



LIVING UP TO ENERGY PROMISES

Too many buildings fail to deliver the energy performance they were designed for. ENERGY STAR offers a bridge from design to operations

BY NAOMI MILLÁN, ASSOCIATE EDITOR

It can seem there are ever-new ways to paint a facility green. And the benefits of garnering any of the number of green designations out there have created a boom in the green construction market. However, many of the certification programs that exist focus on a building's design and its anticipated operation, calculated through models and other projections. Verifying that a facility is meeting energy performance targets has largely fallen by the wayside, even though being green implies being energy efficient.

While other certification programs don't have mechanisms to verify a design is realized into operations, there is one that starts facility executives

down that path: the EPA's Designed to Earn the ENERGY STAR.

Successful marketing efforts for domestic appliances mean that much of

the general public has become familiar with ENERGY STAR. And the concept of an ENERGY STAR-labeled building is familiar to many facility executives. There are more than 5,000 buildings nationwide with an ENERGY STAR label. These facilities are more energy-efficient than 75 percent of comparable buildings.

Less familiar is the Designed to Earn the ENERGY STAR designation, a relatively new program in the EPA that recognizes the energy savings potential of a building's design. It intends to take a building from concept to drawings to reality, with the same high-level metric used throughout the process to serve as a measuring stick.



Kinard Junior High School in Fort Collins, Colo., used one ENERGY STAR tool to help design efficiency into the building and another to confirm that actual performance hit the design goals.

One facility, Kinard Junior High School, has so far made it from start to finish in the ENERGY STAR program. More are poised to cross the finish line in the coming years.

While it might not yet have the same cachet as other programs and can take a bit longer to get to something that can be hung in a lobby, the end result of the Designed to Earn process is real energy savings based on hard energy data, not just speculation.

Designed to Earn the ENERGY STAR

Designed to Earn recognizes that successful operations is a continuous process starting with a successful design. Started in 2004, it creates a pathway via the ENERGY STAR label forward from the early stages of the design process to the building's operations, which falls to owners and operators. Designed to Earn is also a requirement for participating in the ENERGY STAR Challenge, an EPA initiative to improve the energy efficiency of American commercial and industrial buildings by at least 10 percent.

A building's design is eligible for Designed to Earn the ENERGY STAR when it is at least 95 percent complete with construction documents and before the building has generated any actual utility bills. Using the ENERGY STAR Target Finder tool, the projected energy use of the design is rated on a

'WE DON'T WANT THESE BUILDINGS TO JUST PERFORM ON PAPER'

scale of 0 to 100. The tool uses data such as the facility's zip code, building type and estimated energy use to calculate a rating. Designs that achieve a rating of 75 or above are eligible for Designed to Earn the ENERGY STAR.

Qualifying projects get a graphic that can be put onto drawings and other project documents. This serves as a reminder throughout the construction process that a goal for the

building is to earn the ENERGY STAR label. To get a qualifying design, the owners and design team have to start collaborations early on.

"Having a target gets architects on board and buy-in from the building owner," says Karen Butler, EPA's manager for ENERGY STAR Commercial New Construction. "It's a way to get the whole team on line. The design person sits with the operations person."

The Target Finder tool has been available since 1999, but didn't offer

any recognition, only a goal. Designed to Earn creates an incentive for architects to work with the owner to deliver what they designed, as well as take the end-use and operations of the facility into close consideration, says Butler.

ENERGY STAR is also working on getting building owners more involved. An option under review is to include a commitment letter from the owner in the Designed to Earn packet.

Designed to Earn is most like a pre-certification and does not guarantee a building will earn the ENERGY STAR label. With all that happens during construction and operations, facility executives still have to stay on top of the entire process to achieve energy performance goals.

“The buzz on the street is that you can’t predict performance,” Butler

says. “But it’s not about that. It’s about setting a goal and having something to measure against.”

She gives the example of an Olympic athlete. It takes months of training, measuring and tweaking to achieve a medal-winning performance. It is much the same with buildings as far as energy performance goes. The schools in the Pou-

dre School district in Fort Collins, Colo., are just such gold medalists.

