November/December 2015

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## CURRENT LEED STATISTICS

AS OF OCTOBER 2015

Total commercial LEED projects globally **73,419**

CERTIFIED: **30,298**
CURRENTLY REGISTERED: **43,121**
LEED FOR NEIGHBORHOOD DEVELOPMENT: **430**

Gross square footage of LEED projects* **14 Billion**
**Includes LEED-certified, LEED-registered**

LEED for Homes Units **201,732**

*Excludes ND and LEED for Homes

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# Permanence

**RICK FEDRIZZI**
CEO and founding chair
U.S. Green Building Council

In our world, there is very little that is permanent. And as the world around me inevitably changes, I've discovered that the single thing that tends to last is the power of an idea.

That doesn't mean an idea is static. Rather, we constantly tinker with the environment in which it sits so that we can nurture it to full flower. And there is no better example of this than all the changes we're undergoing at USGBC.

Across the globe, LEED is booming. We've registered and certified 14 billion square feet in more than 150 countries precisely because we've kept evolving the rating system to take advantage of the changes in process and products that the green building movement has inspired.

And that's led to changes in the tools we have deployed. Few things were more analog than the three-ring binders that held the documentation of the first LEED projects. Now we have not only a richly functional LEED Online project management platform, but we also have the LEED Dynamic Plaque that can serve as a performance management tool to help building owners and managers continuously improve a building's performance.

It's also become clear that the world now needs to aggregate building performance across entire portfolios and encompass other aspects such as landscape and human wellness and comfort. So we've significantly expanded GBCI's portfolio to now include credentialing and certification for SITES and WELL, and we've added data and financial reporting tools such as GBIG and GRESB, bringing in new audiences and broadening our reach.

This has been the pivot that has caused us to think of ourselves more as the NGO version of a B-Corp than a traditional nonprofit, because we're constantly changing and adding to the ways we fund our work—whether it's green schools, green affordable housing, or a LEED Platinum children's center in Haiti. At the same time, we're partnering with the business community in ways that are expanding their top lines and improving their bottom lines, permanently shifting the sustainability conversation from the pages of the CSR report to the 10K of annual reports.

We're also evolving our organizational structure. We've just completed the process of changing our governance by seating our first-ever Advisory Council, made up of members of our 2015 Board of Directors, and electing a new board slate whose experience and expertise better reflect the needs of the far-reaching organization we are becoming. We're also changing how our army of volunteers is structured as we complete the evolution of our chapter network and deploy ADVANCE.

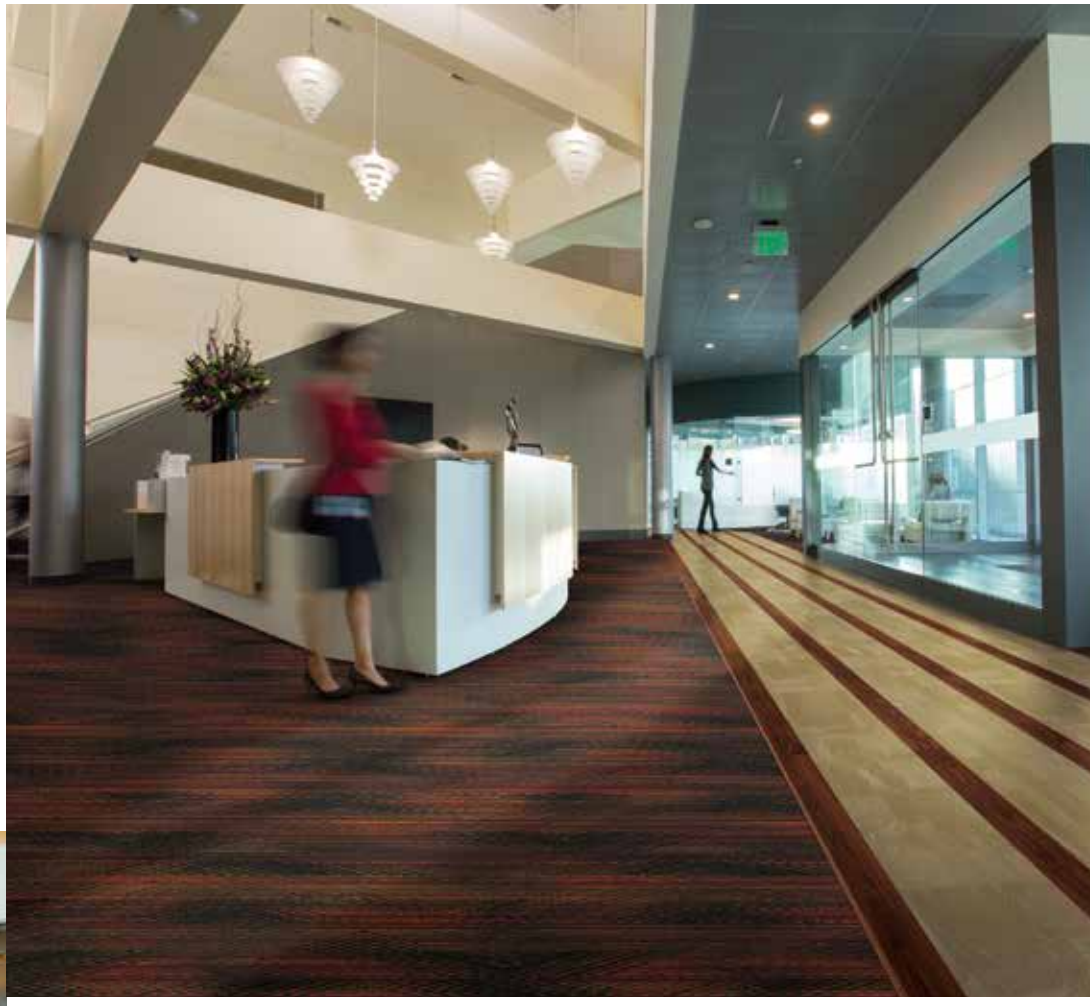
And I'm part of the change, too, as I announced my intention to step down as CEO of USGBC and GBCI at the end of 2016. I'll spend much of next year working closely with Mahesh Ramanujam, who will take over as CEO of USGBC and GBCI in January of 2017, as well as with the amazing USGBC and GBCI teams all over the globe.

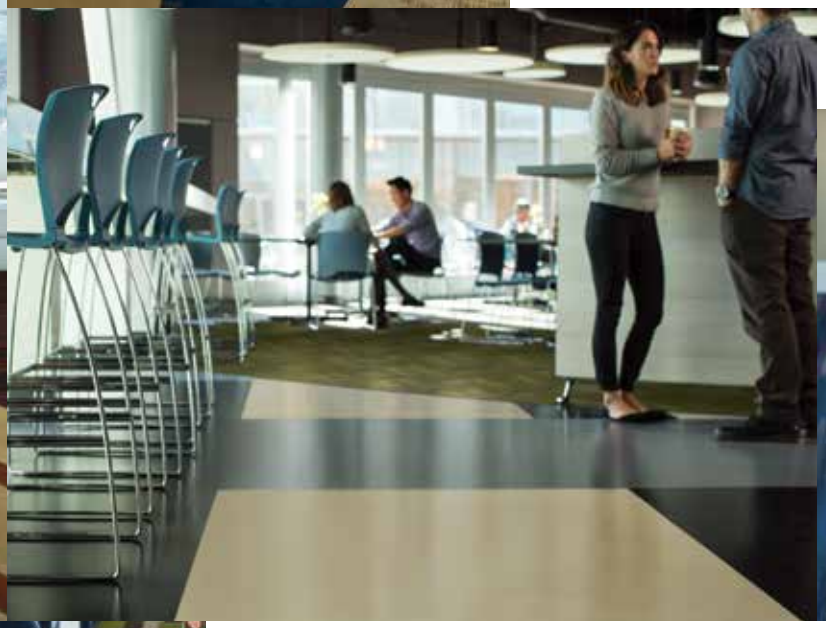
All of these changes are intentional, undertaken to help us evolve and adapt, so we can grow and thrive. Because what will never change is our commitment to the powerful idea on which our mission is founded: green buildings and communities for everyone within *this* generation.

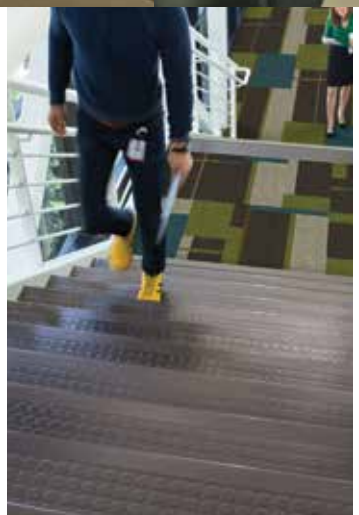
LEED ON,

9:38 A.M.

A VISITOR SIGNS IN WHILE A DEVELOPER RUSHES TO A STATUS MEETING AND A FEW FOLKS GRAB A QUICK WORKOUT BETWEEN CONFERENCE CALLS.







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# Climate Change CONUNDRUM

A conversation with Pulitzer Prize winner Elizabeth Kolbert on the subject of the health of our planet.

**BY MARY GRAUERHOLZ**

The world is in serious crisis. Rising sea levels, destruction of habitat, loss of farmland, and a host of other outcomes of climate change are destroying the earth's ecology and could destroy its most dangerous interloper, homo sapiens.

