



Greening Your Firm: Building Sustainable Design Capabilities

WE HAVE ALMOST A HEAVEN and hell," says Pauline Souza, of Chong Partners Architecture in San Francisco, describing her firm's successes and frustrations at greening their work. Mid-sized and large design firms carry a lot of cachet, and clients tend to follow their advice more readily than they follow the suggestions of sole practitioners or small firms. But getting those bigger firms comfortable recommending green solutions—not just on token projects but as a matter of course—takes persistence, dedication, and some effective strategies. "When I had my own firm, it was an agile little sailboat. This is like trying to turn a battleship around," says John Boecker, of his experiences greening the 500-person L. Robert Kimball & Associates, based in Ebensburg, Pennsylvania.

As we at BuildingGreen prepared to launch our integrated online tool, BuildingGreen Suite, in 2003, we interviewed key players in a number of design firms to learn how they manage green building information. These conversations quickly expanded in scope to include questions about how firms build and disseminate expertise in sustainable design, and how they're enhancing their abilities to provide green buildings for their clients. The core of this research entailed in-depth conversations with green champions at 20 representative firms around the country. Our purpose with this article is to share our findings. While much of this article applies specifically to mid-sized and large design firms, small firms and even sole practitioners can certainly take away lessons as well.

What Is a Green Firm?

For the purposes of this research, we defined a "green firm" as one that creates environmentally responsible, healthy building designs for every client, whether or not the client came to the firm with a green building in mind. Such a firm is experienced and comfortable with an integrated design approach that brings a range of expertise to the table early in the design process. Its designers have the confidence to recommend green solutions and a sustainable design approach even when clients have not explicitly requested them. And, since green design in the U.S. today is largely defined by the LEED® Rating System, a green firm has the knowledge and ability to deliver LEED-certified projects, ideally at a Gold level (although the circumstances and the client's agenda may warrant a different level).

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AIA Announces 2004 Top Ten Green Projects *(see article on page 10)*



Photo: Enrico Dagostini

City Operations Building, White Rock, BC

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Quote of the month:

"As a result of the FSC/SFI dual assessment, Potlatch has made the decision to add FSC certification to our existing EMS program."

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From the Editors

No Polluter Left Behind: Energy and Environmental Policies of the Bush Administration

To say that I'm discouraged with energy and environmental policy trends is an understatement. As someone with a generally optimistic outlook, I keep assuming that the policies of the current Administration can't get any worse. But then I open the morning paper or turn on the radio and learn of the latest action—or inaction.

I've just been reviewing the environmental track record of the Bush Administration. The more digging I do, the more clearly I learn that these are policies of the polluters, by the polluters, and for the polluters. Consider the following.



Alex Wilson

On global warming and energy:

- After pledging to reduce carbon dioxide emissions during his campaign, Bush deferred to oil and coal company interests, pulling the U.S. out of the 1997 Kyoto Protocol and reneging on a campaign commitment to regulate CO₂ emissions from power plants.
- Environmental interests and renewable-energy proponents were almost entirely excluded from the Energy Task Force chaired by Vice President Cheney. While the Administration has refused to release records from the closed-door meetings, it is clear that the fossil fuel and nuclear power industries—and their lobbyists—crafted that plan, which promotes expanded production of fossil fuels (including opening the Arctic National Wildlife Refuge, ANWR) and nuclear power at the near exclusion of energy conservation and renewables.

- The Administration has opposed nearly all efforts to raise vehicle efficiency, despite the fact that readily achievable improvements in fuel economy of vehicles could save far more energy than ANWR could produce and do so far more quickly. ANWR is projected by the Energy Information Administration of the U.S. Department of Energy to provide up to 800,000 barrels of oil per day by 2020. The Union of Concerned Scientists, meanwhile, in the 2001 report *Drilling in Detroit*, projected that raising the corporate average fuel economy (CAFE) standards to 40 miles per gallon (17 km per liter) by 2010 and to 55 mpg (23.4 km/l) by 2020 would reduce oil consumption by 1.5 million barrels per day after only eight years and by 5 million barrels per day by 2020.

- Bush rolled back a Clinton-era air-conditioner efficiency rule increasing the minimum efficiency of central air conditioners from SEER 10 to SEER 13, so that the new minimum would be SEER 12. A federal appeals court overturned this measure, and the Administration—to its credit—opted not to appeal that decision, as we report in this issue (see page 7).

On air pollution:

- The euphemistically titled "Clear Skies Initiative" would significantly weaken air pollution provisions of the Clean Air Act—which currently mandates dramatic reductions in power plant emissions of nitrogen oxides (NO_x), sulfur dioxide (SO₂), and mercury by the end of this decade. Bush's plan would allow power plant emission violations to continue until at least 2015; it would allow more than twice the SO₂ emissions and one-and-a-half times the

NO_x emissions for nearly a decade longer than the current Clean Air Act.

- Under a plan released in late January 2004, the nation's 1,100 coal-fired power plants would be able to emit more than five times as much mercury as allowed by current law for a decade longer—by redefining mercury as a standard air pollutant instead of a hazardous air pollutant. Current regulations require 90% reductions of mercury by 2008.
- In August 2003, the Bush Administration gutted the “New Source Review” provisions of the Clean Air Act, which required that power plants, refineries, and industrial plants be cleaned up when they are upgraded. Now, these plants can be upgraded without bringing pollution controls into compliance with current law (see *EBN* Vol. 12, No. 10).

On toxics, water pollution, and wetlands:

- In October 2001, the Bush Administration reversed the “no net loss” of wetlands policy established under the first Bush Administration. The Administration then went even further by announcing its intent to eliminate protection through the Clean Water Act of all “isolated” waters—effectively removing protection for 20 million acres (8 million ha) of wetlands.
- The Administration legalized a practice known as “mountaintop removal” in the coal-mining industry by redefining “fill” to allow discharge of mining wastes into streambeds.
- The Administration suspended a rule to restrict manure runoff from livestock feedlots—one of the largest sources of water pollution in the country.
- In October 2003, the Superfund trust fund effectively ran out of money, following the Bush Administration's change to have taxpayers—not polluters—pay for the fund.

On enforcement of environmental regulations and permitting:

- Immediately after Bush took office, former General Motors lobbyist and now Bush Administration chief of staff Andrew Card initiated a moratorium on all recently adopted regulations. Since then, the few environmental “victories” have occurred when the Bush Administration has failed to eliminate or weaken a regulation from the Clinton era or earlier.
- According to the Natural Resources Defense Council's Robert F. Kennedy in a November 2003 article, since Bush took office, EPA has halted work on 62 environmental standards, USDA has halted work on 57 standards, and OSHA has halted 21 new standards.
- The Bush Administration has cut EPA environmental enforcement staffing by 210 positions.
- Since the start of the Bush Administration, civil pollution cases referred to federal prosecutors by EPA are down by 25%, while new criminal case referrals are down by 40%.

I could go on—and on and on—with examples of the Bush Administration's efforts to roll back environmental gains—gains that have been made in both Republican and Democratic administrations dating back to the Nixon Administration. Protecting the environment should not—and need not—be a partisan issue. Ensuring a clean environment should be a priority for all Americans: young and old, black and white, rich and poor—people who want a cleaner, healthier environment for their children and grandchildren. Conserving our resources and our natural heritage should be the most “conservative” of causes.

You can stop the pollution politics of the George W. Bush Administration only by getting involved. Raise your voice. Whether you are Republican or Democrat, Libertarian or Socialist, express your views to your elected officials, and work to inspire more people—especially America's underrepresented youth—to participate in the political process.

— Alex Wilson



8th Edition of the EBN Archives Published

Version 8.0 of the *EBN Archives* is now in production and should be shipping by the end of May. The CD-ROM features 99 back issues of *Environmental Building News*, from the very first, in 1992, through the end of 2003—more than 1,600 pages of reporting delivered in Adobe® PDF format.

Find what you need using the fast and comprehensive text-search feature, browse a menu of articles organized by LEED® credit, or view contents by issue. (Text-searching of the *Archives* requires Adobe® Reader® 6, which is provided on the CD-ROM for both Mac and PC users.)

The *EBN Archives* (version 8.0) costs \$199 for new users. Owners of prior versions may upgrade for only \$79.

Visit www.BuildingGreen.com or call our office at 800-861-0954 for more information or to order.

Plastics Trade Organization Defends Fluorine

In *EBN's* March feature article, "Wire and Cable" (Vol. 13, No. 3), the sidebar "Is Fluorine Worse than Chlorine?" may have needlessly alarmed readers in its attempt to summarize the large amount of available information on perfluorooctanoic acid (PFOA) in a short amount of text. The key point is that consumer and industrial products containing fluoropolymers made using PFOA provide many unique benefits and are safe when used as intended. The facts regarding PFOA are:

1. PFOA is essential to the manufacture of materials that are used to make products that span the entire U.S. economy. Its primary use is to help make high-performance, fire-resistant materials known as fluoropolymers. Because of their unique qualities—including great strength and versatility, durability, and heat resistance—fluoropolymers are used to make products that, among other things, reduce fire risk in high-rise buildings.
2. The risk of fire in office buildings is reduced due to fluoropolymers used to insulate wire and cable placed in the air space between a suspended ceiling and the structural floor above, which is generally used for low-voltage data-transmission materials, such as phone cables, computer wire and cables, coaxial cable, and hookup wire. Flame-resistant fluoropolymers do not interfere with signal transmission and are good insulators of low-voltage electricity.
3. The PFOA used to help make fluoropolymers is largely removed during the final steps of polymer production. The fluoropolymer

industry is currently developing test methods to determine the levels of PFOA, if any, in plenum cable and other finished products in cooperation with the U.S. Environmental Protection Agency (EPA).

