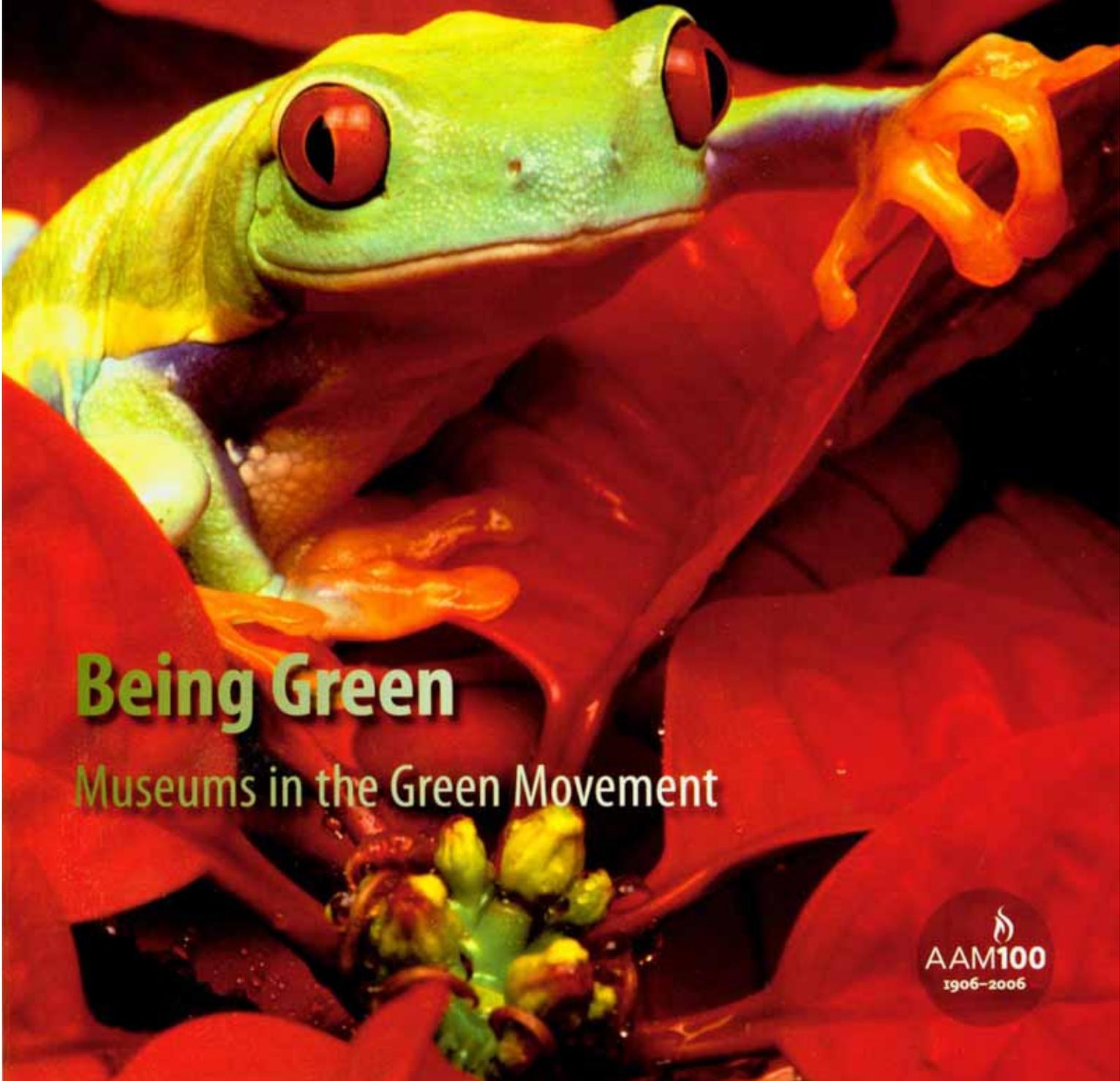


AMERICAN ASSOCIATION OF MUSEUMS

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Being Green

Museums in the Green Movement


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by
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IT'S EASY BEING GREEN MUSEUMS and the GREEN MOVEMENT



Going Green is too expensive. The payback takes too long. Green is only for new buildings or science museums. Green is a great idea, but it would look extravagant and contrived in our museum.

