

January/February 2015

USGBC+

TRANSFORMING OUR BUILT ENVIRONMENT



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ON THE COVER AND THROUGHOUT

This illustration captures the possibilities of a transformative movement. These iconic city skylines represent the global movement of LEED as it continues to expand—reaching more than 150 countries worldwide.

Artist Melissa McGill has worked as a mixed media artist since 1993. Multi-layered, luminous images that combine industry and nature are her trademark. Her client list includes Sony, *Time*, *San Francisco Chronicle*, Adobe, Graphique De France, *Elle* and more.

Illustration by Melissa McGill. www.melissamcgill.com



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Illustration by Melissa McGill. www.melissamcgill.com

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Jenny Wiedow
K12 Manager, Center for Green Schools

CONTRIBUTING WRITERS

Mary Grauerholz Calvin Hennick
Alison Gregor Judith Nemes
Jeff Harder Daniel Overbey

CONTRIBUTING PHOTOGRAPHERS

Ara Howrani Ryan Smith
Mark Osler Michael Stravato
Eric Roth

CONTRIBUTING ILLUSTRATORS

Rosanna Giorlandino
Melissa McGill

EDITORIAL & DESIGN SERVICES

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CURRENT LEED STATISTICS

AS OF JANUARY, 2015

Total commercial LEED projects globally ▶ **68,629**

CERTIFIED: **26,614**
CURRENTLY REGISTERED: **42,015**
LEED FOR NEIGHBORHOOD DEVELOPMENT: **412**



Gross square footage of LEED projects* ▶ **12.4 billion**
Includes LEED-certified, LEED-registered

LEED for Homes Units ▶ **181,221**
CERTIFIED UNITS: **71,454**



*Excludes ND and LEED for Homes

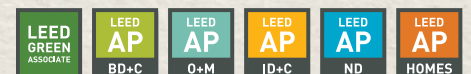
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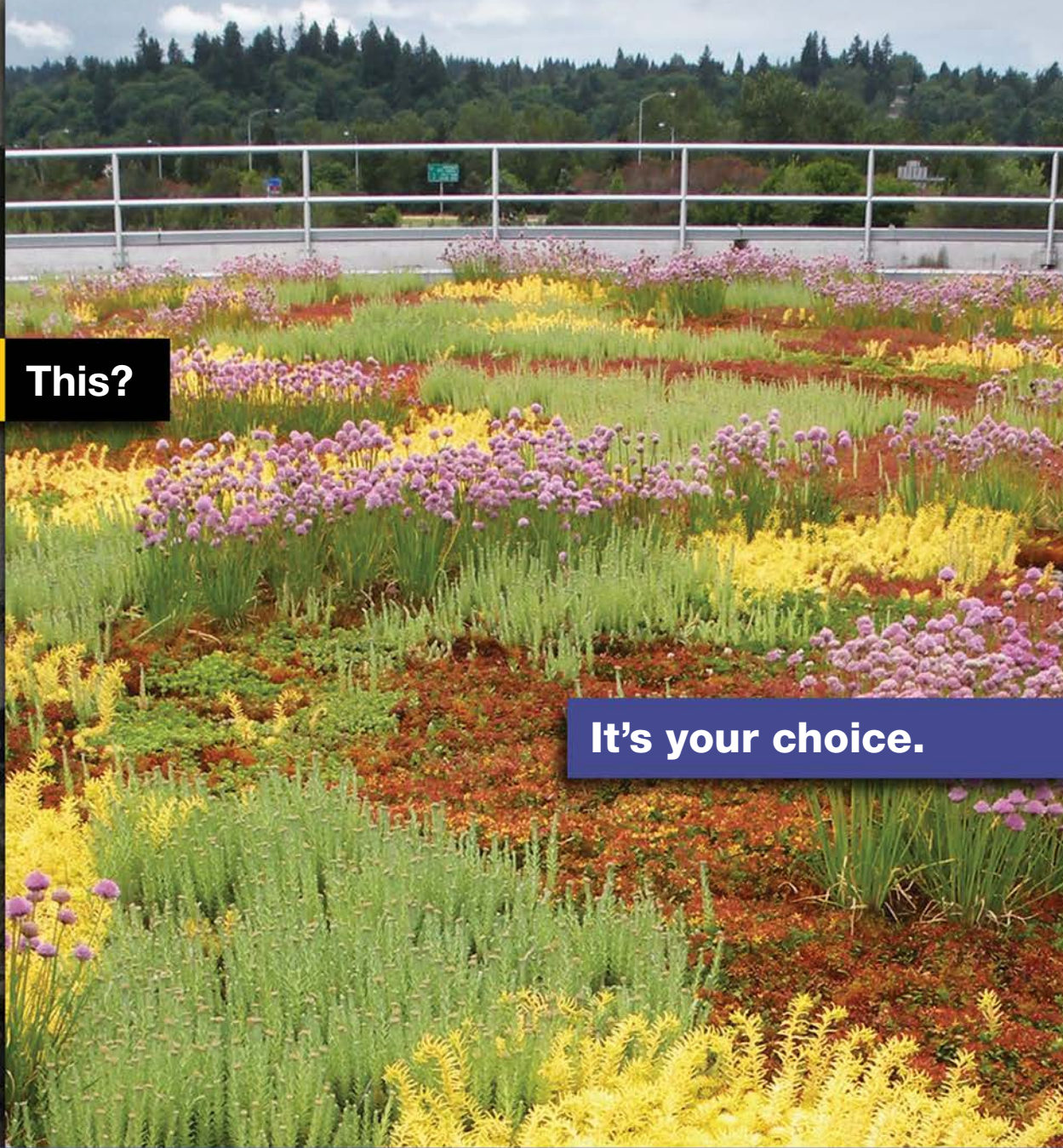
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LEED ON

Leading the Way



MAHESH RAMANUJAM

chief operating officer, USGBC,
president, GBCI

The U. S. Green Building Council (USGBC) has been established for 22 years, and Leadership in Energy and Environmental Design (LEED) for 15.

As we travel around the globe, we hear one consistent message from our leaders: “USGBC is leading the way.” LEED, our tool for market transformation, is used in more than 150 countries and has helped create a trillion dollar industry. USGBC and LEED continue to serve as inspiration for many green building councils and green building rating systems around the world.

USGBC has been able to realize this phenomenal success by associating equal emphasis on the development and implementation of LEED. While USGBC focused on the development aspects of LEED, Green Building Certification Institute (GBCI) began focusing completely and singularly on LEED implementation in 2008. In the past six years, GBCI has accelerated the growth, adoption, and implementation of LEED.

From my past experience with IBM and Lenovo, I know very well that to stay relevant in today’s global landscape, an organization must focus and scale its core competency. In 2013, our board of directors gave me and Rick Fedrizzi, CEO of GBCI, the mandate to “enhance the performance continuum.” Our response to this mandate was a three-step strategy: (1) Continue to focus on capacity building, (2) Create access to a wide variety of markets, and (3) Create significant value to the community, both perceived and actual.

First, GBCI has developed strategic partnerships with Canada, Korea, and Sweden green building councils, in addition to Green Building Japan. We also have established a global strategic partnership with Bureau Veritas (BV) allowing access to their certification capacity in about 100 countries around the world. The Energy Resources Institute (TERI) will help GBCI in India and the Southeast Asia region. These partnerships will focus on establishing regional and local

capacity for certification, credentialing, education, and building performance.

Second, in addition to LEED, GBCI also will become the exclusive certification and credentialing provider for the WELL, Performance Excellence in Electricity Renewal (PEER), Sustainable Sites, and Green Garage Certification standards. Through these engagements, GBCI is able to extend its core competency to new sectors like health, wellness, electricity, microgrids, green parking garages, sustainable land design, and development.

Third, GRESB was added to the GBCI portfolio in September 2014. Global Real Estate Sustainability Benchmark (GRESB) provides the same kind of transparency into the sustainability performance of global real estate holdings as LEED provides to a building. For the first time, there is an asset to portfolio sustainability measurement solution for the world’s largest asset class.

By integrating the LEED Dynamic Plaque, which delivers a live LEED performance score for a building; and GBIG, which provides insights into a green building; into GRESB, GBCI will establish the next generation platform for demonstrating actual and perceived value of green buildings and communities. This is the future.

Recently, I heard a Michelangelo quote in one of our member meetings: “The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark.”

I am grateful that USGBC and GBCI are aiming high with our goals for market transformation. “Everyone in a green building within this generation” is our target, and I have no doubt—with our entire green building community leading us from the front—we will achieve our mark.

LEED ON,



CONTRIBUTORS

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JUDITH NEMES

is a journalist specializing in green issues and urban/corporate sustainability. Her news stories and features have appeared in publications including the *Chicago Tribune*, *USA Today's Green Living Magazine*, *Michigan Avenue Magazine*, and *GreenBiz.com*. She's also an adjunct professor in the journalism department at Columbia College Chicago, where she designed a class on reporting College. Follow on Twitter @JudithNemes and Google+: JudithNemes.

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ALISON GREGOR

has been a journalist at newspapers and magazines for 20 years. After obtaining a master's degree from the Columbia University School of Journalism in 2003, Gregor began her freelance career focusing on coverage of real estate and business in New York City. She has written for the *Columbia Journalism Review*, *Glamour*, *The Real Deal*, *New Jersey and Company*, *NYinc*, *Haute Living*, and other publications.

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CALVIN HENNICK

has written feature stories for a number of national magazines and newspapers including the *Boston Globe*, *The Philadelphia Inquirer*, *New York Press*, *Men's Health*, *Running Magazine*, and *Eating Well* among others. He is a creative writing instructor at the University of Massachusetts.



MARY GRAUERHOLZ

is a healthcare grant writer and feature writer who focuses on sustainability, architecture, health, and food. She has written for a variety of magazines, newspapers, and websites, including *The Boston Globe*, *New Old House*, *Spirituality & Health*, and *Suffolk University Alumni Magazine*. She lives on Cape Cod.



JEFF HARDER

is a journalist who has written for *Triathlete Magazine*, the *Boston Globe Magazine*, *Cape Cod Life* magazine, *New Old House* magazine, *HowStuffWorks.com*, and many other outlets. He lives in Massachusetts.



DANIEL OVERBEY

is the director of sustainability for Browning Day Mullins Dierdorf Architects in Indianapolis. His practice and writing focuses on high-performance building design and construction, applied research in environmental systems, LEED-related services, and energy modeling. He has been published in *High Performing Buildings*, *EcoBuilding Pulse*, and many other outlets.

Illustrations by Rosanna Giorlandino

A hand is shown holding a black frame containing a green graphic. The graphic features the text "BUILD YOUR POTENTIAL" in large, white, bold, sans-serif capital letters. The background of the graphic is a green-tinted architectural rendering of a modern city skyline with various skyscrapers and buildings. The entire scene is set against a white background with a faint, grey line-art sketch of a city skyline at the bottom, including buildings, trees, and a street with benches.

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Q**u**est **vision**

Chairman of the Wellness Institute at the Cleveland Clinic, Dr. Michael Roizen is a champion of good health practices.

BY MARY GRAUERHOLZ

Whether he is writing a best-selling book, creating an Emmy award-winning project, or developing a new patent, Dr. Michael Roizen projects his unique vision of wellness with a ferocious, forward-driving energy. In a world bursting with diet and exercise books, the former anesthesiologist, with his rational, uplifting philosophy, is winning over a worldwide audience hungry for guidance on health and well-being.

But much of Roizen's most influential work is done in a quieter arena, as the chairman of the Wellness Institute at the Cleveland Clinic and the clinic's chief wellness officer, teaching companies and other communities how to establish and sustain health.

For individuals, the heart of Roizen's optimistic message is not just in adopting healthy habits—it is also developing a new way of thinking. "The key is to have a purpose and passion in life, so that everything is fun," Roizen says. "You have to make change happen." This passion, he says, creates the motivation to stay around on earth to enjoy more of life.

For industry and other communities, success is rooted in changing the organizational culture: opening minds to create an environment that promotes physical and emotional well-being, to safeguard people and the earth itself. Or as Roizen says, "Change the environment, change the person."

The first testing ground for Roizen's philosophy is Cleveland Clinic and its 40,000 employees. "As the largest employer in northeast Ohio, we have a responsibility to take a leadership role in making the community more vibrant," he says, "then to take what we learn with our employee base to other corporations."

Creating vibrant communities, he says, means conserving and reinvigorating both its human and nonhuman resources. That means assuring that Cleveland Clinic's building environment is sustainability based. "The clinic has been a leader in recycling, energy conservation, and water conservation," Roizen says. "Any human could literally eat any part of the building materials." Every building material and practice, he says, should be sustainable and efficient in its use of energy and water, leaving as small a carbon footprint

Dr. Michael Roizen is transforming the way Cleveland Clinic employees think about wellness.





Far left: Dr. Roizen is a proponent of walking 10,000 steps a day and believes everything about the work environment must facilitate health.

Left/below: Cleveland Clinic's built environment is sustainable and promotes wellness.

Well-Being

A new pilot project takes wellness to a whole new level.

While Dr. Michael Roizen spreads his message of health and wellness, his colleagues at Cleveland Clinic are building a commitment to green construction. Jon E. Utech, senior director of Cleveland Clinic's Office for a Healthy Environment, sees a natural connection. "Green construction and human and environmental health are intimately linked," Utech says. "When we reduce pollution, our patients are healthier. Roizen is a champion of this."

Cleveland Clinic has found a proponent and partner in the International WELL Building Institute (IWBI), on whose Advisory Council Roizen sits. The IWBI's WELL Building Standard® is the world's first standard to focus on enhancing people's health and well-being through the built environment.

After a two-year pilot program and peer review, the IWBI launched version 1 (v1.0) of its WELL Building Standard in October, says Paul Scialla, founder of the International WELL Building Institute in New York City. The standard, Scialla says, lays out a blueprint for how buildings can create a healthy environment through seven key categories: air, water, nourishment, light, fitness, comfort, and mind. WELL v1.0 comes after seven years of research and collaboration with leading physicians, scientists, and industry professionals, and a three-phase expert peer review process.

These scrupulous peer reviews and an alignment with other standards, such as Leadership in Energy and Environmental Design (LEED), have made the WELL Building Standard the go-to document for affecting human health through environmental sustainability in construction methods. "Our partnership with the Green Building Certification Institute, and the WELL Building Standard's alignment with LEED, demonstrate that sustainability, health, and wellness go hand in hand," Scialla says.

So far, approximately 5 million square feet of commercial, institutional, and multifamily real estate has been registered for certification through WELL. Projects include CBRE Group's Global Headquarters in downtown Los Angeles, the world's first commercial office building to be both Gold LEED and WELL certified. The William Jefferson Clinton Children's Center in Port-au-Prince, Haiti, is a current WELL pilot project. The children's center and orphanage will be LEED Platinum and WELL certified.

The WELL Building Standard's v1.0 is a game-changer for environmentalism. As Utech says, "This is an emerging approach to thinking about healthy buildings that directly links to creating healthy working environments for its occupants."

WELL is third-party certified through the Green Building Certification Institute, which administers the LEED Green Building Rating System. The WELL Building Standard applies to commercial, residential, and institutional projects. Potential pilot projects are encouraged to contact IWBI through www.WELLBuildingInstitute.com.



Transforming **MARKETS**

Benchmarking sustainability is a win-win for global real estate investors.

BY JEFF HARDER

The sustainability performance of portfolios has been an area of increasing focus within the global real estate investment sphere. That's not entirely surprising, considering the impacts buildings can have on the bottom line: Energy efficiency can lead to lower operating costs, vulnerability to extreme weather can mean financial disaster, and bill-paying tenants are increasingly demanding features that promote health and provide superior experience. "One way or another, green building information is relevant to investors," says Chris Pyke, chief operating officer of the Global Real Estate Sustainability Benchmark, also known as GRESB. "How they embed this information into their decision-making is an evolving process, but there's a global consensus that this information should be on hand."

That's where GRESB, an organization that merged with the Green Building Certification Institute (GBCI) last October, comes in. GRESB applies sustainability metrics across real estate portfolios of multiple—and, in some cases, hundreds or thousands—of residential and commercial buildings. Every year, GRESB assesses how property companies and private equity real estate funds integrate and prioritize sustainability; the most recent survey covered 56,000 buildings around the world, worth a combined \$2.1 trillion. "Investors recognize that superior environmental,

social, or governance performance is often a useful proxy for high-quality assets and strong management," Pyke says. GRESB is a window through which pension funds and other institutional investors can find out just how green their assets are—and, in the process, give a market-driven boost to enhance sustainability in the built environment.

In recent years, the finance world has given new attention to environmental, social, and governance (ESG) criteria. "We're not saying that everything has to be green right away, but we think it's important that companies are aware that the world is moving quickly toward ESG awareness," says Gerios Rovers, executive director at the investment firm Cohen & Steers, one of GRESB's investor members. "You've got to think about your environment and how your products fit into it, and that applies for real estate."