Elizabeth Kolbert, a staff writer for the *New Yorker* magazine and author of the 2015 Pulitzer Prize-winning book, *The Sixth Extinction: An Unnatural History*, has devoted years of travel, research, and writing to the situation and what we can do to get back on course. Kolbert will bring her message as a Master Series speaker to the Greenbuild International Conference and Expo, on Thursday, November 19, in her talk, "The Sixth Extinction."

In a telephone interview from her western Massachusetts home, Kolbert says she will explore how fossil fuels and rising $CO^2$ levels are brewing disaster with the climate. But, as she explains, that will be just a piece of her message to the green building community.

"The world that we inherited is really a world that has been evolving since the last major extinction 66 million years ago," Kolbert says. "By causing this extinction, we're undoing that; we're unraveling this very complicated web of life. Predicted results include shorter food chains and ecosystems that are much less rich."

Kolbert says her Greenbuild talk will explore the many ways in which we are bringing about this extinction event. "Unfortunately, it is not limited to climate change," she says, which was the subject of her previous book, *Field*

**In researching her new book, *The Sixth Extinction*, author Elizabeth Kolbert traveled to the Andes, Africa, and the Great Barrier Reef of Australia to examine the real-time impacts that humans are having on this planet.**

*Notes from a Catastrophe: Man, Nature, and Climate Change*. There is also acidification of oceans, which Kolbert has called "the evil twin of climate change"; land conversion and introduced species, defined as those that are living outside their native range due to human activity.

*The Sixth Extinction*, which took the author to rainforest jungles, mountain ranges, and typical American backyards, details the world's first five extinctions. A "sixth extinction" would be a game-changer, a human-driven extinction of a variety of plants and animals.

In the book, Kolbert details the damage that already has been done, including the near extinction of the Panamanian golden frog. "Amphibians have the dubious distinction of being the world's most endangered class of animals," Kolbert writes. "But also heading toward extinction are one-third of all reef-building corals, a third of all fresh-water mollusks, a third of sharks and rays, a quarter of all mammals, a fifth of all reptiles, and sixth of all birds."

She expects her Greenbuild talk to push attendees beyond typical discussions of climate change, although whether U.S. Green Building Council (USGBC) members should be doing anything differently in their work is another matter. "That's a good question," Kolbert says. "I don't claim to be an expert on green building practices. I'll ask people to think about this constellation of issues, as opposed to just focusing on climate change. Unfortunately, we need to be thinking of all these issues, which is a big ask."

Kolbert's work has brought her into close contact with the world's political figures with the clout to push environmental change. The 21st COP (Conference of the Parties), an international climate conference, will be held in Paris beginning November 30, on the heels of Greenbuild. The conference is being promoted as a historic event—Kolbert quotes Fatih Birol, the incoming director of the International Energy Agency, who called it "our last hope." Kolbert realizes how dire the words sound.

"I think that when people say 'our last hope,' they mean we really need to curb emissions downward if we're going to avoid some of the very worst effects," Kolbert says. "We really don't know where the border is, the threshold. If we can't bend that curve—if it keeps going up, up, up—we're locking in more and more damage. This situation is pretty serious; I can't overstate that. But there's not a point at which it wouldn't still be smart to change things."

**The Great Barrier Reef in Queensland, Australia, is one of the most biodiverse places on Earth.**

Scientists have commonly thought that limiting the average global surface temperature increase of 2°C (3.6°F) would be adequate to avoid dangerous climate change. But there is a question, Kolbert says, as to whether we have already reached that limit.

"Are we going to lock in massive changes that cause mass migrations of people, that are very destabilizing for the world? There are 7.3 billion people in the world today. Everyone needs to eat. Everyone needs a place to live. If you really start to mess with where people can raise crops and live, you're obviously creating a recipe for disaster."

Kolbert says ambivalence about climate change in the general public has many sources. "I definitely feel there is a disconnect," she says. "There's a constellation of reasons. There have been purposeful disinformation campaigns. A lot of people don't want to believe it."

The last chapter of *The Sixth Extinction* is titled "The Thing with Feathers," a reference to Emily Dickinson's poem, "Hope is the Thing with Feathers." Having hope is human, and Kolbert lauds the many people who are environmentally conscious and want to create change. At home, she is used to talking about the subject with her three sons, a 21-year-old and 16-year-old twins. "They've really grown up with this issue," Kolbert says. "I think this has sort of been a part of their childhood, for better or worse." When people in the public ask her what they can do to help, the first place she points is to government.

"You really need to become active politically," she says. "If people organize politically, then that will make a difference. It means getting candidates to pay attention to these issues. I urge people to get out and vote, to run for office themselves, or anything in between. People need to understand the issues and write their congressman."

"In almost every municipality there are issues and debates," Kolbert continues, including environmental topics and utility law questions. "As everybody knows," she adds, "there's a lot of money on the other side." ●

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# WALK OF Life

Eco-conscious real estate developer EYA builds homes for the betterment of all.

**BY KILEY JACQUES**

Washington, D.C.–based EYA, a 23-year-old preeminent real estate development and building firm, brings Washingtonians "life within walking distance." Twice named "America's Best Builder," EYA has succeeded in settling homeowners closer to shopping, dining, and business districts in innovative urban neighborhoods characterized by walkability, thoughtfully planned spaces, and timeless architecture.

At its inception, according to senior vice president Brian (A.J.) Jackson, EYA was responding to "an increased demand for opportunities to live closer in and closer to amenities." They saw an opportunity. "That was not something large national builders were set up to provide." With a focus on urban infill, EYA's projects tend to be smaller and more complicated, and typically require significant development efforts, as their sites are often quite challenging.

"We believed that through better design we could increase the density and really transform the townhouse product from a price-point product into a luxury product," explains Jackson. In their early days, they modeled many of their homes after the brownstones of late 19th-century New York. To date, EYA has built more than 4,000 units in more than 30 neighborhoods across the Washington metropolitan area. The firm has become renowned for finding desirable locations on which to build homes that afford a pedestrian-friendly lifestyle.

The market for that lifestyle has burgeoned over the past two decades. With its mission to do things "the right way, at the highest level," EYA has kept pace with those demands, always keying into cultural shifts. "Our homes today are much more energy efficient…and almost all of them have some sort of private outdoor space," notes Jackson. Many of their newer developments feature homes with loft levels or rooftop terraces, as more and more people desire a place for respite.

**Right: Brian Jackson, at the EYA office in Bethesda, Maryland.**

**Photo by Ryan Smith**

**Old Town Commons in Alexandria, Virginia. Photo by Johnny Vitorovich**

In time, EYA sought an even better way to build the urban environment—one that would enhance an entire community's well-being. By 2007, they made the decision to develop all new projects under the Leadership in Energy and Environmental Design (LEED) for Homes model. "That really pushed us [toward] a quantum improvement in terms of methods, energy efficiency, features, and benefits in the units," says Jackson. (No other homebuilder in the Washington, D.C., area has earned as many LEED certifications.)

"More and more people want to be in the infill environment and want to stay there longer," notes Jackson. An uptick in the number of first-time buyers, young families, empty-nesters, and retirees has led to adaptations in floor plans, layouts, and other major design elements. Additionally, there is now a wider range of price points in many of their larger community developments. "We strive to create a broad product mix," says Jackson.

Toward that end, mixed-income housing developments are among their projects. "Those communities have a significant amount of socioeconomic diversity," notes Jackson. Capitol Quarter, for example, is one-third low-income housing, one-third moderate or working-income housing, and one-third market rate. EYA's inclusionary housing—housing required by the city, which may or may not be incentive based—results in 10 to 15 percent of homes targeted for people who can afford between 60 and 85 percent of their area median income (as opposed to affordable housing, for which there is a much higher percentage of the units targeted at a much lower income bracket).

Old Town Commons, a very recent mixed-income project in Old Town, Alexandria, spans five blocks at the city's gateway. It had been the site of a public housing facility with 194 units. Having forged a partnership with the Public Housing Authority for the site's redevelopment, EYA replaced 60 of the public housing units that had been there, and then built another 134 units, 154 townhomes, and 86 condominiums, plus added significant green space that includes a park.

"We ended up basically taking a site that was all low-income housing and transforming it into a site that was one-third low-income housing and two-thirds market-rate housing," explains Jackson. "It's all designed to feel like one product—you can't visually distinguish the affordable housing from the market-rate housing." (The market-rate housing is LEED certified; the affordable housing is a mix of LEED- and EarthCraft-certified units.) In its entirety, Old Town Commons is a remarkable transformation from the two-

story Army barracks-like building that once sat there. "The affordable housing is still there," notes Jackson, "but it is part of a mixed-income community."

Other noteworthy developments include Capitol Quarter, which features over 300 LEED for Homes-certified townhomes, workforce homes, and affordable rental homes. (It has become a national model for mixed-income development and has led to the revitalization of the ballpark district in Southeast Washington.) Harrison Square is located on the site of the old Children's Hospital—it takes up an entire city block, blends beautifully with the historic neighborhood, and is credited with sparking a renaissance of the U Street Corridor. Capitol Square comprises 93 townhomes designed with traditional colonial exteriors and modern interiors, while Bryan Square—the redevelopment of a historic school property—features 38 row homes with three distinct architectural styles designed to complement the surrounding neighborhood. And Chancellor's Row, a 10-acre community of new townhomes, is a prime example of EYA's modern LEED-certified designs.