If you are scared off by any of these arguments about sustainable building and practices, take another look at what sustainability means, what the green-building industry is achieving across the country and how museums are becoming part of the solution to

global climate change while advancing their missions.

"Most people, when they think of this topic, focus on buildings," says Patrick Kociolek, executive director and curator of the California Academy of Sciences (CAS) and an AAM Board member. "Sustainability doesn't have to be about building a building. Sustainability should run all through operations. Should we turn off the faucet? Should we save energy?" Those energy savings speak to museums' bottom line, he says. "I would tell other institutions, 'Don't wait to

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get involved.” Kociolek, his board and staff are \$310 million into their \$392 million capital campaign and well on their way in a comprehensive rebuilding project that will finish in late 2008.

We spoke with museum leaders across the country to learn why and how they are going green. For many, the cost savings were an early motivator. But for most the financial benefits were matched or superseded by the opportunities for education and mission fulfillment through promoting sustainability, reacting to global climate change and leading by example.

Though we tend to use “green” and “sustainable” interchangeably in this article, there is a difference. Green refers to products and behaviors that are environmentally benign, while sustainable means practices that rely on renewable/reusable materials and processes that are green or environmentally benign.

The green movement, once considered fringe, now has some very mainstream advocates. Journalist and best-selling author Thomas L. Friedman told National Public Radio’s *Fresh Air* that “green technology is going to be the industry of the 21st century.” This includes green design, green building and green manufacturing. Why not green education? Why shouldn’t museums—as places of learning, exploration and demonstration, and as models of community-minded behavior—be ahead of the curve? If our job is to teach and inspire, then we are perfectly situated to model green behavior both in pursuit of our missions and support of communities. And not just for the science, environmental and children’s museums. As Betty Arenth, senior vice president at the Senator John Heinz History Center, Pittsburgh, says: “We’re a history organization. Think about it: It’s preservation of the environment for the future.”

Whether you choose to grow a green ethic in your institution, integrate sustainable practices in your design work or improve recycling in the staff lounge, you will have opened the door to educating yourself and your colleagues about the possibilities and value of sustainable performance. You will see beyond your museum’s role as collector, teacher and town square to advancing your museum’s place in whole-community thinking.

Many environmental scientists agree that the increasing severity of hurricanes—Katrina, Andrew, Rita et al.—is directly connected to global warming. The United Nations Earth Summit in 1992, the 1997 Kyoto Protocol and other international gatherings and compacts signal a clear recognition that we are all responsible for reversing the damage of non-sustainable development. The negative environmental results of non-sustainable energy use are likely connected to global climate change. In the United States alone, building construction and operation accounts for one third of the greenhouse gas emissions and more than half of the electricity consumed annually, according to the U.S. Green Building Council’s website, www.usgbc.org.¹ Museums are notoriously heavy energy consumers, using more than twice as much as conventional office buildings, which typically cool, heat and illuminate Monday-Friday, 9 a.m. to 5 p.m. Museums often have extended hours, and collecting institutions need to maintain climate control 24/7. (Aquariums, for example, are off the map in terms of energy use.) With this degree of impact, sustainable design, construction and operations in museums can have positive global consequences.

With a growing awareness of environmental impact issues, a green building movement is taking hold worldwide. The World Green Building Council now counts seven national member coun-



Opposite page: Aerial view of the new California Academy of Sciences.

Left and right: ECHO Lake Aquarium was the first building in Vermont to go green.

cils and eight more under development, including one in China, where it is predicted that half of the world's construction will take place over the next 10 years. In the U.S., the federal government's General Services Administration requires all new and substantial renovations to federal buildings to conform to sustainable design guidelines, and a growing list of states and cities have sustainable policies in place. Colleges and universities, school systems, corporations and other property owners have also developed guidelines on sustainability.