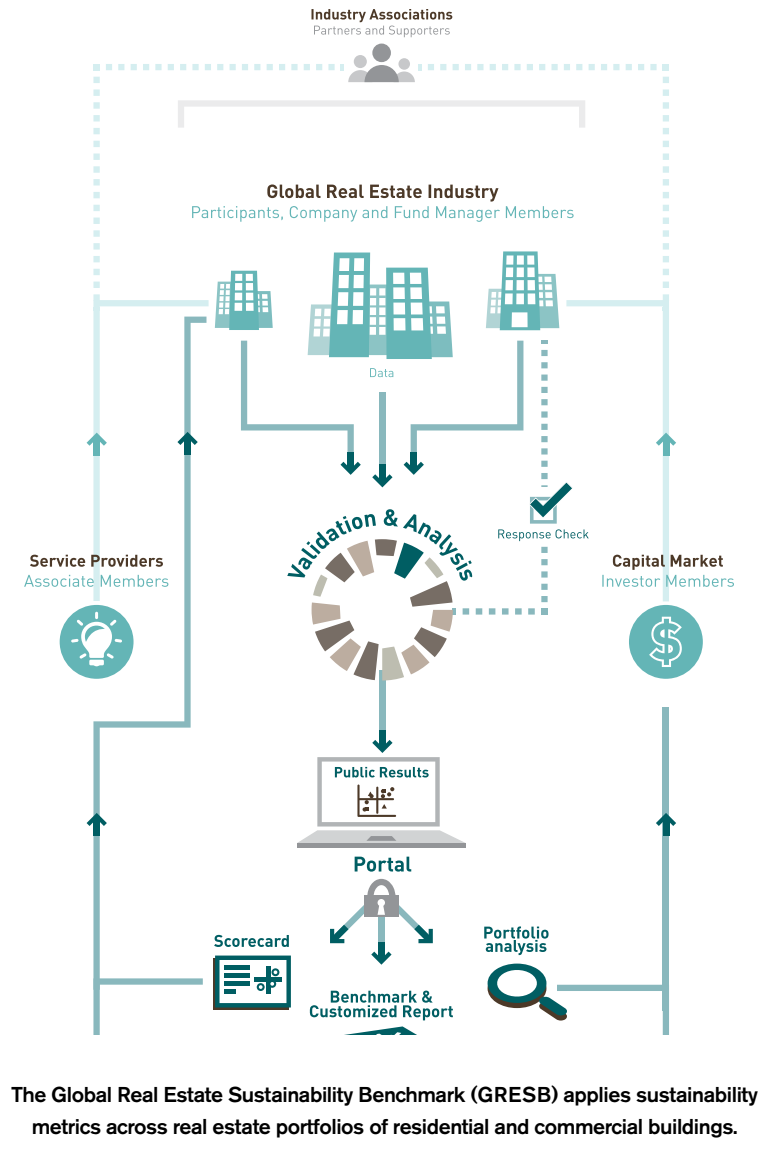
Back in 2009, with reliable ESG metrics hard to come by, Dr. Nils Kok, an entrepreneur and associate professor of finance and real estate at Maastricht University in the Netherlands, spearheaded the creation of GRESB. The organization's core functions involve establishing criteria, facilitating participants' responses, and benchmarking how participants measure up. "This is something that really complements the traditional focus that green building has on individual project certification and helping projects get greener," says Pyke.

The cornerstone of GRESB is an annual survey geared toward looking at how sustainability fits into the interests of property companies and private equity real estate funds. Every year, between April and July, companies and funds provide comprehensive data on how sustainability fits into their overall strategies, whether they assess long-term climate-change-related risks before acquiring a property, measurements of their energy consumption and greenhouse gas emissions, and other facets of sustainability performance. In September, after vetting the data, GRESB releases an analysis that assigns each participant a score reflecting their performance—both in absolute terms and relative to their peers’ performance—as well as areas for improvement.

Those scores contribute to one of four categories that indicate how well the participant has woven sustainability into its portfolio—Green Star is the highest ranking. GRESB enables institutional investors to request survey results from companies and funds. “By asking for those results, you’re telling your investments, or the companies and funds you’re considering investing in, that you care about [sustainability] issues,” Pyke says.

By using the information available through GRESB—and associating strong results with high-quality assets—investors can spot underperforming funds and take action. “This typically does not disqualify the fund from investment,” Pyke says. “Rather, it may lead to a dialogue with the fund about how to improve its performance over a specific period of time.” In the future, investors could opt to select only top performers, or devote their resources toward improving low performers and capturing benefits.

In the five years since its inception, GRESB has seen growth in the number of respondents, and progress in how those respondents make sustainability a priority. In 2014,



the survey had 637 participants—up from 543 the previous year, and roughly 200 in 2009. More than three quarters of participants employ monitoring systems to measure energy and water usage, greenhouse gas emissions, and waste. “GRESB basically uses transparency to encourage the pursuit of these activities,” Pyke says. And 36 percent of participants overall are Green Stars, compared to 22 percent in 2013, and the average participant score overall was nine points higher than in 2013.

When you look at the scores, it’s important to forget about the grades you got in high school: 2014’s average score of 47 out of 100 doesn’t indicate failure, Pyke says. “GRESB is a relative system, and that’s exactly where the middle should be,” he says. “...What we’re trying to say is who

is relatively the best, and who has room for improvement. If we got to a point where everyone is [a Green Star], that would mean that GRESB isn’t doing what it should.”

The results also allow region-by-region breakdowns of sustainability performance in different markets. Australia and New Zealand are perennial leaders, with 70 percent of participants earning Green Star designations in 2014. By contrast, just 32 percent of North American participants were Green Stars. But considering that sustainability is “baked in” to the Australian market, Pyke says, he’s sanguine about our larger region’s future. “I think that when you look at Australia, you’re looking at the U.S. two or three years down the road.”

But when you start to wonder why real estate portfolios in North America aren’t neck and neck with their antipodean counterparts, the answer, he says, isn’t as important as the fact that GRESB provides the data and the transparency to make those observations in the first place—something that would have been impossible a little more than half a decade ago. “The details aren’t that important,” Pyke says, “but the fact that investors can and do ask the question is transformative.” ●

GREATER GOOD

LEED steps into the arena
of social equity with
its newly launched
pilot credits.

BY JEFF HARDER

What if a Leadership in Energy and Environmental Design (LEED)-certified building was as much a benefit to the people living and working around the block as it was to the people on the top floor? What if the workers who built it moved on with new skills and brighter prospects for the future? What if the building used ethically produced materials from the ground up? What if LEED buildings, beyond being healthy and environmentally sound places to live and work, were bona fide forces for social good?

With the recent launch of LEED's Social Equity Pilot Credits, those hypotheticals are beginning to seem a little more real. The set of three one-point credits—Social Equity Within the Community, the Project Team, and the Supply Chain—accounts for the social impacts of building design and construction with a focus that the LEED rating system has never employed before. The credits earned a Malcolm Lewis IMPACT Award at Greenbuild 2014 last October, and while it's too early to glimpse their full impact, the energy and enthusiasm for what's to come is unmistakable, says Susan Kaplan, a co-chair of the Social Equity Working Group. "I've been working on LEED committees for more than 10 years, and I've never seen so much excitement."

With more than 14 percent of Americans living below the poverty line during a drawn-out economic recovery, social equity remains a pressing concern, and sound buildings have potential to be forces for good in the communities where they're assembled. But while LEED never completely overlooked the social impacts of the built environment, it didn't address them with the same fervor as resource conservation and battling the environmental impacts of climate change. Before getting to work on LEED v4, Brendan Owens, the USGBC's chief of engineering who helps establish LEED's overarching system goals, surveyed how well the existing framework addressed social equity issues. "We really came to the conclusion that while we had credits that touched on aspects of each of those things—power-plant siting, energy use, and air quality are all social equity issues—we didn't really have anything that was specifically focused. We felt there was more we could do to use the rating system to effect change."

Once LEED v4 added enhancing social equity, environmental justice, community health, and quality of life to its seven system goals, says Joel Ann Todd, another co-chair of the Social Equity Working Group, "It gave us a firmer foundation for looking at social equity and other aspects that had been ignored thus far in LEED." After establishing

Chicago's Town Hall Apartments may be among the first projects to fit the criteria of LEED's social equity credits.





the Social Equity Working Group, members Kaplan, Ann Todd, Heather Rosenberg, and others spent hundreds of hours speaking with organizations devoted to low-income communities and environmental justice, and thinking about incentives LEED could provide to encourage engineers, architects, and managers to consider social equity in their projects. “For a lot of engineers and architects, this was a completely new world,” says Kaplan, “and it had us really scratching our heads in the best way to get project teams to understand what could be done.”

The result, unveiled at Greenbuild, is three credits added to LEED’s Pilot Credit Library, each devoted to measuring and fostering a piece of the social equity puzzle. The first, Social Equity Within the Project Team, concerns the workers directly involved with design, construction, and ownership of the project. The cornerstones involve paying fair wages—commensurate to specific local or national guidelines, depending on the project’s location—and providing access to training programs designed for workers to leave a project possessing more job skills, life skills, and opportunities than when they arrived.

Social Equity Within the Supply Chain aims to source building materials from suppliers who foster healthy, just environments for the workers who produce them. Among other criteria, the credit requires that suppliers provide safe working conditions, fair wages, and ethical labor practices that avoid using child labor or sweatshop conditions.

Finally, the Social Equity Within the Community credit seeks to connect projects with the folks living in their vicinities—especially those most vulnerable to the impact of the project—and develop strategies for addressing broader

social needs. The specifics vary by community, but the approach involves reaching out to religious and civic groups, neighborhood organizations, and other parties to figure out how to engage communities for positive results. “We’re really trying to reward project teams and give them incentives for actively engaging in a conversation with the community that they’re moving into about what a successful project in that community would look like,” Owens says. “It’s about what the neighborhood can do to support the project, and what the project can do to support the neighborhood.”

While several projects have applied for the credits, Chicago’s Town Hall Apartments are likely to be among the first to achieve them. Built within a decommissioned police station, the 79-unit senior housing complex in the heart of the city’s LGBT community helps a demographic facing a lack of affordable housing. “Providing these seniors the ability to age gracefully within their community not only reduces their annual carbon footprint by half, but it also keeps them connected to a healthy, walkable urban lifestyle with access to amenities, such as healthcare and public transportation, that support their daily lives,” says Gail Borthwick, design director for Gensler, the architecture and design firm that helped bring the project to fruition.

Features of the complex’s design include two green roofs to collect stormwater runoff and healthy building materials that avoid toxic off-gassing. “We also were careful to specify a high percentage of our materials from local sources, in part to promote employment growth and product innovations in our larger Chicagoland community,” Borthwick says. During the project’s execution, previous contamination on the site from leaking gas storage drums was restored to safe

**“I’ve been working on LEED committees for more than 10 years,
and I’ve never seen so much excitement.” –SUSAN KAPLAN**

levels. By repurposing a structure that had been part of the neighborhood for more than a century, the project maintains a sense of authenticity in the broader neighborhood, while simultaneously reducing the raw materials that needed to be processed and shipped to the site. Today, the complex incorporates measures to improve the lives and health of its tenants, like a fitness room and a therapist on staff, as well as access to the services at the adjacent Center on Halsted senior community center.

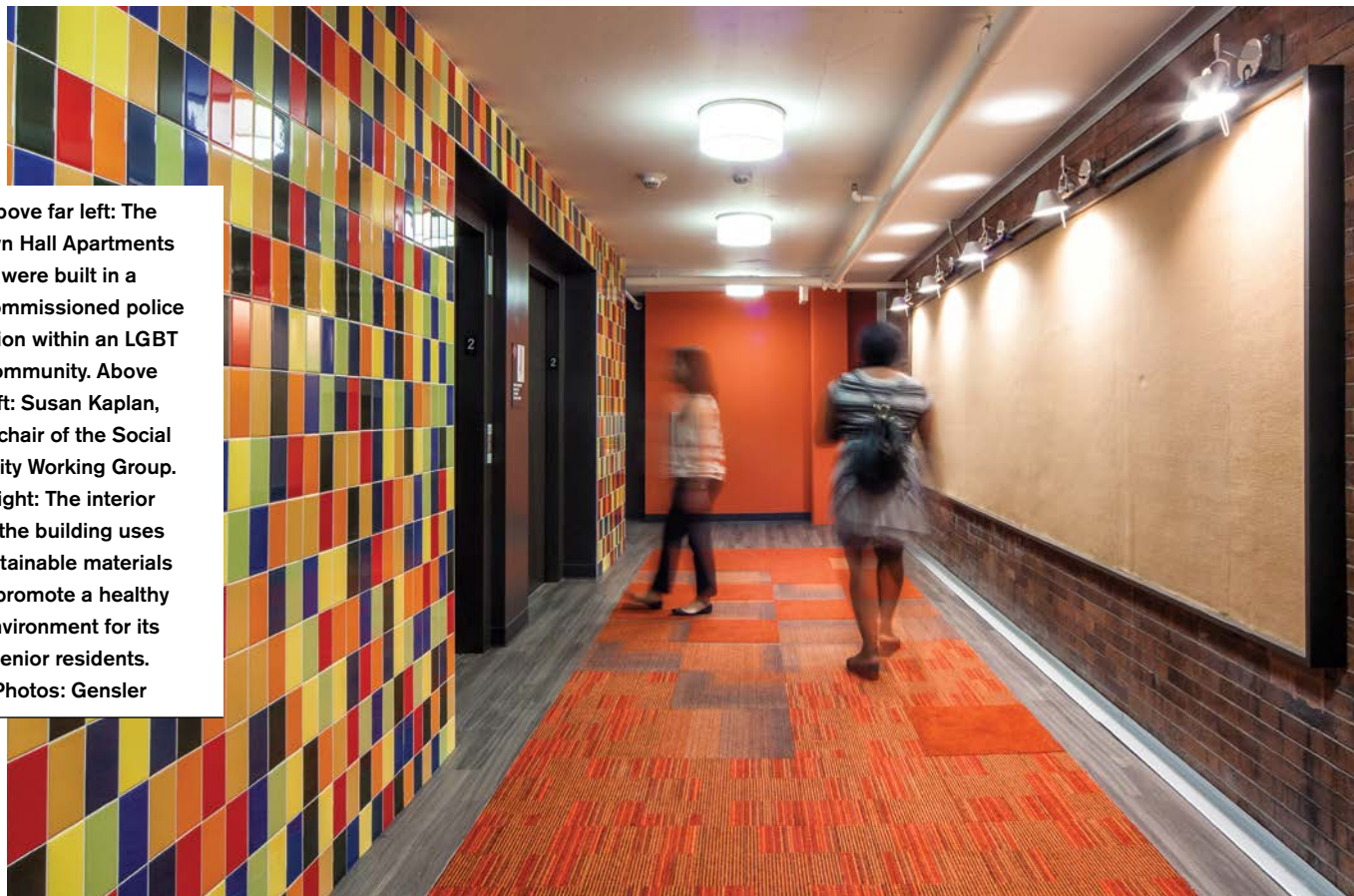
When Borthwick discovered the Social Equity Pilot Credits at Greenbuild 2014—in the midst of Town Hall Apartments’ LEED review and a few months after tenants began occupying the building—she was immediately interested. “Generally, for LEED credits, you need to develop a strategy to achieve the credit at the beginning of a project, but we had intuitively met all of the criteria they seemed to be looking for,” she says. Now that the credits are within reach, Borthwick is eager to see how the complex could make a broader impact. “The designation would allow us to not only showcase the project, but also bring the issue of the shortage of affordable senior housing and the importance of community in sustainability to the forefront.”

Along similar lines, Kaplan and Ann Todd say there has been a deluge of emails, phone calls, and face-to-face conversations expressing interest and excitement around the Social Equity Pilot Credits. “Everyone has said, ‘This is an idea whose time has come,’” says Ann Todd, adding that the enthusiasm has gone international. “People from developing countries are saying that this is what we need to bring green building to countries where developing social infrastructure is as important as the environmental side of things.”

When LEED was first launched, Owens says, so many projects exerted so much time and energy getting up to speed on the system’s energy efficiency and indoor environmental quality elements. Today, the fact that social equity is now under LEED’s umbrella is a sign of the system’s maturity. “I think [a greater focus on social equity] is a signal that we can deal with a more integrated, holistic approach in developing LEED projects. There’s definitely been a very positive market transformation: We’ve gotten people so familiar with the way the LEED rating system works that now we can have a broader, more interesting conversation that includes other critically important topics.”

And one more thing, Owens says, “This is just the start.” ●

Above far left: The Town Hall Apartments were built in a decommissioned police station within an LGBT community. Above left: Susan Kaplan, co-chair of the Social Equity Working Group. Right: The interior of the building uses sustainable materials to promote a healthy environment for its senior residents. Photos: Gensler



Raising the Bar

A new partnership between the USGBC and UL sheds light on product transparency.

BY DANIEL OVERBEY

It has been 15 years since the U.S. Green Building Council (USGBC) launched the Leadership in Energy and Environmental Design (LEED) green building rating system. That first year, 51 projects participated. Today, LEED is the most widely recognized green building program in the world, guiding the design, construction, operations, and maintenance of over 68,000 projects globally.

With the emergence of LEED, USGBC's mission of market transformation took the first steps toward realization. Credits for single-attribute building products featuring recycled content, certified wood, or regional sourcing prompted manufacturers to not just divulge such characteristics about their products, but also to make the information easy to find. Today, manufacturers of building products routinely offer lists of green attributes through convenient resources.

As the market for green building products continues to evolve and improve, it is clear that LEED must continue to lead if it is to remain relevant. Enter the rating system's

latest update—version 4—where credits have been revised to ensure that they truly add quality to the utility of a project. In the case of building products, this means going beyond crediting single-attributes and toward an integrative life-cycle-based framework by encouraging manufacturers to disclose information about the materials that comprise their products—enabling practitioners to make better decisions.

For well over a decade, Interface—a global manufacturer of commercial carpet tile—has offered customers products with single-attribute “green” characteristics, like recycled content. Yet, Mikhail Davis, director of restorative enterprise at Interface, is quick to point out that it was not until the company adopted a life-cycle approach to sustainability that the true impacts of Interface's products could be understood. In fact, Interface learned that increasing the recycled content could actually increase the environmental footprint of their products if they did it wrong. “Life-cycle assessment gave us a way to model changes to our



Mikhail Davis, director of restorative enterprise at Interface, explains it was not until the company adopted a life-cycle approach to sustainability that the true impacts of Interface's products could be understood.

Photo: Huntsman Architecture

products in advance to see if they would move the needle in the right direction, rather than creating unintended new impacts, perhaps at a less visible stage of the product life-cycle." Interface's early efforts to put recycled content in their products focused on the backing, the component they make themselves. "But a life-cycle assessment showed us that until we got our nylon suppliers on board, we were not going to be able to seriously shrink our impacts," explains Davis. In 2011, years of supplier engagement bore fruit in the form of the company's first 100 percent recycled content nylon yarn products, which have a dramatically lower environmental footprint.

The transformative potential of disclosing the life-cycle environmental impacts of building products is not lost on USGBC. One of the ways LEED v4 encourages life-cycle-based decision-making is by crediting projects for using products with fully disclosed ingredients. The most popular reporting tool through which a product's life-cycle impacts are

conveyed is called an Environmental Product Declaration (or EPD). These are comprehensive, internationally harmonized documents through which manufacturers can provide transparency about their products' ingredients. Think of EPDs like the nutrition facts label on the side of a box of cereal—only for building products. In the case of LEED v4, eligible EPDs must be third-party reviewed and certified.