Adding 250 families to an existing community, as in the case of Old Town Commons, requires a lot of forethought if it is to result in a "positive culture," notes Jackson. "We are always building in a context that exists, usually a neighborhood." EYA's understanding of community begins with an examination of the existing aesthetic. "We aren't trying to mimic it, we want to complement it… we are trying to weave ourselves into the fabric of the neighborhood."

To do so, EYA affiliates make efforts to meet and understand the people in the neighborhoods in which they plan to build. They get a feel for the "vibe" of a place. Their onsite offices are up to speed on what is happening in the neighborhood—the events, civic groups, etc. so they can help integrate homebuyers into their new community. "We find that most people who choose to live in a dense urban environment want to be connected," says Jackson. "They want to be plugged in and we try to facilitate that."

"Know Your Neighbor" welcoming events, are one example of such efforts. Hosted for people who will be moving into their homes at about the same time, EYA provides an orientation to the community—its offerings, amenities, etc. "But really the purpose of the event is to get them to know each other," says Jackson. The program started with their mixed-income communities to minimize the potential for social conflict. "What we found was that it is such a powerful and effective way to build community that we do it in every development now." They also create community associations and assemble Listservs to be used by new residents to connect with one another, though they often result in a community Facebook page. "The Listservs are just meant to seed communication," says Jackson.

EYA has received some of the most prestigious national awards for housing design, development, and livability. A strong market supports their work, a solid team furthers their prosperity, and a respected brand stretches their reach. But perhaps the most important thing to be said about EYA is that community is at its core—driving every aspect of every project to make "life within walking distance" attainable for all walks of life. ●

**Capitol Quarter is a townhome community located on five blocks in the Capitol Riverfront neighborhood in Washington, DC. Photo by Thomas Arledge**

# LINE OF Thought

The Metro Foothill Gold Line Construction Authority of Monrovia, California, adopts sustainable design principles despite the seemingly limited options.

**BY KILEY JACQUES**

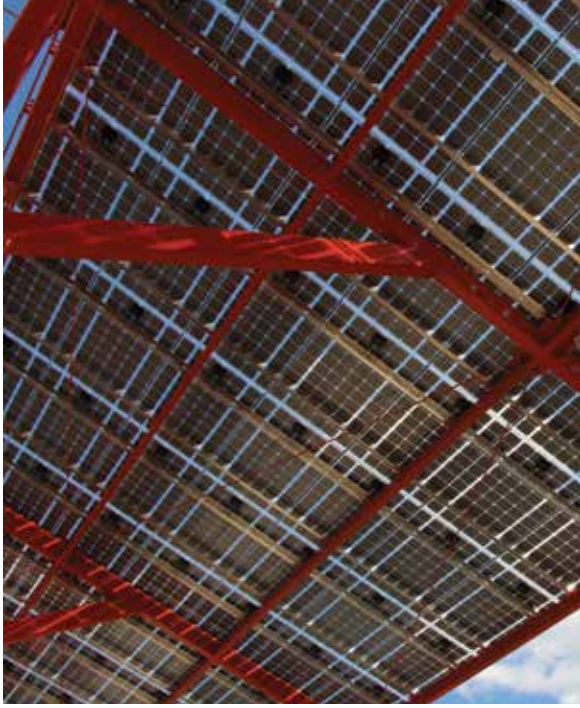
A maintenance facility that services an entire metro system's fleet does not readily lend itself to sustainable design, never mind the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Gold certification. At least that was the thinking at the start of the two-phase Foothill Gold Line light rail project from Pasadena to Montclair—the second phase of which was to include the building of an operations and maintenance facility as part of the Pasadena-to-Azusa segment. However, when key players from the Los Angeles County Metropolitan Transportation Authority (Metro), Parsons architects, and Kiewit Construction came together to look at what could be done, they decided LEED Silver certification was within reach—and then, much like the rail itself, they reached a little further.

In 2011, in the city of Monrovia, a 24-acre parcel of land—once home to a collection of 40- to 50-year-old light industrial buildings—was selected as the site on which to build what is now referred to as the Gold Line Operations Campus. Located just south of the I-210 freeway, the $265 million service facility was built to maintain Metro's growing fleet of light rail vehicles; it houses up to 84 such vehicles and serves as a workplace for 200 employees—24 hours a day, 7 days a week.

Foothill Gold Line Construction Authority CEO Habib F. Balian has been part of the project since phase one, which extended from Union Station to Pasadena, and he played a large hand in the environmental planning and construction of phase two—from Pasadena to Asuza. At its inception, the design-build contract addressed rail alignment, the I-210 bridge, and the parking facilities. "We had a very tight budget going into this and did not really consider there was potential opportunity for any kind of sustainability features," notes Balian. Between the rail, the parking lots, and the stations, he explains, there didn't seem to be a lot of options. But when it came to the maintenance facility and campus, "a light bulb went off" and they started thinking seriously about incorporating sustainable design elements.

**Right: The Gold Line Operations Campus is an integral part of the 6-station, 11.5-mile Foothill Gold Line light rail project from Pasadena to Azusa, California.**


Metro



**Left: Planting a variety of drought-tolerant plants reduces landscape water consumption at the campus by 50 percent. Middle: A 714-panel, 178.5-kw solar panel array generates enough electricity to meet one-third of power needs of the 132,000-sq-ft Main Shop Building.**

Balian credits major developments in the solar industry as playing a large role in changing their way of looking at the design. They adopted the attitude that sustainable features were indeed possible. "If there's a chance to retrofit something in without slowing our schedule or making major modifications to the design, then we should do that," says Balian.

Enter Roland Genick, chief architect (with Parsons) of Rail and Transit Systems. "It became clear…that with some additional efforts, LEED Gold was actually within reach," recalls Genick. "With Parsons as the designer and Kiewit as the builder, we huddled together to identify additional opportunities."

First, they found ways to capture rainwater using filtration systems to collect, clean, and direct water down into the ground. Drought-tolerant landscaping with state-of-the-art smart irrigation systems were added; solar-powered skylights were introduced; energy-saving sensory detectors were placed throughout the facility; and the building was physically configured to monitor power usage. Ultimately, given their large canopy, they even brought in a solar array. "These were things we never thought we would be able to do," says Balian. "Once it became clear these things were feasible, we found we could spend a little more time and additional dollars to make upgrades that were good for the environment and made sense. We thought being sustainable was something that was very good for Metro long term."

With regard to the stormwater treatment system, its designer, Jennifer Hall, says, "The intent was to utilize as much space underground as we possibly could [so as] not to impact what they wanted to build out." Toward that end, they employed a CDS unit to filter oils and sediments from water being directed into the storage system, which will ultimately infiltrate the clean water into the ground. By doing so, they are "renewing the resource daily." The underground storage chamber's footprint is all "gravel," sized for water-quality flow. Any water that ends up in the storm drain is contaminant free. Given the complex and extensive conduit system on site, the infiltration system was divided in two—one part sits under the parking area, the other is in the southwest corner.

In the end, they managed to take six acres of previously impervious conditions and turn them into an area capable of absorbing water. They did, however, need to tie into an existing (and already taxed) city storm drain system, but being able to absorb water elsewhere assuaged additional pressure on that system during flooding. "This changed how long it would take for the water to get from the northeast corner of the campus to southeast corner. If you were to follow the raindrop, we significantly increased the amount of time it [takes.] We helped to alleviate any downstream constraints."

Carmen Cham, a senior architect with Parsons, points out how unique the railyard site is: "So much of the underground infrastructure has not only to do with the utilities but also the electrification of the trains." The space was, therefore, very limited when it came to stormwater storage. On the other hand, it was loaded with ballast, which helped a great deal with infiltration of rainwater and its introduction into the ground.

Given the Operations Campus is located in the heart of Monrovia and, therefore, surrounded by a residential community, the Construction Authority strove to find ways to promote sustainability throughout the campus to help mitigate the impact of such a large facility on the neighborhood. They did everything they could to weave the campus into the environment and make it aesthetically pleasing from its two visible sides, including the planting of citrus trees and a drought-tolerant landscape, the installation of benches and picnic tables, and the construction of "linear

**The full-service, state-of-the-art facility will house up to 84 light rail vehicles and nearly 200 employees over several shifts a day. Water-reduction measures in the Main Shop Building (such as high-efficiency fixtures and infrared sensor faucets) were employed to help achieve a 35 percent water reduction level.**

parks." They even made a deal with the community to turn a triangle-shaped piece of property on the northwest corner into an open-to-the-public viewing portal overlooking the railyard. "We knew people were always going to be interested in knowing what was going on," says Genick.

In terms of attaining LEED Gold certification, Genick says: "It's important to note, from an approach standpoint, that as you are going through the [USGBC] scorecard… [it] wasn't written with a maintenance facility in mind. Understandably so, there aren't that many." Without a model to follow, the team tried to stay true to the certification's criteria, but they made necessary adjustments to accommodate the building's highly particular function. They also wanted to be smart about how they were evaluating all the mechanical systems. "There isn't necessarily a standard value for energy and water consumption as there would be for a traditional office building," notes Genick. So they carefully considered the building's primary purpose: to support the construction and maintenance of trains. "We were building this for an agency that is going to be in this building for the next 100 years," notes Cham. Daylighting was important, particularly in the shop area, where a number of skylights were introduced to minimize the need for artificial lighting. Throughout the facility light sensors dim based on occupancy; others detect the amount of existing natural light and dim accordingly. The HVAC system was designed to be as efficient as possible, and they used all white roofs to avoid heat island effect. Furthermore, recycled steel and concrete were used throughout the project. (For the shop's construction they even reused rail line.) "We were almost at the end of the design when the Authority approached us about getting additional credits," says Cham. "That's when a [solar] array system was introduced onto the site."

