TREND report

A View from the Trenches: LEED, Energy Star, and Green Globes

Joyce Kelly • published in the April 2020 issue

Designing high performance buildings while wading through the algae-encrusted mud of green building rating systems is never easy—but has its moments of satisfaction. On good days, we balance the priorities of building owners with "better-than-code-minimum" energy performance within budget and on schedule. On bad days, we battle the idealistic targets of Leadership in Energy and Environmental Design's (LEED's) latest version for months after the money's run out. Briefly, the top three systems used to measure "sustainable" performance look like this.

LEED v.4/4.1: A Mixed Blessing

LEED Silver certification has been required for every new state funded building in Arizona since 2005, and we are not alone in this endeavor. LEED's creator, the cleverly named U.S. Green Building Council (USGBC), is a membership-based nonprofit formed in the late '90's. Primarily focused on new construction, it also includes existing buildings and their operation. Certification requires extreme levels of documentation to prove performance to off-site reviewers. On the positive side, it requires energy modeling and at least fundamental commissioning, which is where the rubber meets the road for building performance.

In Southern Arizona, some credits, such as daylighting, are rarely attainable. By the time we control our daylight to reduce heat gain, it can't penetrate deeply enough into workspaces to earn a point. Constrained downtown and University sites without room to sort recycling from land fill or manage stormwater on site are also challenges. However, by taking the energy and water efficiency related credits seriously with modeling early in design or re-design, we can make a difference in the operations and maintenance costs of our new and existing building stock.

Has the LEED wave crested and broken on the broad shore of sustainability programs? Our current economic reality may hasten that process. For the moment, LEED certification remains the most visible indication of measurably green buildings.

Energy Star: Raised the Bar

Although limited in scope, this tool facilitates the tracking of energy and water usage with overall metering and monitoring of existing buildings. It only applies to the following categories: offices, retail, K-12 schools, hotels, warehouses and worship facilities. Scores are based on data from similar buildings nationwide. The 2003 database was updated in the summer of 2018 with the 2012 Commercial Building Energy Consumption Survey. This raised the bar against which existing buildings are measured.

As a result, the energy performance score for existing buildings in Energy Star Portfolio Manager dropped significantly. Comparative performance of the buildings we monitor in Tucson, Arizona dropped by 9–14%. Although these buildings are still in the top 25% and continue to be Energy Star certified, it's not as easy to be green, in terms of energy-efficiency, as it used to be.

Replacing interior fluorescents and HID parking lighting with LEDs isn't enough to remain in the top tier of energy performance anymore. Controlling the time period of loads, always a benefit to reduce peak demand utility charges, and upgrading motors with variable frequency drives is essential. Heat pumps and heat recovery systems help a lot. Solving building enclosure challenges such as poor insulation or excessive, unshaded glazing is the next step.

Energy Star is a simple, no cost tool that enables monitoring of any building's energy & water usage. Although many buildings in Southern Arizona advertise old Energy Star achievements with decals on their doors, some dedicated building managers continue to re-certify yearly. Perhaps this is because most federal tenants are still required to lease space in Energy Star certified buildings.

Green Globes: Approved by GSA in 2013 & 2019

The roots of Green Globes are solid, if a bit obscure. In 2004, the Green Building Initiative (GBI) adopted a Canadian web-based tool from Building Research Establishment Environmental Assessment Method (BREEAM), the first sustainability assessment method, which began in the UK and dominates Europe. GBI is also a nonprofit group yet board membership is… interesting. The current chair is the vice president of a lumber company. Sustainability representatives from Ewing Irrigation, and Mitsubishi Electric are also officers along with a representative from the Vinyl Sustainability Council. These are balanced by professors, design and real estate professionals.

Nevertheless, Green Globes is an ANSI-certified, web-based process with final documentation reviewed by an onsite third-party assessor for new and existing buildings. Notably, the General Services Administration (GSA) approved it as equal to LEED in 2013 and recommended that the Department of Energy (DOE) accept it again in 2019. Registration and review fees are equivalent to LEED's, but documentation is more routine.

Like Energy Star, it compares the energy performance of buildings against data from real buildings. Energy modeling software requirements are very stringent and limited to DOE sponsored simulation engines. The final onsite assessment, unique to Green Globes, is efficient and thorough. With federal approval and over 20,000 certified buildings in the U.S. and Canada, this rating system deserves more attention.

Data-Driven Design Yields Measurable Results

Using green building rating programs can prove and substantiate environmental performance. Each of the three leading programs has its own benefits and drawbacks. It is important to understand their parameters to choose the approach that best fits your project's goals and budget. Economically effective, data driven design helps inform decisions that reduce operations and maintenance costs. Ultimately, producing measurably high performing buildings still satisfies those of us in the trenches and leads us closer to a climatically balanced built environment.

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