

Chapter 14

The Revolution in Property Management

Green building advocates realized early on that existing developments represent a major opportunity for achieving energy and water savings and reducing the overall environmental impacts of building operations. After all, in any five-year period, new construction and major renovations affect only a small fraction of the existing building stock. As a result, the USGBC created the LEED for Existing Buildings (LEED-EB) standard in 2004, as a means to benchmark building operations against a variety of sustainability criteria. By the end of 2006, nearly 250 projects had registered to participate in LEED-EB, and about 40 had been certified. Compared with the success of the LEED-NC program, this program has had a slow start. Nevertheless, there is considerable evidence that the LEED-EB program is poised to take off, as more organizations begin to track their carbon footprint and attempt to reduce it.

Of course, building owners have long been renovating and improving their buildings' energy use, using as a benchmark the federal Energy Star program for commercial buildings. Energy Star evaluates energy use, in terms of BTUs per year per square foot, for buildings of a similar type within the same climatic region. By the end of 2006, Energy Star had awarded ratings to about 3,200 buildings, representing 575 million square feet, in all 50 states.¹ An Energy Star designation indicates that a building is in the top 25 percent of all similar buildings for lowest annual energy use per square foot.² Overall, Energy Star-rated buildings use about 35 percent less energy than similar buildings.

At the federal government level, the Federal Energy Management Program has been in place since 1973. At present, federal agencies are tasked to reduce their energy use 35 percent by 2010 compared to 1985 levels.³ Many state and local governments have had similar programs. Reducing energy

use is a clear payoff for most government agencies as well as many private businesses, because the return on investment is very high, especially at the beginning, when programs can capture the easiest retrofits.

In recent years, there has been a strong effort by government and business to reduce lighting energy use and associated cooling demands by replacing incandescent with fluorescent bulbs, especially compact fluorescents and, more recently, with LED lights. And, of course, many people are familiar with the demand-reduction programs of most electric utilities throughout the United States, which offer incentive payments and technical assistance to both businesses and consumers for cutting energy use.

The commercial office building industry spends approximately \$24 billion annually on energy and contributes 18 percent of U.S. carbon dioxide emissions. Energy represents the single-largest operating expense for office buildings, typically a third of variable expenses.⁴ In 2006, recognizing the need to help building owners and managers reduce energy use, Building Owners and Managers Association (BOMA) International, a trade group representing 16,500 members of this sector, launched the BOMA Energy Efficiency Program (BEEP) to educate its members about energy-efficiency upgrades. According to BOMA International, if only 2,000 buildings adopt BEEP's no- and low-cost best practices over the next three years, energy consumption and carbon emissions in those buildings will be reduced by 10 percent, resulting in \$400 million in energy savings and 6.6 billion pounds less carbon dioxide released into the atmosphere.⁵

For energy-efficiency upgrades in new or existing commercial buildings, the federal government offers a tax deduction of \$1.80 per square foot for measures that save at least 50 percent of heating and cooling energy, using a 2001 performance standard referenced in the 2005 Energy Policy Act. Separate partial deductions of 60 cents per square foot are available for measures treating only one of these three systems: lighting, HVAC, and building envelope (insulation and glazing) upgrades. For public buildings, the law allows the design team to take the deduction, since governments don't pay taxes.⁶ As an example, energy-savings renovations in a 500,000-square-foot commercial structure that met the requirements of the law could create a \$900,000 tax deduction for the building owner. At a 30 percent marginal tax rate, that amount could be worth \$270,000, or about 54 cents per square foot.

LEED for Existing Buildings

But energy savings alone don't make for green operations. The LEED-EB standard encourages facility managers and building owners to broaden their horizons to include other issues:

- improved air quality, which betters the health of building occupants
- lower water use, with savings on utility bills
- greater recycling efforts, with reduced waste disposal costs
- reduced use of toxic materials, both inside and outside buildings, to improve worker health and productivity
- lower overall operations and maintenance costs

What sort of measures are part of LEED-EB certification? Some of the most prevalent include the following:

- Change site management practices to reduce the use of chemical fertilizers and pesticides in favor of integrated pest management, and to use native and adapted plants instead of ornamentals, to create better habitat.
- If the building is not close to transit, provide a shuttle link for employees to encourage use of available public transit.
- Provide bicycle lockers and changing rooms to encourage bicycle commuting.
- Provide hybrid vehicles for the organization's fleet or incentives for employees to purchase them; give employees preferred parking for low-emission, high-mileage vehicles to encourage their purchase and use.
- Promote carpools and telecommuting for employees to reduce single-occupant vehicle use.
- If there is enough area around the building, restore open space and mitigate stormwater runoff. (Installing a green roof also helps to meet these requirements.)
- If the roof needs replacing, install an Energy Star-compliant roofing material.
- Shield outdoor lighting to prevent light trespass and night-sky light pollution.