EPDs are not new. They have been around in Europe since the 1990s. However, only since USGBC took a bold stand on product transparency with LEED v4 has the EPD marketplace blossomed domestically—a testament to LEED's ability to shift the market. "EPDs have experienced an explosive level of growth. Five years ago, one would be lucky to find 10 or so EPDs, whereas now there are close to 300 to 400 EPDs, when considering all the North American programs," states Paul M. Firth, product manager at UL Environment, a division of Underwriters Laboratories (UL).

“Manufacturers will be able to develop and certify EPDs with LEED-specific criteria in mind, thus providing their products a differentiator in the marketplace.” -PAUL M. FIRTH

LEED v4 uses EPDs as a tool to promote product transparency, but it also encourages project teams to use the information to make better choices about building products and, consequently, optimize the life-cycle environmental impacts of a project. This is easier said than done in a burgeoning EPD marketplace. The reality is that the market has not quite matured to the point that EPD comparison and product optimization is widely practical. There are a few particular obstacles to greater market uptake. Confusion abounds regarding the usefulness of EPDs; they frequently offer incomparable information; and program operators (the entities that oversee EPD development) are not regulated by consistent standards.

In order to overcome these obstacles and accelerate market transformation, USGBC and UL Environment entered into an exclusive partnership just over a year ago. The partnership is focusing on building materials and product transparency.

The leading program operator in North America, UL Environment is uniquely positioned to facilitate USGBC's work through LEED. “We decided to partner with UL because they have demonstrated they can produce and deliver high quality EPDs,” says Sara Cederberg, technical director at USGBC. With over 120 years of experience with manufacturers in industries ranging from electronics and consumer products, to the automotive industry, UL understands the challenges that companies face.

Prior to LEED v4, the organic nature of market activity related to building product life-cycle assessment allowed manufacturers to engage substantively in the creation of a broad range of tools with varying degrees of oversight. Transformation and innovation was decentralized. The trade-off was significant confusion and a slow rate of market maturity.

Acknowledging the confusion, one of the first things to be addressed by the USGBC/UL Environment partnership will be EPD delivery. “We're starting with EPDs because that's an area where the consistency and credibility are currently a bit problematic,” explains Firth.

UL Environment ensures that all of their EPDs conform to international standards. However, they go a step farther by delivering a concise transparency summary, which essentially serves as an EPD executive summary. The summaries are usually just a few pages, making essential data more palatable to practitioners. Interface—the first North American

company to deliver an EPD—has worked closely with UL Environment for a number of years and understands that the market success of EPDs will hinge on content delivery. Davis states, “We worked with UL Environment to develop the transparency summary format because we understood that EPDs will not increase product transparency if the important EPD facts like material ingredients or carbon footprint are too difficult to find.”

Through a joint EPD program, USGBC and UL are endeavoring to bring a clarity commensurate with the UL transparency summary to the EPD marketplace at large. The belief is if project teams are presented with a succinct and coherent EPD format, then a multi-attribute framework for building product choices may be leveraged more successfully.

The real value in promoting transparency is exposing the detrimental environmental impacts over the creation, usage, and disposal (or reuse) of a product. LEED v4 encourages teams to go one step farther by using the information about the impacts in order to optimize product selection. EPDs are useful because they present life-cycle performance information through numerous distinct environmental impact categories. The problem is that the categories—such as acidification of land and water sources, formation of tropospheric ozone, and eutrophication—are somewhat esoteric and measured in complex units that vary considerably based on which method is adopted for the life-cycle assessment (LCA). Firth affirms, “Ultimately, the goal is to be able to use these EPDs to compare products—currently they are not quite ready for this.”

EPDs simply report the results of an LCA. To the extent that LCAs for similar products may be scoped differently, one can look to the “rules” defining their respective assessments—termed product category rules (PCRs). “In order to produce high quality EPDs, we must first provide robust product category rules,” Cederberg explains. There are a handful of PCR guidance documents available internationally, but they are open to a wide range of interpretation.

To establish greater consistency, USGBC and UL Environment are exploring a common PCR development framework that addresses the aspects of inherent variability in PCRs to date. “One of the reasons the USGBC/UL partnership was launched is to try to help narrow in on those aspects of LCAs, PCRs, and EPDs that need to be refined to best provide information necessary to make an informed comparison,” states Firth.

All Type III (third-party verified) EPDs require an independent agency, called a program operator, to ensure that EPDs are developed in accordance with international standards.

According to USGBC's Cederberg, another important piece of developing a quality EPD is ensuring the program operator is experienced and credible. "Just like we look for credentials for commissioning agents or require labs to be accredited for testing low emitting materials, so too would we want to be sure that there is a level set for program operators." The USGBC/UL Environment partnership is in the early stages of developing such criteria.

The intended outcomes of the USGBC/UL Environment partnership focus on the coherence, consistency, and technical rigor of the EPD development process. This in turn will accelerate the rate of market transformation and improve the overall quality of transparency in the building product market sector.

Considering past successes in shifting the marketplace, it makes sense that LEED could serve as a vehicle for greater market transformation. Firth suggests, "Manufacturers will be able to develop and certify EPDs with LEED-specific criteria in mind, thus providing their products a differentiator in the marketplace."

Davis attests that rigorous product transparency holds the promise of incentivizing manufacturers to take on the tough challenges that will really improve their products, rather than doing just enough to make a product claim. "For example, we could claim recycled content using recycled mineral fillers in a product, but EPDs show that only when we replace high-footprint plastics like nylon with recycled or biobased substitutes can we really reduce our impacts."

The promise of the partnership, however, goes far beyond LEED. Armed with consistent declarations and comparable data, a more sophisticated marketplace may be able to aggregate building product data to achieve environmental building declarations. Practitioners may eventually be able to optimize impact categories through building information modeling (BIM). It is even conceivable that building occupants will someday be able to observe real-time impacts on a dashboard, such as the LEED Dynamic Plaque.

The USGBC/UL Environment partnership sends a clear message to the marketplace—the stakes for product transparency have just been raised. ●



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EMERGING LEED

A LOOK AT INNOVATION AND INSPIRATION IN SUSTAINABILITY.

WRITTEN BY **JUDITH NEMES**

If you threw a dart at a map of the U.S., chances are good you'd hit a city with some innovative green projects in the works, yet some urban centers stand out more than others. They're emerging as leaders in specific areas of sustainability that are likely to change the character of their city and the way they're viewed nationally, even internationally. Seattle, Houston, and Atlanta exemplify some of the ambitious green endeavors underway in the country. We're betting they can offer inspiration to green champions elsewhere.

Seattle

Seattle isn't likely to come to mind when you think of an emerging sustainable city in 2015. You could argue Seattle emerged on the green scene more than 20 years ago, long before most other urban centers in the U.S. were even thinking about how they could embark on sustainable endeavors. And yet, the city on the (Puget) Sound is at it again—pushing the green envelope in new ways that once again raises the bar on reimagining our urban eco-experience.

"There was this combination of a creative city with lots of economic vitality and set in a beautiful and somewhat wild setting that created tension and opportunities 20 years ago," says Tom Paladino, founder and CEO of Paladino and Company, a Seattle-based green building and sustainability consulting firm. "LEED (the U.S.



Green Building Council's Leadership in Energy and Environmental Design rating system) emerged from that."

"Today that continues in Seattle with a focus on carbon reduction at the city level, a wave of building renovation based on seismic upgrades and great interest in older structures, and a heightened focus on the wellness of the people that live and work in the buildings," says Paladino, who is considered one of the pioneers of the green building movement and one of the original creators of the LEED green building rating system.

New kinds of green building experiments are underway in Seattle that will likely redefine the boundaries going forward. Architects, engineers, consultants, and interior designers are collaborating on new structures that are more mindful than ever of energy and water consumption, building materials, and air quality. There's also a lot more emphasis on how people working within those buildings interact with their surroundings for a more healthful, positive experience.

In addition, there's provocative design work taking place that is finding new uses for older buildings and new design strategies that emphasize how workers use the space.

As older cities—including Seattle—reinvent themselves, there will be lots of renovation of older structures because that's where the creative types want to work, asserts Paladino. "People want soul and character to a building so there's a renewed appreciation for the randomness and grittiness of the city that they find in these older structures." His firm continues to work on projects on that cutting edge of excitement in green building.

The Union Stables renovation project, now under construction and nearly completed, is a great example of a Seattle structure being transformed to meet those new workspace expectations. The 1909 building was originally a parking garage for horses, filled with stables for the animals when they were off the streets. The historic landmark, which had been vacant for the last 15 years,

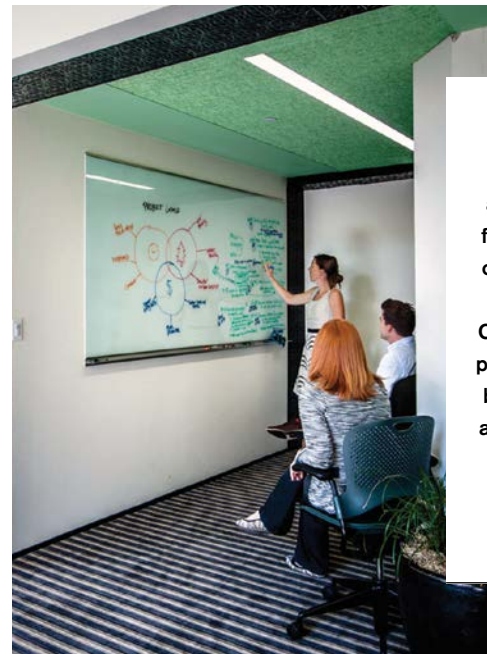
had a brick exterior and timber frame interior, explains Paladino, whose firm was a consultant on the project. Tenants for the four-story building will include Weinstein A+U, the Seattle architectural firm that redesigned Union Stables, a technology company, and a pub.

There are many challenges renovating older buildings and incorporating the latest iterations of green building design. The Union Stables team had to decide what to save and what to take out. "This is a building that has a beautiful set of old bones, but you have to find a way to elegantly mesh modern people patterns to the historic bones of a different era," says Paladino.

Architects redesigning the windows on the Union Stables building, for example, had to adhere to strict landmark designation rules to preserve the exterior look. They had to simultaneously meet tough city energy codes with a well-sealed window design. And the windows had to be operable so they could be opened during the day and meet wellness standards of fresh air circulation for employees who work there, explains Paladino. "You need a much more complex brain to operate these kinds of building systems, especially when there's a higher interaction of people with the building systems."

Seattle has become a testing ground for an innovative green design concept called the "Abundance Approach." Developed by Paladino and his colleagues, the concept encourages designers and architects to first look at what is present on the project in abundance, and then figure out how to put that resource to work. He used the new 10,000-square-foot Seattle headquarters office renovation of Paladino and Company in 2014 as an experimental opportunity to apply that design technique.

So lots of bicycles become art on the wall instead of gear that requires a closet. High concrete ceilings became part of the cooling system rather than a rough surface that needed to be hidden, he explains.



Far left: Tom Paladino is the founder and CEO of Paladino and Company, a sustainable consulting firm in Seattle. Paladino's offices are in a renovated historical building. Concrete ceilings become part of the cooling system, bicycles become wall art, and sustainable materials abound throughout the interior space. Photos: Paladino and Company

In another example, employees there spend a lot of time collaborating on projects during the day so they decided to designate more of the office footprint to the group space instead of the individual desk areas, says Paladino. A huge box of “we” space was created within the central area of the full-floor office that included collaborating rooms with floor-to-ceiling glass whiteboards and another wall with a stickable pinup surface. The rooms come in different sizes to accommodate different size groups including those with two, four, or eight people. There is a larger 24-person room and a 40-person version as well.

There also are spaces within the office that have access to more sunlight and open work areas with walls that are brightly painted; there are other work spaces with colors that are more subdued to appeal to different moods of the staff at any given time, he explains.

“We give people the ability to move their location in the office rather than placing a lot of technology to change the thermostat or increase air flow at their stationary desk,” he explains.

As a result, the individual “me” spaces are smaller than the average office cubicle and the open “we” or communal workspace is much larger. “We said: What’s the smartest use of our people and let’s configure our space to that,” says Paladino. “That’s the new formula for green design. Before, we would measure and tape the work space and put people in it.”

Paladino’s office renovation garnered a LEED v4 Gold rating from the USGBC, a relatively new upgrade to the organization’s rating system. That rating is difficult to achieve because of its rigorous requirements, including inclusion of wellness standards for employees in the building. The Paladino office renovation project was only the seventh certified LEED v4 Gold rating in the world and the first one in the Pacific Northwest.

These kinds of office designs are going to be essential to attract creative millennials to work for certain types of companies, insists Paladino.

“When you have a digital native and you hand them a laptop, cell phone, Skype, and the ability to work remotely from anywhere, you have to create an effective workspace that makes it a better place for them than working at home or at a coffee shop,” he says.

Houston

Houston is often considered synonymous with the big oil and petroleum companies that are headquartered there. But if Roksan Okan-Vick has her way, very soon more people will think of the “Bayou Greenways” and alternative transportation when Houston is the topic of conversation.

Indeed, an ambitious \$220 million public/private partnership now underway is radically transforming and creating 300 miles of greenways throughout the bayou waterway system in Harris County that leads into Houston and criss-crosses throughout the city. The plan is to create a continuous path of biking, running, and walking that will touch just about every community in the city, according to Okan-Vick, executive director of the Houston Parks Board, a nonprofit organization that works in partnership with the city of Houston on parks and other green spaces. The initiative will connect mismatched pathways and build new ones where none exist. Some 4,000 acres of new green space up and down the corridors alongside the bayous will be created as well, she says.

“The bayous already are part of the fabric and quality of life we have here,” explains Okan-Vick, who also is an architect and urban planner. “They drain the lands all the way to the Gulf of Mexico. But they also are the most beautiful natural happening in our city with bayou corridors that are incredibly rich ecologically.”

The Bayou Greenways Project is one way city officials hope to draw more people to move to Houston.



Right. The Bayou Greenways offer an alternative to driving to work. Far right: Roksan Okan-Vick is the director of Houston's Parks Board. Photo: Michael Stravato

Many other U.S. cities are undertaking their own flavor of off-road trails as alternative means of transportation for residents to get around for both work and play. The Houston initiative, however, is more ambitious than most in the sheer magnitude of the pathways that will be created and interconnected. City planners also were intent on making sure that every neighborhood in Houston benefits from this project instead of just carving out neighborhoods with high real estate values for the benefit of a smaller fraction of the population.

What's more, city officials intend to tout this project as a reason for people to move to Houston. The city won't just be about oil any more.

"We're growing so fast as a city and we want to make sure we can attract the best and brightest to come live here," says Okan-Vick. "Environmental leadership is something we need to pay attention to in a real way and the Bayou Greenways project is a way to use our natural assets as a draw to our city."

Big population boosts can offer both a blessing and a curse. The greater Houston area has close to four million people today (about 2.2 million living within the city limits) and is on track to double in the next 30 years, says Okan-Vick. From an urban planning standpoint, there was some urgency to create solutions for the projected congestion of so many more cars anticipated on the roads that go hand in hand with population growth. The Bayou Greenways will hopefully inspire many people who work relatively close to where they live to ride bikes to work and leave their cars at home, she notes.

"We are so in love with our cars in this city that it will take a mind shift to get people out of their cars to use the greenways instead," she suspects. "But we have a few counters in some spots and the numbers of people using the greenways there are staggering. When we build more of it, I'm sure more people will use it."

Houston is known for having a decent amount of green space but much of it is clumped together in big parks. Many underserved communities in Houston have relatively little or no green space at all, explains Okan-Vick. An important element that got city officials and some private donors on board with this project was the underlying equity factor: The greenways would be equally distributed throughout the county and all neighborhoods within the city of Houston, says Okan-Vick.

"Some parts of the city are park-poor and that population doesn't have access to nature where they can get exercise and stay healthy," argues Okan-Vick. "The need for these greenways is more important in these neighborhoods where there are higher obesity rates. By bringing those green assets closer to these residents, there's an incentive to take a dog on a walk or go for a run. This is really important for the health of our city."

When the entire project is complete, it's expected that more than half the population of Houston and Harris County will be within 1.5 miles of a greenway path.

Another impetus to get this project off the ground was an analysis that determined more established greenways alongside the bayous will aid in flood control of storm water, and overall water quality enhancement. More land next to the bayous will absorb more water during major rain events and could prevent floodwaters from heading into nearby neighborhoods, she says.

"By virtue of having green, spongy land next to the bayous, the stormwaters slow down and filter into the water, which improves the overall quality of our water," explains Okan-Vick. Besides, "It's harder to build in a flood plain so it's not likely that highrises would get built on that land any time soon."

The initiative for this mammoth green project started about five years ago with various players gathering to look at the best ways to maximize the natural resources



of the city. They settled on the obvious: connecting a long corridor of paths for biking and hiking that would run along the hundreds of miles of existing bayou waterways. After analyzing the full scope of this endeavor, the project's planners concluded they would need \$490 million for the countywide component, recalls Okan-Vick. They decided to divide the project into two phases—the first phase would focus on the area within the city limits with a cost estimate of \$220 million.

They approached the Mayor of Houston, Annise D. Parker, and asked if she'd include a request for \$100 million in a planned \$410 million special bond issue referendum that was scheduled for a vote by city residents in November 2012. The nonprofit told the mayor they would launch a fundraising campaign to solicit the remaining \$120 million from private foundations and corporations.

The mayor agreed and the bond referendum passed with approval for the \$100 million earmarked for the Bayou Greenways initiative.

Now that the project is underway, "The Bayou Greenways 2020 is a showcase project for Houston because it demonstrates the interconnectivity of sustainability and resilience," says Mayor Parker. "The connected greenways and hike and bike trails demonstrates our commitment to providing alternative transportation options. Bike commuters will have an added option of taking a scenic ride along the bayou to get to work, and we are excited about this opportunity to help alleviate some traffic congestion in our city."

Okan-Vick was grateful to the mayor for getting behind the project in its early stages and supporting the request for public funding. "I need to give the mayor credit

because she led this effort not knowing how it would turn out," she says. "Public funding for these projects can't happen without elected leadership behind it."

On the private donor front, an impressive \$80 million of the total \$120 million was raised as of late 2014. Some of the private funds already are being used to buy land next to the bayous that are owned by the county, and other private interests.

Big chunks of donations have come from prominent family foundations. The Elkins Foundation, which focuses on Houston-based projects, was eager to get on board.