The average public school in Colorado consumes about 80 kBtu per square foot per year, according to Stuart Reeve, energy manager for the Poudre School District in Fort Collins, Colo. Kinard Junior High School, one of the most recent crown jewels in the Fort Collins portfolio

PROJECT PROFILE

EPA Region 8 Headquarters Aims for ENERGY STAR

The path from earning the Designed to Earn the ENERGY STAR Label to actually earning an ENERGY STAR label is not necessarily a quick one. Not even for the EPA itself.

When the GSA was looking for a build-to-suit contract for the new EPA regional headquarters in Colorado, language requiring the design meet Designed to Earn was right in the RFP, which Opus Corporation won.

The requirements were significant, says Jim Blackledge, director of Strategy Groups and owner’s representative for Opus at the time. The building design had to meet the minimum rating of 75, with a goal of 85. Because it is an EPA-occupied facility, one might assume the goal would be as near-perfect a rating as possible, but funding was limited due to a congressional appropriation. “It’s like building a LEED Platinum building to get a 100 in ENERGY STAR. The design team was realistic,” he says.

The headquarters’ design gained Designed to Earn in 2006 with a rating of 86 and was fully occupied by March 2007. The original lease language sought to achieve the ENERGY STAR label within 14 months of occupancy, says Amy Smith, senior property manager for Opus Northwest Management. However, the contract has since been amended to say the label will be

required by June 2009.

“Right now, the numbers are not a clear reflection of the energy efficiency of the building,” Smith says. “New buildings need a year of commissioning activities to get top efficiencies.”

One example of issues to get straightened out during the shakedown period was a steam meter that was generating incorrect data. If that data had been used, the building would have looked like an energy hog, Smith says.

Carefully examining the building for actual use once it’s occupied is another important activity, she says. Operational efficiencies can often be discovered.

“Don’t assume that the designed use is the actual use,” she says. “You can get efficiencies by looking at actual use and adjusting the system to properly condition areas for that use.” For example, the Region 8 Headquarters includes a large educational center on the first floor that was never built out. The space is now used for storage, which requires different conditioning than the original design.

Smith says the facility is on track to apply for the ENERGY STAR label using 2008 energy data and is currently tracking at a 92.

— Naomi Millán



The new EPA Region 8 Headquarters in Denver has become a regional testbed for energy-efficient technologies, with innovations such as an underfloor air distribution system.

and the first building in the country to earn the ENERGY STAR label after earning Designed to Earn, consumes 22 kBtu per square foot per year.

Fast on its heels are Rice Elementary, completed in August 2007 and eligible for the label in a few more months, and the just-completed Bethke Elementary. Both have Designed to Earn under their belts. Bethke also has a few other green designations, including a LEED for Schools application in the works that is expected to earn Gold certification.

'IT'S ABOUT SETTING A GOAL AND HAVING SOMETHING TO MEASURE AGAINST'

Kinard is the product of an arsenal of best practices in place at the school district, not the least of which is a close partnership with the ENERGY STAR program. Kinard earned a Designed to Earn the ENERGY STAR designation in 2005 with a rating of 91 for its design. Completed in 2006, it achieved the ENERGY STAR label in 2007 with a rating of 95. In its most recent recertification, the school scored a 97, according to Reeve.

Several components went into Kinard's success, starting with its design. The school is 112,735 square feet and serves 750 students. The closed loop geothermal system is made up of 100 wells that tunnel 300 feet deep into the ground. Each of the 72 classrooms or office areas has its own heat pump. It has low-E operable windows and incorporates light tubes into its daylighting system. It is now the district's prototype for junior high schools.

Reeve says it is so far the most comfortable and energy-efficient school in the district and possibly all of Colorado. During a recent tough winter, the coldest in 20 years, the school received fewer hot/cold calls than any other in the

district. Reeve credits the geothermal exchange system with much of the comfort.