- Change landscaping practices to reduce or eliminate potable water use for irrigation.
- Reduce water use in the building by replacing older fixtures with more efficient units, including water-free urinals, low-flow sinks, and low-flush toilets.
- Recommission the building to ensure that all energy-using equipment is performing according to design intent, and replace older equipment with more efficient systems. As a minimum, achieve an Energy Star rating of 60 (meaning that the structure ranks in the top 40 percent among all similar buildings).
- Replace all HVAC equipment that is still using CFC refrigerants banned under the Montreal Protocol. (This was done by the National Geographic Society in its LEED-EB upgrade, described below.)
- Install energy-saving retrofits of HVAC, lighting, and water heating systems to improve energy performance by 20 percent or more over current baseline usage.
- Install on-site renewable energy systems such as photovoltaics, or purchase green power from a recognized provider of wind and solar energy.
- Educate the building staff on appropriate operations and maintenance best practices to reduce energy use.
- Meter energy use in greater detail, so that areas of improvement can be easily found.
- Measure and promote waste recycling by occupants to achieve 50 percent reduction of the waste stream.
- Adopt environmentally preferable purchasing policies to promote the use of salvaged and recycled-content materials, locally produced materials, bio-based materials such as agricultural fiberboard, and sustainably harvested (certified) wood products.
- Use only paints, adhesives, carpets, and other products that have low or zero emissions of volatile organic compounds.
- Adopt green cleaning practices for building maintenance.
- Install carbon dioxide sensors to control building ventilation systems.
- Improve energy use with lighting and occupancy controls.
- For construction projects, adopt high standards for waste recycling and indoor air quality maintenance.

- Where possible, redesign office and workspace layouts to promote views to the outdoors and improved daylighting for occupants.

Clearly, there are a large number of actions that any facility, office, or factory can take to create a healthier and more resource-efficient place to work. LEED-EB can be used as a benchmarking and rating system to assess both current performance and annual improvements. The most difficult part of the journey is just getting started, because most of these changes cut across departmental lines and require coordination among many levels of an organization.

Successful LEED-EB Projects

One good example of a successful LEED-EB project is the 2006 Platinum certification of three buildings at the headquarters of Adobe Systems, a software maker in San Jose, California, shown in Figure 14.1. These projects represent the largest such effort in the world to date. To demonstrate its commitment to environmental stewardship, an important public issue in northern California, Adobe decided to invest \$1.1 million over five years to turn its three existing towers downtown—ranging in age from three to ten years and totaling almost one million square feet of offices and 940,000 square feet of garage space—into an environmentally friendly campus, and it chose to do it under the LEED-EB program.

In that five-year period, Adobe reduced electricity use by 35 percent, natural gas use by 41 percent, building water use by 22 percent, and irrigation water use by 75 percent. Adobe now recycles 85 percent of its solid waste. Through saving energy and buying green power, Adobe reduced pollutant emissions by 26 percent. By the company's own reckoning, the projects they've undertaken have resulted in an overall 114 percent return on investment. Retrofit and upgrade projects include reduced lighting energy use, the addition of motion sensors to turn off lights and HVAC equipment when spaces are unoccupied, installation of variable-speed drives on pumps and fans to match supply to demand, real-time metering to reduce electricity bills by cutting power use during peak periods, upgraded building automation and control systems, and recommissioning of major energy-using systems.⁷



Figure 14.1. Adobe Systems demonstrated its commitment to environmental stewardship with three LEED-EB Platinum-certified buildings on their San Jose campus. Photo by William A. Porter, courtesy of A&R Edelman.