Because the Construction Authority was only responsible for the planning, design, and construction of the project, while Metro owns and manages all operational elements, including the Operations Campus and the six-station light rail system, the team worked with Metro's sustainability coordinator to be sure no features were implemented that could not be sustained over time. From the start, Metro was aware of what they would be responsible for, and they committed to maintaining both the operation and its certification. "They knew what they were getting and they are invested," says Cham.

Today, the Gold Line Operations Campus comprises a main shop building; a car wash facility; a maintenance-of-way equipment storage canopy (the structural support for the campus's solar power array, which produces nearly 22,000 Kilowatt-hours of electricity per month); a car cleaning platform; a materials storage building; storage tracks, where light rail vehicles are kept when not in use; and a 600,000-gallon fire reserve water tank and attendant pump/hydrant system.

Compared to other Metro facilities, this is a much improved work environment for employees. "We approached it in a very different way. We call it a campus instead of a maintenance or railyard," explains Balian, noting that the initial design proposal looked more like a prison, which, given its location in the middle of a community, didn't seem like a good idea. "The biggest challenge was getting the community's buy-in," he says. "We wanted to be generous to the community and do nice things for it. I think we did a whole lot to create a nice environment for the people who are going to be working there." Beyond that, they enhanced the neighborhood with upgraded intersections and better street lighting. "That's the great thing about these projects," says Balian, "they are catalysts for improvements in the neighborhoods, and that's what this did."

# THE BUSINESS OF Being Green

A look at green building adoption in Chicago, New York, and Washington, D.C.

**BY ALEXANDRA DELUCA**

Whether you get your hot dog from a cart in Manhattan, "drag it through the garden" in Chicago, or order one at Ben's Chili Bowl in Washington, D.C., you are stopping for a snack in one of the nation's green building apexes.

"Each of these three cities is an example of a strong sustainable market," says Dave Pogue, global director of Corporate Responsibility at CBRE, which published its "National Green Building Adoption Index" in June of this year. The index aims to measure the growth of green building certification—either EPA's ENERGY STAR program or the U.S. Green Building Council's LEED—for the top 30 U.S. commercial markets over the past 9 years.

But like their culinary offerings, Chicago, New York, and Washington, D.C. have marked differences in how and why their real estate sectors have adopted sustainability. "Chicago is the most dynamic of the markets," Pogue says. "It has really embraced green building practices more than average." More than two-thirds of Chicago's square footage has one or more green building certifications, placing the city number three in the index. This was a surprise, says Pogue, due to the immense size of the metropolis, but the reasons why are multipronged.

"Chicago is a first-tier city," he says. "They have very large buildings and very large corporations. There are civic ordinances requiring certain disclosures such as ENERGY STAR scores." While green certification used to mean you were ahead of the pack, these days it is something you must maintain to stay competitive, he adds.

In Washington, the capital's well-known building height restrictions kept them lower in the rankings, which measured percentage of space rather than number of buildings—at eighth place. But the nation's second largest commercial office market—second only to Manhattan—has more than 40 percent of certified green space. "D.C. has adopted green building," says Pogue. Much of that has to do with the U.S. General Service Administration (GSA) comprising the bulk of its tenant base and occupying ENERGY STAR-labeled buildings. "Buildings want to lease to the number one tenant in the city," he says. "There are also lots of institutional owners. They tend to go for certification more than private owners."

**Disclosure requirements and energy audits make New York City a first-tier "green" city.**

**More than two-thirds of Chicago's square footage has one or more green building certifications.**

In terms of ordinances supporting green buildings, no one ranks higher than New York City, says Pogue. "They were the first. They have disclosure requirements and energy audits that buildings have to do. It's not just disclosure—it's physical action. Clearly a first-tier city," he adds. Again, the high institutional owner base is sophisticated, though New York City does not have the active government or technology tenant base of other cities like D.C. and San Francisco. In terms of percentage of green space in a market, Manhattan ranks 12th.

Chicago, New York, and D.C. remain three of the most dominant cities in America——but there is concern about abatement.

"We are concerned that we may have had hit a peak because so many of these buildings have become 'sustainable,'" says Pogue. "In some of these cities, particularly in Chicago, a high percentage of real estate has attained these certifications. The challenge is: How do you maintain and how do you add to a very large base?"

Nick Stolatis, senior director of Global Sustainability & Enterprise Initiatives, Global Real Estate, at TIAA-CREFF, says, "I think all three cities are maintaining momentum. It's a steady process and that is really what we want to see—the long-term commitment is important. More and more owners and more and more managers are getting on board. The tenants are sophisticated enough and more and more of them are asking what they are doing."

It's how TIAA-CREFF approaches its $86 billion of assets under management. "I would argue that all of it is being operated under sustainability for the long movement. In our global real estate initiative, there are three key principles we apply: conservation of energy, reduction of waste, and benchmarking our assets."

Pogue points out that it is important to remember even a decade ago was a very different time for green certification. There was little adoption of ENERGY STAR program and LEED was still in its infancy. "Fast forward to 2013/14, and we have found a dramatic uptake of these certifications in particular markets." In 2015, it means that growth in the 30 largest markets continues, but at a slower pace—indicating that many of the buildings that can get certification have sought it.

So what's next? "That is the question we have asked ourselves," Pogue says. "Here is a giant city like Chicago, where two-thirds of its buildings are green. How are you going to the next tier? This is where the problem lies."

The problem can be better understood in terms of building size. More than half of all buildings over 250,000 square feet are currently certified. This represents 67 percent of those buildings' total square footage. The figures are 62 percent and 76 percent, respectively, for buildings over 500,000 square feet. Compare this to buildings under 100,000 square feet, where less than 5 percent of buildings have a certification, which comprises 7 percent of their total square footage.

"This is a big buildings phenomenon," says Pogue. "It's skewed toward large buildings.

"The industry needs to understand how to get the message to smaller owners," he adds. "This is trench warfare—hand-to-hand combat."

"Size is definitely has an advantage," says TIAA-CREFF's Stolatis. "Office buildings tend to have more opportunities for the landlord to save energy and money. That isn't to say smaller buildings can't be improved. Our approach is, we want to engage with those residents to advise and help them reduce their cost."

Energy costs may be a good starting point with smaller building owners, especially in less positive economic times. "When we get into a touchy market again—and we will—that may be when smaller building owners do it," says Pogue.

"It has to do with economics," he adds. "For buildings who have not previously participated, the next downturn may be the next opportunity." ●

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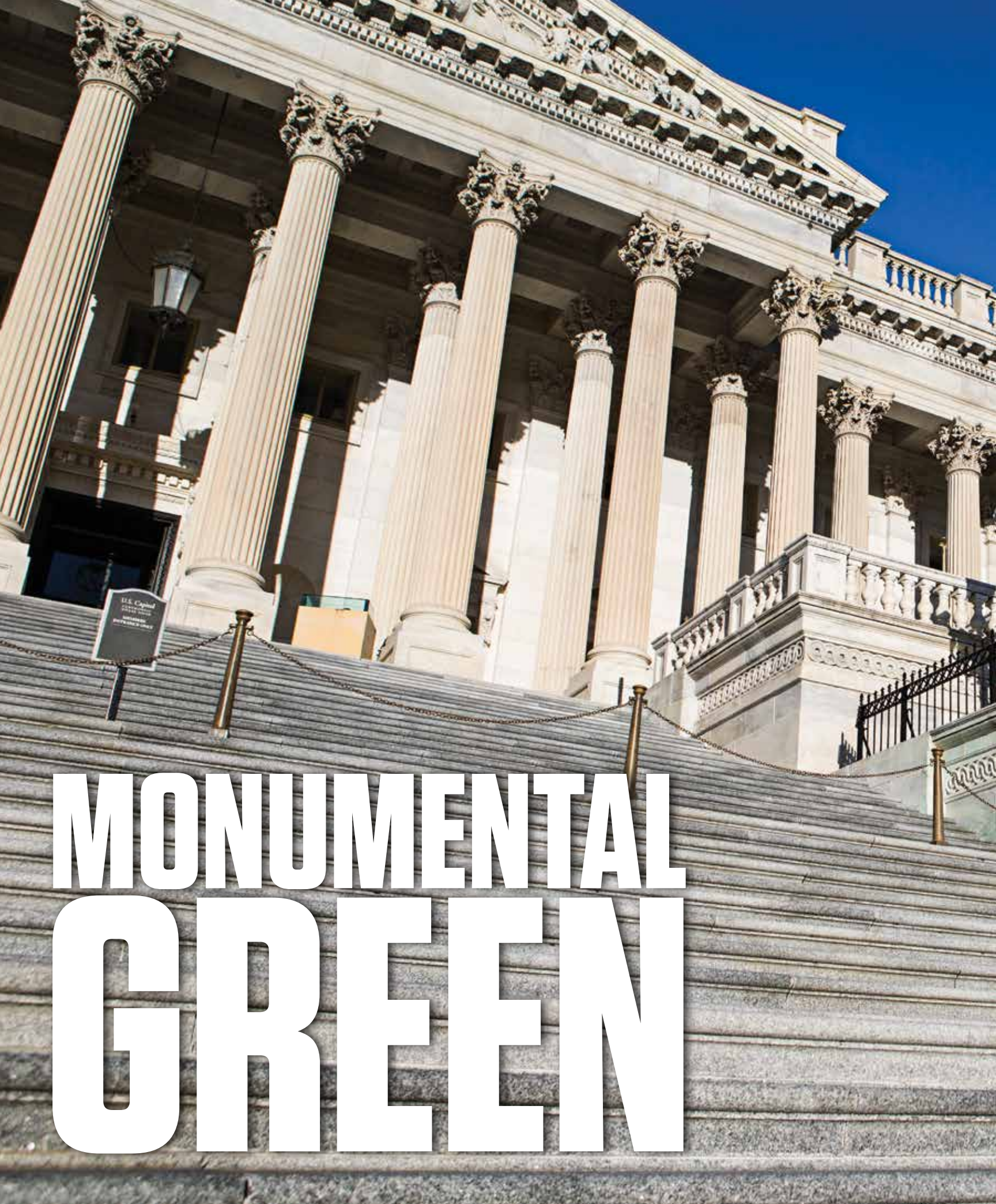