The facility also benefits from a deep culture of energy conservation in the school district. Even before Designed to Earn came along, Reeve was using every tool he could to manage the design and operations of his facilities in an integrated and efficient manner. The district's strategies include sustainable design, EnergySmart Schools (a U.S. Department of Energy program), working with the local utilities, and LEED. The operations team uses infrared cameras to check the building envelope for leaks, submetering, energy profiling and automated utility programs. Designed to Earn fits right into that toolbox.

"We've been an ENERGY STAR partner since 2000," says Reeve. "We're holding the team to an expectation. We don't want these buildings to just perform on paper. We're looking

ENERGY EFFICIENCY

Tips from a Pro

Stuart Reeve, energy manager at the Fort Collins, Colo., Poudre School District, offers some ideas for success in achieving exceptional energy performance.

- Make sure you can work with the entire architectural team and that they're open to new ideas. Instead of sticking to standard practices, they're going to have to meet the project's performance goals. "You have to find someone who is willing to drop their fences and really collaborate," he says.
- Commissioning should be part of substantial completion. Rather than accepting a handover at 70 percent completion, try to achieve 90 percent. "It's worth the extra dollar per square foot it will cost to get a commissioner involved," Reeve says.
- Embrace the cutting-edge, instead of the bleeding-edge, of innovations. Accept that it's a continuous learning experience and try things out. "You don't want to get out there too far with the technology, but get out there," Reeve says. Networking with other facility executives can help expose you to innovations.

— Naomi Millán

Daylighting techniques at Kinard Junior High School have been adjusted to overcome initial problems with glare.



RB+B ARCHITECTS



For more information on the Designed to Earn the ENERGY STAR program, including design guidance and the Target Finder tool, go to: WWW.ENERGYSTAR.GOV/INDEX.CFM?C=NEW_BLDG_DESIGN.NEW_BLDG_DESIGN

at where the rubber meets the road.”

Performance goals are designated at the first design charette. Everyone, from the operations team to the archi-

tect is involved from the start. Reeve says that using the Target Finder as part of Designed to Earn ends up being an accountability tool. Every deci-

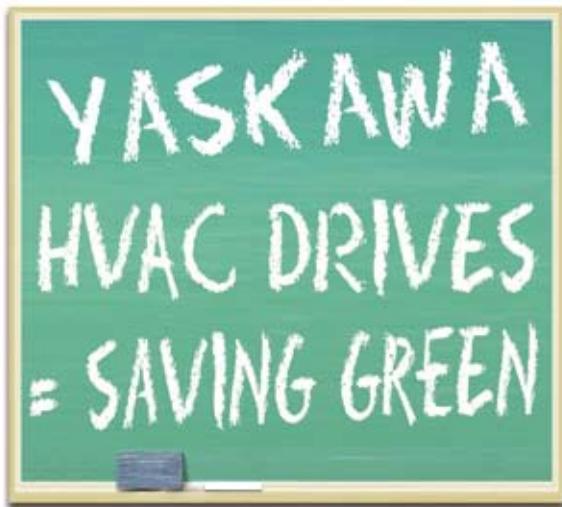
sion is measured against how it's going to affect the expected energy profile, he says.

In addition to having a sustainable design process, the school district also has a sustainable management process in place, Reeve says. “It’s part of the overall corporate vision,” he says. “We’re trying to put as much money as possible into the classroom by operating the buildings as efficiently as possible. It’s a management best practice.”

As part of a continuous commissioning process, which starts during the design, the schools are benchmarked every year to make sure they’re meeting their goals. “With energy costs the way they are, it’s a

ADD IT UP!

Use Less Energy and Preserve the Environment



- Quick Payback +**
- Reduced Power Bills +**
- Lower CO2 Emissions +**
- Less Water Consumption +**
- Decreased Maintenance Costs**

SAVING ENERGY LEAVES MORE MONEY FOR USE IN THE CLASSROOM

pretty high priority for the staff,” Reeve says. If a building starts to slip a little, the operations team is right on it. Any variance from the optimal energy profile is addressed or explained within six months.

“You need to keep an eye on buildings from the beginning so you can ensure a building is working as it should as soon as possible,” Reeve says. “And even when they do perform, you need to keep an eye on them so they continue to perform at optimum level.”