The U.S. Green Building Council's LEED Program (Leadership in Energy & Environmental Design) developed methods to rate green building and construction practices. LEED uses a rating system with Platinum at the top, followed by Gold, Silver, Bronze and Certified, the minimum level. The rating system covers six areas: sustainable sites (from access to public transportation and light pollution control to stormwater management); water efficiency (use reduction inside and outside); energy and atmosphere (energy performance, renewable energies such as wind and solar); materials and resources (recycling of construction waste, materials with recycled and renewable content); indoor environmental quality (CO₂ monitoring, low emitting materials, thermal comfort and daylighting); innovation and design (including providing for an educational component). Institutions undergoing a build or renewal may choose a specific LEED goal before starting. Some hope for certified, others go for platinum, but they choose a performance level and then they design, build and behave in ways geared toward demonstrating that level of achievement when the building is done.

In 2004 the Brooklyn Children's Museum (BCM) began construction to double the size of the museum. During the initial planning process, the building owner, the City of New York, was "looking for ways to promote environmental quality, contain future energy costs and save taxpayers money by making a special effort to pursue high-performance buildings" says Paul Pearson,

vice president of programs at Brooklyn Children's Museum. After completion in late 2007, the new building's high performance features, which include a geothermal heating and cooling system, will save more than \$100,000 annually in energy costs. It was a collaborative decision to go green.

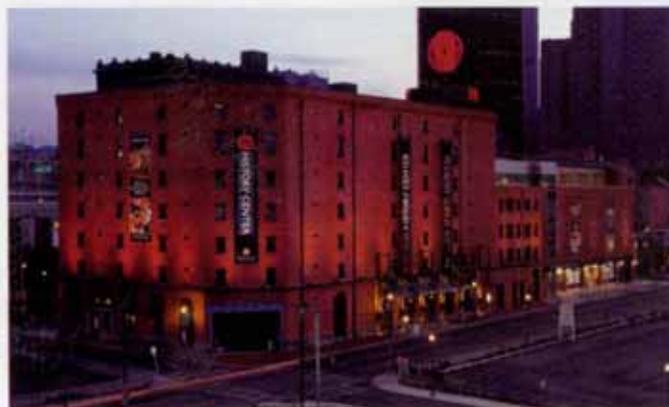
"City planners were interested in the [LEED] rating structure," said Pearson. "We saw it as fitting with our interests in being leaders in our field, a chance to [invest] where our ideals around environmental stewardship reside." The measuring and quantifying that are part of the LEED rating system offer helpful guides. However, many owners pursue LEED standards without undertaking the documentation that ends in certification. Often the decision to pursue certification is based on the public-relations value of the LEED brand and the value of evaluation and accountability already associated with museum culture. Reporting on project outcomes is a great motivator to do it right.

In the last decade 20 or more organizations under the museum umbrella have added green buildings or were born green. Many more follow green practices in their day-to-day operations in existing buildings. Though we can cover only a small portion here, there are many, many innovative projects that offer significant lessons and can help you green your museum.

Reduced energy costs are an important, practical driver behind the majority of museums undergoing expansion using high-performance, energy-efficient systems. Consider your own museum. Do growing utility bills compete with program allocations or even staff positions? Have you scaled back major exhibits or other projects because of expected jumps in energy costs? You are not alone. Sustainable systems, services and materials can help reduce those ever-rising utility costs. And sustainability is becoming easier and easier to implement.

When the California Academy of Sciences considered the sustainability of its future café, six providers wanted the contract—all prepared to provide a guaranteed positive financial return and programmatic support that would create a seamless message of sustainability from exhibit areas to the eating area. The vendors all promised to demonstrate and interpret sustainable practices by explaining and labeling products and processes for the visitors. This can mean explaining food choices based on buying local and/or organic produce with no- to low-environmental impact from pesticides and transportation requirements. It can be eco-friendly oven-cleaning products and recycling and composting. Visitors will learn about all the practices at the museum and be able to implement them at home.