# MONUMENTAL GREEN

# The federal government sets the bar high for sustainability across the nation's capital.

WRITTEN BY **JEFF HARDER** | PHOTOGRAPHED BY **RYAN SMITH**

When the Greenbuild International Conference and Expo makes its inaugural trip to Washington, D.C., this November, it will set up shop in one of the greenest cities in the world. The city's eight wards are peppered with sustainable spaces, from the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Gold-certified main building for the U.S. Department of the Treasury just east of the White House, to the LEED Platinum-certified Dunbar High School on New Jersey Avenue. Last year, our nation's capital became the latest of four cities to surpass more than 100 million square feet of LEED-certified space. And at the same time, D.C. has earned bragging rights for having more LEED-certified space per capita than anywhere else in the world.

That superlative is a natural result of the recent community wide push to make the District a greener place to live. In 2011, the city's Department of Energy and Environment and the Office of Planning launched Sustainable D.C., an effort bringing together constituents from across the spectrum to make the city the most sustainable in the country over a 20-year span. And despite Capitol Hill's reputation for political gridlock that rivals the congestion on the Beltway, legislative efforts to bring energy savings to government buildings and structures have transcended party affiliation.

"We've been fortunate that sustainable building executive orders and legislation haven't gotten bogged down in a lot of the controversy of climate change," says Lance Davis, sustainability architect for the General Services Administration (GSA), an agency that manages 9,600 federal buildings across the country. "Both sides of aisle seem to be focused on [the fact that] a sustainable building is generally a building that's saving taxpayer dollars, it's better performing, the people in them are generally happier—and isn't that exactly what we want for our federal agencies? Isn't that exactly how we want to spend taxpayer dollars?"

In fact, executive orders and congressional legislation have played large roles in D.C.'s green building zeitgeist—particularly the Energy Policy Act of 2005 (EPAct 2005) and the Energy Independence and Security Act of 2007 (EISA 2007), which, among other goals, targeted incremental energy reductions totaling 30 percent by 2015. "That was the biggest legislative driver for our conservation and sustainability components," explains Doug Helmann, deputy chief sustainability officer for the Architect of the Capitol (AOC), which maintains some 17.4 million square feet of libraries, office buildings, and other locations on and around Capitol Hill, including the iconic U.S. Capitol Building that houses the Senate and House of Representatives. Those mandated energy targets had their desired effect: Speaking on the eve of fiscal year 2015, Helmann says the AOC had already surpassed its 30 percent energy reduction target.

**Lance Davis, AIA, LEED program manager for Design Excellence Architecture+Sustainability, in front of the U.S. General Services Administration in Washington, D.C.**

Along the way, LEED standards have helped agencies to put their sustainability aims into action. Stephen Ayers, head of the AOC, is the first LEED Accredited Professional (AP) to hold the honor and one of 28 LEED-accredited employees within the organization, and the AOC's goal is for new projects to target LEED Silver for New Construction and Major Renovations guidelines.

As for the GSA, after first incorporating LEED standards in 2000, the agency raised its mandatory minimum for large-scale projects to LEED Gold in 2010. "What we've seen from the LEED rating system is that aspirational aspect for our design teams," Davis says. "They recognize that they can't just focus on energy: They have to look at the complete system and say, 'How does this project relate to its site, to the materials I'm selecting, to the energy and the water, to the people inside? By being at that level, it ensures the design teams are looking at each project holistically."

Now, with the AOC and the GSA as our guides, let's look at a few of the greenest places that this ultra-sustainable city has to offer.

## U.S. Capitol Building

While its signature dome is now going through its own renovation, the U.S. Capitol Building finished a three-year-long overhaul in 2012—one that resulted in a 40 percent energy reduction over five years. "We were proud that we were able to make those achievements," Helmann says, noting that night and weekend work was an inevitable part of the process. "You can imagine trying to get in and do that work while Congress is in session."

The $20 million project was financed through an Energy Savings Performance Contract (ESPC), a mechanism that allows the AOC to pay for energy-saving projects without bearing the full cost upfront. "We were a big advocate of that method because it allows us to make these improvements without having to use precious dollars that we have appropriated to preservation, or to more pressing needs in our portfolio," Helmann says.

The majority of the improvements to the U.S. Capitol Building came through tried-and-true upgrades: more efficient lighting systems, water-saving measures, and building and automation controls to regulate the mechanical and HVAC systems—a particular advantage in a place that can go from quiet to bustling faster than you can say "fiscal cliff," and that needs to maintain certain environmental parameters to preserve the valuable artwork under its watch. And by data-mining information from the new automation systems around the Capitol, the AOC can find new ways to reduce energy use. "That's been a key part of getting to our 30 percent reduction," Helmann says. "We got a lot of our early savings through projects, but a substantial amount of recent savings has come from our operators figuring out how to make our buildings operate more efficiently."

## U.S. Coast Guard Headquarters

Located on the western end of the campus that once housed St. Elizabeth's Hospital, the proximity of the 1.2-million-sq-ft campus for U.S. Coast Guard headquarters to the Potomac River was a major built-in design challenge—and a major concern when it came to stormwater runoff. But now the headquarters is a point of pride for the GSA: Its 550,000-sq-ft planted roof is among the largest in the world. "Every drop of water that falls on that site is going through extreme filtration through plants and their root systems, coming out as super-clean water that is part of a natural hydrological cycle," Davis says.

And while it remains a highly secure facility, it will not induce claustrophobia: The hillside landscape on a property with a National Historic Landmark designation includes a quartet of courtyards, each planted with different fauna schemes, from an Appalachian Mountains theme, to coastal lowlands, to others formed from some 200,000 plants and 300 trees—amenities that serve as pleasing lunch-hour vistas or de facto outside office space on sunny, breezy days. "This is a building that really took the landscape and used it to its fullest advantage," Davis says. "…They're not stuck in an underground bunker that's all about security: This is design excellence that's providing security and sustainability as a holistic concept."

**Doug Helmann, deputy chief sustainability officer for the Architect of the Capitol.**

## GSA Central Office Building

Built in 1917, the GSA's headquarters at 1800 F Street NW is in the midst of a multiphase, American Recovery and Reinvestment Act–funded renovation that has involved upgrades of all stripes, from state-of-the-art electrical HVAC systems to a 70,000-gallon cistern that captures and filters water for reuse. But within its 710,000-sq-ft confines, few of its 4,600 occupants have an assigned desk. Instead, the GSA uses software that enables employees to check out desks like a hotel room—and save resources through a flexible office environment. "This whole concept of getting away from this idea of a cubicle where everyone owns their space is really allowing us to change how we deal with being an owner," Davis says.

By allowing groups inside the multi-agency building to check out clusters of desks alongside whomever they need to work with, it encourages more face-to-face collaboration and communication. By giving equal access to treadmill desks and WiFi enabled spaces on the building's planted roofs, it fosters healthier and happier workers. This strategy may even allow them to schedule occupants to work on the same few floors and shut down the rest of the building on days when most employees are telecommuting, or open this space to other agencies as a cost-saving alternative. Since completing the first stage of the renovation on its headquarters, the GSA has saved $24 million on annual rents by closing down a dozen leases in the D.C. area, and they expect energy usage at 1800 F Street NW to stay the same despite a 2,000-person growth in the building's occupancy. "It gives us a lot of options for the federal workforce as to how and where they work, but it's also saving us money at the same time," Davis says.

## Thomas P. O'Neill, Jr. Federal Building

Once the epitome of a glum government building from the mid-20th century, the Thomas P. O'Neill, Jr. Federal Building emerged from a complete gutting and redesign in 2013 as a LEED Platinum ambassador of green building in the heart of D.C. "It was not a

**The green roof of the U.S. Coast Guard Headquarters in Southeast Washington, D.C., is one of the largest in the world.**

place you'd want to come to work on a regular basis," says Davis of the GSA. "But because of the high level of sustainability we were shooting for, we were able to achieve LEED Platinum, open the building up, and bring in some pretty high design to make it a very desirable, Class A office space."