"The Bayou Greenways project touches almost every corner of our city and will enable many more Houstonians to have access to the most significant natural assets we have in the midst of our fast-growing urban environment," says Leslie Elkins, a trustee of the Elkins Foundation and an architect whose work is rooted in sustainability. "It resonated with our trustees because of the huge impact it will have on the quality of place for all of us who live and work here."

In 2013, Mayor Parker told the C40 Cities Climate Summit in Johannesburg, South Africa, that "Houston has proven to the world that it can maintain its title as the energy capital of the world while at the same time pursuing green policies that lift our reputation as a world leader in sustainability."

The entire Bayou Greenways project is expected to be completed in about six years. Luckily, they have had community support that included residents at the grassroots level voting in favor of the bond issue, private funding stepping up, and elected leaders in high office getting behind it too.



Atlanta

Atlanta is on a quest to be recognized as a regional leader in sustainability. Civic leaders in Atlanta, like many other cities that are building new sports stadiums, museums, and other large-scale gathering venues, are commissioning them to be constructed with green design features so they can tout their metropolises as more eco-friendly. Getting that LEED certification plaque in the front lobby is certainly one measure of proclaiming how green you are.

For the most part, it's not the bragging rights they're after—it's the desire to construct sustainable buildings that will leave a softer carbon footprint on the planet going forward since those structures are likely to be part of the urban landscape for the next 50 years or longer.

But what happens when city officials turn their attention to a massive meeting place that's already been around for decades—like the Georgia World Congress Center (GWCC)—and apply the same LEED certification requirements to bring it up to current sustainability standards? The folks running the facility get a daunting project on their hands.

Last fall, the convention center, with 3.9 million square feet of space spanning across three connected buildings, was awarded the U.S. Green Building Council's LEED for Existing Buildings (EB) certification at the Silver level. As of last fall (2014), the GWCC, which is governed by the Georgia World Congress Center Authority, nabbed the title of world's largest LEED-certified convention center.

"Documentation for LEED certification is very rigorous," observes David Freedman, executive director of the Georgia Chapter of the U.S. Green Building Council. "But it means something. The USGBC isn't trying to scare people off from going through the process. But when you go into a building and see the LEED plaque, people know that a lot of effort went into making that happen."

The GWCC's ability to attain LEED certification is a huge accomplishment on its own, but it also simultaneously catapults Atlanta into a bigger spotlight as a city that's going green in a big way, asserts Freedman, who also runs Freedman Engineering Group in Marietta, Georgia, an Atlanta suburb.

"In the Southeast it's not obvious to be green compared to other parts of the country," explains Freedman.

"Atlanta is a big metropolitan in the Southeast and it has an opportunity to distinguish itself in the region. If you go to Charlotte or Nashville, it's not quite as commonplace to find many certified LEED buildings. Atlanta wants to be an example to other cities in the Southeast."

While the recent LEED certification for Atlanta's convention center was touted as a green milestone for the city, it's noteworthy that GWCC joins a growing legion of high profile buildings with LEED plaques that are mostly clustered together in the downtown area. A new Center for Civil and Human Rights and the College Football Hall of Fame were recently awarded LEED certification. The Philips Arena, home to the Atlanta Hawks basketball team,



Far left: The Georgia World Congress Center spans 3.9 million square feet and is the largest LEED-certified convention center in the country. Middle and right: The Center for Civil and Human Rights in downtown Atlanta is also LEED-certified.

received LEED for Existing Buildings. And the new Falcons football stadium currently under construction will also seek LEED certification, notes Freedman.

The focus on making the convention center a greener facility started back in 2005, with the idea they would seek LEED for Existing Buildings certification as part of that effort, recalls Josh Robison, director of engineering. By 2008, Robison and his staff realized the task was too overwhelming for them to pursue and maintain their day-to-day responsibilities at the same time. As a result, Timothy Trefzer was brought on board as the Georgia Congress' first sustainability manager who would focus solely on greening practices.

"They wanted to do the right thing for years, but they needed someone to lead the charge," observes Trefzer, who was hired with an agenda to begin pursuing LEED certification. "When I started, only the convention centers in Denver and Portland had a sustainability manager."

Competitive interests drove some of the impetus to get moving on the sustainability front as well, admits Trefzer. Newer convention centers were being built to LEED standards and they were beginning to pop up in smaller cities in the region (Charlotte and Nashville, for example) that previously couldn't compete with Atlanta's huge meeting venue, explains Trefzer. "Until recently, we only had to compete with Orlando and Chicago," he notes.

Besides, more groups looking for convention space are seeking out greener venues. Leaders at Atlanta's GWCC

saw a need to listen to their customers. Trefzer says about 25 percent of the center's potential clients ask about their sustainability practices and whether they have LEED certification. How green they are isn't usually the deciding factor for choosing the venue, but that may change in the years to come.

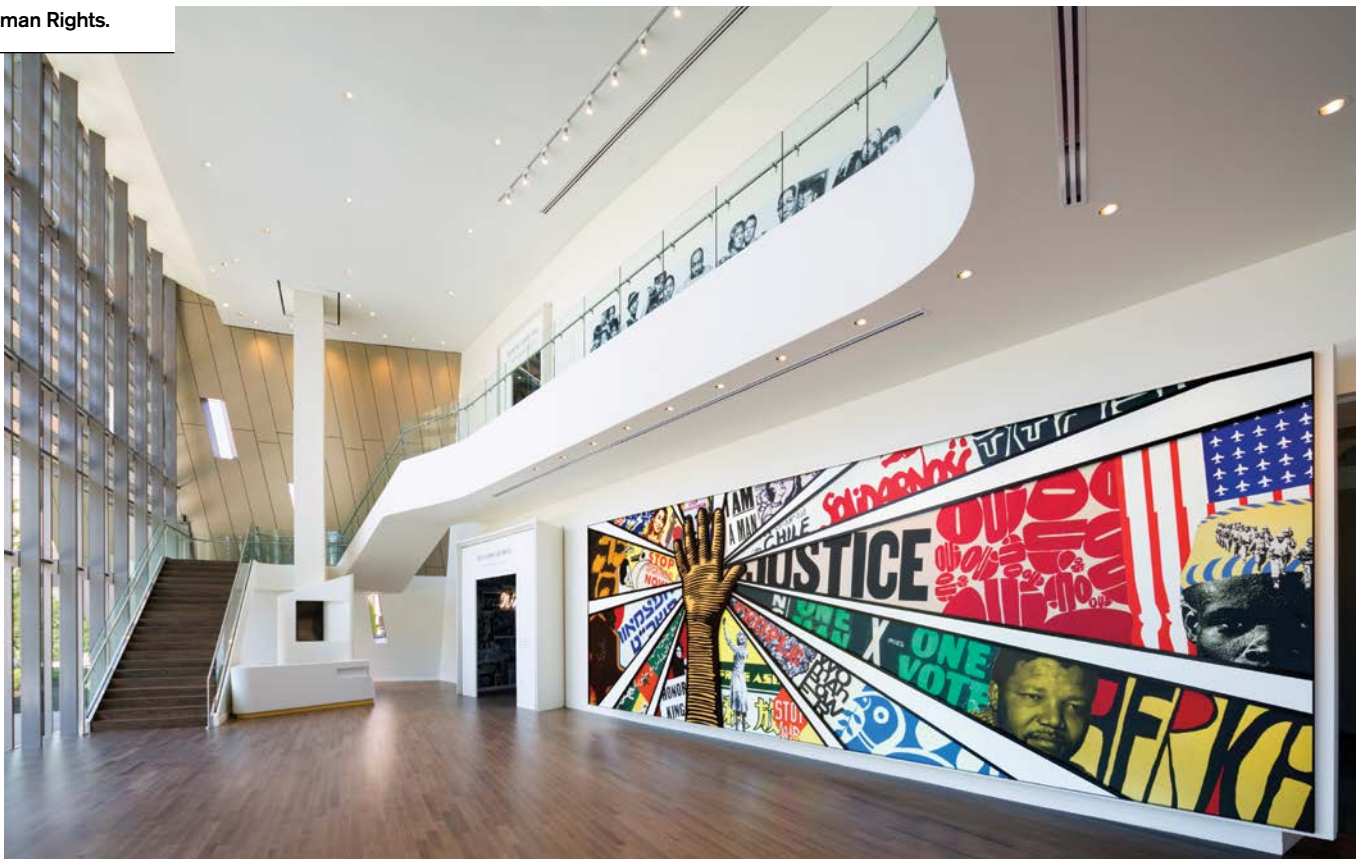
Trefzer predicts the demographics of the workforce will continue to create more demand for partners who are concerned about sustainability and are pursuing practices that minimize their contribution to climate change. "As the younger generation moves into roles of meeting planners and suppliers who already expect sustainable practices to be in place, all convention center buildings will have to go after benchmarks for sustainability or they'll stick out as a sore thumb for being the only one that isn't doing it," asserts Trefzer, who is 28 and was raised with recycling and other green practices that seem second nature to him and many in his age group.

The conference center is such a high visibility structure in the city that Trefzer hopes the LEED for EB certification sets an example for more building owners in Atlanta to follow in their footsteps.

"My goal is to make sustainability in Atlanta more ingrained in the culture by using our facility as a catalyst for change," he says. "I also hope this creates an economic benefit to the city. We're the second largest economic engine in the state (behind the port in Savannah)."



Interior spaces of the Center for Civil and Human Rights.



“In the Southeast it’s not obvious to be green compared to other parts of the country. Atlanta is a big metropolis in the Southeast and it has an opportunity to distinguish itself in the region.” -DAVID FREEDMAN

Perhaps the biggest challenge of seeking LEED for an existing building of this size is the grand scale of every aspect of the project, admits Robison. The convention center was built in several stages beginning in the 1970s; it kept growing to meet the demand of groups that wanted to hold bigger shows there. Some of the earlier sections of the center were constructed at a time when there weren’t indoor air quality requirements, which are standard now for LEED, he explains. They had to review all their air handling units meticulously to check which ones had to be retrofitted to meet LEED’s criteria.

“I’ve got over 500 air handling units in the buildings and most were in really good shape,” he says. “The newer ones were in closer compliance [with LEED] so they were easier to update, but we had to retrofit others, too.”

Aside from retrofitting air handlers, the convention center had to inspect and update some of its 26,000 light fixtures and 57,000 light bulbs. Even though Robison has a staff of 80 engineers, they had their hands full maintaining the buildings and running operations for the shows while a simultaneous certification process was underway. Since the documentation requirements were so intense, an outside firm was hired as a third party to bring in the manpower necessary to test and balance all the inner workings of the building and do any retrofitting that was needed, he says.

Documentation was tough. Robison estimates they submitted tens of thousands of pages of information to demonstrate their compliance in all the categories to meet LEED’s standards. Interestingly, Robison and his team were already implementing some of the sustainable practices required to qualify for LEED, which was just part of their own upgrading agenda.

For example, last fall they were in the process of renovating about 100 restrooms in one of the buildings

and they were already including low-flow fixtures and pint-flush urinals. “We were doing it because we were following best practices,” he says. “We just had to get all that information rounded up in some semblance of what they [LEED] were looking for.”

Even upgrading lighting to meet LEED’s criteria was no small feat. Some 1,200 light fixtures were changed in all 12 exhibit halls at the convention center, says Trefzer. They expect the retrofit will also result in a 25 percent savings in energy consumption.

Other big green achievements posted in fiscal year 2014 included: diversion of over 275 tons of single-stream recyclables, 119 tons of organics for composting, and donations of over 58 tons of food to local organizations. They baled over 27 tons of cardboard and diverted a total of 602 tons of material from landfills.

Trefzer says one of the most important ingredients to getting a massive LEED certification project to completion is a good dose of patience. “This was a four-year process for me and people had been trying to get the LEED effort up and running before I got here,” he says.

In addition, working well with partners is essential. He credits working closely with the mayor’s office of sustainability, the Atlanta Downtown Improvement District, and other outside parties that helped get the job done.

Robison’s advice to others: Don’t be afraid to tackle big endeavors. “You’re probably already doing most of the things the LEED requirements are asking for. You just have to learn how to document these facts or activities in the format the USGBC demands.”

And finally, taking on such a huge project also takes leadership. Adds Freedman: “You need people who are willing to step out on a limb to make this kind of project happen. You have to find those green champions wherever you are.” 🌱



STOCKHOLM, SWEDEN



SÃO PAULO, BRASIL



GLOBAL LEED

TWO POLAR OPPOSITE CITIES TAKE THE LEAD IN ENVIRONMENTAL DESIGN.

WRITTEN BY ALISON GREGOR

Leadership in Energy and Environmental Design (LEED) is expanding internationally with about 44 percent of all square footage pursuing LEED certification falling outside the U.S. That growth is not confined to one or two specific geographic regions or economic zones, but is spreading far and wide globally. Among the countries with the largest numbers of LEED registered and certified projects are China, Singapore, the United Arab Emirates, Brazil, India, the United Kingdom, and Canada, but some cities have also distinguished themselves as areas where LEED has taken hold. Here's a glimpse at two of them in particular, Stockholm and São Paulo.

Stockholm

When Sue Clark was a student in the early 2000s, she tried repeatedly to get a job with the city's only green architect, who was making straw-bale houses. "There was not much green work at the time, and she was a one-woman show," says Clark, who eventually received a master's of architecture from Canada's University of Waterloo in 2009. "She must have been tired of this student asking for a job every eight months."

Clark never did get the job making straw-bale houses, but her passion and persistence did land her a position in 2004 at the engineering firm, Morrison Hershfield, where she did her first LEED project. "I'm very grateful for that early start, because when the real green building boom began around 2007, I was able to jump right in as a LEED consultant," says Clark, who also has worked extensively with the Canada Green Building Council as a certification review team leader.

It was as a proponent of LEED (though as a follower of her husband, who landed a job opportunity) that Clark ended up moving to Sweden in 2011. There, she has become one

The Stockholm Waterfront building is the first building in Sweden to achieve LEED for New Construction v.2009.



of the heavyweights of the green building movement as the LEED manager for the Sweden Green Building Council.

The green building movement has mushroomed in Sweden, particularly in the capital Stockholm, since Clark appeared on the scene. A metropolis built on 14 islands, Stockholm is surrounded by water so crystal and clean that one can swim in the city center, and it was chosen as the European Union's first "green capital" in 2010. As the largest city in Scandinavia, Stockholm is perhaps no surprise in being among the cities recognized as leaders in LEED throughout the world.

The city itself has just under a million residents but there are more than 2 million people in the greater metropolitan region, so Stockholm's reach is substantial. As of the middle of December, that metropolitan area had 55 LEED-certified projects, the large majority of them Gold, encompassing more than 18 million square feet of space, most of it within the city limits.

When Clark first started working with the Sweden Green Building Council, which is based in the greater Stockholm area, there were only three staff members and none had experience in LEED—perhaps a reflection of there being only 11 LEED-certified projects in all of Sweden. "It was good timing on both sides," she says.

Stockholm continues to achieve firsts, with a large portion of the city's LEED-certified properties—28 to be exact—being part of the first volume certification ever awarded in Europe. In mid-December, Vasakronan, the

largest property management firm in Sweden, certified 48 properties in Sweden, most to the Gold level, in the largest LEED for Existing Buildings: Operations & Maintenance volume certification ever awarded outside of North America.

Obviously, the LEED-certified projects in Stockholm, most of which are commercial office and mixed-use buildings, have yielded benefits that are part and parcel of the city's long-term approach to building sustainably in the urban environment. Smart buildings are a key part of living in a world that is growing more urbanized, says U.S. Ambassador to Sweden Mark Brzezinski.

"Globally, urbanization is occurring at a rapid pace, bringing enormous challenges, and at the same time, tremendous opportunities to shape our urban environment," he says. "We seek buildings that are healthy, safe, productive, and comfortable. We aspire to enable urban landscapes that are vibrant and exciting. After all, it is in cities where most of us live and work and raise our families. Certainly, part of the equation involves smart buildings."

The Sweden Green Building Council recently formed a strategic partnership with the U.S. Green Building Council—the first of its kind in Europe. "LEED moves us—the United States, Sweden, all of Europe—in the right direction," Ambassador Brzezinski says. "It brings together stakeholders, companies, and consumers to deliver smart and healthy buildings, whose effects are profound."

Clark can unfold the history of LEED in Sweden as if she knows it by heart, which she most likely does, having experienced most of it. The first buildings in Sweden to be LEED-certified were in Stockholm: existing buildings owned by Nordea, a forward-thinking financial services group, in late 2009. LEED offered an internationally recognized environmental standard for Nordea, which owns buildings in various countries.

"They were the first organization to certify projects in Norway and Denmark as well," says Clark, "and they were certainly amongst the first organizations to certify in Finland. They continue to do really quite progressive work on environmental certification."

The first LEED for New Construction v.2009 certification was of the Stockholm Waterfront, the downtown complex with office, conference center, and hotel next to Stockholm's Central Station. That was awarded in mid-2012.

The Waterfront's Gold certification is in large part due to its energy solutions. The buildings, with glass facades acting as huge solar collectors, share an energy system and employ a unique technology whereby 250 tons of ice are stored for use with canal water in regulating temperature. An advanced media center factors in water temperature, insulation values, weather forecasts, and

statistical weather data to regulate heating, cooling, and lighting to minimize energy consumption in the buildings.

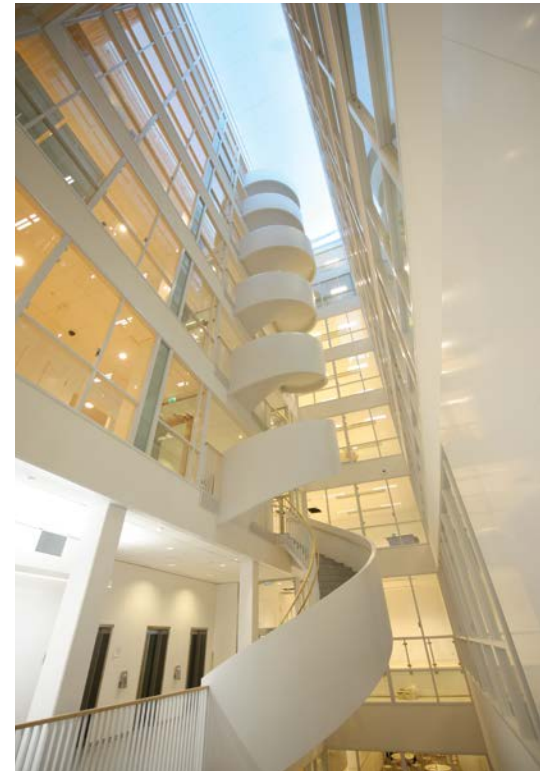
The dedication to green building in Stockholm, where three other certification schemes besides LEED are regularly used, has developed quite naturally out of a set of environmental objectives defined by the Swedish government, one of which is to develop a good-quality built environment, Clark says.

