

[Back](#)

LEED Certification and 'Green' Buildings

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With energy costs soaring and municipal budgets being squeezed, a program that combines energy efficiency and environmental sustainability would seem to be just what the doctor ordered. Yet the LEED building certification program, administered by the U.S. Green Building Council, has not yet caught on with Maine municipalities – though there are signs that may be changing.

LEED stands for "Leadership in Energy and Environmental Design," and was devised by the Green Building Council in 2000 as a way of encouraging more sustainable approaches to building design after two decades of sprawl and increased building sizes – and relatively low petroleum costs — had markedly increased national demand for energy.

The certification program emphasizes energy efficiency, but does so by going beyond heating and cooling systems and insulation levels to include siting, water efficiency, materials and resources, and innovative design. Locating a building in a central location, close to transit, earns LEED points, as does recycling demolition debris when existing structures are renovated or removed.

The program got a major boost in Maine early in the current administration with an executive order signed by Gov. John Baldacci on Nov. 24, 2003, which requires the use of LEED standards in new or substantially renovated state buildings "provided that this can be accomplished on a cost-effective basis."

The very first LEED-certified building in Maine was the National Weather Service's Caribou forecast office, completed in 2002, but other public buildings soon followed. Complying with the state executive order, the University of Southern Maine achieved LEED certification in 2005 for the renovated and expanded John Mitchell Center on the Gorham campus, where the construction contractor, Wright-Ryan, managed to recycle 91 percent, or 637 tons, of waste material. Much of the debris was used as base material for an extension of a runway at the Portland International Jetport.

Since then, USM has undertaken two more LEED projects, while the University of Maine at Farmington is also building two, including the new College of Education, Health and Rehabilitation. The program has been even more popular with private colleges, with Bates, Bowdoin, Colby, Unity and College of the Atlantic all building LEED-certified structures; Colby has vowed to construct all new buildings to LEED standards.

The executive order also applies to state-supported school construction projects. The first such new building, the East End Elementary School in Portland, was completed in 2006 and has been LEED-certified.

Off to a Slower Start

Municipalities are exempt from the executive order, and it has taken time for informal discussions at town hall to translate into actual LEED projects. There are now several, however. The new Falmouth Police Station, completed in April, is apparently the first LEED-certified municipal building in Maine, coming in on time and under budget.

Orono will likely start construction on a new library this fall, and Bangor's renovation and expansion of the passenger terminal at Bangor International Airport is also getting under way. Both will be LEED-certified. Bangor, in fact, has gone further, with the city council adopting a policy requiring LEED standards in all city-owned or funded buildings. This is a more comprehensive stance than the state executive order, since it will apply to subsidized housing

projects, for instance.

Energy-efficient buildings are in demand for commercial use, institutions, and government, but the reasons are a little different in each case, according to Jim Wilson, a senior project manager for Woodard & Curran in its Bangor office.

"With commercial projects, you're looking for marketability, and getting an edge with potential clients," Wilson said. LEED-certified buildings can command higher rents, and may be favored by firms seeking to enhance their image.

Hannaford, for instance, made a splash when it announced that it would build the first LEED platinum-certified supermarket on the site in Augusta once occupied by Cony High School. (There are four levels of certification: basic, silver, gold and platinum). Construction on the formerly city-owned site followed controversy and court filings that delayed the project for more than two years.

The 49,000-square-foot supermarket, the fourth of its size in the capital city, will include geothermal heating and cooling, solar panels, high efficiency refrigeration, and even a vegetated roof.

With non-profit institutions, such as private colleges, image may matter for other reasons. Both College of the Atlantic and Unity College have strong environmental programs, so undertaking LEED construction was not a difficult decision for them.

With municipalities, it's different. Town and city officials usually focus on the basics, which recently have included rapidly rising construction costs. Taxpayers may be skeptical about project details that cost extra money, and many municipal officials are used to doling out tax dollars sparingly.

Penny-wise, Pound-foolish?

Ed Barrett, Bangor city manager, takes exception to that approach, and he has an example in mind when he does.

"When I was being interviewed by the city 20 years ago, one of the first city buildings I saw was a fire substation that had just been built. It was a metal building, and it cost more to operate than the 100-year-old station they'd torn down," he said.

Now, a replacement for the metal substation could be one of Bangor's first LEED projects, along with the airport expansion, though bids came in well above the \$2 million estimate, and the project may be delayed.

Another approach can be to use LEED standards as a guideline, but not actually going through the certification process, which, everyone agrees, costs money and can involve a lot of meetings and paperwork.

John Ryan, president of Wright-Ryan in Portland, said that's what some of his clients have done. The new Topsham town complex incorporated LEED elements, but did not involve certification, "and that worked well for them," he said.

Devon Carter, a project manager with Woodard & Curran, said third party certification can bring up a lot of details that might otherwise be missed. "It goes beyond the design to how the building actually works, whether things are functioning the way they're supposed to. Otherwise, you might never know where you're having problems."

Ed Barrett agrees. When staff first moved into its new downtown police station, the first electrical bill was a shock. "It turned out that the heating and cooling systems weren't working together, that they were actually fighting each other," he said. "We got it fixed, but it would have been a lot

better if we'd known from the beginning."

The Falmouth Police Station project had already been approved by voters in November 2006 when the town council started discussing whether LEED certification made sense, according to Town Manager Nathan Poore. The building committee, he said, decided it was "very possible," and the finished building has achieved silver level certification.

The LEED item fits within the \$2.5 million budget, which provided an 8,000-square-foot building, and, while Falmouth didn't track LEED-related costs separately, Poore said the certification process cost about \$40,000, which included a consultant hired for the process.