After that three-year renovation, the building—alternatively known as FOB 8—includes green roofs and stormwater retention systems, high-efficiency fixtures, a more robust tree canopy, and other water-saving features. A high-performance glass curtain wall on the building's façade is the most striking in a slate of energy-saving features that includes efficient appliances and LED light fixtures. The construction of the building also incorporated a variety of reused and recycled materials: Limestone was salvaged from the original facade and repurposed in the building's lobby and a pair of atriums, and those latter features deliver a deluge of natural light throughout the interior office spaces. Davis adds, "It's a nice visual of how you go from a mid-century ugh to a modern wow."

## Cannon House Office Building

First opened in 1908, this 806,115-sq-ft Beaux Arts building at 27 Independence Avenue SE has a special place in Capitol Hill history: It is the oldest congressional office building. "Basically, this was the first place where a member of Congress could actually have a Washington, D.C. office," Helmann says. It's been a fixture as the House of Representatives and its congressional staffs have grown larger. And today, after a lifetime without a major overhaul, the Cannon House Office Building is beginning a 10-year, $752 million renewal that is putting sustainability at the forefront.

Helmann says the project is targeting a LEED Silver baseline with a design that calls for special attention to the Sustainable Sites, Energy Conservation, and Indoor Environmental Quality LEED sections. "There's a lot of historic fabric within the building, and a top priority is holding onto that embodied energy: How do we modernize it, but at the same time hold on to most of the stone work that the building has, the

**The Rayburn House Office Building behind the Bartholdi Fountain, located within the United States Botanic Garden.**

wood features, the plaster walls," Helmann says. Once the renovation is completed, the AOC expects the building to be the most energy-efficient large building in its portfolio, reducing its energy consumption by 58 percent over its predecessor. "We've had it for 107 years, and the goal is to get the building positioned for its next 100 years."

## Rayburn House Office Building

Capitol Hill's trio of office buildings devoted to members of the House of Representatives have been the sites of remarkable sustainability achievements, including a 23 percent reduction in energy consumption and a greater than 60 percent reduction in water usage. Notably, the Rayburn House Office Building—a 50-year-old structure named for Sam Rayburn, the longest-serving Speaker of the House—is host to an innovative, sustainable water feature.

Operating the flowing fountain outside the Rayburn building results in evaporating large amounts of water, but the AOC has devised a novel idea to fulfill one fountain's needs while simultaneously conserving water: A fountain in the Rayburn courtyard captures the moisture that the building's air handlers remove through normal air conditioning. "It's just moisture from the air," Helmann says. "It's very clean, but most of us typically send it down the drain." Instead, the system feeds those million-plus gallons of clean water to the fountain. Beyond eliminating the need to draw that water from elsewhere, it also reduces outflow into the city's combined sewer system, a LEED regional priority credit for the District.

This selection of sustainable sites only scratches the surface of how LEED assists the federal government in its goals surrounding energy use and climate change. An analysis by the Energy Information Administration released in October finds "newly constructed and renovated federal buildings—many of them LEED certified—have been a contributing factor in federal energy use reaching a 40-year low." Findings also highlight that LEED certification delivers this type of accountability cost effectively. For a city with many divisions, our nation's capital is united in being the vanguard of sustainability.

**New office space at the U.S. General Services Administration in Washington, D.C., provides plenty of natural daylighting.**

# America's Greenest College Town

## Washington, D.C.'s, institutions of higher learning are graduating to new heights of sustainability.

WRITTEN BY **CALVIN HENNICK** | PHOTOGRAPHED BY **RYAN SMITH**

The District of Columbia Mayor's College and University Sustainability Pledge started with numbers. Nine, for example. That is the number of institutions of higher learning that signed the pledge in 2012 as part of then Mayor Vincent Gray's quest to transform the nation's capital into the "healthiest, greenest, and most livable city in the United States." And three: That is how many "Green Star" awards each college could earn under the program. Five, too—the number of sustainability achievements required to earn each star.

Then the numbers got fuzzier. Each school was supposed to set its own goals around issues like green building, water and energy reduction, education, research, purchasing, and transportation. A university could commit to reducing potable water use per square foot by X percent from a baseline figure, for example, or hosting Y major sustainability outreach events annually, or ensuring that Z percent of food and beverage dollars were spent on sustainably sourced food.

But it turned out that each school measured things differently. One school's X percent decrease might have been another school's Y, and one school's definition of a "sustainability-focused" course (worth a point toward a Green Star) might vary ever so slightly from the rest of the group's. "The universities spent a lot of time trying to figure out how they could collect data in a way that allowed everyone to share it," says Dan Guilbeault, chief of sustainability and equity for the District's Department of Energy & Environment. "That turned out to be a much bigger challenge than anyone anticipated. Everybody collects data just a little bit differently, and this discussion was really monopolizing a lot of the time of the pledge."

So the members of the pledge revised their plans. Even if the colleges' representatives could not compare their sustainability statistics with the rest of the group in a true apples-to-apples fashion, they could still share their progress with each other. Even if no one would be doling out Green Stars, they could still collaborate on projects and benefit from direct access to the District's sustainability personnel.

"The group made a decision," Guilbeault says. "Let's stop trying to quantify all of these things, and let's figure out what are the highest needs for the group overall. It's more continuously working with each other, figuring out what's possible, helping them find the right people to work with, and then talking to each other. It's idea development, and then helping them through the process."

**Previous spread, left to right: American University, McKinley Building; New South Building at Georgetown University.**

**Far left: Dan Guilbeault, chief of sustainability and equity for the District's Department of Energy and Environment. Left: Audrey Stewart sustainability director at Georgetown University.**

"We started off really wanting it to be quantitative," Guilbeault continues. "We wanted people to earn points and achieve different levels and all provide data in the same way. It has really turned much more into networking and positive peer pressure, with schools sharing how to do things and overcome challenges. It is also valuable for them to have direct access to the government."

In short, the pledge quickly stopped being about numbers. It became about people instead.

Higher education as a sector, and particularly higher education in D.C., was already a leader in sustainability even before the 2012 pledge. "College and university campuses are their own microcosms, their own cities," says Jaime Van Mourik, higher education strategic lead for U.S. Green Building Council (USGBC). "Things can be tested within their own infrastructure, their own communities, and that can really be an opportunity to beta test new concepts."

"They're the hotbeds of innovation and research," she adds. "The mission is to educate the future leaders and citizens of this world. Topics like climate change and resiliency, it is all part of the purpose of this particular sector, why it exists—to make change, to connect to the local communities and regions, and to be a driver of what the future can look like."

Audrey Stewart, sustainability director at Georgetown University, calls sustainability "a natural extension" of her university's mission. "Sustainability has long been a priority at Georgetown," she says. "It's really been inspired by our Catholic and Jesuit heritage, and our core mission of educating students, creating knowledge, and doing good in the world."

As is still the case today, some of the District's universities were significantly ahead of others when it came to sustainable practices in 2012, in part because some schools simply lacked the capacity of their larger peers. While several institutions employ full-time sustainability directors, for example, some of the others rely on various faculty or facilities staffers to serve as a point person on green issues. Still, there was a feeling among leaders at some of the universities that the pledge must include all of the District's major institutions of higher learning—or include none of them. Only through a unified approach, they felt, could the colleges announce themselves as leaders in the movement to make D.C. into a beacon of sustainability.

"All of us were already meeting on a regular basis to share best practices and figure out if there were ways to work together," says Meghan Chapple, George Washington University's sustainability director. "This

was a way we thought we could have a stronger and more powerful presence and voice. It sent a signal to the D.C. constituents that this was a sector that was taking sustainability seriously."

Ultimately, all nine major institutions of higher learning in the district—excepting for-profit schools and niche institutions such as seminaries—signed on to the pledge. The list included American University, Catholic University of America, Gallaudet University, Georgetown University, George Washington University, Howard University, Trinity Washington University, the University of the District of Columbia, and Corcoran College of Art and Design (which has since merged with George Washington, bringing the current number of signatories to eight).

Van Mourik says the pledge, to her knowledge, is unique to Washington, D.C. The commitment, she says, is similar in some respects to Leadership in Energy and Environmental Design (LEED) building standards but different in others. While the pledge allows the universities to publicly declare their dedication to sustainability, she notes that, unlike the LEED program, it lacks the originally envisioned third-party verification measures. The result is a sort of trade-off. On one hand, member institutions are not held accountable for their progress by an outside group. On the other hand, the pledge is open to colleges and universities that value sustainability but may lack the resources and staff needed to pull off innovative, large-scale green projects. So, the "superstar" institutions with large existing sustainability programs can collaborate with one another, while also sharing their knowledge with colleges and universities with less of a track record.

"The leaders help to mentor those institutions that are maybe just starting their sustainability journey," Van Mourik says. "Collectively, they're all driving toward that future state that they have outlined in their vision. In a lot of cases, the low-hanging fruit has been picked,

**Left: Meghan Chapple, sustainability director of George Washington University.**

**Right: Megan Zanella-Litke, American University's sustainability director.**

and now they're looking at the harder aspects of implementing sustainability."