4. Although some laboratory studies have indicated that PFOA causes adverse health effects in rodents exposed to very high levels, there is no evidence of adverse human health effects caused by PFOA exposure, either for the public or for industry employees at facilities where PFOA was manufactured or used whose health has been studied for many years. And the EPA has stated as recently as April 2003 that "EPA does not believe there is any reason for consumers to stop using any consumer or industrial-related products."

The Society of the Plastics Industry, Inc. (SPI) has created a Web site, www.PFOA-facts.com, to address questions about PFOA and the products made from it. We invite you to explore the site and its resources. For more information, you also can contact SPI through the Web site or directly at 202-974-5210.

*Donald K. Duncan, President
The Society of the Plastics
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Washington, D.C.*

Kudos, and Corrections, on Turf

When I picked up my April 2004 issue of *Environmental Building News* (Vol. 13, No. 4) and saw the main article's title, inwardly I groaned. I usually look forward to, read thoroughly, and then treasure the detailed completeness of each *EBN* feature article. But "Which Grass is

Greener? Comparing Natural and Artificial Turf"—how interesting could this be?

Well, I want to commend its author, Jessica Boehland. It was so well done, so well researched and nicely composed, that frankly I found it gripping. Yessir, true! Thank you so much for turning what could have been a boring necessity into an engaging learning experience.

May I add this comment: Perhaps the feeling under bare feet after a summer rainshower outweighs any other measure as the decider in appropriate applications. And perhaps the safety to skin and bones of athletes using playfields is the decider for those applications. In other words, treat this just as we treat any choice that we, as responsible architects, make: the best for the application, applying the highest standard of environmental well-being. And never forget the satisfaction and stimulus to the spirit of that squishy feel, the smell of living, wet earth.

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P.S. I'll forgive the absent identification of Turfgrass Producers International, which appears throughout the article only as "TPI."

Editor's Response: *Thanks for sharing your thoughts on the turf article and for pointing out the absence of TPI's full name within the main text. We also mistakenly reported on page 10 that the average suburban lawn consumes 1,000 gallons (3,800 l) of water each year. The correct figure, as reported in Amy Vickers' Handbook of Water Use and Conservation, is 10,000 gallons (38,000 l). Thanks to Ms. Vickers for catching our error.*

Letters to the Editor are welcome and may be edited for space limitations. Send by post or e-mail to an address listed in the masthead on page 2.

What's Happening

New Leadership at USGBC

The U.S. Green Building Council (USGBC) announced on April 15 that president and CEO **Christine Ervin** is stepping down from her leadership role.



Christine Ervin

Rick Fedrizzi, founder and president of Green-Think, Inc., and founding chairman of USGBC, has been selected to fill her position in an acting capacity. According to the Council, "The change is part of the organization's planned transition to a management team based in the organization's Washington, D.C. headquarters." Ervin lives and works in Portland, Oregon. The transition became effective April 30.



Rick Fedrizzi

Fedrizzi praised Ervin's five-year tenure with USGBC, during which she led the organization to the forefront of the green-building movement. Fedrizzi says he plans to focus on building the staff infrastructure, enhancing and expanding the growing body of LEED® Rating System products, establishing more local chapters, and broadening the Council's financial development. —JB

For more information:

U.S. Green Building Council
www.usgbc.org

California Releases Its First EPP Standard

On April 8, 2004 the California Division of the State Architect (DSA) released a draft of its first environmentally preferable product (EPP)

standard—on composite panel products—for public review. Once the standard is finalized, products that conform to it will be eligible to be included in the DSA's database of environmentally preferable products for use in California schools. The composite panel standard will be finalized during May. A second standard, on drywall panels, should be available for public comment by the time you receive this newsletter. These two are the first in a series of 20 to 25 standards due to be released over the next year. The first ten product categories for which standards are likely to be developed are:

1. Composite panels
2. Drywall panels
3. Insulation
4. Finished wall panels
5. Carpet
6. Acoustical ceiling tile
7. Adhesives and sealants
8. Resilient flooring
9. Paint
10. Casework and cabinetry

The standards development team is led by CTG Energetics of Irvine, California, and includes Scientific Certification Systems, Inc., Green River Data Analysis, Inc., and Building-Green, Inc. A working group consisting of experts from various government agencies (including federal, state, and local government offices) oversees the standards development process and makes final decisions regarding the standards.

Once a standard is finalized, manufacturers and suppliers of conforming products will be able to submit applications and supporting documentation to have their products considered for listing in the DSA's database. For several months after each standard is released, a limited number of products will be

reviewed at no charge to the manufacturers, although manufacturers will be expected to cover the costs of any testing or certifications that may be required by the standard. Subsequently, a fee will be required to cover the cost of reviewing additional products.

Interested parties can sign up on the project's Web site to be notified when draft or final standards are released. Each draft standard will be posted online for a four-week public comment period. The Web site allows any visitor to read and download the standard, but only registered users of the site can post comments. —NM

For more information:

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916-322-7991
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LEED Goes International—in British Columbia

The first LEED® Rating System based outside the U.S. was officially launched in Vancouver, British Columbia on April 14, 2004 by the Canada Green Building Council (CaGBC). The program is now accepting project registrations and has, in fact, already received its first full application, from the City of Vancouver. The development of LEED-BC was spearheaded by Thomas Mueller, of the Greater Vancouver Regional District and chair of the British Columbia Branch of the U.S. Green Building Council's Cascadia Chapter.

LEED for British Columbia (LEED-BC), an adaptation of the United States' LEED for New Construction, was under development well before there was a licensing agreement authorizing a Canadian version of LEED (see *EBN* Vol. 12, No. 12), and even before the creation of the CaGBC. The CaGBC is making LEED-BC available on an interim basis, according to president Alex Zimmerman, and the plan is to phase out LEED-

BC after LEED-Canada is launched later this year.

The project for which the City of Vancouver submitted its application for certification at LEED-BC's launch ceremony is the Chess Street Works Yard, a new operations yard that includes an administration building and a parking operations center. The 40,000 ft² (3,700 m²) two-story building, constructed on a 13-acre (5.3 ha) brownfield site, was designed by the Omicron Group of Vancouver.

The project had been registered for LEED certification with the U.S. Green Building Council, but the City chose to submit its application through LEED-BC once that program became available. There are 36 projects in British Columbia that are registered with the USGBC, according to Zimmerman, all of which now have the option of applying for certification through LEED-BC—though it has not yet been determined whether they will have to reregister with LEED-BC first. — NM

For more information:

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Potlatch Corporation Adopts FSC Certification

Spokane, Washington-based Potlatch Corporation has become the first U.S.-based, publicly traded wood products company to have its forestlands certified according to standards of the Forest Stewardship Council (FSC). Potlatch chairman and CEO L. Pendleton Siegel announced on April 20, 2004 that forestry operations on the company's 668,000 acres (270,300 ha) in Idaho have been FSC-certified. The company's Idaho lumber and plywood mills will be chain-of-custody certified by the third quarter of 2004, and Potlatch is evaluating FSC certification for its 320,000 acres (129,500 ha) in Minnesota and 485,000 acres (196,300 ha) in Arkansas.

Scientific Certification Systems (SCS) carried out the FSC certification for the company. "Potlatch approached the evaluation process with a commitment to transparency and a willingness to move to the next level in forest certification," said Dr. Robert Hrubes, senior vice president of SCS. "FSC certification confirms that Potlatch is practicing responsible forest management on its Idaho lands."

In 2002, Potlatch earned third-party certification through the Sustain-

able Forestry Initiative (SFI). The company then participated in a nationwide pilot study of the two forest certification systems conducted by the Gifford Pinchot Institute (see *EBN* Vol. 12, No. 4). As a part of that study, Potlatch has made all aspects of the evaluation, including the final reports from both the FSC and SFI, publicly available. The two certification reports and a comparative report are posted on the Pinchot Institute Web site.

The report comparing the SFI and FSC systems, prepared by Potlatch's Idaho Region Resource Management Division, carries a lot of weight as an independent comparison of these competing certification protocols, based on actual field experience. The report concludes that both systems have a lot to offer and, in fact, "are not interchangeable, but rather should be considered complementary." The report also notes the widely accepted distinction that the FSC system is more comprehensive, especially in its inclusion of social and economic criteria.

In another area of distinction, the reports notes that the SFI auditors (from the Quality Management Institute of Canada) worked independently and therefore covered more ground and spoke much more with contractors in the field. The FSC team from SCS, on the other hand, traveled together in an interdisciplinary team, visiting fewer sites but challenging forestry personnel more.