"That's basically where environmental certification got its foot in the door in Sweden," she says. "The building industry was looking for methods that allow them to address this Swedish environmental objective. Certification also allows buildings to address some of the government's other objectives, like energy conservation and preserving a non toxic environment."

With no real fossil-fuel resources of its own, Sweden saw itself significantly challenged during the energy crisis of the early 1970s. Thus, the Swedish government also instituted a series of energy conservation measures, and in complying with those, buildings can do "very well on LEED's criteria for energy," Clark says. "The excellent public transportation system in Stockholm also gives buildings seeking LEED certification a great running start."



The Hötorget buildings are five high-rise office buildings in Stockholm, Sweden. Photos: Vasakronan



Skanska's headquarters in Stockholm are distinguished as a Core and Shell triple Platinum v.2009 project. The building has also obtained LEED for Commercial Interiors v.2009 Platinum certification as of last August.

"We're building to a fairly high density in the urban core, so all of this means there's about 30 points out of 60 needed for Gold certification that are fairly straightforward for a Stockholm LEED project to achieve," Clark says.

Frequently, the companies seeking LEED certification for their buildings in Stockholm are companies that operate in an international milieu, like Nordea, or have international tenants like Vasakronan, which owns or operates more than half of all LEED-certified projects in Stockholm.

"If a building owner wants to attract an international client, and also when the company has properties in multiple countries, they want one certification that will be universally recognized and work similarly across all of those countries, and LEED is often chosen in that case," Clark says.

One good example is Skanska, a multinational construction and development company based in Sweden but operating throughout the United States, Europe, and Latin America. Entré Lindhagen, Skanska's headquarters in Stockholm, received the 2014 LEED Award at the third annual Sweden Green Building Awards and has the unique distinction, with a little help from Nordea, of being known as the "triple Platinum" project, Clark says.

Skanska's building received a LEED for Core and Shell v.2009 Platinum certification in April 2014, and Skanska built out its offices to obtain a LEED for Commercial Interiors v.2009 Platinum certification last August. In the meantime, Nordea, a tenant in the building, achieved a LEED for Commercial Interiors v.2009 Platinum certification for the build out of their offices in the building in June.

As a significant champion of LEED in Stockholm, and internationally, Skanska is constructing what may be one of the first university hospitals in the world to be LEED-certified: the New Karolinska Solna, located in Stockholm's suburbs, which is the world's largest public-private partnership project and the first in Sweden, Clark says.

"Nordea has also been a large driver of LEED in Stockholm and Sweden in general. The company will be a tenant in a new office building that is pursuing Stockholm's first Platinum certification under LEED for New Construction v.2009."

It hasn't been awarded yet, but this is what the developers are targeting. "I think Nordea is an important player in the LEED market in Sweden, and they're helping to drive some property owners to use LEED on their projects when Nordea's a major tenant," she says.

Another compelling project being watched due to its size and central location is Urban Escape Stockholm, Clark says. AMF Fastigheter, a large property investment and development company based in Stockholm, will build almost 1.4 million square feet of space, including offices, hotels, shops, and restaurants, in the heart of the city. The Urban Escape will be LEED certified and built around Gallerian, an existing collection of more than 80 shops, restaurants, cafes, and other services, currently managed by AMF Fastigheter.

"This is an up-and-coming LEED project from an organization that's new to LEED," Clark says, "so we're quite excited about this in the LEED community in Sweden."



Top left: São Paulo is the world's seventh largest city with almost 12 million residents. The LEED-certified Ecoberrini building stands in the center of this vibrant metropolis. Top right: Anderson Benite is a leading sustainability consultant in Brazil.

São Paulo

Anderson Benite had his first taste of green building in 2006, when his company's client, Tishman Speyer, asked for consult on the Ventura Corporate Tower in Rio de Janeiro.

Benite worked for Centro de Tecnologias de Edificações (CTE), a consulting and management company to Brazil's construction industry, formed in 1990. The experience of consulting on the Ventura tower, which was the first Brazilian project to be registered in Leadership in Energy and Environmental Design for Core & Shell and eventually was certified Gold, opened Benite's eyes to the potential for green building in Brazil.

"After that, our team developed some new competencies, providing LEED AP exams and hiring some professionals that were required, such as energy modeling and HVAC specialists," says Benite, a civil engineer with a master's in management systems from São Paulo University who developed and now directs CTE's green building consulting practice.

Benite has become one of the leading green building specialists in Brazil, and CTE has consulted on 100 projects nationwide that have been certified as green buildings, a substantial number of them through LEED, leading the Brazilian market.

"CTE also helped a group of professionals to establish the Green Building Council Brasil and presented the LEED certification in many construction congresses and seminars nationwide," Benite says.

However, LEED achievements can be easily overlooked in a place as colossal as São Paulo, a vibrant, diverse, electric city of almost 12 million residents. São Paulo is at the heart of the world's seventh-largest metropolis with more than 21 million people, and owes much of its character—and many of its problems—to unrestrained and unplanned growth.

As such, there may be few places where LEED achievements are needed more, and green building consultants say São Paulo leads the country in its LEED achievements. With 74 LEED-certified projects for a total of more than 13 million square feet, most certified Gold, São Paulo is the home of 35 percent of the LEED projects in Brazil. In a country that is more than holding its own in the world's green building arena, with 209 LEED-certified projects, São Paulo is a natural leader, says Maria Carolina Fujihara, the technical coordinator for the Green Building Council Brasil.

"São Paulo is the biggest city in Latin America, and it's where all the problems and solutions are established," she says. "It's the richest city in Brazil, and where all the international companies are based. As a result, São Paulo is a natural leader in a lot of subjects, including building certification."

Some may argue that Mexico City is slightly larger than São Paulo, but few question the role that São Paulo has played as a green building pioneer. The first LEED-certified buildings in Brazil were in or near São Paulo: a bank building by Banco Real was certified in 2007 in Cotia,

“The main driver for LEED in São Paulo is that many international companies, and even important Brazilian companies, require LEED for their buildings and offices due to their sustainability policies and goals.” -ANDERSON BENITE

a city near São Paulo; a medical laboratory, created by the company Delboni Auriemo, received Silver certification under LEED for New Construction in June 2008 in São Paulo; and then a couple of months later, Morgan Stanley received Silver certification for its São Paulo offices under LEED for Commercial Interiors.

Currently, leaders in São Paulo’s municipal government, at the behest of the Green Building Council Brasil, are seriously considering instituting tax incentives for LEED-certified buildings, which would be the first initiative of its kind in Brazil.

“If this is approved for next year, for sure LEED certifications will grow at an exponential rate,” Fujihara says.

Tax incentives aside, private companies and their investors have been the catalysts behind São Paulo’s LEED achievements, Benite says. More than half of the LEED-registered projects in Brazil are related to commercial activities, and São Paulo, as the business and economic center of Brazil, is where powerful multinational companies with environmental mandates tend to locate, he says.

“The main driver for LEED in São Paulo is that many international companies, and even important Brazilian companies, require LEED for their buildings and offices due to their sustainability policies and goals,” he says, offering countless examples, such as the Odebrecht Group, Camargo Corrêa Group, Barclays, Google, General Motors, Renault, Petrobras, and others.

Indeed, a LEED certification is so important to most corporations that it’s seen as an essential in an office building, not just a perk, Benite says.

“Today, an office building without a LEED certification is not ranked as a top building—which is a triple A classification in Brazil—and that has an adverse impact on its occupancy, selling, and rental prices,” he says.

The LEED-certified buildings in São Paulo tend to run toward commercial office buildings ranging from about 100,000 square feet to about 1.25 million square feet. Most of the certifications are for new construction, though the number of certifications for operations and maintenance of existing buildings is growing, Fujihara says. The only two office towers in Brazil to achieve a Platinum certification are in São Paulo: the Eldorado

Business Tower, certified for Core & Shell in 2009, and Eco Berrini, certified for Core & Shell in 2012. Both are over a million square feet. “They both sold all their units in the day after launching,” Fujihara says.

Benite agrees that São Paulo’s Platinum certifications were a watershed: “These certifications skyrocketed LEED in the media—the news, technical magazines, TV—and increased the demand of LEED consulting services.”

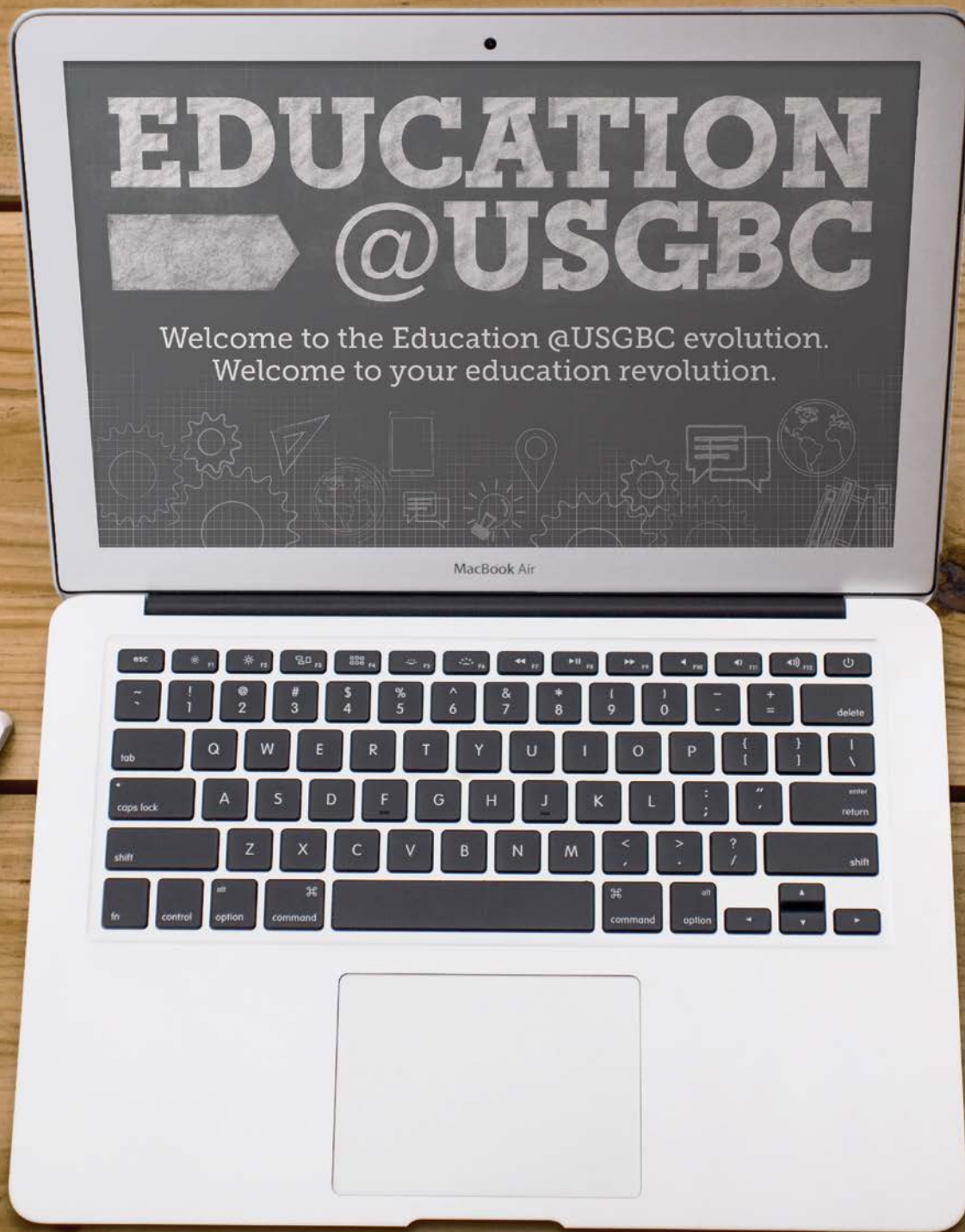
There are other types of LEED structures as well in São Paulo, especially if the much larger domain of LEED-registered buildings is included. Structures range in size from the small coffee shops of Starbucks, working through the LEED Volume Certification program, to the huge Allianz Parque arena, a multipurpose arena with 43,600 covered seats that was completed in 2014 to stringent environmental standards, Benite says.

One area LEED hasn’t dominated in Brazil is the residential construction market for various reasons. However, there was recently the first LEED certification for Neighborhood Development, which was awarded at the Silver level in December to Parque da Cidade, an approximately 20-acre site in southern São Paulo that will be part city park and part mixed-use development, being done by Odebrecht Realizações Imobiliárias.

The plan calls for about 5.5 acres of the Parque da Cidade site to remain green space, while about 15 acres will be open to the public. There will be five corporate towers, an office tower, two multifamily residential buildings, a shopping mall, and a hotel, which will all aim for LEED certification. The first buildings to be delivered—a corporate tower and the office tower—should open around September, while the entire project is forecast to be completed in 2019.

With entire green neighborhoods now being created, the pace of projects being LEED-certified in Brazil—which has grown from 17 in 2011 to 75 in 2014, Benite says—continues to grow each year, and that’s expected to be reflected in its ebullient commercial center, São Paulo.

“São Paulo is where we concentrate the know-how, the knowledge, the money, the pollution, the bad air-quality, the stress, the leader initiatives, and so on,” says Fujihara. “It couldn’t be different from what it is.” 🌿



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NEW YORK



CHICAGO, ILL.



BOSTON, MA



DENVER, CO





BEST OF LEED

BEHIND EVERY SQUARE FOOT OF NEW
LEED SPACE IS A STORY.

WRITTEN BY CALVIN HENNICK

An office worker who's stopped getting headaches when she comes to work, now that she spends her days in a place with adequate lighting and airflow. An executive who buys an electric car, now that his company provides charging stations. A classroom full of kids who get hands-on experience learning about sustainability, now that their school has a recycling program and vegetable gardens.

There are more of these stories every day. The growth of Leadership in Energy and Environmental Design (LEED), especially over the last five years, has been nothing short of astonishing. At the end of 2009, a total of 632 projects had attained LEED certification in California, for example. Today, that number stands at 3,289. Over the same span, the number of certified projects in Texas rose from 227 to 1,353; in Ohio, from 111 to 755; in Maryland, from 83 to 668.

And the list goes on.

Developers, business owners, sustainability professionals, public officials, and even a church president—in five of the country's hottest markets for green development—are just a few of the forces behind the millions of square feet of sustainable office, retail, residential, transit, and institutional spaces.

Those profiled here are doing some amazing things, but the truth is, the LEED boom has produced more dazzling, innovative, energy-saving buildings than could possibly fit inside a single story.

The truth is, this is only a small sampling of the many, many people and projects that make up the "Best of LEED."



2014 Rank

1 ILLINOIS



174

Projects
Certified

42.4

Square Feet
(in millions)

3.31

Per Capita
Square Footage

Chicago

The large corporations headquartered in Chicagoland are helping to drive sustainable practices in the city and region—and throughout the country, too.

In Evanston, Illinois, the Chicago suburb where Northwestern University is located, sits a Walgreens pharmacy with 850 solar panels on its roof, a 550-foot-deep geothermal system, and two wind turbines.

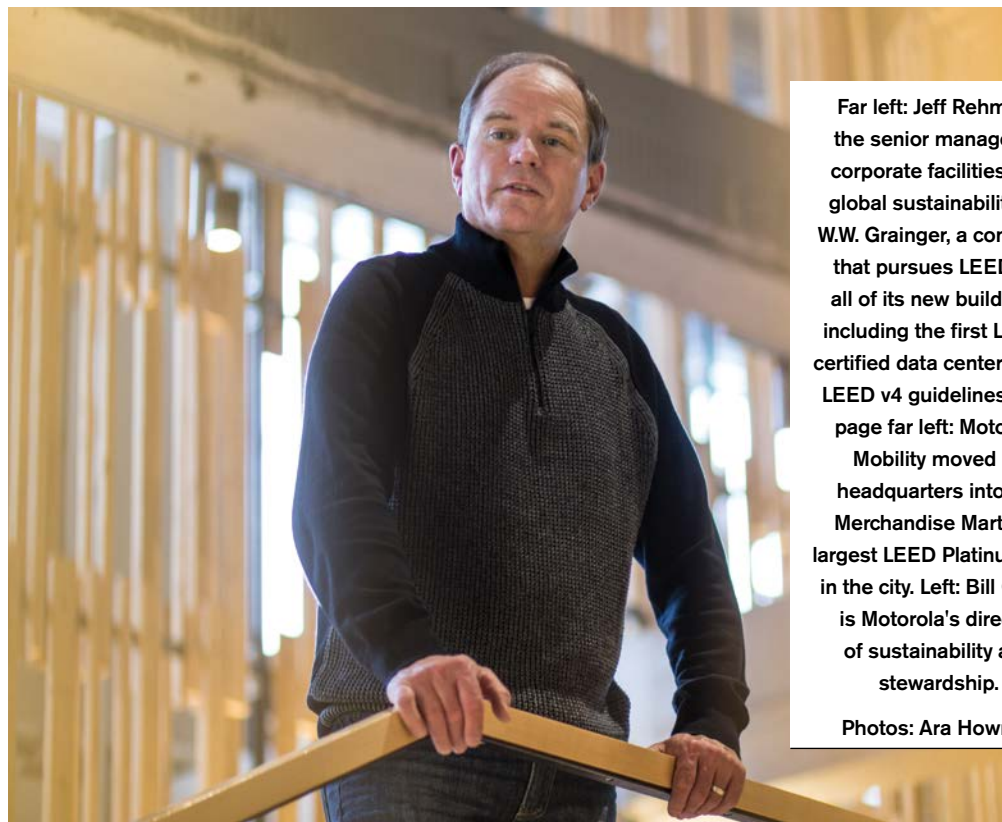
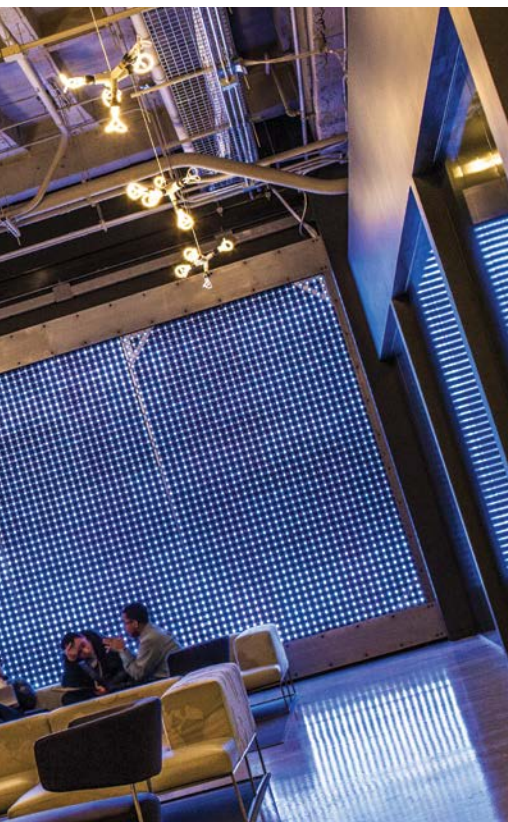
The Walgreens, which opened in the fall of 2013 and is believed to be the nation's first net zero energy store (producing more energy than it uses), is a bold statement. But as the practices and lessons from that store filter through the company's other 8,000 locations, that bold statement will turn into a deep impact.

