



Public sector goes green

States, cities and the federal government are positioned to be key players in the green building movement

BY SANDY VASENDA

In recent years, many states have delayed new capital construction projects as they've struggled just to operate and maintain the buildings they already own. But now that there's light at the end of the deficit tunnel, new construction projects may be on the horizon.

The public sector is taking the lead in a growing trend in construction and design: the "green building" movement. *Building Design & Construction* magazine reports

that "an estimated \$15 billion worth of green buildings are currently in design or under construction in the U.S., representing 12 to 15 percent of total public construction and about 2 percent of private-sector construction, according to Capital E's Gregory Kats."

States, cities and the federal government are positioned to be key players in this momentum-gaining movement – not only through public projects, but also through mandates and incentives for the private sector.

Sustainable design

Initially driven by the desire to reduce dependence on fossil fuels, the movement toward "green" building – also known as sustainable design – refers not to a building's color, but to its impact on the environment and human health.

According to the Massachusetts Executive Office of Environmental Affairs, buildings and their landscapes "are a major source of pollution in the United States, accounting for a third of all energy consumed, more than a third of the carbon dioxide emissions and almost half the sulfur dioxide emissions produced in the country."

Lighting is the primary source of carbon dioxide from commercial buildings (which include government buildings, schools and universities), according to a paper by Jonathan Kooney delivered at a 1996 Climate Change Analysis Workshop. Electric cooling, miscellaneous electricity, natural gas heating, miscellaneous natural gas, electric water heating and ventilation also emit carbon dioxide, although not as much.

Sustainable design initiatives strive to reduce these and other environmental impacts through a variety of methods. In September, the Office of the Federal Environmental Executive released a report titled *The Federal Commitment to Green Building*, in which it defined green building as "the practice of 1) increasing the efficiency with which buildings and their sites use energy, water, and materials, and 2) reducing building impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and removal – the complete building life cycle."

Green buildings are usually built using the concept of "whole building design," in which all of a building's components – from site and material selection to lighting

California's Environmental Protection Agency headquarters is a model of sustainable design.

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to landscaping – are integrated into a high-performing whole. The ideal result is an economical, resource efficient building that provides a pleasant atmosphere for people with minimal impact on the environment.

The headquarters for New York's Department of Environmental Conservation, for example, is designed for optimal energy performance, and is expected to cost approximately 40 percent less per year to operate than a typical building its size. More than half the materials used (in dollar value) were recycled, and 20 percent of the materials were manufactured within 500 miles of the site, which cut down on emissions released while transporting them.

The building uses low-emitting materials (such as adhesives, sealants, paints, composite wood products and carpets) and indoor chemical and pollutant source control measures to improve air quality. Diffuse sunlight reaches 90 percent of the interior space. There is a special ground-floor area for sorting, storing and collecting recyclable materials. Only native plants that can survive without irrigation are used for landscaping, and the building is designed to accommodate and be accessible by alternative forms of transportation, including bus, bicycles and electric cars.

The building that houses California's Environmental Protection Agency is also a model of green building principles. It not only maximizes natural light and uses special glass to conserve energy, it employs super high efficiency/low mercury lighting tubes and perimeter light sensors that dim the lights in bright sunlight. The building uses solar panels, low-flow toilets, and special paints and carpets that minimize or eliminate harmful emissions. Among other features, it has 25 electric vehicle charging stations and the capacity to add a natural gas powered fuel cell in the future.

A range of state measures

Although New York and California's environmental agencies may be ahead of the curve, they are not alone. As of October 2003, 118 state and local governments were members of the U.S. Green Building Council, a nonprofit coalition

founded in 1993 that represents more than 3,000 organizations working to promote green buildings.

State and local governments have instituted a variety of measures related to green building, including incentives to promote the practice among private developers, regulations encouraging or requiring adherence to the USGBC's LEED (Leadership in Energy and Environmental Design) Green Building Rating System, regulations related to sustainable design, and others.

According to *Building Design & Construction's* recent "White Paper on Sustainability: A Report on the Green Building Movement," California, New York, Maryland and Oregon all offer incentives for private developers.

multifamily residential buildings that meet green standards. And as of 2001, sustainable buildings qualify for Oregon's Business Energy Tax Credit.