Both audits identified areas of non-conformance. The SFI approach was to ask Potlatch to propose its own solutions, while the FSC team prescribed specific actions. The report also questions some of the prescriptive requirements in the FSC's Rocky Mountain Regional Standard. The final report from the FSC team is much more comprehensive and detailed, which "makes the FSC audit process more transparent to both internal personnel and outside observers," according to the report.



The City of Vancouver's \$22 million Chess Street Works Yard will be the first assessed under LEED for British Columbia. Photo: Peter Bremner, City of Vancouver

"As a result of the FSC/SFI dual assessment, Potlatch has made the decision to add FSC certification to our existing EMS program," concludes the report. The fact that this commitment comes from a publicly traded company is significant. Michael Washburn, vice-president of forestry and marketing for FSC-US, told *EBN* that Potlatch's FSC certification "is consistent with what publicly traded companies are accountable for—what they have to deliver to their shareholders. This ought to eliminate any perceptions that FSC is anti-business," he said.

Siegel concurs. "We expect that our FSC certification will contribute significantly to our strategy of employing third-party certification to improve earnings and add to shareholder value," he said in making the announcement. — AW

For more information:

Potlatch Corporation
509-835-1550
www.potlatchcorp.com

Pinchot Institute for Conservation
202-797-6580
www.pinchot.org

Scientific Certification Systems
510-452-8000
www.scs-certified.com

Forest Stewardship Council
— U.S. Office
202-342-0413
www.fscus.org

Newsbriefs

EarthCraft House Communities is now in its pilot phase. Building on their successful EarthCraft House program (see *EBN* Vol. 8, No. 10), Southface Energy Institute designed the Communities program to address the environmental performance of individual homes as well as neighborhood design, site modification, and community education. Four Georgia developments, representing hundreds of acres and thousands of homes, are serving as pilot projects: Vickery in Forsyth County, Glen-

wood Park in downtown Atlanta, Clark's Grove in Covington, and a neighborhood in Fulton County's Chattahoochee Hill Country. The program is sponsored by the Greater Atlanta Home Builders Association, the Urban Land Institute, the Atlanta Regional Commission, and the Southface Energy Institute. For more information, contact Southface at 404-872-3549, or visit them online at www.southface.org.

The National Building Museum plans to showcase **the work of architect Samuel Mockbee** in a traveling exhibition. The exhibition, which



Photo courtesy of the National Building Museum
The Bryant House, one of more than 100 photographs in a new traveling exhibition celebrating the work of Samuel Mockbee.

will feature 12 models and more than 100 photographs of Mockbee's work at Auburn University's Rural Studio, will open in Washington, D.C. on May 22. For more information on Mockbee and his work, see the review of *Rural Studio: Samuel Mockbee and an Architecture of Decency* in *EBN* Vol. 12, No. 1. More information about the exhibition can be found at www.nbm.org.

When the **Bush Administration attempted to lower energy-efficiency standards** set by the Clinton White House (from SEER 13 to SEER 12), a

coalition of consumer organizations and attorneys general challenged the move. The Second Court of Appeals in New York City rejected the Bush plans (see *EBN* Vol. 13, No. 2), but air-conditioner manufacturers and the U.S. Department of Energy (DOE) threatened to appeal the Court's decision. Both groups have now declined to appeal, allowing the new standard to take effect as scheduled, in January of 2006.

Wal-Mart, the world's largest retail company, plans to test a range of **green building strategies** at two new supercenters in Aurora, Colorado and McKinney, Texas. The retailer plans to partner with colleges and universities to measure the success of the technologies; results will then be shared with the broader design and retail industries, and promising solutions could become standard in new Wal-Mart stores. The company chose Aurora and McKinney because their climates offer distinct testing conditions for the technologies, which are expected to range from photovoltaic panels to stormwater management systems. Wal-Mart hopes to break ground on the two experimental stores as soon as late summer 2004.

Shortly after celebrating the fourth anniversary of the LEED® Rating System, the U.S. Green Building Council (USGBC) awarded its **100th LEED certification**—a Silver rating for the Bonneville Power Administration Ampere Annex in Vancouver, Washington—on April 14, 2004. And, on April 19, USGBC received a LEED registration for the St. Francis Indian School in St. Francis, South Dakota, fulfilling the Council's goal to have registered projects in all 50 states and Washington, D.C. More than 1,200 projects have so far been

registered with the USGBC, with the goal of LEED certification.

New Jersey's Renewable Energy Task Force, created by Governor McGreevey in January 2004, finalized in March plans to strengthen the State's **renewable portfolio standard** (RPS), which requires energy suppliers to provide a certain percentage of renewable power, including that from solar, wind, renewable biomass, landfill gas, geothermal, and tidal sources. The Task Force recommended doubling the current RPS from 2% to 4% by 2008 and established a new requirement that the State acquire 20% of its power from renewable sources by 2020. Governor McGreevey accepted the recommendations and asked the Board of Public Utilities to begin implementing them.

The **Certified Wood and Paper Association** (CWPA), which was formed in 2002 during a reorganization of the Certified Forest Products Council, ceased operations on April 15, 2004. According to a letter on the CWPA Web site by the Board of Directors, the organization was forced to dissolve due to lack of financial resources. Michael Washburn of the Forest Stewardship Council's U.S. office told *EBN* that CWPA played two important roles: first, they delivered training programs for architects on how to specify FSC-certified wood; second, they worked with individual architects and contractors to procure FSC-certified material (a sort of hand-holding function). **Metafore**, the other organization that was formed during the reorganization of CFPA, has a broader mandate that is not limited to FSC certification; that organization promotes other certification systems as well as wood-use efficiency, waste reduction, and recycling. Metafore maintains the certifiedwood.org Web site. While Washburn is disappointed to see CWPA disappear, he argues that

FSC certification will continue to be promoted, and training programs for architects will continue. "The world isn't going to stop," he said.

According to the Energy Information Administration of the U.S. Department of Energy, **net petroleum imports** into the United States reached a new all-time record in 2003: 56.1% of oil consumption. This represents a 5.1% increase over net imports in 2002, and a 1.1% increase over the previous record in 2001. Imports from OPEC represented 42.2% of the total imports in 2003, which is still well below the all-time peak of 70% in 1977.

Catherine Shawn, an energetic and inspiring advocate of green building and director of the highly regarded High Performance Buildings Salon lecture series held throughout New York State, died of breast cancer on April 5, 2004. Shawn was the creator of the Go2Buildings.com Web site and environmental clearinghouse, which brought designers, builders, and suppliers together to advance green building. Prior to that she worked with Ecosmart, an environmental showroom on Wall Street. She had also worked with architect Bill Bobenhausen, FAIA, who noted that "no one cared more or worked harder for environmental change." The **Center for Economic and Environmental Partnership, Inc.** (CEEP) in Albany, which sponsored the Salon series, will continue that program under the direction of Julia Lynch. For information visit www.ceepinc.org.

Karl Bren has left the Virginia Housing Development Authority to form his own consulting firm, **GreenVisions Consulting**. Bren has been a leading advocate of green building and sustainable development in Virginia since the early 1990s, when he founded the Virginia Housing and

the Environment Network (VaHEN). In his new role, he will consult and conduct training on green building and sustainable development, focusing on affordable housing and community development. Bren can be reached at 804-288-2348 or through his Web site, www.green-visions.com (which was not yet operational at press time).

David Nelson, AIA, IALD, after 11 years with Clanton & Associates in Boulder, Colorado, has formed his own company, **David Nelson & Associates, LLC**. Nelson is an architect and a highly respected lighting designer; he has a bachelor of science degree in architectural engineering from the University of Colorado and a master's in architecture from the Massachusetts Institute of Technology. Prior to joining Clanton & Associates, he worked for several years with Lam Partners in Cambridge, Massachusetts. He serves on the AIA Committee on the Environment (COTE) Advisory Group and the Illuminating Engineering Society of North America's Sustainable Design Recommended Practice Committee. He is a LEED® accredited professional and has participated on design teams for numerous LEED-certified projects. Nelson can be reached at 303-926-9829 or by e-mail at dnadesign@comcast.net. A Web site is forthcoming.



Dave Nelson

Scientific Certification Systems, Inc. has released an **Indoor Air Quality Performance certification program for interior products**. The program is designed to demonstrate product conformance with the indoor emissions limits associated with California's Section 01350 specification, as well as emission criteria in the LEED® Rating System and inter-

national standards for environmental labeling. This new certification program is likely to compete with the Greenguard™ Certification Program, which until now was the only certification program of its kind in the U.S. (see *EBN* Vol. 12, No. 10). To support the certification program, SCS also released a Standard describing its approved protocol for the testing of VOC emissions in small-scale environmental chambers. See www.scs-certified.com/iaq/ for details.

Awards & Competitions

Architectural Press and Elsevier Publishers, in conjunction with Teachers in Architecture and the Circle 33 Housing Group, have announced the **2004 Design Competition for an Ecohouse**. The competition is based on the principles described in the book *Ecohouse 2*. Author Sue Roaf says the challenge is "to create an Ecohouse that is comfortable, with areas of real 'thermal delight' ... and able to survive without relying on a great deal of fossil fuel." The competition is open to architecture students, and submissions are due August 31, 2004. For details, visit www.architecturalpress.com/companions/ecohouse.