Walgreens (based in Deerfield, Illinois) is one of dozens of large corporations headquartered in and around the centrally located Windy City, and many of these businesses have active sustainability programs and have taken a leadership role in green building and other environmental practices in Chicago. But that influence doesn't stop at the shores of Lake Michigan. Fortune 500 companies have tentacles that stretch into far-off corners of the country, and what's learned in Chicago often ends up lowering the electricity bill, reducing emissions, and providing healthier workplaces in locations from coast to coast.

Walgreens, for example, only has the single net-zero-energy store, but the company has been working on solar panel projects since 2007 and now has 150 solar installations in California, Illinois, Oregon, Ohio, Connecticut, and New Jersey.

"Illinois is a national leader in green building in large part because of corporations headquartered in Illinois who have made sustainability a big part of their business plan," says Brian Imus, executive director for the Illinois Chapter of USGBC.

Ari Kobb, the Illinois Chapter board chairman and the director of sustainability and green building solutions for Siemens Industry, Inc., sees power in the partnership between Chicago's green building professionals, big businesses, public officials, and nonprofit organizations. "For me, there's a certain Midwestern nature of things, which is collaborative," Kobb says. "There's this connectivity. It's about working together to achieve things."



Far left: Jeff Rehms is the senior manager of corporate facilities and global sustainability for W.W. Grainger, a company that pursues LEED for all of its new buildings, including the first LEED-certified data center under LEED v4 guidelines. This page far left: Motorola Mobility moved its headquarters into the Merchandise Mart, the largest LEED Platinum site in the city. Left: Bill Olson is Motorola's director of sustainability and stewardship.

Photos: Ara Howrani

Last spring, Motorola Mobility moved its headquarters nearly 40 miles south from suburban Libertyville to the historic Merchandise Mart building in downtown Chicago. The 600,000-square-foot space, which takes up most of four floors of the building, is the largest LEED Platinum site in the city, says Bill Olson, the company's director of sustainability and stewardship.

"This isn't just an office space," Olson says. "We relocated all of our labs and engineering. It was quite the move. It wasn't just people."

Construction crews gutted the space and used reclaimed materials to build parts of the offices. They painted directly over the concrete, even leaving a few holes in the walls—an intentional move, Olson is quick to point out.

"It would have been cheaper and easier if they'd just put a bunch of wallboard up, but they kept as much of the original walls as possible," he says. "They did that to celebrate the history of the building, and also to not use a lot of extra material. It gives the space a lot of character."

"There are also payoffs from an employee perspective," Olson adds. "They get to come in and enjoy this world-class environment. We think that employees will be more productive, and happier, and enjoy this space more, than if we'd come in and just put up wallboard everywhere."

On a more global scale, Motorola was the first company to use recycled content plastic in cell phones, a practice that is now widespread.

Olson says it's a "misconception" that big businesses don't care about the environment. "Motorola has always cared about the workplace, and their employees, and the communities they live in," he says. "When you become operationally more efficient, it costs less money to heat and cool your building. That's a good business practice."

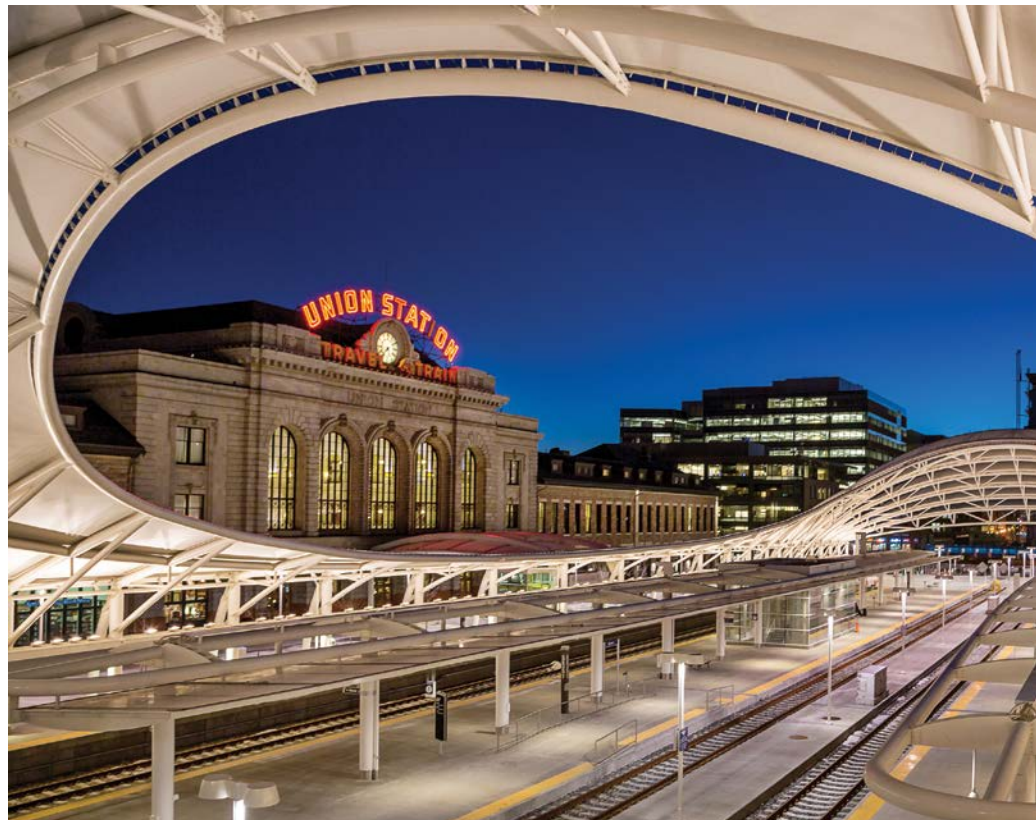
At the Lake Forest, Illinois-based W.W. Grainger, Inc., which distributes industrial supplies, executives are also hoping that sustainable practices give them a business edge, in addition to aligning with the company's values. Jeff Rehm, senior manager of corporate facilities and global sustainability, says that clients often ask about the company's green practices during the bidding process.

"It's difficult to quantify [the business impact]," Rehm says. "But it's something that we get asked about, and we feel like we have a really good story to tell."

Part of that story is how Grainger pursues LEED certification for all of its newly constructed buildings, including the first data center in the world certified under the new LEED v4 guidelines. The LEED Gold facility at the company's headquarters uses about half as much energy for cooling as comparable data centers.

Certainly, that results in an operational cost savings for the company, but Rehm says Grainger's commitment to sustainability goes deeper than that.

"Grainger has been around for 87 years," he says. "We want to be around for another 87 years, and then some. This is the planet where we plan to do business, so we want to take care of it."



2014 Rank

2 COLORADO



102
Projects
Certified

15.8
Square Feet
(in millions)

3.15
Per Capita
Square Footage

Denver

An investment in public transit has helped launch a cluster of green development in the Mile-High City's Union Station neighborhood.

When Katrina Rodriguez, an engineer for Greater Denver's Regional Transportation District, moved into her office at the downtown Union Station four years ago, the historic building housed only a few other offices, as well as the city's Amtrak stop. Outside her window was a field.

"There were no people," she says. "There were a few families of foxes that we watched run around."

Over time, Rodriguez watched that field transform into a huge hole, and then into a below-ground bus terminal. Eventually, she saw a commuter station rise up from the earth, and then she had to move her office as the historic train station itself was renovated.

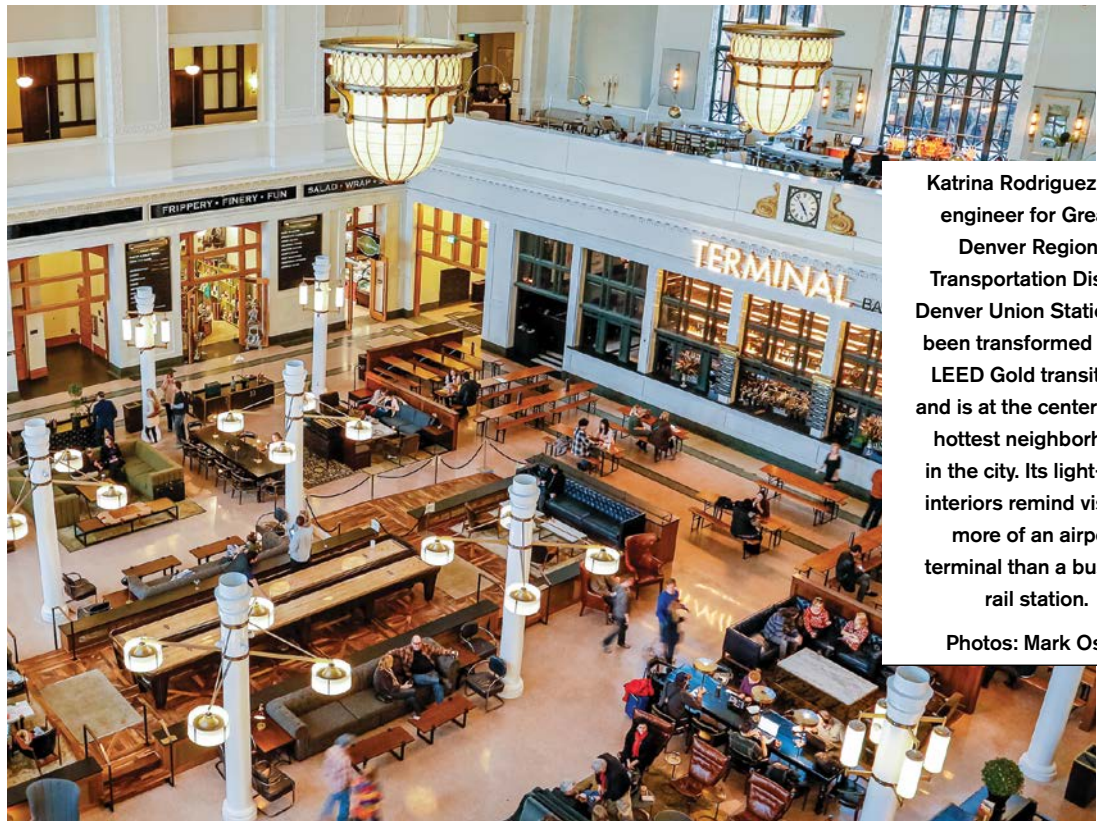
Today, the LEED Gold Denver Union Station is the city's transit hub, bringing together Amtrak, buses, commuter rail, light rail, shuttles, taxis, and bike and pedestrian traffic. The nearly \$500 million transit center, which opened in May, has also become the center of the hottest neighborhood in the city. The site itself includes a boutique hotel and a number of retailers and restaurants, and around a dozen other LEED-certified or registered buildings have popped up around the station.

Evelyn Baker, deputy director of community planning and development for the City of Denver, says she's heard Union Station called "Denver's living room."

"It's one of those places where we take our out-of-town guests to visit, and it's showing up on the tourist map," Baker says.

Anyone who's traveled across the country by bus could be forgiven for guffawing at the idea of a bus terminal anchoring a hip new neighborhood. And a below-ground bus terminal? In many cities, that would simply be a euphemism for "public toilet."

Planners in Denver took pains not only to reduce energy and water consumption (resulting in one of the few LEED Gold transit centers in the U.S.), but also to create a pleasant place that would leave a lasting impression on visitors to the city and encourage residents to spend time there, as well. Although the bus concourse is below ground, it's been lit with skylights, and some people say it reminds them more



Katrina Rodriguez is an engineer for Greater Denver Regional Transportation District. Denver Union Station has been transformed into a LEED Gold transit hub and is at the center of the hottest neighborhood in the city. Its light-filled interiors remind visitors more of an airport terminal than a bus and rail station.

Photos: Mark Osler

of an airport terminal than a dingy bus station. (“When you walk down there, it still feels like you’re outside,” says Sharon Alton, executive director of U.S. Green Building Council [USGBC] in Colorado.) The historic train station’s Great Hall has furniture where people can sit and mingle, and also three shuffleboard tables. In the plaza outside, kids play in the dancing water fountain in the summertime.

People aren’t flocking to the area just to sit in nice chairs and play shuffleboard, though. Union Station was designed to be the hub of the multibillion dollar FasTracks transit initiative, which is adding new transit lines and facilities over a number of years, and planners had hoped the station would activate the previously dormant surrounding neighborhood. So far, it’s working. In particular, the area seems to be attracting businesses, residents, and shoppers who value sustainability.

Mercantile Dining & Provision, located inside the station, is a farm-to-table restaurant and store that composts food scraps for its farm, repurposes burlap coffee bags into gift bags, and uses compostable flatware. “We wanted to be a part of Union Station because it is such a great redevelopment project for Denver,” says Alex Seidel, the owner and chef. “It really fit in with our concept for our market.”

Although Denver doesn’t have zoning bylaws or other regulations that require development to achieve LEED building standards, virtually all of the projects in the surrounding neighborhood are pursuing certification. When USGBC Colorado asked the developers why they were building to LEED standards, they all had different reasons.

“One of them had investors who wouldn’t purchase anything less than LEED Gold,” says Alton. “Another had been hearing that young employees wanted to be in a green building. They knew that, to be competitive in the future, they had to prioritize these things. Another said, because of how green that neighborhood is becoming, and how the Millennial generation is flocking there, it was a must-do.”

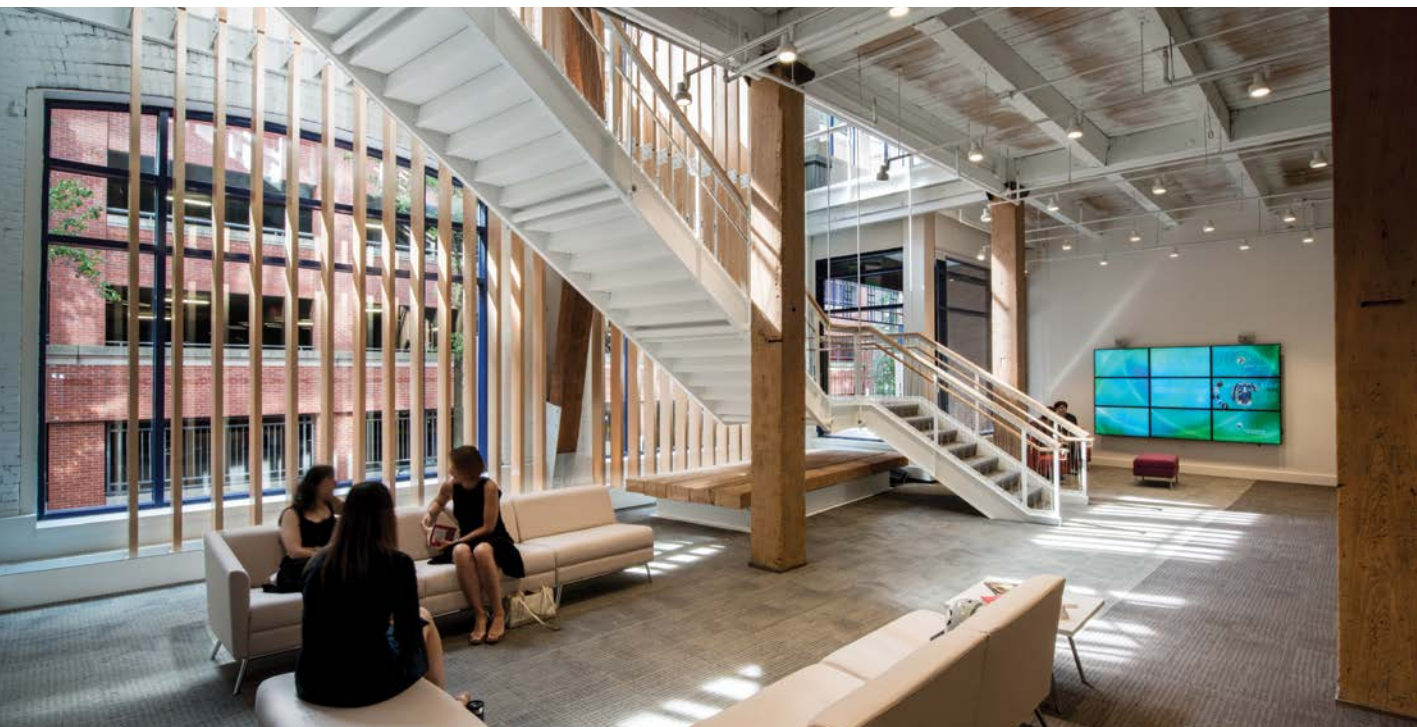
James McGibney, president of First Century Development and the development manager for the LEED Gold North Wing Building at Union Station, says that green building is “more than a financial play.”

