

What's in YOUR Building?

By Mark G. Dotzour and Beth Thomas



Is your commercial building Leadership in Energy and Environmental Design (LEED) certified? If so, has it earned the basic certification or silver, gold or platinum? What is your building's Energy Star design rating? A growing number of local government officials and prospective tenants want to know.

Cities across the nation are looking for ways to encourage or mandate the private sector to build and renovate to LEED specifications, also known as “green building” or “sustainable development.”

Commercial Goes Green

Since 1999 the number of commercial buildings being built according to the LEED Green Building Rating System has grown at an average annual rate of 40 percent. The LEED system has become the nationally accepted benchmark for design, construction, and operation of high-performance green buildings.

The City of Austin passed a resolution in June 2000 requiring LEED certification of all public projects over 5,000 square feet. Dallas officials have issued a resolution requiring all city buildings larger than 10,000 square feet to have at least LEED silver certifications. Houston adopted a similar resolution in 2004.

Plano’s city council recently adopted a building sustainability policy. From now on, that city will use the LEED rating system, requiring the highest level of LEED certification possible for all city facilities.

The City of Hutto recently became the 20th city in Texas to sign the U.S. Mayors Climate Protection Agreement (CPA), which calls for cities to meet the goals set by the international Kyoto Protocol to address climate change. Although the U.S. government did not sign the Kyoto Protocol, mayors of 755 U.S. cities

have signed the CPA, which urges state governments and the federal government to enact policies and programs to meet or beat the 7 percent greenhouse gas emission reduction target suggested for the United States.

According to Energy Star, a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy, 30 percent of the typical office building’s costs go to energy use. In fact, energy is a property’s single largest operating expense. That cost gets passed to tenants, who want as much as possible of that operating cost off their bottom line. As a result, the market is rapidly approaching the point at which developments that are not LEED certified will be unable to attract the anchor tenants needed to guarantee success.

In many large cities, if a new building is not LEED certified, it has almost no chance of being classified Class-A or -AAA. Consequently, that building might not rent at top market rates nor will its value appreciate at a rate equal to energy-efficient buildings of similar design. Relatively new Class-A buildings not LEED certified could become Class-B simply because the market does not consider them energy efficient.

These factors bring to light a huge problem in the U.S. commercial building stock. The Commercial Buildings Energy Consumption Survey estimates there were nearly 4.9 million existing commercial buildings and more than 71.6 billion square feet of commercial floorspace in the United States in 2003. In 2007, only 1,129 buildings were LEED rated; 8,566 under-construction buildings had applied for LEED certification. Clearly, the nation’s commercial building stock will face stiff competition as certified energy-efficient buildings come online.

Building owners and developers are being pressured from all sides to go green. But while owners and developers understand that green building has become a necessary marketing tool, the perception remains among them that the added costs of green building outweigh the benefits. Another misconception is widespread — that energy savings cannot be measurably proven or satisfactorily maintained.

Major problems occur when building owners implement technological changes without knowing what energy technology to install or how to operate and maintain it. In short, technology alone does not equate to high performance. One size does not fit all buildings.

As a result of these challenges, a new breed of real estate professionals is emerging. Calling themselves “building commissioners,” these experts perform quality assurance, known as building commissioning, which can detect and remedy most deficiencies found in either new

or existing building design. Like engineers who design new automobile engines and bodies for fuel efficiency, building commissioners look for ways to streamline buildings for energy efficiency.

Commissioning and Retrocommissioning

Building commissioning confirms a building’s energy systems function according to criteria described in the project’s construction documents and meet the owner’s operational needs.

Retrocommissioning, also called recommissioning, is the process of investigating, analyzing and optimizing system performance in existing buildings. In this scenario, the building commissioner functions like an auto mechanic who fine tunes a car for maximum efficiency. After analyzing the current systems, building commissioners make recommendations that will improve operation and maintenance to ensure continued high performance. Retrocommissioning helps make the building systems perform interactively to meet the owner’s — and the owner’s tenants’ — current facility requirements.