This level of vendor interest is evidence of "natural capitalism," a term popularized by Amory and L. Hunter Lovins and Paul Hawken in their 1999 book *Natural Capitalism: Creating the Next Industrial Revolution*. Without much legislation to prompt them, the world's individuals and organizations are finding ways to make their resources more productive in terms of money, time, materials and processes. Some businesses, institutions and people do it because they believe it's a moral issue, others because consumer



Thanks to grants, the Senator John Heinz Pittsburgh Regional History Center achieved LEED silver status.



Front view of the new California Academy of Sciences at night.

interest demands it and the cost of going green is decreasing. If they don't do it, Hawken and the Lovinses say, "There is now sufficient evidence of change to suggest that if your corporation or institution is not paying attention to this revolution, it will lose competitive advantage."

Since the flower-power era, the sustainable technology industry has been working to perfect green processes and resources. Consumer and material choices are far better today. "It was hard to pioneer green practice when materials were scarce and technology expensive; now it is getting easier because demand is increasing," says Julie Silverman, a director at ECHO at the Leahy Center for Lake Champlain in Burlington, Vt. ECHO is a lake aquarium and science center that in 2003, just five months after completion, became the first and only LEED-certified building in Vermont, and only the third certified building in New England. Since then the number of LEED-certified buildings has dramatically increased and green processes and product availability has improved.

"The cost to design and build green will come down as demand rises," says Martin Moeller, who was trained as an architect and now is senior vice president and curator at the National Building Museum in Washington, D.C. In 2003 the National Building Museum organized "Big & Green: Towards Sustainable Architecture in the 21st Century" (see review on page 31). "The Green House: New Directions in Sustainable Architecture and Design" will be up through June 3, 2007. "As Wal-Mart, Home Depot and other huge corporations are responding to the demand for green products, the cost is decreasing rapidly. Also as municipalities are changing their practices, the soft costs connected to permitting, legal fees and the like are also declining."

Choosing durable materials will reduce replacement costs and demand on the environment. Choosing sustainable materials, like fast-growing bamboo flooring and plywood, capitalizes on renewable resources, not those that take many years, or even centuries, to replace. Using carpet tiles instead of single-piece installation allows single-area replacement for stains instead of a complete re-installation, which reduces your cost and reduces the environmental demands of both manufacturing and disposal. According to ECHO's Silverman, "Making well-thought-out sustainable choices is not only good to the environment, it also makes good economic sense. With rising fuel costs, Katrina and other global issues, an efficient building can really have a significant impact on the survival of an institution when times are tough."

Those tough times may be coming sooner than we thought. Joseph C. Thompson, director of MASS MoCA in North Adams, Mass., says "MASS MoCA's energy costs—always staggering—have tripled in the last three years. And it's no exaggeration to say that the sustainability of this institution is linked to our success in finding radical cost savings in our utility bills." BCM's Pearson agrees. "Even now, since energy costs have risen so rapidly we see [that] our payback time will be shortened. Even since we began our project, the materials and technologies are becoming much more accessible, making green design that much more cost-effective." ECHO's energy-efficient construction—including computerized monitoring of temperature, light and airflow and an energy recovery wheel, which uses recycled energy to heat and cool—means big savings. "ECHO's annual utility bill averages \$50,000 for a 28,500-square-foot building—23 percent less than if built to city code," says Executive Director Phelan Fretz.