"The consensus thus far is that incentive programs are the preferred means to promote green design in the private sector," the magazine reported. "Yet, with more and more mandates being handed down on the public side, further demands on the private sector may not be far behind."

Several states have required their facilities to adhere to the U.S. Green Building Council's LEED Green Building Rating System – mostly through executive orders. New York's Executive Order 111, for example (June 2001), requires state agencies to follow green building guidelines set forth in



The Adam Joseph Lewis Center for Environmental Studies at Oberlin College is a "living machine" that combines elements of conventional wastewater technology with the purification processes of natural wetland ecosystems to treat and then recycle the building's water.

Oregon's Small Scale Energy Loan Program gives developers low-interest loans to reduce energy use in new or existing buildings. California's Savings by Design program, administered by four utilities under the auspices of the state Public Utilities Commission, gives building owners incentives of up to \$150,000 for investing in energy efficient designs.

New York and Maryland offer tax credits for owners and tenants of commercial or

the Green Building Tax Credit and the LEED rating system.

The LEED system rates buildings based on six categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design process. California, New Jersey, Pennsylvania and Maryland all have executive orders or programs based on or modeled after LEED.

As of October, 13 percent of the 948

projects registered with LEED were owned by state governments, 25 percent by local governments and 10 percent by the federal government, according to *Building Design & Construction*.

In addition to incentives and LEED-based regulations, states have implemented a variety of measures to encourage the use of sustainable design. Massachusetts' Sustainable Design Initiative, for example, is part of a broader State Sustainability Program. The state's Division of Capital Asset Management has actively promoted sustainable design in recent years and has developed "Sustainable Design Guidelines" for state agencies. According to the initiative's Web site, through partnerships with private energy companies, the state

change "the way buildings are procured, designed, built and operated."

Colorado's Governor's Office of Energy Management and Conservation helps support "Built Green Colorado," a voluntary industry program that has offered technical and marketing assistance for homebuilders since 1995.

California's Sustainable Building Task Force, designed to implement an executive order issued in 2000 by then-Gov. Gray Davis that created a sustainable building goal, brings together representatives from more than 40 state agencies. The task force's October 2003 report, *Building Better Buildings: An Update on Sustainable Building Initiatives*, documents the state's progress toward its goal.

Costs and benefits

As the green building movement has gained momentum in recent years, some people who may have jumped on the bandwagon have hesitated due to one factor: cost. Although it is generally accepted that green buildings can save money by using resources more efficiently, debate has continued over whether or not initial building costs outweigh the long-term savings and benefits.

As the cost of going green has come down in recent years, however, and as more research has been done on the issue, it seems clear that sustainable design has the potential not only to benefit the environment and create a healthful work environment, but also to save significant sums of money in the long-run. In fact, although green buildings can be slightly more expensive to build, they are not necessarily any more expensive than conventional buildings.

In October, California's Sustainable Building Task Force released *The Costs and Financial Benefits of Green Buildings*, the most comprehensive study of its kind to date. The report, prepared by Greg Kats of Capital E, concluded that "a minimal upfront investment of about 2 percent of construction costs typically yields life cycle savings of over 10 times the initial investment. For example, an initial upfront investment of up to \$100,000 to incorporate green building features into a \$5 million project would result in savings of at least \$1 million over the life of the building, assumed conservatively to be 20 years."

These savings are achieved through lower costs, such as energy, water, waste

disposal, environmental and emissions, operations and maintenance costs. In addition, green buildings can save money by improving employee health and productivity, although more research is needed in this area.

"The bottom-line benefits of energy and water savings, waste reduction, and environmental improvement are already becoming well documented and accepted by the real estate marketplace," according to *Building Construction & Design's* white paper. "Proving the business case for the human and social benefits of green building may be more challenging, but could prove to be vastly more rewarding in the long run."

Only time will tell, but as the economy starts to improve, the public sector may be in the forefront of promoting the benefits of sustainable design.

— Sandy Vasenda is an environmental policy analyst at The Council of State Governments.



has saved \$114 million through sustainable design and construction projects and partnerships.

In 2002, the division sponsored a Sustainable Design Roundtable to initiate discussion between the public and private sectors on sustainable design and construction practices. Similarly, the Florida Design Initiative, created in 1992 by executive order, brings together private sector design professionals and state agency heads to