Emerging Green Builders has announced its second annual **USGBC Design Competition**, intended to engage and recognize environmentally conscious students and professionals new to the building industry. In order to compete, current students and professionals with less than three years of experience in the building industry are invited to submit designs for a complete building and site designed in accordance with the LEED® Rating System. Winners will be announced during the 2004 Greenbuild conference, to be held in Portland, Oregon this November. For more details, visit www.usgbc.org/chapters/emerging_green/emerginggreen_designcomp.asp or e-mail emerginggreen@usgbc.org.

The National Association of Home Builders (NAHB) announced the winners of the **2004 National Green Building Awards** in March during their Green Building Conference in Austin, Texas.

- **Tom Hoyt**, co-owner of McStain Enterprises in Boulder, Colorado, was named *Green Advocate of the Year*. Hoyt has built more than 8,000 resource- and energy-efficient homes during his 35 years with the company. McStain is online at www.mcstain.com and profiled in *EBN* Vol. 9, No. 10.
- **Southface Energy Institute's EarthCraft House Program** was designated *Green Program of the Year*. The Atlanta-based EarthCraft Program's 74 member builders completed and certified more than 1,200 EarthCraft homes last year. For more about EarthCraft, visit www.southface.org/home/ech/earthcraft_home.htm or see *EBN* Vol. 8, No. 10.
- *Green Multifamily Project of the Year* was the Douglas Meadows Project in Portland, Oregon, an eight-unit townhouse built by the **Seabold Construction Co., Inc.**, of Beaverton, Oregon. This affordable housing project was built with attention to energy efficiency and indoor environmental quality.
- **Yavapai College** in Prescott, Arizona, was named *Green Custom Project of the Year* for its building science and residential building technology program. Each year, Yavapai building-science students design, build, and sell a custom home. Visit online at www.yc.edu.
- Los Angeles-based **Pardee Homes** won *Green Production Project of the Year* status. Pardee meets Energy Star® Home certification as a minimum in energy efficiency. Pardee is online at www.pardeehomes.com.
- *Green Remodeling Project of the Year* was awarded to Atlanta-based **Sawhorse Construction**.

Sawhorse renovates residences through its EarthCraft House Renovation Program, focusing on energy efficiency and indoor environmental quality.

- The *Outstanding Green Product Award* went to American Clay, LLC, of Santa Fe, New Mexico, for its **American Clay Earth Plaster**. The plaster contains no volatile organic compounds (VOCs), fillers, or additives, and is naturally resistant to mold. Visit online at www.americanclay.com.

AIA Names 2004 Fellows

The American Institute of Architects (AIA) has announced this year's inductees to the College of Fellows, among the highest honors bestowed on AIA members. Five of this year's Institute Fellows are noteworthy green designers:

- **Michael Holtz**, president of Architectural Energy Corporation in Boulder, Colorado;
- **Peter Pfeiffer**, principal at Barley & Pfeiffer Architects in Austin, Texas;
- **Henry Siegel**, principal at Siegel & Strain Architects in Emeryville, California; and
- **Alison Whitelaw**, principal at Platt/Whitelaw Architects, Inc. in San Diego, California.



Peter Pfeiffer



Henry Siegel

All 81 of the 2004 Institute Fellows will be invested during the upcoming AIA National Convention in Chicago on June 11. A complete list of the new Fellows is posted online at www.aia.org/institute/fellows/2004fellows.asp.

AIA Announces 2004 Top Ten Green Projects

The American Institute of Architects (AIA) has selected this year's Top Ten Green Projects from among an especially strong pool of submissions. The 2004 jury, chaired by Sandy Mendler, AIA, included Susan Ubbelohde, Tony McLaughlin, Don Watson, FAIA, and William Moorish. Full project information is online at www.aiatopten.org/hpb/ or in the BuildingGreen Suite at www.buildinggreen.com/hpb/.

City of White Rock Operations Building White Rock, British Columbia

Architect: Busby + Associates Architects

This LEED® Gold building (see p. 1) uses operable windows, daylighting, appropriate shading, and occupancy sensors to keep energy use low. Solar hot water is used for radiant-floor heating, fulfilling the majority of the building's heating needs. Natural ventilation is used in place of air-conditioning. Photovoltaic panels provide about 5% of the building's energy. A green roof and pervious parking lot reduce site runoff, and a stormwater detention pond provides water for flushing toilets and cleaning city vehicles. More than 97% of the demolition waste was diverted from the landfill.

Factor 10 House Chicago, Illinois

Architect: Esherick Homsey Dodge & Davis



Photo: Doug Snower Photography

The goal for this single-family residence was to reduce its life-cycle environmental impact by a factor of ten, compared with a conventional American home.

It's modular design reduced material waste and allowed for some off-site assembly. An open floor plan maximizes the benefit of natural ventilation and daylighting. A green roof and grass pavers reduce stormwater runoff. The home achieved a HERS rating of 86.1.

Genzyme Center Cambridge, Massachusetts

Architect: Behnisch, Behnisch & Partner with Next Phase Studios and House Robertson Architects

The 344,000 ft² (32,000 m²) Genzyme Center includes offices, a cafeteria, a library, gardens, a conference center, cafés, and public retail space. The



Photo: Anton Grassl

building is located on a former brown-field site near several subway lines. A vegetated roof reduces stormwater runoff while limiting the building's contribution to the urban heat-island effect. A high-performance curtain-wall glazing system includes operable windows and allows for automated control and nighttime flushing. The central atrium acts as a return air duct and light shaft, with daylighting aided by tracking light scoops and reflectors. The building is heated and cooled by steam from a nearby combined heat and power (CHP) generating station.

The Gilman Ordway Building at Woods Hole Research Center Falmouth, Massachusetts

Architect: William McDonough + Partners

This office building and laboratory combines new construction with the renovation of a 19th century summer home. Good insulation, extensive



Photo: © Judy Watts Wilson

daylighting, and efficient equipment reduce energy use. A 26.4 kW photovoltaic array, a closed-loop ground-source heat pump system, and a solar hot-water system further reduce the building's use of nonrenewable energy. An innovative denitrifying septic system protects the fragile site while providing a research opportunity for the Center's soil science laboratory.

Greyston Bakery Yonkers, New York

Architect: Cybul and Cybul Architects

This 23,000 ft² (2,100 m²) production bakery was built on a former brown-field site near downtown Yonkers. Windows, skylights, and light shafts were strategically placed to bring daylight to 50% of the building. Concrete floors and walls act as heat sinks. The



Photo: Cybul and Cybul Architects

oven is so well insulated that its exterior is not hot to the touch. Outside ambient air is used in one stage of cooling baked goods. A roof garden serves as a public meeting space.

Herman Miller Building C1 Zeeland, Michigan

Architect: Krueck & Sexton Architects

In this LEED Gold renovation, 100% of the existing 1974 shell was reused—original structural materials such as steel and brick were left exposed as interior finishes. The resulting office building uses 31% less water and 29% less energy than a minimally



Photo: Mariusz Mizera

code-compliant building. An on-site biomass-powered central plant supplies all heating and cooling needs and more than 12% of the electricity. An open floor plan brings daylight deep into the building, and all occupants have a direct line of sight to the outside landscape. Low-VOC paints, carpets, and sealants were used throughout.

Lake View Terrace Library Lake View Terrace, California

Architect: Fields Devereaux Architects & Engineers

This 10,700 ft² (1,000 m²) facility serves as a public library and multi-use fa-

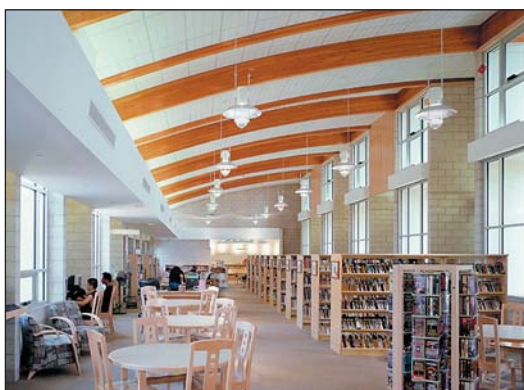


Photo: RMA Photography, Inc.

cility for the City of Los Angeles. The building is 40% more efficient than required by California's strict energy code. Masonry walls ensure the building's durability and serve as thermal mass to moderate its temperature. Building-integrated photovoltaic panels shade the building's entry and generate 15% of its energy needs. Approximately 80% of the building is naturally ventilated by operable windows, and, during the typical day, all public areas are daylit.

Pierce County Environmental Services Building University Place, Washington

Architect: Miller|Hull Partnership, LLP

The introduction of daylighting, interior vegetation, and views to the outside make this suburban office building a pleasant work environment. Stormwater is collected and treated onsite through a series of ponds, a bioswale, and an infiltration pond. Nighttime flushing cools the building's concrete



Photo: Eckert & Eckert, Inc.

thermal mass, reducing cooling needs in the morning. Environmentally responsible material choices include wheatboard, cork, and FSC-certified wood. Interpretive exhibits educate building occupants and visitors about the project's green features.