“It’s a good business deal, but it’s more than that,” McGibney says. “It’s making sure that the city’s built in a way that will be here to serve our kids and serve their kids. It needs to stand the test of time, and it will.”

David Zucker is principal at Zocalo Community Development, the firm that developed the Cadence Union Station high-rise residential building. Zocalo is seeking LEED Gold certification for the building.

Zucker says that the Union Station neighborhood is an example of public investment successfully driving private development. He likens the transit center project to a train line extension built nearly a century and a half ago that linked the city to the rest of the country.

“Had Denver not done that 140 years ago, it would have just been a dusty outpost,” Zucker says. “Union Station echoes that [project] to a degree. It’s tremendously pioneering.”



2014 Rank

5 MASSACHUSETTS



99

Projects
Certified

14.6

Square Feet
(in millions)

2.2

Per Capita
Square Footage

BOSTON

A religious organization's green headquarters is one of the newest residents of "Boston's 21st Century Neighborhood." For Rob Molla, picking out office furniture is a religious act.

Molla is human resources director for the Unitarian Universalist Association (UUA), and he led the association's design team as it sought to move from its cramped and aging headquarters in Boston's Beacon Hill neighborhood into a rehabbed LEED Platinum site in the city's Seaport District. The sustainable building itself was in keeping with the church's values and reputation (UUA President Peter Morales jokes that he didn't drive a Prius when he was a minister because he wanted to be able to find his car in the parking lot), but even the chairs and desks proved an opportunity to "live out our faith values," Molla says.

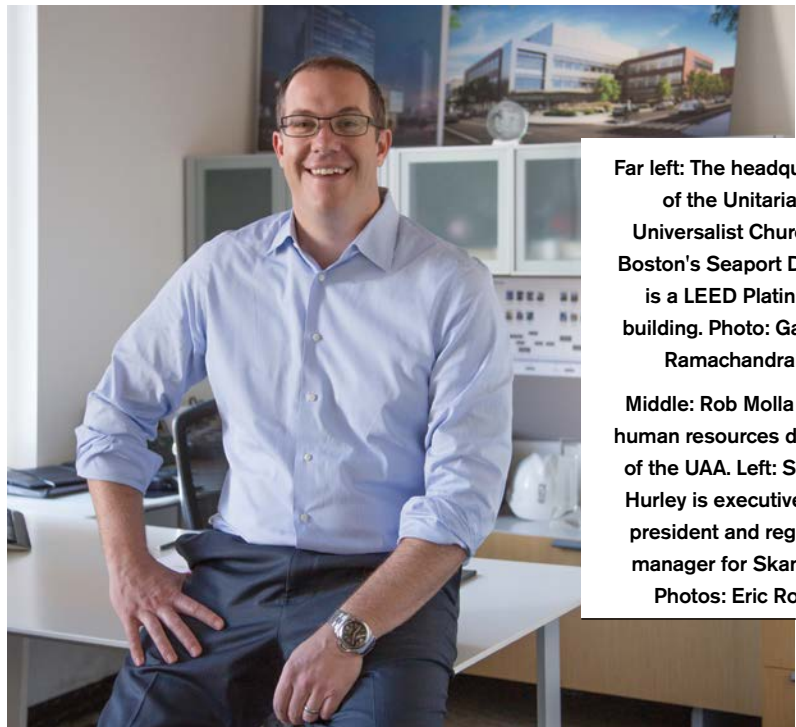
Molla wanted the furniture to embody the church's Seventh Principle ("respect for the interdependent web of all existence of which we are a part"), the same way the energy-efficient light fixtures and a focus on recycling construction materials did. But he also wanted to stay true to the church's First Principle ("the inherent worth and dignity of every person") by allowing employees to work however they wanted. So, Molla found a vendor who supplied customizable workstations made with recycled materials.

"Human resources is about how people work, and I wanted to have a strong hand in how we designed our workplace for the next 100 years," says Molla. "We didn't envision moving again for many, many years, so we really wanted to make sure we designed a healthy, green, accessible, welcoming, flexible, beautiful workplace."

"On many levels, this building was an expression of not only who we are, but who we aspire to be, and where we're going," says Morales. "It's an expression of our values, living in harmony with the planet."

The association moved into its \$10 million, 34,000-square-foot headquarters in May, and Molla and Morales believe that the space may be the first LEED Platinum religious headquarters in the world. But in the Seaport District, green building is hardly unique.

Until the Big Dig infrastructure project was completed in 2007, the Seaport District (officially, but infrequently, called the South Boston Waterfront) was cut off from the downtown by the elevated I-93 roadway, and the neighborhood was occupied largely by enormous, low-cost parking lots used by downtown workers. The Big Dig moved the interstate underground and replaced it with the Rose Fitzgerald Kennedy



Far left: The headquarters of the Unitarian Universalist Church in Boston's Seaport District is a LEED Platinum building. Photo: Ganesh Ramachandran

Middle: Rob Molla is the human resources director of the UAA. Left: Shawn Hurley is executive vice president and regional manager for Skanska. Photos: Eric Roth

Greenway, taking away a major psychological barrier between the downtown and the Seaport.

In 2006, the Institute of Contemporary Arts moved into the district, and the next year, the Boston Children's Museum unveiled its renovated and expanded headquarters in the district. The neighborhood is also home to the Boston Convention and Exhibition Center, which opened in 2004, as well as the Harpoon Brewery, a comedy club, and a number of restaurants. Many visitors to the district drive in, park in one of the enormous lots, visit one of the attractions, and then immediately drive back home.

But now, a number of large developers have swooped into the neighborhood, hoping to turn it into a place where more people live and work. In part because the Seaport is one of the first neighborhoods to see major development since the city enacted new green zoning regulations in 2007 (and since the economic downturn), the neighborhood has the chance to become home to the densest cluster of LEED development in Boston.

"You bring in this infrastructure and open up the waterfront, all of a sudden it's like a palette that we get to use to paint and create," says Shawn Hurley, executive vice president and regional manager for Skanska Commercial Development. "I think that this mix of uses allows for the potential to have a true 24/7 neighborhood. It's Boston's 21st century neighborhood."

Skanska has two projects underway in the Seaport District, with another in predevelopment. At least one of the buildings is targeting LEED Platinum certification, and all of Skanska's projects target a minimum of LEED Gold.

The Skanska buildings are part of the 23-acre Seaport Square Master Plan project, an effort led by Boston Global

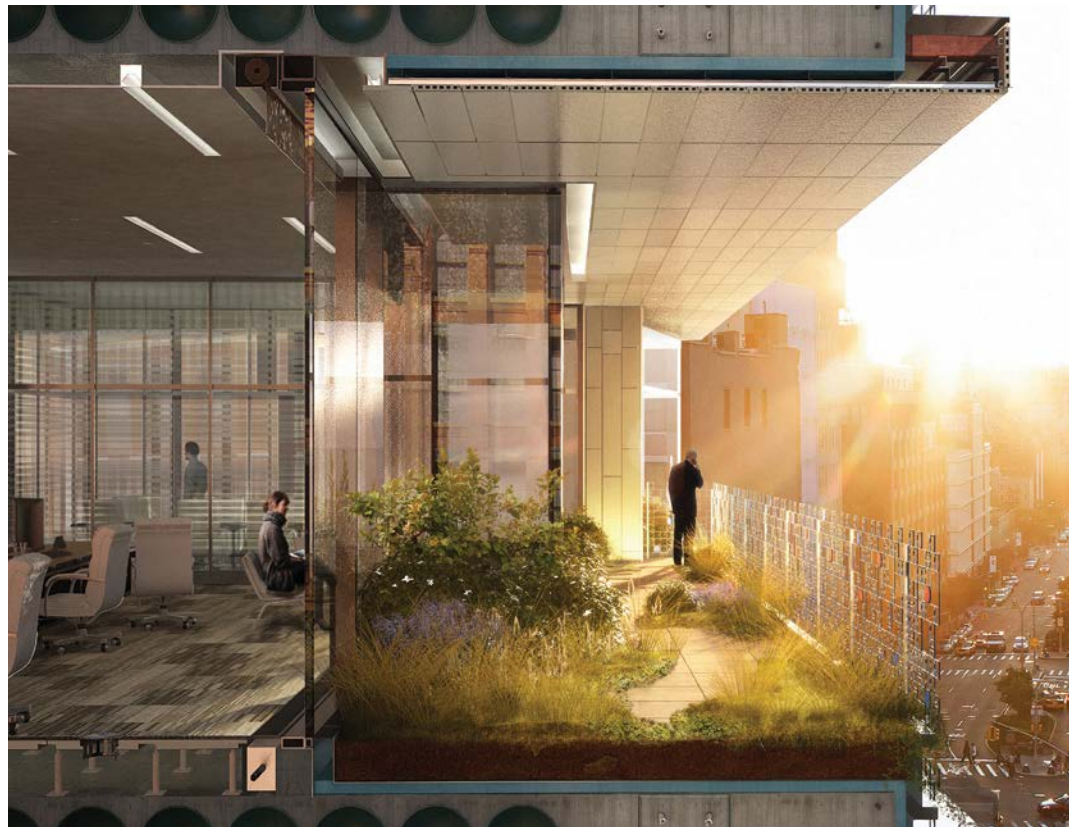
Investors. That plan is targeting a Gold rating under LEED for Neighborhood Development.

Andrew Albers, director of sustainable development for Boston Global Investors, notes that the entirety of the plan site was previously made up of parking lots. He attributes the interest in green building in the area not only to city regulations, but also to a changing market. "I think the real estate industry was starting to move in that [green] direction," he says. "It was entering the general lexicon."

Bryan Koop, senior vice president and regional manager for Boston Properties, agrees. "The amount of customers that we have that are focused on occupying sustainable workspace, it has definitely grown over the last five years," he says. "I think companies are seeing others that are performing very well that have commitments to sustainability. There's a war for talent, and companies want to create a great environment for the people who want to work for them, and sustainability fits into that strategy."

Boston Properties developed Atlantic Wharf, Boston's first LEED Platinum skyscraper (the building sits just across the Fort Point Channel from the Seaport District, but is often lumped into the neighborhood). The building's green roof houses beehives, and Boston Properties gives away the honey to tenants in the building. "It's been a hit," Koop says.

Since the UUA began looking to move to the Seaport District a couple of years ago, Molla says, the change in the place that the church plans to call home for the next hundred years has been impossible to miss. "Empty lots are getting bought up. Vacant parking spaces are getting developed," he says. "The development is phenomenal."



2014 Rank

10 **NEW YORK**

(Tied with Arizona)



250

Projects
Certified

33.6

Square Feet
(in millions)

1.74

Per Capita
Square Footage

NEW YORK

In the country's densest market, green design is helping to connect the built environment with the great outdoors. New York City has some of the best parks in the country, but that's not the only reason residents flock to them. Without the occasional trip to the Jacqueline Kennedy Onassis Reservoir or the Brooklyn Botanic Garden, many New Yorkers' worlds would consist of nothing but steel and concrete.

"It can be claustrophobic," says Pam Campbell, a senior associate at COOKFOX Architects. "It's hard to find a space that's not full of people, not full of cars, not full of noise. In a city like this, people can spend months without walking in some grass or amongst some trees, or seeing some wildlife, and that disconnect is very problematic. How can people even begin to care about things like biodiversity if they haven't experienced it?"

The architects at COOKFOX try to create designs that bring a bit of the natural world into the buildings New Yorkers inhabit. A prime example is the firm's design for the LEED Platinum Bank of America Tower at One Bryant Park, completed in 2009. A bamboo canopy at the building's entrance extends into the lobby, establishing a connection between the indoor and outdoor space. Inside, the Urban Garden Room gives visitors a place to sit and relax in an almost-outside environment.

Even the round tables and lightweight, portable chairs were chosen to mimic those in Bryant Park. "The idea was to have a place at the pedestrian level that would bring in some natural landscaping, some greenery that would connect visually to the park," says Campbell.

The firm also designed the adjacent LEED Gold Stephen Sondheim Theatre, leaving a through-block pedestrian passage between the buildings. The passageway, another nod to the congestion of Midtown Manhattan, is meant to give pedestrians an option besides the crowded sidewalks. It also serves as a gathering space after shows, when theatergoers wait outside the stage door to get their playbills signed.

The firm's architects also incorporate outdoor space in their smaller residential and office projects, although these spaces aren't open to the public. The design for an office building at 300 Lafayette Street in Soho—formerly home to a gas station—



Far left: Pam Campbell is a senior associate at COOKFOX Architects in New York City. Photo by DBOX

Left and right: 300 Lafayette Street and One Bryant Park—the Bank of America Building—are just two sustainable projects designed by COOKFOX.

Photos: © COOKFOX Architects



includes spacious balconies with natural plantings, which all together will cover more square footage than the site itself. “We’re providing more outside space than if it was just a clear site,” says Campbell.

Campbell says that cities like New York are “inherently sustainable” due to their density and extensive public transportation networks, but she notes that many features that pop up at LEED-certified building sites in other markets—such as wind turbines, constructed wetlands, and massive solar panel installations—are difficult or impossible in a city with so little open space. “The building has to do a lot more, because the landscape around it can’t,” she says.

James Stawniczy is vice president and head of sustainability for Lend Lease, which managed construction for the September 11 Memorial and Museum at the World Trade Center. He says there’s a “dire need” for more outdoor space in the city, and that developers and public officials have begun to respond to that need.

Stawniczy points to the proliferation of rooftop restaurants and bars, which give people a place to gather outdoors, away from the bustle of city streets. Often, he says, parts of rooftops are also set aside for green space. “We’re creating people places, finally, but we’re also creating biodiversity places, where birds can nest and have a home.”

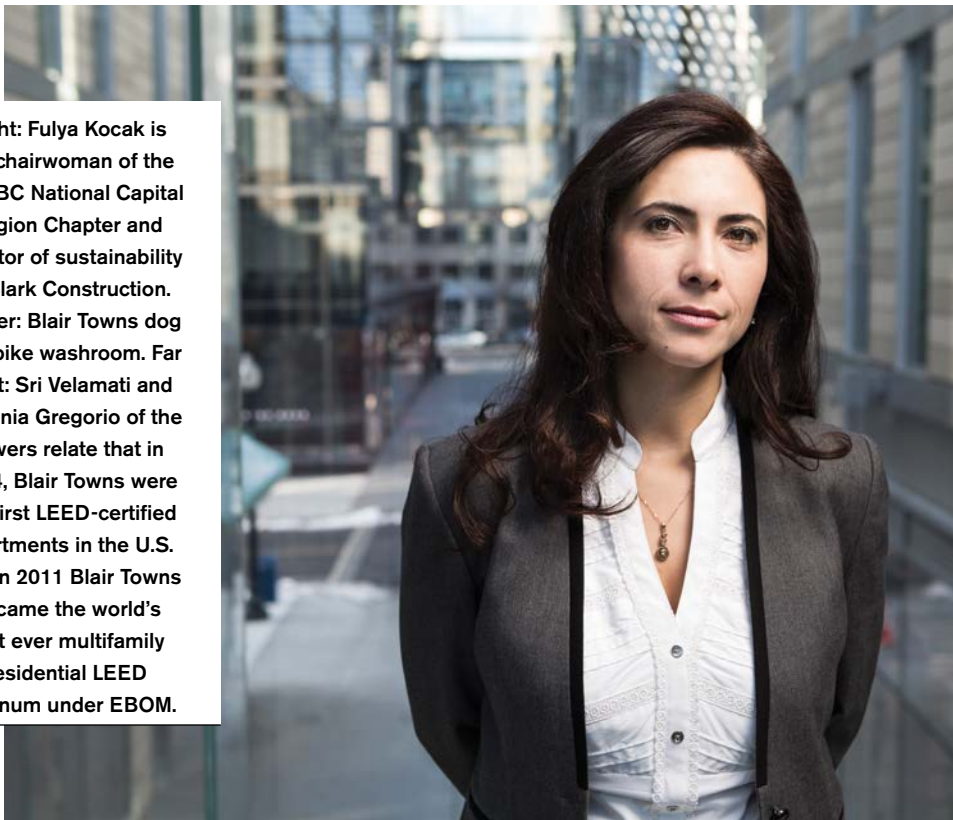
He also expresses excitement about buildings that interact with the High Line elevated park, a master plan for Columbia University that emphasizes open space, and

the Brooklyn Bridge Park, which was created in the last decade out of former industrial space.

There are tricks designers can play to temporarily transport people away from the chaos of the city, Stawniczy says. The waterfalls at the World Trade Center site, for example, drown out car horns and fire engines.

“I brought a coworker there from Nashville and said, ‘Do you hear any cars?’” remembers Stawniczy. “And she said, ‘I don’t hear anything but the waterfall.’ It’s a whole other dimension.”

Right: Fulya Kocak is the chairwoman of the USGBC National Capital Region Chapter and director of sustainability at Clark Construction. Center: Blair Towns dog and bike washroom. Far right: Sri Velamati and Eugenia Gregorio of the Towers relate that in 2004, Blair Towns were the first LEED-certified apartments in the U.S. and in 2011 Blair Towns became the world's first ever multifamily residential LEED Platinum under EBOM.



2014 Rank

N/A WASHINGTON, D.C.

(Not ranked as a state, as it is a federal district)



102

Projects Certified

17.7

Square Feet (in millions)

29.44

Per Capita Square Footage

Washington, D.C.

The nation's capital is bursting with sustainable workplaces. The next frontier? Green apartments. When Washington, D.C., passed 100 million square feet of LEED-certified building space in September, it became only the fourth city in the United States to hit the benchmark, and by far the smallest, joining the ranks of New York, Chicago, and Houston.

As in those markets (and in virtually all others), commercial development has fueled the green building boom in Washington. But some observers say that residential development is finally poised to take off, too.

"In the commercial market, you have many LEED-certified or [otherwise certified] green buildings, and if you're not going for LEED certification, you'll be left out," says Fulya Kocak, chairwoman of the USGBC National Capital Region Chapter and director of sustainability at Clark Construction Group, LLC. "Now, for residential, we're seeing the same thing."

"The new grads who are just starting their careers, they're looking for these types of apartment buildings, where you don't have to buy a car, and there's great air quality," Kocak adds. "They like living in the city, walking, going to restaurants. And developers are very aware of this, and they're building for that demand."

"There's huge demand for projects that are in walkable and transit-type areas of the city," says Bill Updike, green building specialist for the District Department of the Environment. "There's no denying that."