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Building commissioners' contributions include acting as consultants, project managers/value engineers and facilities managers. Their incomes are based on flat consulting fees, a percentage of the annual cost savings realized, maintenance programs involving key performance indicators, or a combination of these.

Analyzing Efficiency

Traditional consulting firms, which include Arthur Little, Deloitte, and Bearing Point, perform "business sustainability value analysis," but may or may not perform or oversee the suggested cost savings initiatives, depending on their client. Some consulting services may include tracking the success of the client's implemented changes. Most service only high-income clients who own high-square-footage buildings (upward of 500,000 square feet), representing a small percentage of the U.S. commercial building stock.

Real estate firms such as Cushman & Wakefield, CB Richard Ellis and the Staubach Company are expanding into facilities management through "value engineering," which describes the process of commissioning new or recommissioning existing facilities to operate at maximum efficiency.

Cushman and Wakefield's George Denise, project manager for the Adobe Systems Inc. headquarters located in downtown

government agencies and reduced operating costs by some \$1.2 million annually. The project had an average payback of 9.5 months with return on investment netting a whopping 121 percent. Notably, even though these buildings were relatively new at the time of recommissioning, the payback still proved worth the expense.

Commissioning and recommissioning buildings is proving extremely valuable to the client. According to Energy Star, along with realized cost savings, recommissioned buildings typically sell for about 5 percent more than similar nonrecommissioned buildings.

In a study entitled "The Cost-Effectiveness of Commercial-Buildings Commissioning," analysis of 224 buildings totaling 30.4 million square feet across 21 states found that commissioning has far broader relevance than simply optimizing energy-efficient systems. Knowledge of day-to-day systems operations is essential. Cost savings are directly impacted by the extent to which energy efficiency research, development and deployment programs are combined with quality assurance in design, delivery and operations maintenance.

For example, a fan study conducted by the Environmental Protection Agency found that 60 percent of building fan systems are oversized by an average 60 percent. The 224-building study found chillers were oversized by 50 to 200 percent.

Across the nation, improper installation, inaccurate sizing and poor maintenance are negatively affecting building efficiency.

Building commissioners apply an emerging form of cost-effective quality assurance procedures that provide a way to define measurable performance targets and evaluate as-built and as-operated systems.

As part of an integrated strategy for improving building energy performance, commissioning is an effective and far-reaching means of improving energy efficiency across the U.S. building stock.

Commissioning professionals are risk managers helping to ensure funds are spent wisely and that intended energy savings targets are actualized. Commissioning provides a way to define measurable performance targets and evaluate existing operating systems.

With more than 99 percent of the nation's existing building stock facing market demand and local governmental pressure for recommissioning, expect to see demand for building commissioning profes-

sionals explode. ♣

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ALL OUTDOOR LIGHTING at Adobe Towers in San Jose, California, was retrofitted with energy-efficient luminaires and advanced lighting controls.

San Jose, Calif., has documented phenomenal success with value engineering. Adobe's headquarters are in three buildings known as Almaden Tower, East Tower, and West Tower, which are 17, 16 and 18 stories, respectively, and at the time of recommissioning were three, nine, and 11 years old. Combined, the buildings total 989,358 square feet of office space, situated above an additional 938,473-square-foot enclosed parking garage.

After analyzing the three towers, Cushman & Wakefield implemented energy saving techniques that reduced per-occupant electricity use by 35 percent, natural gas use by 41 percent, domestic water use by 22 percent, CO₂ emissions by 23 percent, and landscape irrigation by 76 percent. In addition, they are diverting solid waste by up to 87 percent. Adobe spent just over \$1 million, received about \$389,000 in rebates from

THE TAKEAWAY

Cities are encouraging builders to develop commercial buildings to meet energy-efficient LEED standards. Retro-commissioning, the process of analyzing system performance in existing buildings for the purpose of improving operations and maintenance, is becoming more common as owners struggle to maintain Class-A and -AAA ratings.



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