Integrated design methods can control your project costs and help you earn your return on the investment immediately or soon after. A study of green building performance shows the "green premium" (the cost of green choices) can be reduced or even eliminated through integrated design, a process that brings architects, engineers, lighting and landscape designers and other consultants together to work collaboratively with the owner. The team considers the project from every angle to produce a healthy and safe, resource-efficient, flexible and durable building and site, according to "Managing the Cost of Green Buildings," a 2002 research paper commissioned by the California State and Consumer Services Agency's Sustainable Building Task Force and the Alameda County Waste Management Authority.²

It's not just the consultants promoting integrated design. When asked why museums should be green, The Kresge Foundation's Sandy Ambrozy talks instead about giving incentives "for people to become informed." Rather than directing or commenting on the choices museums make, Kresge awards planning grants through its Green Building Initiative and capital grants through its core Capital Challenge Grant Program that support sustainable institutional development. It has had a fascinating result: "Integrated design means you will likely get a green building whether you meant to or not [because] integrated design is a comprehensive process that brings everyone to the table," says Ambrozy. "The outcome is a more efficient building, and that usually means green."

Kocielek at California Academy of Sciences says his board and staff's "huge" commitment to green developed after the near-destruction of their museum during a 1989 earthquake. Kocielek

The term "environmentally advantaged" may sound a bit politically correct, but it's a powerful concept that will give institutions an edge in a competitive market for public attention and support. By integrating strategies for operational cost savings with mission objectives (both financial sustainability and environmental sustainability), museums are finding a powerful voice in green, one that is being heard and supported.

Is saving on annual operating and facility costs connected to mission? Certainly. The Art Institute of Chicago (AIC) has long been concerned with operating energy costs and was taking steps to address them well before launching the current capital project, says Meredith Mack, vice president for finance and operations. "Energy efficiency audits done in 2005 showed specific projects we could implement to reduce our energy consumption," she said. "This interest in energy savings has intensified as energy costs have increased and will be an ongoing issue as they continue to rise."

AIC is part of the Green Museums Steering Committee, formed in June 2005 to maintain a collective effort among nine Chicago museums to promote green museum operations, exhibits and programs.³ The consortium is supported by the city's Office of the Environment and Mayor Richard Daley, who has vowed to make Chicago the "greenest city in the country." AIC's new Modern Wing is working toward LEED Silver, an initiative funded by the Illinois Clean Energy Foundation.

One of the world's oldest land conservation organizations, the Trustees of Reservations, operates six regional offices managing 55,000 acres of open space and historic landscapes. It also stewards four National Landmark properties and significant collections of historic structures, designed landscapes and art, artifacts and archives. President Andrew Kendall describes the decision to go green as a natural one: "What it really came down to was that, for a conservation organization launching a new building project never before undertaken in its 100-plus-year history, not to go green would be a huge missed opportunity to put its money where its mouth or values [are]." The Trustees' Doyle Conservation Center was recently rated LEED Gold. The center's building is 60 percent more energy-efficient than conventional buildings. In addition to quantifiable energy savings, the center carries a powerful message as "a showcase for responsible design and construction practices," says Kendall.



There are dozens of science and natural history museums, children's museums, zoos, aquariums, botanical gardens and conservation organizations going green. Many see this as clearly connected to their mission and are integrating green practices with community needs.

Director Carol Enseki clearly articulated this thinking when describing BCM's approach. "Children's museums have embraced it because of their heavy focus on education. For us, what clinched the decision to go green were the educational opportunities that added benefits above and beyond the operational cost savings around energy efficiency.

"Environmental education is a strong focus for us, and there has been tremendous excitement relative to our urban setting and science education and career preparedness," she adds. "The residents in our urban neighborhood have low representation in science fields. We see science education as a way to give kids and families access to information they can use to better their lives and advocate for change. For example, asthma rates have a direct correlation to indoor air quality; sustainable design offers solutions to this and other urban ills."