The Plaza at PPL Center Allentown, Pennsylvania

Architect: Robert A.M. Stern Architects

Located in downtown Allentown, this LEED Gold building provides office space for a regional energy company and some street-level retail space. A



Photo: Peter Aaron - Esto

green roof and interior winter gardens connect occupants to living systems. Extensive perimeter glazing and a central atrium bring daylight deep into the building's core. Low-VOC paints, adhesives, carpets, and composite woods were used throughout the facility, and more than 85% of the wood products are FSC-certified.

The Solaire at 20 River Terrace New York, New York

Architect: Cesar Pelli & Associates

This 357,000 ft² (33,000 m²), 27-story residential tower in Battery Park City was designed to use 50% less potable water and 35% less energy than a conventional residential building while providing copious fresh air to all units. A building-integrated photovoltaic array generates 5% of the building's energy needs. Wastewater is treated on-site and used for the cooling tower

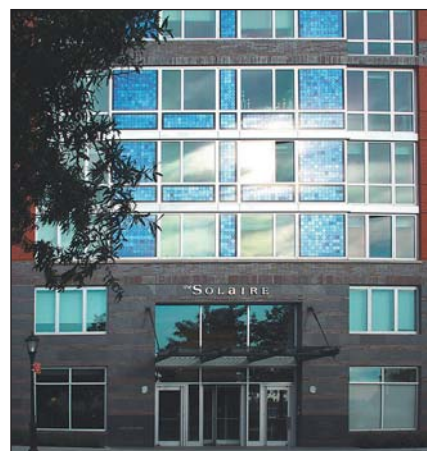


Photo: Cesar Pelli & Associates

and flushing toilets, as well as to irrigate a nearby park. Stormwater is used to irrigate the site, including its rooftop gardens. The building has achieved a LEED Gold certification. For more on the Solaire, see *EBN* Vol. 9, No. 11.

Product News & Reviews

Solargenix Energy Offers Leading-Edge Solar-Thermal Technology

Solargenix Energy, LLC is moving full-steam ahead on several exciting fronts in the solar-thermal industry. Solargenix began as Solar Roof International in 1987 with a number of partners including the architecture firm Innovative Design of Raleigh, North Carolina. In 1997, with the Israeli company Solel Solar Systems as a partner, the company entered into a joint venture with Duke Power Corporation (one of the nation's largest utility companies) and changed its name to Duke Solar. The relationship with Duke Power ended in 2002, when the utility company sold its Duke Engineering & Services Division to the French nuclear-engineering company Framatome ANP. Duke Solar bought out Framatome's interest in the venture and changed its name to Solargenix Energy in April 2003. The company offers solar-thermal technologies ranging from large utility-scale power generation systems to much smaller water heating, space heating, and cooling systems.

Power Generation

The Power Generation Division of Solargenix is picking up where the Luz Company left off when it went bankrupt in 1991. Luz built nine solar electric generating system (SEGS) power plants using high-temperature, solar-trough collectors in the Mohave Desert in the 1980s and early '90s, with a total generating capacity of 354 megawatts (MW)—see *EBN*

Vol. 8, No. 7. When the Luz Company folded, Solel purchased the intellectual assets of the company, which have been brought to Solargenix. (The nine Luz plants, in Kramer Junction, California, are still functioning very well).

Here's how the Solargenix solar-trough system works: Tracking,



Photo: Solargenix Energy, LLC

Completed two years ago, this Power Roof system drives a 50-ton (176 kW) cooling system for a 10,000 ft² office building in Raleigh.

parabolic-trough collectors focus sunlight on pipes filled with mineral-oil heat-transfer fluid. The oil is heated to between 250 and 550°F (120–290°C), and then passes through a heat exchanger where a secondary fluid is vaporized. This high-pressure gas spins a turbine, generating electricity. The gas is then condensed back into a liquid and cycles back through the vaporizer to repeat the process.

On March 24, 2004, Solargenix broke ground on its first power-generation system: a 1 MW solar-trough power plant for APS (previously Arizona Public Service Company), Arizona's largest electric utility. The plant, being built in Red Rock, approxi-

mately 30 miles north of Tucson, is expected to be completed in April 2005. The generating station will help satisfy Arizona's renewable energy portfolio standard, which requires that APS generate at least 1.1% of its electricity from renewable sources by 2007—60% of it solar.

Gary Bailey, AIA, an architect with the Las Vegas office of Innovative Design and Solargenix, told *EBN* that they are hoping to break ground in July 2004 on a much larger, 50 MW solar-trough power plant in Las Vegas.

The company is looking at opportunities to build additional power plants in Nevada, New Mexico, and California, and they are working on joint ventures for projects in Australia, Mexico, and Spain. According to Bailey, Governor Schwarzenegger is pushing to increase California's renewable portfolio standard from 20% to 30% and achieve that by 2017 instead of 2020. "That's a pretty aggressive timeframe," says Bailey, suggesting that they won't be able to meet that level of production with just wind and geothermal power. There is also a federal initiative to develop

1,000 MW of solar-thermal power in the Southwest that Solargenix hopes to plug into.

The Solargenix power generation technology is well suited for hybrid applications with other power production technologies, such as combined-cycle natural gas, wind, and biogas. The three 30 MW power plants that the company is planning in Australia are to be hybrid systems using methane from landfills.

Power Roof

At the commercial-building level, Solargenix is continuing to monitor a Power Roof™ system installed in July 2002 on a 10,000 ft² (930 m²)



This demonstration cross-section shows the insulation, glazing, and concentrating parabolic collector configuration used in the Winston Series CPC collector. Photo: Solargenix Energy, LLC

pond parabolic concentrating (CPC) collectors within an insulated box glazed with low-iron glass (see photo, left). The parabolic reflectors focus light onto absorber tubes through which heat-transfer fluid is piped. The product line is named for Dr. Roland Winston, a physics professor

who invented the non-imaging optics technology used by Solargenix while he was at the University of Chicago. Solargenix licenses the technology from the University.

Solargenix has sold several hundred systems since launching the CPC line, but sales are expected to ramp up significantly with the opening in March 2004 of a manufacturing facility for the collectors in Chicago. (Prior to this, the CPC collectors were manufactured in Florida, but all production has shifted to Chicago.) The City of Chicago has contracted to purchase \$5 million worth of CPC collectors over the next three years—which should be a significant fraction of the company's output.

The CPC collectors do not use evacuated tubes, though on first glance they look somewhat like evacuated-tube collectors (see *EBN* Vol. 8, No. 7). One, two, or three collectors are commonly used for residential solar water-heating systems: a single collector when a 50-gallon (190 l) hot-water storage tank is needed, two collectors with an 80-gallon (300 l) tank, and three collectors with a 120-gallon (450 l) tank. They are commonly sold as systems in one of two configurations. A roof-integrated thermosiphoning configuration is possible with new

construction; the collectors are integrated into the roof with the glazed surface approximately flush with the roof surface and the storage tank located higher than the collector inside the attic. With a more conventional active-solar configuration, a small heat-exchange SolPac module sits next to the hot-water storage tank and transfers heat into the storage tank. "I believe in separating the solar from the water heater," says Guiney, noting that conventional storage tanks are much less expensive than special tanks designed for solar water heating.

The installed cost of a two-collector Winston Series CPC system varies widely by region, largely due to differences in labor cost but also affected by freeze-protection strategies. According to Guiney, the equipment cost for an 80-gallon (300 l), two-collector SolPac system runs about \$2,500, while installed costs range from \$3,500 to \$6,500. The largest system installed to date using the CPC collectors is a 30-ton (105 kW) absorption-cooling system with 180 collectors installed for Austin Energy in Austin, Texas. —AW

For more information:

Solargenix Energy, LLC
2101 Westinghouse Boulevard, #115
Raleigh, NC 27604
919-871-0423
www.solargenix.com

office building in Raleigh, North Carolina. This system utilizes a *fixed* parabolic reflector and tracking receiver and provides 50 tons (176 kW) of cooling as well as heat. (Solargenix power generation systems, by comparison, use *tracking* reflectors.) Bailey says that system is doing extremely well—actually exceeding the designed 50-ton (176 kW) output. "If it can produce that well in Raleigh," says Bailey in Las Vegas, "it will do even better out here."

The Power Roof system in Raleigh produces 340–350°F (170–175°C) water that powers a double-effect absorption chiller manufactured by the Chinese Broad Air Conditioning Company, Ltd. The building-integrated system is also designed to deliver daylighting, provide an insulating radiant barrier, and serve as a watertight roofing system. Where needed, the thermal energy can be converted into electricity. In a Southwest climate, Bill Guiney of Solargenix says the Power Roof could achieve collection temperatures of 750°F (400°C) or higher. Power Roof sales have been slow, pending results of testing the system in Raleigh, but one contract is in place in Australia, and a system is being discussed for Denver.