Another result of the loose nature of the pledge is that it is impossible to measure its impact with any sort of precision. Sustainability leaders at various universities can quickly point to collaborative efforts, but it is sometimes difficult to decipher which bits of a project were spurred by the pledge, and which would have come about anyway through a school's own efforts. Still, while those involved in the pledge might not be able to assign a numerical value to it—no counting of Green Stars or totaling the tonnage of carbon dioxide retention—they all seem to agree on one thing: It is working.

"The [former] mayor's pledge plays a central role in our sustainability efforts," says Fred Weiner, assistant vice president for administration at Gallaudet University. "A lot of what we do at Gallaudet is tied to the mayor's pledge that we signed in 2012. It gave us some objectives to meet, and we feel like we're a part of a team here in D.C." Weiner directly credits the pledge with spurring the university to set goals around reductions in water and energy use, and says Gallaudet has consulted with other member institutions on how to improve practices like trash collection.

Georgetown's Stewart says that, while "it's hard to draw a line" between the signing of the pledge and specific university initiatives, the commitment has increased awareness of the school's shared goals with other colleges and with the District itself. "The pledge gave us a more coherent framework to collaborate as a sector and to collaborate with our local city government," explains Stewart. "I think it helped us become more aware of local sustainability priorities and how we could align with them." For example, she says, the university is working to contribute to the District's efforts surrounding stormwater runoff reduction. "In our new construction, we're being really intentional about more effectively managing stormwater."

George Washington's Chapple says that the pledge "helped build a bridge" between universities and the D.C. government. "If we had a question or a problem around putting solar on rooftops because of a height restriction, the pledge gave us access to people who

# Eight Shades of Green

Among them, the eight members of the District of Columbia Mayor's College and University Sustainability Pledge have launched countless green initiatives. Here's a small sampling of what each school is up to.

**American University**. In 2010, American adopted a "zZero wWaste" policy, aimed at eventually reducing the amount of waste sent by the university to landfills and incinerators to nothing. As part of the effort, the school composts paper towel waste from all campus restrooms, as well as kitchen waste and coffee grounds from several campus eateries. The university also collects and recycles vehicle waste such as oil and batteries, has reduced food waste by eliminating trays in a dining hall, and converts kitchen grease into electricity and hot water via a Vegawatt generator.

**The Catholic University of America**. The university offers LEED Lab as an elective course within the school's Master of Science in Sustainable Design Program. The course is also open to undergraduate and graduate students in the School of Architecture and Planning and other schools at the university. Students in the course assess the performance of existing buildings on campus, learning how to meter and track systems such as electricity, energy, water, and transportation. The students graduate from this course ready to take a LEED AP exam.

**Gallaudet University.** The Green Grow garden at Gallaudet produces fresh fruits and vegetables –including blueberries, broccoli, peppers, tomatoes, watermelon, onions, and kale–that are both consumed in the student dining hall and sold at local farmers' markets. The garden, a student-led effort meant to shine a spotlight on the importance of locally sourced food, is irrigated with reclaimed rainwater. The garden and associated student group also host fundraisers and educational events to promote sustainability.

**Georgetown University.** The university has already met its goal of cutting its carbon footprint in half from a 2006 baseline level before 2020–reaching a cumulative 70 percent reduction in 2104. A number of initiatives have contributed to the achievement, including a reduction in the number of printing devices on campus, a pledge by more than 400 faculty and staff members to help conserve energy, and a student-led solar panel project on six campus townhouses.

**The George Washington University.** Unveiled in 2011, the university's GWater Plan is one of the most comprehensive plans for water sustainability adopted by any higher education institution in the U.S. The plan calls for a 25 percent reduction in potable water over 10 years from a 2008 baseline, a 10 percent increase in permeable space over ten years from a 2011 baseline, and a 50 percent reduction in university purchases of bottled water over five years from a 2011 baseline.

**Howard University**. The Howard University Central Campus Master Plan includes a number of changes aimed at increasing overall transportation efficiency to and from campus. These changes include adding bike sharing stations and increasing participation in alternative forms of transportation such as carpooling, walking, cycling, and public transit. University officials have also discussed increased telecommuting as a way to reduce car trips to campus, promote productivity, and allow employees to spend more time with family.

**Trinity Washington University.** The university's technology services division has enacted a number of waste-reducing and energy-efficient practices, including making double-sided printing the default for many print jobs, purchasing efficient computers, recycling e-waste, and reducing the footprint of the university's data center (and, therefore, reducing heating and cooling needs) through virtualization. During the 2013-2014 school year, double-sided printing alone saved more than 430,000 sheets of paper.

**University of the District of Columbia.** "Post-Oil City: The History of the City's Future," an exhibition of panels and workshops hosted at the university last year, explored how cities of the future might be able to achieve water and food security while also reducing long-distance transportation, increasing urban food production, and improving water capture and reuse. The exhibition culminated in a dialogue that included the leaders of the District's Water and Sewer Authority and Department of the Environment.


**Capital Bikeshare at Milken Institute School of Public Health at George Washington University.**

could help us navigate that quagmire," she says. In addition, she continues, the pledge keeps sustainability issues on the radar of university presidents and other top-level leaders. "I think it helps the leaders at a university see how they are performing alongside their peers in terms of sustainability on campus. It definitely creates a buzz, and it highlights things that people can be proud of."

Chapple also credits the pledge with paving the path to a large joint purchase of renewable energy with American University. The partnership between the two schools, plus the George Washington University Hospital, will help the school derive more than half of all its electricity from solar power. In total, it will result in the purchase of 123 million kilowatt hours (kWh) of emissions-free electricity per year drawn from 243,000 solar panels at three sites—the equivalent of taking 12,500 cars off the road. Now, other D.C. universities are considering teaming up for similar renewable energy purchases.

"Having this group, this collective, really helped facilitate that joint purchase," says Chapple. "We went out to bid together. We designed the scope for a large-scale renewable energy project together, because we wanted to maximize the scope of our joint purchasing power. Because we had this group, and because we had this access to the city government, we could start talking about creative solutions to climate change."

If any D.C. university would have been fine going it alone, it is American University. The school has a well-deserved national reputation as a sustainability leader, and alone it accounts for more than 3 million of the approximately 8.7 million square feet of higher education LEED certified and registered space in the district. It is also one of a handful of universities across the country using the LEED Volume program to streamline certification. "It's one of the reasons I wanted to come here," says Megan Zanella-Litke, American University's sustainability director. "Just walking across campus, you notice it. It's written literally on the buses—they have different facts about our sustainable commitments written on the buses. It's just a nice, constant reminder that the university as a whole is committed to this."


**Georgetown University student Monica Mahal fills a water bottle at a bottle-filling station.**

And yet, Zanella-Litke says that American has benefited significantly, not only from the joint energy purchase, but more generally from the collaborative framework formalized by the pledge—the ability to share ideas and work toward common goals in tandem with the rest of the District's colleges. "Knowing that there are resources around the city that we can reach out to is beneficial," she says. "One of the long-lasting impacts of the pledge is the network that it created, and the extended resources that we get to help move these goals forward."

Universities, of course, are more than just assemblages of buildings with LEED Silver, Gold, and Platinum plaques displayed at their entrances. They exist to educate future generations of thinkers and problem-solvers. And that mission, higher education leaders say, is where the sector may ultimately have its most profound impact in the sphere of sustainability.

"The individuals who want something to happen on their campus, they wield the power of the students," says Van Mourik. "If their colleagues either won't listen, or they're stuck in their ways, they get students there to rally around it. This is a generation of change makers. They're so sick and tired of hearing about doom and gloom. They want to change it. And that's what we need. We need to harness the power and enthusiasm of this untapped resource on campus."

"The credit should really all go to the students," echoes Zanella-Litke. "They really keep us moving forward as institutions. They really care about these places. They're not just trying to enact change for the sake of change."

Students, Chapple confirms, push for green practices in order to improve their campuses. "They want to say, my university did this, and I'm very proud of them," she says. But also, she adds, students are looking to find ways to improve the larger world, to fix the environmental problems that they are inheriting from previous generations. "Our students know that they're the ones who are going to have to live with this," she says. "And they know that they're going to have to create the solutions going forward."

Allen + Maurer Architects Ltd. won the second Sustainable Forestry Initiative Award in the 2014 North American Wood Design Awards Program for their innovative use of wood certified to the SFI Standard in the Askew's Uptown Food Store located in Salmon Arm, British Columbia.