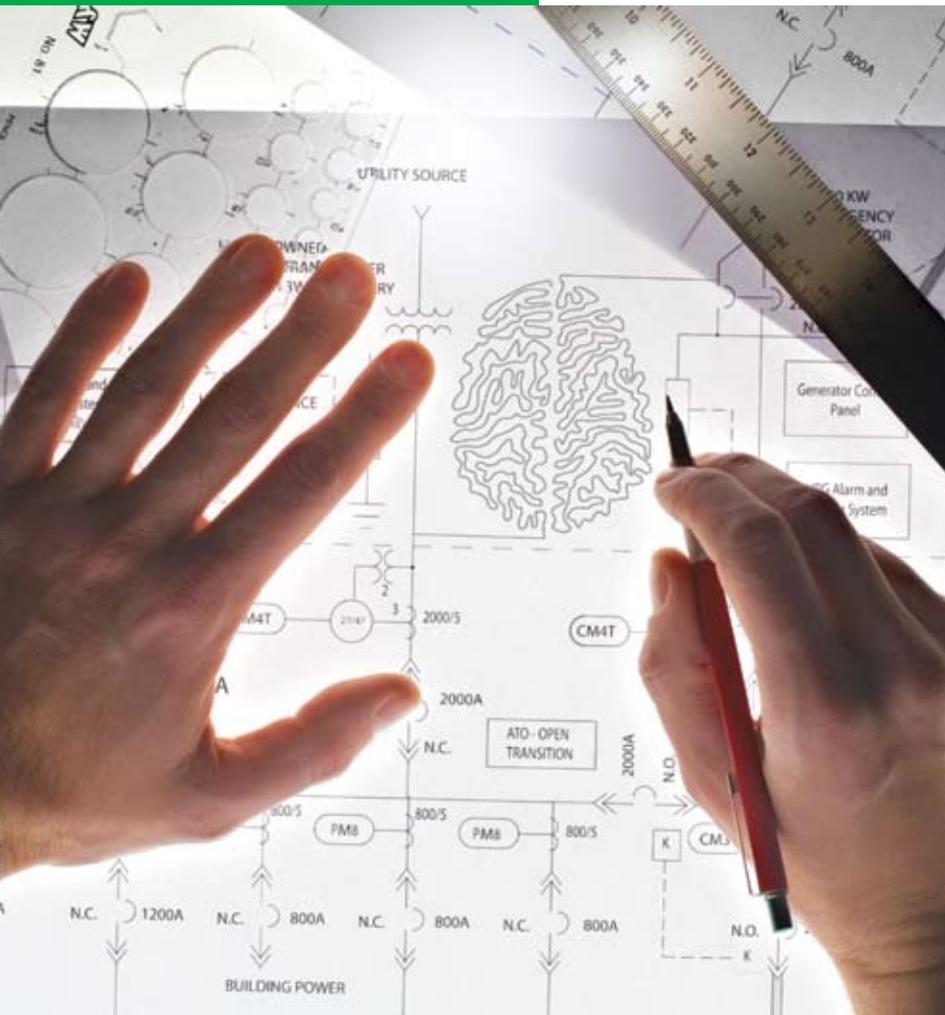
Another aspect of the success Kinard enjoys is a continuous search for improvement. Reeve says the district strives to learn from the successes and failures at each facility to improve the next. An example is with their progression of elementary schools. Zach Elementary, which opened in 2002 and is currently the prototype, performs in the 40 kBtus per square foot

YASKAWA
The Drive for Quality™
1-800-927-5292
www.yaskawa.com

Free CD
Calculate Energy Savings and Payback
Go to www.yaskawa.com/E7

Looking for a big idea to strengthen bottom-line performance?

Take a smarter approach to energy and power management.



per year. Rice Elementary, completed in 2007, performs in the 30s and the just finished Bethke Elementary in the 20s.

Educating an Industry

To date, 93 projects nationwide have earned Designed to Earn the ENERGY STAR. The program started off with 10 projects in 2004, then two in 2005 and seven in 2006. Since then, numbers have picked up, with 32 projects in 2007 and 42 in 2008.