Solar Hot Water Collectors

The third product line from Solargenix is the Winston Series CPC Collector, which is used for residential and commercial solar water-heating systems. The basic collector is 42" by 82" by 3.3" thick (107 x 208 x 8.4 cm) and is comprised of 12 small *com-*



This 64-panel array of Solargenix CPC Collectors serves a mixed-use building in New York City. Photo: Solargenix Energy, LLC

Greening Your Firm (continued from page 1)

Few firms meet this definition across the board. At larger firms in particular, comfort with integrated design and experience with green approaches vary greatly from office to office and even among studios within an office. Obviously, some individual designers are more experienced and engaged with green design than others. Through our research, we investigated how firms are using those green leaders, and how firms and individuals are pushing their green perspective deeper into their practices.

The good news for the green building movement is that nearly every major design firm in the U.S. is now actively seeking to develop green capabilities, especially in market sectors where demand from clients is greatest. "In the science and education sector, 100% of the RFPs we get now speak about sustainability," reports Margaret Montgomery of NBBJ in Seattle. "The demand is very client-driven. People are beginning to realize that this is not a fad, it's not going away, and they need to pay attention."

Approaches to Greening a Firm

Changing how a large firm functions is no easy task, notes Tom Paladino, whose Seattle-based firm, Paladino & Company, consults on green design and management practices. "As individuals, architects and the more design-focused engineers are quite avant garde and willing to try new things. But as firms, they are actually quite conservative," he says. There are good reasons for them to resist change, Paladino notes, as both their dependable profitability and the brand associated with their design work may be threatened by any substantive process changes. As a result, upper management at many firms tends to try to adopt green design as another type of expertise that can be

overlaid onto the firm's existing process. "Challenging the design criteria and setting green goals is seen as too much of a big-picture approach in those situations," Paladino says.

To be effective, change has to take place within a firm both from the bottom up and from the top down. At all these levels, firms are exploring a range of specific actions in their efforts to gain green design capabilities (see Table 1, p. 15). Some of these actions are project-specific, while others are aimed at building capabilities and infrastructure in general. Whether on a project-specific or general basis, each of these actions is intended to accomplish one or more of four things to promote the implementation of green design:

- Inspire and motivate designers;
- Disseminate the information designers must know;
- Provide the skills designers must have; and
- Change processes to improve support for integrated design.

Experiences of various firms with each action are described below.

The Green Team

Most mid-sized and large firms rely on a network of "green champions"—either formally or informally organized—to spearhead the company's efforts. Often the participants in this network are also the most knowledgeable about green design, so they take on a dual role of managing initiatives to bring the whole firm up to speed while participating in, or consulting with, project teams when a green design is called for. In larger, multi-office firms, this group often participates in regularly scheduled conference calls, publishes an in-house newsletter, and is assigned a formal budget.

It is tempting for many firms to use their green team as in-house consul-

tants, pulling them in to help with green projects on a sporadic basis as an efficient way to provide green design services without investing the resources needed to transform the firm as a whole. Most firms do this sort of internal consulting informally, following a model established for sharing other areas of specific expertise, such as acoustics, lighting, or design for certain occupancy types. Some companies have even set up formal structures for loaning in-house green experts to projects on an as-needed basis.

The internal consulting model "works best if mentoring is involved," says Nick Rajkovich of Einhorn Yaffee Prescott (EYP) in Albany, New York. John Boecker is very explicit about this mentoring role for his work at L. Robert Kimball & Associates: "I consult on every LEED project that we pursue, with the goal of teaching each member of each team how to do it for themselves. It's getting more and more effective, and I am depended on less and less."

While everyone seems to acknowledge that this small group of committed individuals is the only thing that can change the firm (to paraphrase Margaret Mead), there are doubts about investing too much in the green team as a cadre of green experts. "We have deliberately made the decision to not have a group of sustainability gurus," says Mary Ann Lazarus of HOK in St. Louis. "We made that decision early, and have confirmed it since. Our mission is to integrate sustainability into our daily practice as deeply as possible." Drop-in consulting may be a good way to distribute expertise that only a few people have, but if the project team isn't up to speed and committed, there may be a lack of follow-through. "An in-house consultant can never be there at the exact right time to affect the important decisions because they get made at unexpected times," says Scott Shell of EHDD Architecture. "It's the work that gets done day in and

Table 1. Survey Results: Actions for Greening a Design Firm

Action	% of Firms for Which a Focus ¹	Self-Reported Value ²	Cost in Time (hrs/month ³)	Cost in Dollars (\$/year ³)	Comments
GREEN TEAM					
Organize a green team	65%	very high	35	\$6,238	Very common, especially at firms with many offices, as a way of sharing resources and approaches
Publish in-house newsletter	35%	high	4	-	Common at largest firms but too time-consuming for others
Offer internal consulting to projects	65%	moderate	40	-	Most useful when an element of training is explicitly included
TRAINING AND EDUCATION					
Provide regular education sessions in the office	88%	very high	32	\$7,475	Often provided at no cost by consultants who are working with the firm on a project
Host regular presentations by green vendors	59%	moderate	32	-	Vendors typically provide lunch, and those that bring the best food get the best attendance!
Support and encourage training	59%	very high	30	\$6,190	Everyone recognizes that training is essential, but it's expensive. The best support is in firms with strong buy-in from management.
Support conference attendance	82%	very high	12	\$5,257	High value for promoting motivation and knowledge, but expensive. Clever green teams are investing in their future by sending their bosses to conferences.
Pursue research funded by outside entities	29%	very high	30	-	A huge opportunity to gain knowledge and skills at little cost (even at a profit!). Funding sources vary by state and region.
INFORMATION MANAGEMENT					
Hire a green-focused librarian	47%	moderate	-	-	Seems to happen more by chance and personal inclination than by design
Maintain a library of in-house research	29%	very high	19	-	---
Make a firm-wide effort to green in-house specs	59%	high	20	-	Nearly all firms with a strong in-house specification system are working on greening that spec. Others are relying on outside spec-writers or on ARCOM's greening efforts with MasterSpec™.
TOOLS FOR GREENING					
Provide information and modeling tools	47%	moderate	-	\$2,200	Providing tools company-wide helps develop a shared set of language, concepts, and metrics.
Use information and modeling tools widely	29%	very high	-	-	Getting busy designers to use new tools is a challenge.
EXPERTISE FROM THE OUTSIDE					
Give green champion input on new hires	24%	high	3	-	Green team members rarely have the opportunity to influence hiring on the basis of their green interests.
Cultivate relationships with capable consultants	47%	very high	3	-	Consultants' attitudes and abilities can make or break a project. Those who are strong in sustainable design can help bring a less-advanced in-house team along as well.
GREEN PROJECT GOALS					
Use LEED as a goal-setting tool with clients	71%	high	2	-	More and more firms are introducing LEED as a goal-setting tool, even when clients don't ask for it.
Conduct an internal LEED review of all projects	35%	high	-	-	LEED self-assessments can be overly optimistic.
Start with a green intent for all projects	35%	very high	10	-	A green intent that diverges from LEED can be useful to focus a team.

Notes: 1. Indicates percent of firms for which this is a focused effort, not just something that happens casually (based on data set of 20).
 2. Self-reported value among firms that focus on this action.
 3. Amount spent in time (labor hours per month) and direct expense (dollars per year) by firms that focus on this action, based on data from those firms that were able to provide an estimate, normalized to a hypothetical 100-person firm.

Source: Interviews conducted by Jim Newman and Nadav Malin between September 2003 and April 2004

day out in the trenches that is where the action is," he adds. If the firm is small enough or the green team is big enough, assigning someone with green expertise to each project is preferred because that person will be involved throughout the design process.

In spite of the perceived drawbacks of an in-house consulting model, every firm draws on its green experts at strategic times. "It works great for specific questions and discrete examples," says Shell. Even at HOK, "We do have people cross-consult on a case-by-case basis," Lazarus admits, adding, "For example, Sandy [Mendler] will show up on projects across the firm, on special cases, for special opportunities."

Training and Education

When it comes to helping people gain knowledge and skills in green design, there is no substitute for training and education. "Our whole program is about education," says Rajkovich of EYP. "We want to get sustainability into a project before it starts," he adds. But training can be expensive, especially if it involves travel expenses on top of course fees (not to mention staff time). Fortunately, some good opportunities are available to firms at minimal cost.

Vendors of green products and services are always willing to give lunch-time presentations, and they often provide lunch as well. While they come in with their own agenda, they generally share a lot of technical information. It helps to have on hand a few knowledgeable people from within the firm to ask hard questions and put the vendors' information into a broader context. "No manufacturer comes through our office without getting grilled on sustainability," says Jason Kliwinski of the Prisco Group in Hopewell, New Jersey.

A better source of free in-house training is available in the form of consultants who may be in the of-



Half of the 250 designers (some are shown above) at Keen Engineering are LEED-accredited and proudly wear their hockey jerseys to prove it. Photo: Keen Engineering

fice working on a specific job. Outside consultants are often willing to provide a presentation on their areas of expertise, such as daylighting or green roofs or stormwater management, as a way of making their services known to other design teams within the firm. Most firms already have some program for in-house educational sessions in place, so adding green design topics to the schedule is relatively easy.