Pam Askew, senior vice president for the Washington, D.C., development and property management company WC Smith, says that the market for green residential space is "absolutely" picking up. "I think people appreciate green features within their apartment and within the home that they're renting. There's more awareness of the impact to the environment."

Residential is the third most active sector in Washington, D.C., for LEED registrations, trailing only office and education. The number of LEED registered residential projects in the city (115) still lags far behind the number of registered office projects (852). But this gap is smaller than in many other markets, where residential trails sectors like retail, healthcare, and public assembly and religious worship.



A newly adopted green building code gives residential green building a further boost. Adopted last March, the code applies to multifamily residences greater than 10,000 square feet and at least four stories tall.

There are several reasons why commercial green development had outpaced residential, both in the capital and across the country. For one, public green building standards have often exempted residential space. (Washington, D.C.'s, pioneering Green Building Act, passed in 2006, helped drive much of the sustainable development in the city, but it didn't apply to residential buildings.) Also, businesses tend to be more sophisticated than residential renters when calculating their costs, and are likely to pay close attention to their utility bills, in addition to their rents. Longevity is also a factor. A business moving into a new space might plan on staying for 30 years or more, while a 25-year-old renting a one-bedroom apartment might move on after a year or two.

"Part of it is the psychology of transience with apartment moving," says Sri Velamati, vice president of development for The Tower Companies, a real estate developer based in Rockville, Maryland. "You feel it being temporary. They're not necessarily thinking about their health and well-being as much as if they were in a condo or single-family home."

The Tower Companies built, owns, and manages hundreds of LEED-certified apartments at its Blairs residential campus in Silver Spring, Maryland, and will construct hundreds more at the site in the near future.

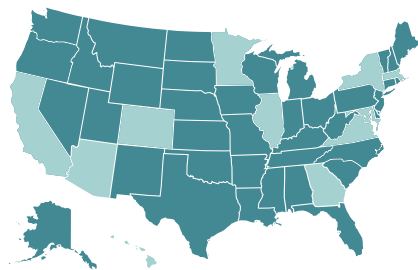
Velamati says the company's motivation to develop green buildings stems from its philosophy, as well as its long-term interests—but not from higher rents in the near term. "It's the right thing to do," Velamati says. "We want to be on the forefront of it. We think there's a message there that has a stronger value. These changes take a long time. Our view of the world isn't five years, it isn't ten years. It's relatively infinite."

Eugenia Gregorio, director of corporate responsibility for The Tower Companies, holds out hope that residents will begin to demand green living spaces in the same way that companies have come to expect green offices. "Especially in the D.C. area, there's more of a sustainability mindset among companies and individuals and it continues to become more common, where people are interested in working and living in green buildings," she says. "But location, amenities, and cost seem to be the three things that people are interested in the most. Hopefully, the residential market will continue to demand "green" as a standard, like it is already on the commercial side, and residents will come to expect it."

Kocak, the regional chapter board chair, says that some green features—like bike storage, car shares, and green space—can help developers attain LEED certification while also providing amenities to residents. "While [developers] are getting three points [toward certification], their tenants are getting this feature that they appreciate," she says. "When you have a checklist that you're running through, it's sometimes easier to realize those opportunities that exist. You don't have to go and think about these creative ideas. They're there for you."

2014 Rank

TOP 10 STATES FOR LEED



1,662

Projects
Certified*

*Does not include D.C.

251.7

Square Feet
(in millions)

LEED makes an impact across the U.S.

This per-capita list highlights states throughout the country that are making significant strides in sustainable building design, construction, and transformation—using less energy and water resources, saving money, reducing carbon emissions, and creating a healthier environment for residents, workers, and communities.

Now in its fifth year, the per-capita list is based on 2010 U.S. Census data and includes commercial and institutional green building projects that were certified throughout 2014. Illinois retained its top position for the second year in a row, with 174 LEED certifications representing 3.31 square feet of LEED-certified space per resident.

Two newcomers to the list, Georgia and Arizona, show that 2014 was a year of major growth for LEED in the South and Southwest regions of the country, while the continued strong performance of Washington, D.C., Maryland, and Virginia have helped the mid-Atlantic region remain the epicenter of green building across the country. Washington, D.C., which is not included on the Top 10 States for LEED list due to its status as a federal territory, is notable as it continues to lead the nation with 29.44 square feet of space per resident certified in 2014. Maryland and Virginia finished third and fourth respectively, and both states increased their per capita totals to 2.70 and 2.33 square feet of LEED space per resident in 2014.

The 2014 list had the highest average (2.34) of per capita space certified per resident per state since 2010, and the second highest average to date. Six of the eight states (Illinois, Colorado, Maryland, Virginia, Massachusetts, and Hawaii), which were also on the list in 2013, increased the amount of square feet of space they certified per resident in 2014. Illinois and Colorado are the only two states to make the list every year since 2010.

2014 was a historic year for the LEED green building rating system, globally with the 675.9 million square feet of space certified in 2014 representing the largest area ever to become LEED certified in a single calendar year. 2014 saw a 13.2 percent increase in the square footage certified over 2013 (596.7 million square feet), further expanding the rating system's impact as a global bulwark for environmental sustainability. 🌱

| Rank | State | Projects certified in 2014 | Square feet LEED certified in 2014 | Per-capita square footage |
|-----------|------------------|----------------------------|------------------------------------|---------------------------|
| 1 | Illinois | 174 | 42,457,254 | 3.31 |
| 2 | Colorado | 102 | 15,816,498 | 3.15 |
| 3 | Maryland | 132 | 15,583,423 | 2.70 |
| 4 | Virginia | 150 | 18,617,712 | 2.33 |
| 5 | Massachusetts | 99 | 14,662,950 | 2.2 |
| 6 | Hawaii | 30 | 2,657,808 | 1.95 |
| 7 | California | 517 | 69,762,936 | 1.87 |
| 8 | Georgia | 87 | 17,748,781 | 1.83 |
| 9 | Minnesota | 39 | 9,511,684 | 1.79 |
| 10 (tied) | Arizona | 82 | 11,152,201 | 1.74 |
| 10 (tied) | New York | 250 | 33,691,209 | 1.74 |
| * | Washington, D.C. | 102 | 17,716,622 | 29.44 |

*Washington, D.C. is not ranked as it is a federal district, not a state.



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Taking Shape

The USGBC's Texas Gulf Coast Chapter is making inroads into middle-class green living.

By Kiley Jacques

Since 2008, U. S. Green Building Council's (USGBC's) Texas Gulf Coast Chapter board chair, Sergio Grado, has been promoting Leadership in Energy and Environmental Design (LEED) for Homes in Houston. Grado, owner of GradCo Structures and Homes—a construction company specializing in green building—has made it his mission to push LEED certification toward the mainstream. He feels most green efforts are made in either low-income sectors or among affluent homeowners. According to Grado, multifamily, section eight, or million-plus-dollar homes are more likely to be LEED certified than are those belonging to the middle class. “That's where the bulk of the activity is

being seen right now,” notes Grado. The other arm of the effort is in the military, which is building LEED-certified army barracks and homes.

But he and board members Paul Vanderwal and Michael Martin, among others, are working to change that. “Here in Houston, we are trying to spotlight those builders who have taken it upon themselves to [construct] super energy-efficient homes,” he explains. In 2010, Grado joined forces with Vanderwal, a local architect focused on sustainability, and Martin, partner of law firm Martin & Stillwell, LLP, to organize the Piney Woods branch of the chapter. “We really need to get more of the mainstream builders involved in

LEED for Homes, and get them to start including it in their marketing efforts,” says Grado.

Toward that end, the branch aims to build a home that will inspire contractors and homeowners to go green. The goal is to have people understand that LEED for Homes is highly beneficial and affordable. When Roger Platt, president of USGBC, came on board in October 2014, Grado spoke with him about his mission in Houston. “There are inroads we are trying to make,” he says. “Our chapter's Piney Woods branch is doing a project in partnership with New Caney High School.” Modeled after a shipping container home designed by Costa Rican architect Benjamin Garcia Saxe, they plan to build a LEED-certified demonstration home. Grado purchased the rights to the design, but finding a place to locate it proved challenging. They wanted an easily accessible, highly visible locale that residents would readily visit. They looked high and low, to no avail. “We even tried putting it in a park so people would come out and see it,” notes Grado.

Ultimately, the vocational high school in New Caney agreed to host it on their property. Students from the welding and carpentry training programs will work alongside volunteer architects and contractors focused on sustainability. The project will be a real grassroots undertaking—one with regional reach. “The school will give us a lot of exposure—between students, parents, and media,” says Grado, who really values the public venue.

When completed, the home will feature energy efficiency, recycling,



water management, and green products. Constructed from two 40-foot cube shipping containers, it will function “completely off the grid,” with solar panels, a composting toilet, a rainwater capture system, and a thermal dynamic water heater; the Piney Woods branch will seek LEED certification for the project. “Whether it will be Gold or Platinum is still unknown because it is a work in progress right now,” notes Grado.

His hope is that the model will influence Montgomery County community members to make their own homes green. He also hopes nonprofit organizations addressing the demand for affordable housing will look to it as an example of what can be built. “I know that if we get this [demonstration home] built, it would really send a message that LEED for Homes can be affordable,” says Grado. The home will be worth \$50,000, at base price.

The city of Houston and the Houston independent school district have shown a lot of interest in the project. Other schools have even approached Grado to ask if similar efforts could be made on their properties. “The great thing about that is they actually have the money to pay for it,” says Grado. That, in part, is what the city likes about the proposal. In fact, officials have given thought to the idea of LEED homes being developed in areas where homes under \$80,000 are desperately needed. The board even spoke at length with a resident who owned a condemned property; they suggested



the house be demolished and replaced with a shipping container home. He entertained the idea. “There’s a lot of interest there, we just don’t have the showcase model yet,” says Grado. “If we can [build it] and attach LEED for Homes to it, then we can make some progress.”

That’s why the New Caney project is so important—when people come through the house with questions, they will have answers. They will be in a position to refer builders, break down costs, discuss requirements, and explain codes. For Grado, that’s the real value of the home—it will be a platform for promoting green building principles among the mainstream populace.

The LEED for Homes mission truly takes root in places where people constantly champion the effort. Grado is one of Houston’s greatest champions. At this point, he’d like to know who else is ready to take up the bullhorn. “We’re committed, but in order to really get the message out there, it’s got to get into the mainstream.” ●

USGBC's Gulf Coast Chapter board chair, Sergio Grado, looks to bring more attention to LEED homes in Houston. He purchased the rights to a shipping container home designed by architect Benjamin Garcia Saxe.

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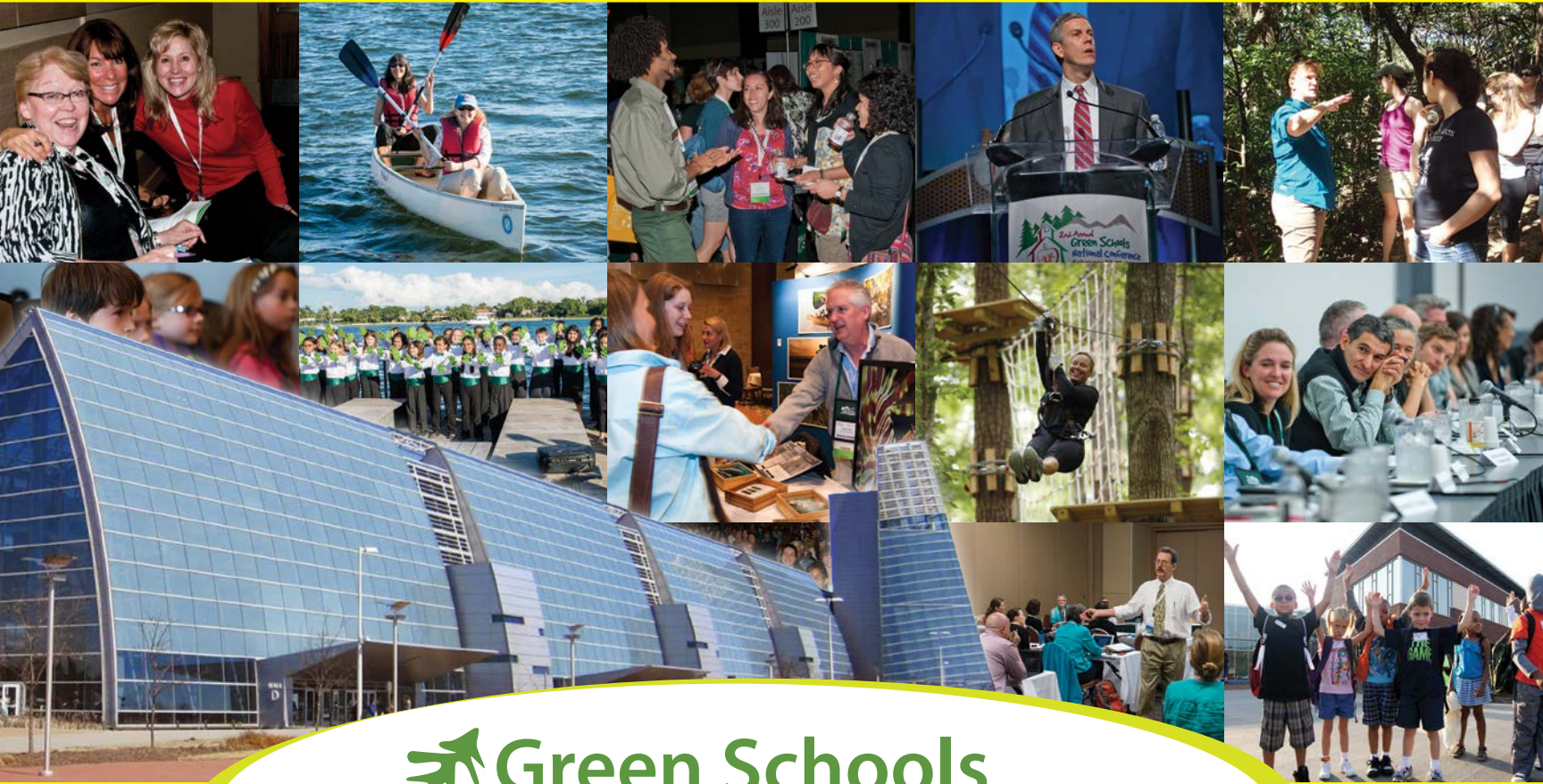
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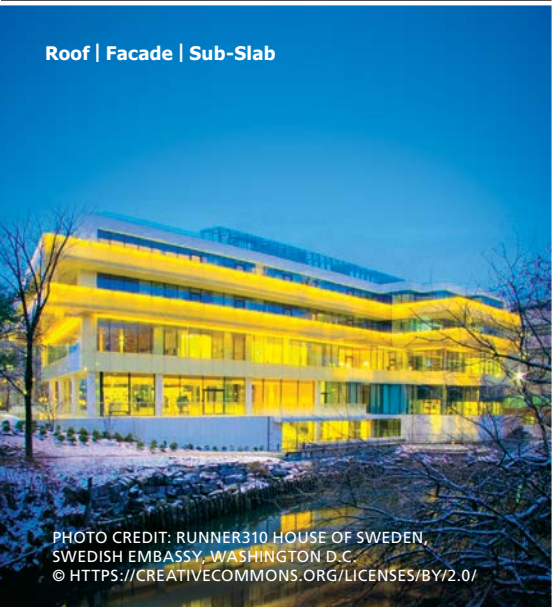
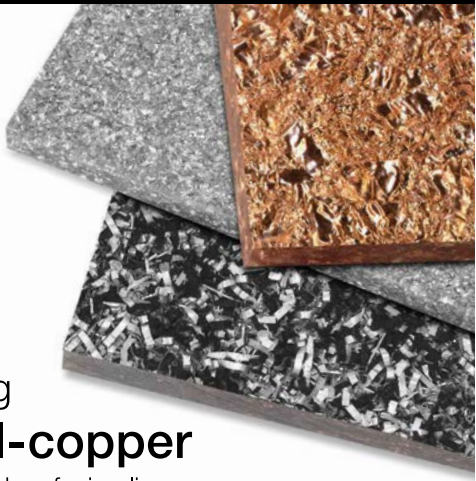


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Q&A

Greg Shank,
chair of the LEED
Steering Committee

Greg is a proven leader in managing complex design, construction, and operations projects with a focus on measuring performance and building team capacity. He has 18 years experience in environmental science and engineering and the building performance analysis. He is a principal with and president of Altura in Irvine, California.

Q. What are some of the big changes are you seeing in the market right now?

With buildings and real estate, we are seeing the financial markets begin to take a larger role in driving green building performance. Investors are seeking companies that can demonstrate better environmental sustainability metrics than their competitors. And the evaluation of these metrics is becoming more quantitative and sophisticated. As a result, there is a growing paradigm of not only being capable of reporting portfolio environmental performance and carbon emissions but also showing concrete evidence of how you are valuing environmental risk and what projects you are undertaking to position that portfolio for a changing climate.

Q. What are some new green building innovations?

New software ventures are looking to leverage data and the Internet into the green building market almost daily. There is enormous potential for bringing down the cost of a building's ongoing energy management and customized benchmarking across portfolios, regions, and industry sectors. I am also excited about innovations surrounding occupant engagement in green buildings. In particular, I see some amazing design approaches and uses of technology to adapt to the more mobile workplaces with dynamic and flexible spaces replacing static floorplans.

Q. What's the coolest project you're working on right now?

Altura is the executive commissioning agent on the new PNC Tower in Pittsburgh, which aims to be one of the greenest high-rise buildings in the world. The building has a mixed mode HVAC design, with an innovative passive ventilation mode activated by its active dual façade. We have deployed analytics software that will be continuously running functional tests on the building as it is completed.

Q. What's next for green building?

I expect and hope that higher education curricula will soon catch up to the skill sets that are being demanded by the green building industry. For example, the evolution of green building programs has stimulated a strong demand for commissioning of building mechanical and electrical systems, but too few university engineering programs teach the types of systems engineering and integrated energy analysis skills that create the foundation of a great commissioning engineer. In a sense, the green building community has an opportunity to support the establishment of a new integrated science education curriculum to ensure that the design and construction industry can evolve with future demands.

For more with Greg visit <http://plus.usgbc.org>.



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