An early LEED-EB Platinum project was the California Environmental Protection Agency headquarters building in Sacramento, shown in Figure 14.2. Owned and managed by Thomas Properties Group LLC, this 25-story, 950,000-square-foot building completed its Platinum certification in 2003 with a series of projects that reduced energy use by 34 percent (compared with the then-prevailing 1998 state energy code), diverted 200 tons of waste from landfills per year, and increased the building's asset value by about \$12 million. Total investment was about \$500,000, with annual energy and water savings of \$610,000. The building received an Energy Star rating of 96, putting it in the top 4 percent of all energy-efficient operations.⁸

Another state-owned building in Sacramento, the six-story, 336,000-square-foot Department of Education building, received LEED-EB Platinum certification in 2006. Completed in 2003, this building received LEED-NC Gold certification as a newly constructed project, and was the first major project in the world to receive both high-level designations. It also has an Energy Star rating of 95, with energy use about 40 percent less than re-



Figure 14.2. The LEED-EB Platinum-certified California Environmental Protection Agency building uses 34 percent less energy than a comparable building. John Swain Photography, courtesy of Thomas Properties Group, Inc.

quired by state code. The building features more than 100 different sustainable solutions to improve energy efficiency, indoor air quality, water conservation, and resource conservation.⁹

The National Geographic Society operates a four-building headquarters complex in Washington, D.C., whose buildings range from 20 to 100 years old. With a \$6 million retrofit, the organization added \$24 million to property value, receiving LEED-EB Silver certification in 2003.¹⁰

The JohnsonDiversey Corporation headquarters in Sturtevant, Wisconsin, was certified LEED-EB Gold in 2004. The three-story, 277,000-square-foot building contains 70 percent offices and 30 percent labs. Because it was built in 1997 with sustainability in mind, it was fairly easy to fine-tune existing systems to receive the LEED-EB designation.¹¹ With a \$74,000 LEED-EB project cost, JohnsonDiversey saved about \$90,000 in annual energy costs, reduced water use by more than two million gallons, and documented employee recycling rates above 50 percent.

One recent institutional commitment to LEED-EB deserves note. In December 2006, the University of California, Santa Barbara campus agreed to use LEED-EB to assess 25 buildings over the next five years. Jon Cook, acting director of physical facilities, said, “We believe that performance under the LEED system is a key indication that we are achieving our goals” of taking care of the environment and of the health of employees and building occupants.¹²

Barriers and Incentives to Greener Building Operations

These case studies demonstrate substantial savings and other benefits from a comprehensive evaluation and retrofit program at large facilities. So what’s holding everyone else back? The most significant factor, of course, is money. It’s hard to get money for operations upgrades in most companies, compared with investing in marketing to increase revenues, developing new products, and implementing cost-reduction projects. In public agencies, the split between capital and operating budgets means that facility managers and building operators need to argue the case every year for enough money just to operate their buildings, making it even more difficult to get money for longer-term savings programs.

Private building ownership is often similarly fractured, with a split between ownership and operations. Specialized property management firms typically get a percentage of rents to operate and maintain buildings. Any investment funds need to be secured from the owners. According to BOMA International, 41 percent of all building owners operate fewer than six buildings, making discretionary investment money more difficult to obtain. Only 17 percent of all properties are owned by firms with more than 50 holdings; these are the firms most likely to have ready access to capital and to see the broader benefits of green upgrades and operations.¹³

Table 14.1 lists the benefits of green upgrades and some of the major barriers. Basically, without a comprehensive corporate or institutional commitment to sustainability, it’s difficult for the facility manager or sustainability director, someone lower on the corporate “food chain,” to get the funds required for a good LEED-EB certification effort, which can cost \$50,000 to \$100,000, not counting the costs of upgrades necessary to meet the stan-

Table 14.1a**Benefits of Greening Existing Operations**

1. Saving energy and water costs can often return the initial investment in less than one year, as well as creating eligibility for federal and state tax incentives and utility rebate payments.
 2. Reducing exposure to toxic chemicals used in cleaning can improve health and productivity.
 3. Lighting and ventilation upgrades and retrofits can improve health and productivity.
 4. Positive public relations can help attract new tenants and keep existing ones.
 5. Improved morale among occupants and better working conditions may lead to greater retention of key employees.
 6. Greening is a positive and productive response to corporate sustainability initiatives.
-

Table 14.1b**Barriers to Greening Existing Operations**

1. There may be resistance to the cost of doing something that's discretionary. In private business, it's hard to get money for investments that don't go toward new products or sales; in public agencies and institutions, there is typically a need for a legislative appropriation.
 2. Greening may require coordinating across a number of departments and gathering data that no one had thought to assemble before.
 3. Management may question the value of incurring certification costs just to "prove" what the organization is already doing.
 4. Facilities and maintenance staff may not have the time or knowledge to implement a new program.
-

dard. In commercial real estate, the divided responsibilities between owners and tenants make it difficult to have the dialogue necessary for a LEED-EB upgrade. For the California EPA building, a long-term lease with a single tenant made it easier for the property owner to realize the financial returns from certification.