Outside the firm itself, the availability of local training opportunities varies greatly by location, but they are increasingly common thanks to the proliferation of local chapters of the U.S. Green Building Council (USGBC) and other groups. LEED trainings from the USGBC are also available throughout the U.S. and Canada. While these are expensive, the fact that most designers don't have to travel far or incur lodging costs to attend them keeps the overall costs down.

Green building conferences are a popular venue for training and education. Established national conferences, such as Greenbuild, EnvironDesign, and Greenprints, as well as a growing stable of regional events, offer valuable learning opportunities. National conferences are also a valuable opportunity for designers from various offices within a firm to build or strengthen relationships. "We spend a lot of time together after hours," notes Montgomery of NBBJ. "It's our best chance to get our sustainable design people together." Most conferences hold in-depth

workshops before or after the main event. Conferences with strong keynote presentations—EnvironDesign has especially good keynotes—can inspire designers, increasing their motivation to pursue sustainable design. A growing number of annual conferences are also available on specific subjects of interest to green designers, such as the Green Rooftops conference, the Conference on Building Commissioning, and the new Engineering Green Buildings conference sponsored by HPAC Engineering magazine.

While registration fees and travel costs for trainings and conferences can add up, the biggest cost to firms is usually staff time. Companies that are entering the field cautiously tend to limit the number of workshops and trainings they pay for, while the more aggressive firms—typically those with the strongest support from upper management—have more liberal policies. The budget for trainings (in both dollars and time) tends to come from a combination of a firm-wide pool for promoting green design (when such a pool exists) and the available resources of individual offices or studios within a firm. Green teams are also realizing that sending someone from upper management to a conference can be a good investment of limited resources: "We target key influential people in the firm that we want to sponsor to attend," says Montgomery.

Designers are always constrained by the limited project time available for researching new design approaches,

technologies, and products. Sometimes, outside sources pay for part of that research, though, and research into specific areas of sustainable design is an excellent way to gain expertise—it can even become a profit center. Keen Engineering hired a full-time researcher to assist designers and learn more about their projects through efforts such as post-occupancy evaluations. “It’s the best investment we’ve made,” says Keen’s president Kevin Hydes. EHDD’s Scott Shell feels it’s especially useful for designers to be involved directly in the research as a way of deepening their understanding of sustainable design. He credits the firm’s research into the design of laboratories that foster scientific collaboration and significantly cut energy use with opening a new design opportunity for the firm. “Our success in this area is directly a result of research we did,” says Shell. “We would have laid off a bunch of people if we hadn’t gotten the lab work.”

A number of firms, especially those based on the West Coast, value their association with the research consortium at the University of California at Berkeley’s Center for the Built Environment. Consortium membership costs \$10,000 each year and provides firms with an opportunity to influence the direction of the research and learn about the results before they are published.

Managing Information and Tools

Collecting, storing, and disseminating information within a design firm is always a challenge, and green information is no exception. None of the firms we spoke with has a librarian dedicated solely to green resources, but everyone agreed that having a librarian with a strong interest in sustainable design is a great help. “Our in-house green resources were not so good until a really committed librarian came in,” reports Lance Davis of his work at RTKL (he has since moved to Wisniewski Blair & Associates).

Since the research for this article began as market research for BuildingGreen Suite, it isn’t surprising that many of the firms we interviewed are using that online resource as a way of making green information available throughout the firm. Relying on a common resource throughout the firm can help get everyone on the same page: “One of our goals is to create a common language of high-performance building throughout the office, so that we can raise the level of discourse,” says Ron Ostberg, principal and director of design at Stubbins Associates in Cambridge, Massachusetts.

Product samples and binders on green products are not typically kept separate from those for conventional products, although some green teams have flagged green products within the sample room. A few firms, such as HDR, Inc., maintain their own comprehensive materials databases, which describe green features of products. Such in-house information is limited in most firms, however, so they rely on their green team to find information and make it available. Most firms find it more time- and cost-effective to rely on outside sources, such as Sweets® for general product information and BuildingGreen’s GreenSpec® Directory for information on green products.

Specifications are a critical part of green project delivery, but changing how specs are managed in a firm can be a long, slow process. HOK has invested a fair amount of effort in developing language for a Division 1 section on green requirements, as well as sections on indoor air quality and LEED requirements, according to Lazarus. But the “use of that material is not as consistent and thorough as we’d like,” she acknowledges.

Firms vary widely in how they manage specifications in general, and these differences affect how they go about greening their specs. For firms with a strong centralized specification system, the key seems to be getting the spec-writers on board and then making sure that project managers use the most up-to-date specs rather than adapting those from a previous project. “Here, typically project managers write specs, but we also have a central spec-writing team who are guardians of the firm spec,” says Boecker. He reports that having one of those spec-writers get fired up about greening the specs has been really helpful. Bryna Dunn, of Moseley Architects in Richmond, Virginia, agrees: “Our spec-writers are very enthusiastic and knowledgeable about incorporating high-performance criteria into our standard spec—that is fantastic for me.”

Companies that rely on outside spec writers, or those in which each studio or project team maintains its own specs, are more constrained. Some are taking advantage of the fact that independent spec-writers are increasingly knowledgeable about green requirements. Others rely on MasterSpec™, which is rapidly incorporating LEED requirements into its boiler-plate language.

Software for energy modeling, daylight simulations, and other features is, not surprisingly, common at engineering firms and at the more technically inclined architecture firms. The German architecture firm Behnisch, Behnisch & Partner,



Bob Mills (standing), president of Moseley Architects, participates in a private LEED training—one of four the firm has held as part of a commitment to have all professionals in the firm LEED-accredited by the end of 2004.

Photo: Moseley Architects

which has recently started to work in the U.S. (including designing the award-winning Genzyme Building in Cambridge, Massachusetts), uses a wide range of simulation tools in-house, even though they also collaborate closely with engineers. While most *engineering* firms have a standardized set of tools for their practice, most *architecture* firms rely on individual designers to choose their own, if any at all. The main barrier to the use of any of these tools is not the purchase cost but the investment in time and education required to use them effectively.

Mainstream mechanical engineers have not historically been asked to do a lot of energy simulations, beyond what is needed to size equipment. As a result, even firms that provide both architecture and engineering services often use outside consultants for energy modeling currently, while they work to develop the in-house expertise.

Bringing in Outside Expertise

Like the skin on a person, the boundaries of a firm are a porous membrane that defines and contains the organization while allowing exchange and interaction with the outside world. When it comes to expanding green design capabilities, most firms have to let in a lot of ideas and expertise, and also collaborate with consultants who can help make it happen.

In response to the skyrocketing demand for green buildings, a number of established firms have added a key individual or two to their staff to jump-start the firm's capabilities in this area. In general, this approach

seems to be quite effective, although its reach depends on the skills of the individual and the amount of support she or he receives from the firm. The firm's intent in bringing on such a person also varies—in some cases, the firm brings on the new hire because his or her green design skills enhance the firm's credentials directly, while in other cases, the firm hires a green expert with the explicit intent of training and educating the firm as a whole.

The green team members we spoke with rarely influence a firm's hiring choices. As the market demand

stand integrated, sustainable design. This approach requires finding the right consultants and then engaging them in a truly integrated process, in which everyone helps design the whole building. "Design engineering and applied engineering are different skill sets, and you need to start with a design engineer to make a real integrated team work," says Rick Ames of Next Phase Studios in Boston. Ames' recent experience working with Behnisch, Behnisch & Partner and with Buro Happold, consulting engineers on the Genzyme Building, opened his eyes to the potential of this process: "What's excit-

ing is when you have real-time engineering information affecting form, immediately."

Shell reports, "We have found it much more difficult to get a traditional consultant to do sustainable design work than one who is already excited about it. I spend an enormous

amount of time trying to put together the very best team, and it has been extremely beneficial." Beyond aiding the integrated design process, "working with a good consultant gets your team excited," he says. "That's when it is getting really fun."

Public-sector projects tend to be constrained by bidding requirements in their consultant-selection process, so hand-picking consultants may not be feasible. "In our RFPs we stipulate that the consultant must be LEED-accredited, must be familiar with or have worked on LEED projects, and must design to meet a LEED Silver rating or higher if the project warrants it," says Kliwinski of the Prisco Group.



Rendering by Gary Strang, landscape designer for EHDD Architects

EHDD Architects worked with the Chartwell school to win a grant from the Kresge Foundation in support of sustainable design research. They plan to use the funds to create a life-cycle inventory assessment of the building, create a model of the water cycle on the site, increase the use of salvaged materials, and work on design for disassembly of the building.

for green services grows, those in management are increasingly considering a designer's green credentials in hiring and promotion decisions, however. Even when a green champion at a firm has the power to influence hiring decisions, green expertise alone is rarely sufficient to get someone hired. "A lot of people come to us wanting to do sustainable design work, often just out of school," says Shell. "But we don't have a place for people who just want to do sustainable design. They also have to be good designers, and good at the day-to-day work of the firm."