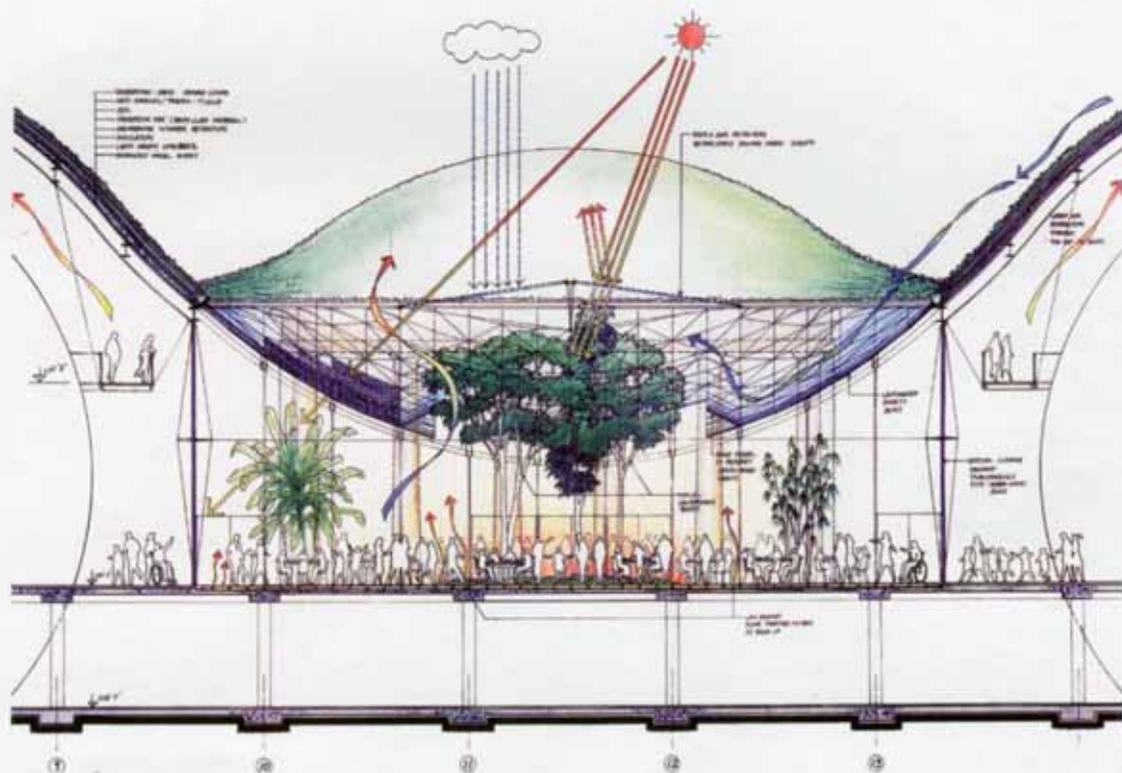
Green principles also provide institutions with easy education tools. ECHO offers visitors an energy and environmental quest called E2, with special stickers and labels on LEED certification elements in the building. Staff created a scavenger hunt that shows visitors ways to conserve energy in their homes.

The Children's Museum of Pittsburgh's "Be a Green Sleuth" booklet helps visitors uncover its sustainability secrets. "Green buildings do not look different from other buildings, unless you know where to look," the booklet explains. Each section leads explorers to parts of the old building, salvaged theater seats, connections to wind and solar power, low-flow toilets, recycled wood posts and wheat-board wall panels as examples of green building and practice.

The Brooklyn Children's Museum is planning "Energy Adventures," an exhibit that will demonstrate how the building harvests and uses solar power and how water is used to heat and cool the facility through geothermal pumps. The exhibit will also cover renewable resources, such as bamboo, as well as sustainable materials such as cork, rubber and linoleum, which are all used in the museum building.

You don't have to be a science or children's museum to choose cork or bamboo—or make any other sustainable choices. Anyone in the preservation business has a huge opportunity to use sustainable design to educate audiences about the responsibilities of caring for collections in perpetuity. One art museum representative was asked why the institution's media kit on its green expansion didn't mention the LEED goal or energy-efficiency or sustainable

An architectural rendering of the Brooklyn Children's Museum, whose green building will be completed next year.



Above: Air flow patterns in the new California Academy of Sciences.