Designed to Earn is still in its infancy and is slowly gaining market credibility. But Butler prefers to take a slow and steady approach. For instance, the fact that only one out of 93 projects has gone on to earn the label is not so surprising.

"Everybody wants it fast and now," Butler says. But because of the nature of the construction cycle, fast is just not possible. "The other ones will come along. It just depends on how long it takes to get the building off the ground."

Because Designed to Earn refers only to the design and can be awarded at the time the design goes out to bid, there's still the construction, shake down, and a year's worth of benchmarking before the ENERGY STAR label even becomes possible. At best, it's a two-and-a-half-year process, she says. One possible reason Kinard is the first across the finish line is that, in addition to the well-oiled machine in Fort Collins, schools are relatively quick to get out of the ground.

Butler says what is more important than getting a bunch of the Designed to Earn buildings to earn the label immediately is the education process that is going on within those facilities and in the industry as they look at what they expected to happen and what actually occurred. The pioneers in the program are now looking at lessons learned and figuring out where surplus loads and extra energy use came from.

Even though the program is still in its education phase, Butler says it is getting more exposure in the market. The path to the ENERGY STAR label is pretty straightforward, she says. The only real addition of time to the design process is the legwork the architect has to do to use the Target Finder, which includes energy modeling of the design.

Schneider Electric can reduce energy costs and improve uptime.

Our Square D® PowerLogic® systems act like a layer of intelligence across all your energy assets. From a single circuit breaker to multiple sites around the world. From simple web-enabled monitoring for energy savings to advanced power system controls ensuring continuous service. And on top of that, we've installed more systems than anyone else in the industry.

To learn more, call **1-866-466-7627** or visit www.powerlogic.com/intelligent today.

Make the most of your energySM



by Schneider Electric



FREE INFO: Circle 425

We've Got It Covered!

- Lightweight
- Seamless
- Long lasting
- Easily and inexpensively renewed
- Significant life cycle savings
- Easier, faster and cleaner to install than most conventional roofing systems

RoofMart International, Inc.™

Toll Free: 800-345-1439

www.roofrmi.com



"World Class Products
Protecting
World Class Assets"

▲ **FREE INFO: Circle 427**

In addition, Designed to Earn creates a metric that is more accessible across more layers of an organization than code. "The metric created by Designed to Earn is accessible to the building owner, the CFO, the A&E firm, the operations staff. It permeates all the layers. Code does not," she says. The initiative is better understood throughout the organization because of the existing familiarity with the ENERGY STAR concept in the general population.

Butler believes the interest is definitely out there. Though she doesn't know how many people are using the Target Finder tool but not applying for Designed to Earn, at a recent Target Finder training Butler had 1,000 people enrolled. That there aren't 1,000 applicants to Designed to Earn doesn't concern her. These "free riders" are still being influenced, she says. "It shows people are engaged."

In the end, it's not a competition between Designed to Earn and other rating systems. It's about collaborations to meet common goals.

"If you want to save money, save energy and save carbon dioxide emissions to reach the targets that have been set for 2030, we don't have time for competition," Butler says. "We all need to participate. We all win. We all help to achieve the goals. We all need to be in the saddle together." **BOV**

E-mail comments to naomi.millan@tradepress.com.

Discuss. Design. Deliver.

It's what we do.™

CES Group DELIVERS QUIET with Mammoth® ULTRALINE™ Chillers

CES Group™ is the market leader providing custom-engineered solutions in heating, ventilating, and air conditioning equipment *since 1935*. Solutions like ULTRALINE chillers from Mammoth—available in air-, evap-, and water-cooled condensers and with low-sound options for quiet operation. Our AMCA Standard 300 accredited sound laboratory helps us deliver the sound performance you require. Our local professional representative can help you custom-engineer the right solution for your application. Contact us to learn more.



CES™ group INC.
Customization
Is Our Standard™

Web: www.mammoth-inc.com
Email: info@mammoth-inc.com
Tel: 952-361-2711

© 2008 CES Group, Inc. Each company is a separate and distinct legal entity