the energy savings as typical approaches. Many Energy Star partners have asked for guidance, especially for energy performance tracking tools and targets. The response was to create the national energy performance rating system, now available to 50% of the commercial building spaces in the US, including office buildings, K-12 schools, hotels, supermarkets and hospitals.

Measuring Energy Performance

Facility managers who replace lights, install variable speed drives, tune up or commission, install low-E windows, join a voluntary programme or design better code expect to have energy efficient buildings. Intuitively, this makes sense as today's building components are at least 30% more efficient than 20 years ago. Analysis of the US Department of Energy's Commercial Building Energy Consumption Survey data reveals a surprising fact – the energy intensity (kBtus per square foot per year) of US buildings varies by 200% to 400%, regardless of the year of construction. In short, a building (including hospitals) built today may not automatically perform better than one constructed 30 years ago.

Energy Star believes that facility managers need to know how their buildings perform in order to make

the most effective management decisions. Knowing that energy-efficient equipment is owned is not enough, whereas knowing the actual energy consumption will enable confirmation of intuition, evaluation of maintenance, ensurance of proper equipment installation or the implementation of other practices that save significant amounts of energy.

The US Energy Performance Rating System

The US energy performance rating system uses a 1–100 scale to give relative meaning to energy use. Hospitals rating high on the scale are considered to be better energy performers (lower energy use) than those with low ratings (higher energy use). A rating of 50 is defined as the industry average. A hospital with a rating of 75, therefore, means that it performs better than 75% of similar hospitals across the US. In other words, 25% of similar hospitals perform equal to, or better than, this one. A US hospital that rates in the top 25% is considered to be a 'top performer' and is eligible to receive the EPA's award for superior energy performance – the Energy Star label. Hospitals outside the US could not apply for the building label at the time of press.

Jean Lupinacci, Energy Star's chief of commercial buildings, cautions that the rating system is more than just about winning labels. "While only the top 25% of hospitals will receive a label-qualifying score, hospitals anywhere along the scale can use the rating system as a regular part of their monthly energy management activities," she says. "Setting performance goals and tracking changes to your baseline rating is the real value of this system."

Indeed, many of the 4,000 users (a growing number) of the rating system who have already benchmarked over 20,000 buildings are asking their energy service and product providers to incorporate Energy Star into their service contracts. Baselineing is a common request. An interest in specifying request for proposal (RFP) language to guarantee performance rating increases for a given upgrade package is also being seen. Given its widespread application, the EPA's energy performance rating system is fast becoming the

miles-per-gallon equivalent for buildings in the commercial sector. Since few organisations outside the US have used this rating system to date, no studies have been conducted to determine the validity of international scores.

Behind the Curtain

The US energy performance rating system is accessible to the public for free through Energy Star's website (www.energystar.gov/benchmark). Users create their own private password-protected account in the 'Portfolio Manager' benchmarking tool. For hospitals, the tool is a 'campus-based' application, meaning users are asked to describe basic features of their hospital campus or stand-alone facility.

The model recognises that energy intensity is a function of the business activity, the climate and the choice of fuel mix. Analysis of data obtained from the Electric Power Research Institute's (EPRI) Energy Benchmarking Survey (1997) indicates that hospital energy intensity in the US is related to the following key characteristics, which are queried in the rating tool:

- hospital type – acute care or children's hospital;
- total campus square footage;
- number of licensed beds;
- number of buildings on campus;
- total number of floors of the tallest building on campus;
- presence of tertiary care, laboratory and on-site laundry; and
- above-ground parking.

Once the hospital space has been defined, users enter energy consumption data from utility bills or an energy management system. At least a year's worth of data are needed to receive a rating and users have the option of baselining even further back in time to see trends in energy performance. For those wanting to track the cost per square foot over time, cost is also listed as an optional field.

Energy performance ratings are automatically calculated and are immediately available to the user. Ratings are weather-normalised to account for the year-to-year variations in the weather. If the weather is more severe one year than the 30-year average for that location, the algorithm adjusts the rating upwards (or vice versa for milder weather) to avoid 'penalising' the facility for using

more energy than normal. International users of Portfolio Manager can weather-normalise their score by choosing the city associated with their country in the drop-down menu. The accuracy of the rating will decrease the further the hospital is from the listed city.

After-rating Process

Since increasing a facility's energy performance will lead to lower operating costs, increased competitiveness and greater pollution prevention, the only direction to go now is up, wherever profitable. Although the US energy performance rating system does not identify specific buildings on a campus to upgrade or prescribe specific actions to increase performance (better left to energy auditors and other professionals), Energy Star informs American users that the ratings can provide general recommendations.

Low Ratings (1–49) – Greatest Opportunities for Investments

Hospitals in this category have the most attractive returns for capital investments. Opportunities to upgrade lighting and other significant energy using systems including system co-ordination should be looked for. Renewing the commitment of senior executives to energy management will be an important component to the strategy.

Middle Ratings (50–74) – Fine-tune Operations and Maintenance

Hospitals with mid-range benchmarks should consider low- or no-cost activities such as re-commissioning campus buildings, developing and implementing preventative maintenance plans, increasing employee training or re-assessing incentive, recognition and reward systems to ensure that they drive energy performance. Often, these relatively low-cost efforts can turn these facilities into 'top performers'.

High Ratings (75–100) – Reward and Learn

Hospitals within this range are among the highest energy performers compared with US hospitals. Facility managers may consider sharing their energy management plans and operational strategies with other hospitals in their system and they can continue to improve performance. Many hospitals have increased in score from the mid 70s to the upper 80s. ■

This article is continued in the Reference Section on the website supporting this business briefing (www.touchbriefings.com).

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