Opposite page: Daylighting in action in the main entry lobby and exhibition space of the Doyle Conservation Center at The Trustees of Reservations, Leominster, Mass.

design. The response was, “[I]t isn’t our mission; we are not a science or natural history museum.”

In fact, many recent and planned art museum expansions incorporate high-performance energy-efficient mechanical, ventilation and lighting systems yet their press materials don’t mention the operational cost savings and environmental advantages, and the average person is hard-pressed to know or find out about them. (The new DeYoung Museum, the High Museum expansion and the current construction at the Museum of Fine Arts, Boston are just a few high-profile examples.) In part this results from the mainstreaming of sustainable design among architects, many of whom see it as simply good design. Also, perhaps art museums don’t see it “as their mission.” On the contrary, however, art museums would benefit from informing visitors about the dollar and environmental cost of collections care and sharing how they are responsibly managing that cost for a better bottom line and for a better environment for objects and people. This would build on the popular trend towards visible storage and sharing back-of-the-house activities.

Art museums know well the precarious balance of weather, older buildings and their mechanical systems. Facilities managers understand the daily dance of tweaking controls for appropriate environmental conditions. AIC’s expansion project includes an overhaul of the mechanical systems in the existing exhibition and storage areas to make them more energy-efficient and compatible with new construction. Executive Director of Conservation Frank Zuccari and engineers tested best conditions as they designed and phased upgrades to the systems, zone by zone. He and the design team also reduced electricity use and controlled the cumulative exposure of objects to light through a new sunshade system that

diffuses and redirects sunlight and works in conjunction with the artificial lighting system. Although the energy savings from an integrated approach to lighting will be significant, Zuccari doesn’t necessarily see it as green; he is focused on good conservation practice: chiefly controlling light, humidity and air pollution.

If we telescope the issues from the micro-environments of exhibition and storage facilities to the macro-environment of the planet as a whole, we can see how poor environmental practices have put our shared cultural heritage at risk. Think of the collections and structures lost or damaged in Hurricane Katrina last year. In the spring 2006 issue of *Museum Practice* magazine, David Martin writes, “There is little point in preserving collections for posterity if survival of future generations is under threat or the cultural heritage is at risk from environmental catastrophes.” Check UNESCO’s endangered places list and you’ll see that threats from energy development, sprawl, flooding and pollution are proliferating. Athens’s Acropolis and hundreds of important sites in Rome, Venice, Mexico City and elsewhere are being degraded by pollution, climate change and non-sustainable development and poor land management practices.

It is an easy intellectual step—from the AIC’s focus on the importance of protecting the environment of its art collection to Fruitlands’ and ECHO’s commitment to protecting and learning from the landscape. The argument is the same for protecting nearby historic structures and faraway world monuments. Global climate change affects them all.

Sustainability is often described as “whole-systems thinking,” approaching environmental issues in an integrated fashion. “We humans are part of the place we live—not separate from it—and

our decisions and choices affect the health and welfare of that place," says ECHO's Silverman.

Sustainable practices have a positive impact on the environment worldwide. They create more pleasant and attractive places to work and learn, they support preservation goals and, connected to mission advancement, they can be leveraged for support and recognition.