Aside from hiring green designers, the best way firms can draw on the capabilities of outsiders is by working with consultants who under-

Green Goals for Projects

Aside from pursuing LEED certification, firms are using LEED in two other distinct ways: a majority use LEED as the framework for goal-setting charrettes with clients, and a few measure all their projects against LEED internally, as a way of tracking their progress at incorporating green design. The effectiveness of design charrettes depends on holding them early in the process and on including “enough of the team and expertise to actually get somewhere in the charrettes,” says Davis. Going through the LEED checklist with clients is a good way to “make sure you’re not missing a whole category of things,” says Shell. Moseley Architects designs primarily public-sector projects and finds that most of their clients are open to using LEED as a framework. “Not every client elects to have their project certified, but we do bring it up more and more,” says Dunn.

Many firms have also created their own processes for setting green goals with clients. These are often based on LEED but customized to meet the firm’s needs. At L. Robert Kimball & Associates, for example, even projects that are not using the entire LEED framework are encouraged to pursue specific environmental improvements, such as upgrading a building’s thermal envelope, increasing the flyash in concrete, and using recycled-content materials. EHDD has long worked with green goals around issues of orientation, connection to site, and shading, according to Shell, but “now we are doing it on a broader set of issues.” For firms based in Europe with a strong environmental focus, setting an aggressive green design intent is nothing new. At Behnisch, Behnisch & Partner, for example, it is “very much a part of the firm culture,” according to Günther Schaller.

Some firms that are committed to incorporating a green approach are using LEED internally, even when the client isn’t interested. “Our 2004

goal is for every new project to use LEED as a design tool throughout the process,” says Lazarus of HOK. Kliwinski describes a similar policy: “All of our projects are screened for LEED-certification compatibility,” he says. While Moseley Architects doesn’t have as strict a policy about using LEED, Dunn has screened enough of their work to establish their internal benchmark: “We find that we routinely address 16 to 18 LEED points with what we would normally do.” (A total of 69 points are available, and minimal LEED certification requires 26 points.)

Generating Demand

Ultimately, there must be both personal commitment from individual designers and a perceived business opportunity on the part of the firm before sustainable design can become integral to the firm’s operations. On the personal commitment side, “it’s a hard thing to tackle,” says Hess, adding: “Even when demand is there, somebody emerges that tackles it because of their interest.”

The business opportunities emerge either when market demand becomes obvious or when a firm becomes proactive in generating leads around sustainable design. “At firms we’ve worked with, there is usually a marketing person who has been involved in the trainings,” says Paladino. The marketing department is interested in learning how to talk about sustainable design and how to present the firm’s capabilities to potential clients. Often firms will invite key clients to sustainable design conferences and events as a way of introducing them to the possibilities.

At L. Robert Kimball & Associates, John Boecker has found that generating market demand is a great way to inspire the firm to respond. “Absolutely the most effective thing, without question, is the business development effort,” says Boecker. “Either we find clients that are already committed to LEED, or we convince them that that’s what they should be

doing. Once the client has hired us on that basis, the project team has to get up to speed.”

Wrapping Up

There’s no single right way to green a design firm. Different actions are appropriate for different settings and at different stages in each company’s evolution. To be most effective, a firm’s activities as a whole have to provide designers with motivation, knowledge, skills, and support for an integrated design process. Trends that emerged from our conversations with the key players are:

- Training and education are essential activities that all firms pursue in one way or another—those that don’t invest in regular staff travel to conferences all make regular in-house training a priority.
- The few firms that have found ways to get paid for doing in-depth research into sustainable design also tend to be those with an interest in going beyond the LEED framework in setting green goals for projects.
- Managing specifications is an ongoing challenge for nearly all the firms. Greening a common firm specification is challenging enough; getting project managers to use it may be even trickier, unless they are committed to the green agenda.

“There tends to be a lot of interest among younger people in the firm,” notes David Hess of Cesar Pelli & Associates in New York, who suggests making use of their enthusiasm. Newcomers to a firm also tend to be less constrained by established procedures and design expectations, and therefore more open to fundamental changes in the design process. Change is always challenging for organizations. The commitment to change in so many firms is a testament to the dedication and creativity of the green advocates and to the compelling market demand for green buildings.

– Nadav Malin, with research help from
Jim Newman

Calendar

MAY

18-21 • Creating Solutions for Using Small Trees, Sacramento, CA. *Sponsor:* Forest Products Society. *Information:* 608-231-1361 x208; www.forestprod.org.

25 • It's Hot!!! Manage Mold & Mildew, Cary, NC. *Sponsor:* PADIA Green Center. *Information:* 919-481-1777; chukins@padiaconsulting.com (e-mail).

29 • Superbia!, Golden, CO *Sponsor:* Sustainable Futures Society. *Information:* 303-674-9688; www.sustainablecolorado.org.

JUNE

2-4 • Greening Rooftops for Sustainable Communities Conference, Awards, and Tradeshow, Portland, OR. *Sponsor:* Green Roofs for Healthy Cities and City of Portland. *Info:* 416-686-5887; www.greenroofs.ca/grhcc/trade_show.htm.

7-July 2 • Sustainable Materials & Methods, Prescott, AZ. *Sponsor:* Ecosa Institute. *Info:* 928-541-1002; www.ecosainstitute.org.

10-12 • AIA National Convention & Design Expo, Chicago, IL. *Sponsor:* The American Institute of Architects. *Information:* 800-242-3837; www.aia.org.

11 • Buy Green and Save Green: Strategies for NJ Local Governments and School Districts, Piscataway, NJ. *Sponsor:* N.J. DEP, U.S. EPA, et al. *Info:* 732-932-9155 x233; <http://aesop.rutgers.edu/~envpurchase/epconf/>.

14-16 • NeoCon: World's Trade Fair, Chicago, IL. *Sponsor:* Merchandise Mart. *Info:* 800-677-6278; www.neocon.com/neocon/.

14-18 • Sustainability and Beyond: Business Leadership through Innovation and Design, Charlottesville, VA. *Sponsor:* Darden School, University of Virginia. *Info:* 877-833-3974; Darden_Exed@Virginia.edu (e-mail).

24-27 • CNU XII - Blocks, Streets, and Buildings Today: The New City Beautiful, Chicago, IL. *Sponsor:* Congress for the New Urbanism. *Information:* 800-788-7077; www.cnu.org.

26-July 3 • Natural Building Colloquium-East, Bath, NY. *Sponsor:* Gaiatecture Design. *Info:* 585-624-2540; www.gaiatecture.com.

JULY

11-14 • Solar 2004, Portland, OR. *Sponsor:* ASES, Solar Energy Association of Oregon, U.S. DOE. *Information:* 303-443-3130; www.ases.org.

14-18 • Sustainable Communities 2004, Burlington, VT. *Sponsor:* Global Community Initiatives. *Information:* 802-272-2684; ghs@global-community.biz (e-mail).

15-16 • M6: Mold, Moisture, Misery, Money, and Myth – Plus Management, Chicago, IL. *Sponsor:* Building Environment and Thermal Envelope Council. *Information:* 202-289-7800; www.nibs.org.

20-23 • Engineering Green Buildings, Cleveland, OH. *Sponsor:* HPAC Engineering. *Information:* 216-931-9575 (Kathy Lambrix); www.hpac.com/products/egb.htm.

24-25 • Research & Design for Ecological Structures, Warren, VT. *Sponsor:* Yesterday Design/Build School. *Information:* 888-496-5541; www.yesterdaymorrow.org.

AUGUST

8-11 • Energy 2004, Rochester, NY. *Sponsor:* U.S. DOE/FEMP, DOD, GSA. *Info:* 703-921-1719; www.energy2004.ee.doe.gov.

21-22 • SolFest 2004, Hopland, CA. *Sponsor:* Solar Living Institute. *Information:* 707-744-2108; www.solarliving.org.

22-27 • Summer Study: Breaking Out of the Box, Pacific Grove, CA. *Sponsor:* ACEEE. *Information:* 302-292-3966; www.aceee.org.

SEPTEMBER

1-3 • Deconstruction & Building Materials Reuse, Oakland, CA. *Sponsor:* U.S. EPA Region 9, Used Building Materials Association, Alameda County Waste Management Authority. *Info:* 415-972-3282; www.decon04.org.

OCTOBER

4-6 • Wood-Frame Housing Durability and Disaster Issues, Las Vegas, NV. *Sponsor:* Forest Products Society, USDA Forest Products Lab, and Forintek Canada. *Info:* 608-231-1361 x208; www.forestprod.org.

20-23 • EEBA Building Solutions Conference & Exposition/Sunbelt Builders Show, Dallas, TX. *Sponsor:* EEBA, Texas Association of Builders. *Info:* 952-881-1098; www.eeba.org/conference/.

NOVEMBER

10-12 • Greenbuild International Conference & Expo, Portland, OR. *Sponsor:* U.S. Green Building Council. *Information:* 202-828-7422; www.usgbc.org.

DECEMBER

5-10 • Performance of Exterior Envelopes of Whole Buildings IX: Integration of Building Envelopes, Clearwater Beach, FL. *Sponsor:* Oak Ridge National Lab. *Info:* 865-574-7267; www.ornl.gov/buildings.

More info and listings are online at:
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