There no question that "we saved a lot of money" for operations by using LEED design elements, he said, and it was also clear that townspeople supported the idea. "It was an important enough project that we wanted to lead by example," Poore said.

While LEED influenced a huge number of elements – right down to what cleaning fluids to use for maintenance – one suggestion didn't end up fitting. "We investigated geothermal heating, but for this site, with its soils and ledge, it didn't work," he said.

One rule of thumb among designers is that renovations or construction worth at least \$500,000 is where LEED makes the most sense. Additional costs can range from 1% to 6% of the budget, depending on the level of certification, but 2% is usually adequate to see the project through.

"There are people who say you can do it with no additional costs, but we haven't seen that," said John Ryan. "The paybacks, though, can be pretty quick, within two to three years."

Location, Location

In Orono, the new library project was all about "location, location, location," said Librarian Katherine Marks-Malloy. The current library at the high school site is at the top of a steep hill above downtown, which makes it difficult for many library users to walk there and, once inside, the layout is antiquated and broken up.

"We don't have any programming space, for instance," Marks-Malloy said. "This isn't a visitor-friendly building."

The new library site is right downtown, between two elderly housing complexes where many library patrons live. Existing buildings will be removed and the material recycled and, working with WBRC Architects, the new building will be sited to afford full daylight is both the children's and adult's sections.

In addition to people being able to walk to the library, the design incorporates other key energy items, such as water conservation. "As a public building, we get a lot of use, so we have to pay attention to those things," she said.

The library project, budgeted at \$2.2 million will be financed mostly with private contributions, where LEED certification was also popular with donors. The town is likely to contribute \$600,000, or perhaps a bit more, when the issue is decided in September, Marks-Malloy said.

Portland, Maine's largest city has not commissioned a LEED building itself – the East End school was constructed under state guidelines – but the city is now actively considering moving ahead, said Barry Sheff, vice president with Woodard & Curran in Portland.

The first LEED-related project may be an office park on Rand Road, where the city expects to sell lots starting next year. Companies building them may be required to be certified, or may want to pursue certification on their own, he said.

Sheff said that there's another important advancement coming from the LEED program, whether

or not projects are certified. "Materials from sustainable and recycled materials are now a success in the marketplace, in large part thanks to LEED," he said. Carpets that use recycled material and contain little or no formaldehyde, recycled plastic, and green-certified wood are now available at no or little additional cost, he said. By creating consumer demand, LEED has encouraged manufacturers to take efficiency into account, he said.

Jim Wilson is working on a project for Presque Isle, a new \$8 million community center, that may become LEED-certified. But the program has already had an impact, particularly on the site.

"The city was looking at six sites, many of the greenfield sites that in this case are old potato fields," he said. It eventually picked a brownfield site downtown, however. It will take some cleanup from an old underground petroleum tank, but it's central location will help boost the downtown, he said.

Not for Everyone

For those still skeptical about LEED, John Ryan agrees that it's not for everyone. The first question he often hears from clients is "How much is it going to cost," but it's a question without a simple answer.

"I avoid generalities because each project is unique," Ryan said. "Each owner has his or her own hot button issues, and they may supercede other concerns about energy or other design features."

While some municipalities, like Topsham, are satisfied to use LEED elements without seeking certification, the process can be helpful for a number of elements, Ryan said. "A lot of the time involved is spent seeing whether the systems are working as designed," he said. "In the end, you know whether your building is performing properly, and that's something that may be hard to find out otherwise."

One LEED project sometimes leads to another. "As you get more of them under your belt, the certification costs go down and you're better at evaluating the various alternatives," he said.

In his experience, the cheapest parts of LEED involve building siting and orientation, access to transit, and recycling of materials from old structures. The most expensive are more sophisticated mechanical and control systems, so-called "green roofs," and geothermal installations. "In those cases, you're often talking about significant additional expense," Ryan said.

The Whole Nine Yards

Devon Carter of Woodard & Curran suggests that municipal building owners take a comprehensive approach to issues of design and construction.

"It's not just about the cost of the building, or the cost of operating it," he said. Better design can have a big impact on workplace efficiency, according to Carter. Attractive office space, within a well-sited building that has plenty of daylight, good air quality, comfortable furnishings, and non-glare lighting, can have a measurable effect on worker productivity. "Good working conditions can be the difference between someone who stays, and someone who decides to look for a new job," he said.

Carter sees this as "making the proper investment in people," who are not always considered when project managers are making decisions about what features to include, and which to cut when plans are being modified.

The best thing about the LEED process, he said, is that it "gets everyone involved in the process from the beginning." The architect sits down with the engineers designing heating and cooling and electrical systems, to make sure everything fits together. "These are often separate phases

of the design process," he said. "Fitting things into a pre-determined design is a lot different from getting all the input up front," he said.

In Bangor, Ed Barrett said that he believes more and more municipalities will come to the conclusion that LEED, and a lot more, will be required in the years just ahead.

"When your fuel budget goes up by 85 percent in a single year, you have to take notice," he said. "Last year we locked in heating oil for \$1.85 a gallon, and this year we'll be lucky if we can get it at \$4."

Bangor is now considering implementing the results of a city-wide energy audit, with an \$8 million package of improvements on the table. If the council approves, funding is likely to come from a number of non-tax sources, including Efficiency Maine grants from the state, the airport reserve fund, and lease-purchase agreements for some new buildings.

"We decided to consider anything that would pay for itself in 10 years when we started," he said. "By the time we're done, we'll probably discover it can be paid off in five years."

Bangor has already made a statement through its comprehensive LEED building policy, and in Falmouth, Nathan Poore expects the town to do likewise: "Everything I've heard from the council and from the public makes believe that we'll be doing LEED buildings from now on."