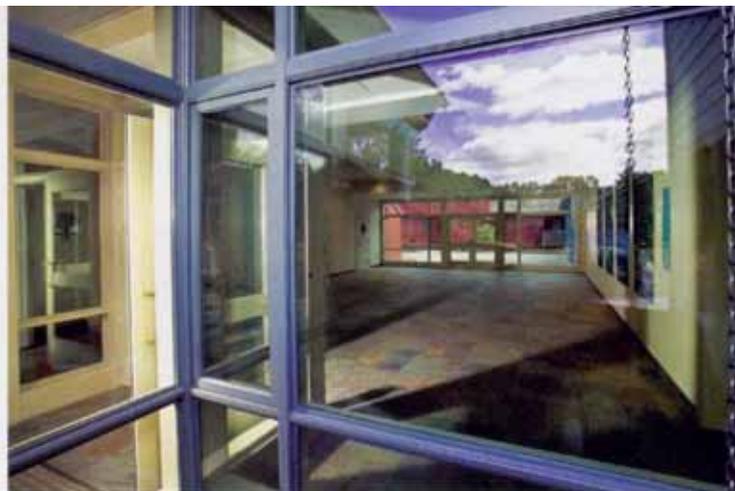
BCM's Enseki sees a world of opportunity in green. "As an educational institution that is going green, we have a chance to bring knowledge to the public," she says. "I can see future AAM accreditation criteria dealing with sustainability. A good aspect of planning is how to improve energy efficiency, which of course frees dollars to go towards programs and services. I would encourage museums that are going green or have already done it to get the word out."

As institutions standing at the intersection of research, education, teaching and discovery, museums are best positioned to share sustainability with the broadest audience in the most meaningful ways. In their role as places of authority and keepers of culture, museums have unequaled power and responsibility to model and to teach the methods of preserving ourselves, our planet and our cultural resources. "[Green building] is as basic to our mission as anything," says California Academy's Kociolek. "[Sustainable practice] is the right thing to do. Each institution will make its own decision about whether it's important to tell their audiences about sustainable practices, but we're going to shout it from the mountaintop. It's part of our mission, our ethic and values as a community."

Sustainable practice in museums serves our whole community—not just the audience inside attending lectures, visiting exhibits and participating in our town meetings, but those all around us. It is service to the whole community we inhabit, with all its members benefiting from museums even if they don't walk in our doors. It's the ultimate programmatic outreach: connecting with an expanded audience by reaching them literally where they live.

NOTES

1. Data about emissions levels and energy use is widely available. The U.S. Green Building Council's website is a very informative and instructive resource www.usgbc.org.
2. "Managing the Cost of Green Buildings," a research paper commissioned by the California State and Consumer Services Agency's Sustainable Agency's Sustainable Building Task Force and the Alameda County Waste Management Authority, Co-authors: Geof Syphers, P.E.; Arnold M. Sowell, Jr.; Ann Ludwig; Amanda Eichel. Undated (c. 2002).
3. The members of the Green Museums Steering Committee are the Adler Planetarium, Art Institute, Chicago History Museum, DuSable Museum of African American History, Field Museum of Natural History, Museum of Science and Industry, Museum of Contemporary Art, Mexican Fine Arts Museum and Shedd Aquarium. ■



GREEN IS EVERYWHERE

A small sampling of the many green museums built or in development across the country.

History

Mashantucket Pequot Museum, Mashantucket, Conn.
Harley-Davidson Museum, Milwaukee
Clinton Presidential Library, Little Rock, Ark.

Art

Blanton Museum of Art, Austin, Texas
Contemporary Art Museum of St. Louis
Crystal Bridges Museum of American Art,
Bentonville, Ark.
Grand Rapids Art Museum, Grand Rapids, Mich.
Provincetown Art Association and Museum,
Provincetown, Mass.
University of Michigan Art Museum, Ann Arbor

Zoos & Aquariums

National Aquarium, Baltimore
Saint Louis Zoo
The Lion House at the Bronx Zoo, Bronx, N.Y.
Tucson Zoological Society, Tucson, Ariz.

Science & Natural History Museums

Museum of Science, Boston
North Carolina State Museum of Natural History,
Raleigh
Santa Cruz Museum of Natural History, Santa Cruz, Calif.
Bell Museum of Natural History, University of Minnesota,
Minneapolis

Botanic Gardens

Brooklyn Botanic Garden, Brooklyn, N.Y.
Chicago Botanic Garden
Toronto Botanical Garden
Queens Botanical Garden, Queens, N.Y.

Children's Museums

Boston Children's Museum
Children's Museum of Naples, Fla.
Children's Museum, Pittsburgh
Children's Museum of Durango, Colo.