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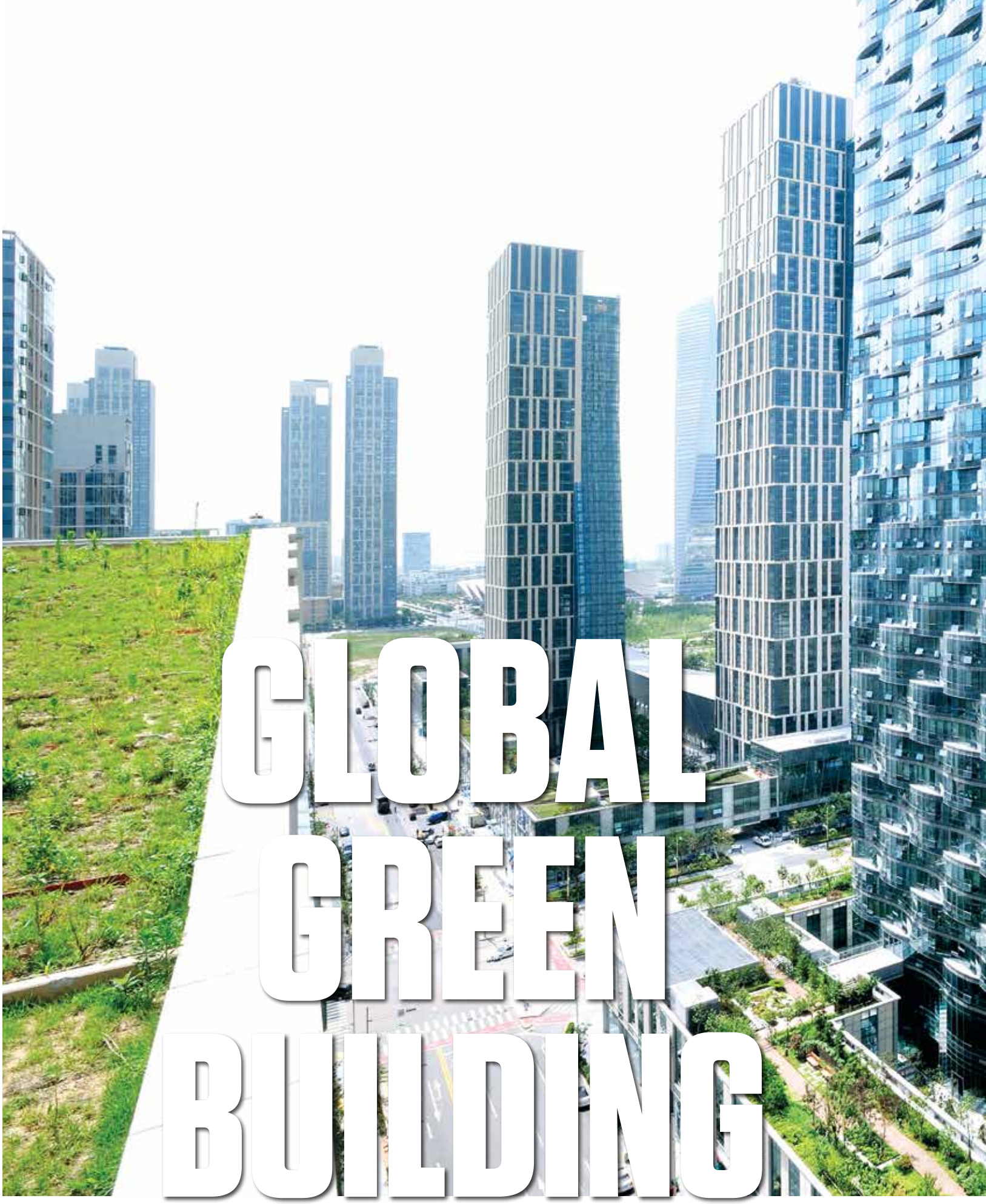


# GLOBAL GREEN BUILDING

# South Korea has developed one of the greenest cities on the planet.

WRITTEN BY **ALISON GREGOR**

What if you could design a city center with New York's Central Park and with the canals of Venice or Amsterdam or San Antonio? Or with the high-end shopping of Fifth Avenue and the giant boulevards of Paris? And buildings on the water as iconic as the Sydney Opera House?

There also would be few cars to congest the streets—and the giant boulevards would be open to pedestrians—because the cars would be parked underground. And there would be no garbage trucks to wake you in the wee hours with racket only to clog the streets the rest of the day, because the waste disposal system would be handled pneumatically in an underground system of pipes.

This city would also be one of the greenest cities on the planet, about 40 percent green, and in fact, it already exists: It's Songdo International Business District (IBD), South Korea, located about 20 miles from Seoul and about 20 miles from the border of North Korea as the crow flies—and also a 20-minute drive from Incheon International Airport, one of the busiest airports in the world.

Green properties "will be more than 50 percent of the total 100 million square feet of built space planned for Songdo IBD," says Stanley C. Gale, the chairman and managing partner of Gale International. "This is a very high concentration—we have been told by U.S. Green Building Council [USGBC] that Leadership in Energy and Environmental Design [LEED] principles have never before been applied to a single development at such a scale."

"To give you a sense, Songdo's LEED-certified space represents 40 percent of all the LEED space in Korea," he says.

Songdo has a lot of competition: It's not the only city being designed and built from scratch by planners and architects. There's Lavasa, in Maharashtra, India, projected to be complete in 2021; Destiny in Osceola, Florida; Dongtan in Congming-Iland, China; Qatar's Energy City; and India's Gujarat International Finance Tec-City.

The history of the Songdo IBD is one that came about prior to the 1990s, when South Korea felt very vulnerable between two economic powerhouses: Japan and China, says Richard Nemeth, a principal with Kohn Pedersen Fox (KPF), the architecture firm that's been involved in the creation of Songdo IBD almost since the beginning.

"Korea felt sandwiched between Japan and China, these two huge goliaths, and as their economy transformed from agriculture to manufacturing to technology and then into service, which is where most of the economy transformed, South Korea felt that they were going to get eclipsed by these massive economies on either side of them," Nemeth says.

"So South Korea had the brilliant idea of setting up these free trade zones along with their coastal land, which they were reclaiming at a rapid pace, from the Yellow Sea near Incheon."

"Their ideas were to create these free trade zones along the coast where companies would come

**Previous spread: Songdo IBD, South Korea, is one of the world's most sustainable cities and boasts the highest concentration of LEED-certified projects in the world.**

**Below: Canal Walk features four blocks of 5-story low-rise buildings that run along either side of a central canal. The canal is lined with assorted greenery and wood decking.**


**Central Park is the centerpiece of Songdo IBD's green space plan, comprising almost 10 percent of Songdo IBD's total acreage.**

and set up shop to do business in China, Japan, or elsewhere—and get a significant tax break. Trying to set up a company is difficult to do, it's hard to get money in and out, so they thought this was great: We'll do an international city that Westerners will move into and feel comfortable doing business there," Nemeth says.

The Korean government also hoped to create a city that demonstrated the country's technological prowess as well. So the idea was underway, with support from the Korean steel giant POSCO, until the Asian economic crisis of the early 2000s hit, and Songdo's source of financing went under. At that point, Korean companies sought to diversify their investment partners to try to prevent economic failure.

Even though Gale and KPF were not even yet on board with POSCO, there was a lot of work ahead of them. First, the city would pave all the city streets on what had been tidal wetlands. Second, the ideas for planning cities, especially sustainable ones, were quite different culturally between the countries that became involved.

"The planners mentioned that there were obstacles in the sense that the Korean idea of planning communities is much different from Western ideas: from large, roughly 20-foot-tall uniform buildings to spread-out communities to gigantic blocks. So did any of these traditions of planning present any obstacles or challenges in doing Songdo IBD? They did," says Tom Murcott, an executive vice president of International with Gale International.

Concessions had to be made. If fact, the Korean populace had to be educated about green building.

"When we first came on the project nine years ago now, we were constantly studying the blogosphere because here we were [pushing] this Korean thing but was Korea even behind it?" Murcott questioned. "Places like the U.S. and Singapore were using green development, but the Korean population didn't care that much about green."

The new presidential administration of Lee Myung-bak changed all that, as he laid out an agenda for a National Strategy for Green Growth and the Five-Year Plan for Green Growth in 2008. In February 2009, President Lee established the Presidential Committee on Green Growth, which would be largely under the direct authority of the president.

Even something that seems as logical to a westerner as devoting 101 acres to a city central park was by no means self-evident to the South Korean planners, Gale

**A 12-passenger water taxi provides a leisurely cruise down the 1.8-km seawater canal that flows through the park.**

says. A canal was not easy to sell to Koreans, who live in a low-water-use country and had to rely on saltwater wherever they could. Consequently, the canal that goes through the park uses seawater for obvious reasons: conservation, cleanliness, and evaporation.

"To inspire vibrancy, Songdo was designed to have a high-density core," he says. "Like New York, a mix of high-rise residential and commercial buildings is located at the center of the city, ringing the park. It's true that this was not a commonly held idea in Korea when we started building Songdo, but we convinced city-planning partners that an amenity like a city center park would increase property values and enhance the quality of life for all Songdo residents."

Thus, LEED for Neighborhood Development (LEED-ND) began to be tested in Songdo IBD as part of a pilot program, "but this was begun before you realized that there were some conditions that precluded [us] achieving LEED-ND," Murcott says.

Nevertheless, about $35 billion of the master plan has been built out with 65,000 projected permanent residents—mostly Koreans as foreign residents have been slow to move in, with about 1,500 foreign residents in June 2014, according to the Incheon Free Economic Zone (IFEZ) Authority. A total of about 35 million square feet of residential development (about 22,500 new housing units) is projected.

With about 40 million square feet of office space planned, it's estimated that about 300,000 commuter and business travelers will come to Songdo by 2020. The approximately 65,000 residents who will eventually live inside the Songdo IBD do not include the roughly 300,000 residents who may live outside the business district, which means greater Songdo may ultimately have a population of well over 300,000—the size of Tampa, Florida, on a fraction of the land mass.

Besides office buildings, about 10 million square feet of retail space, including a retail complex with 150 retail specialty shops, a hypermarket, and multiplex cinema will be included. And 40 percent of Songdo IBD development will be set aside as open space.

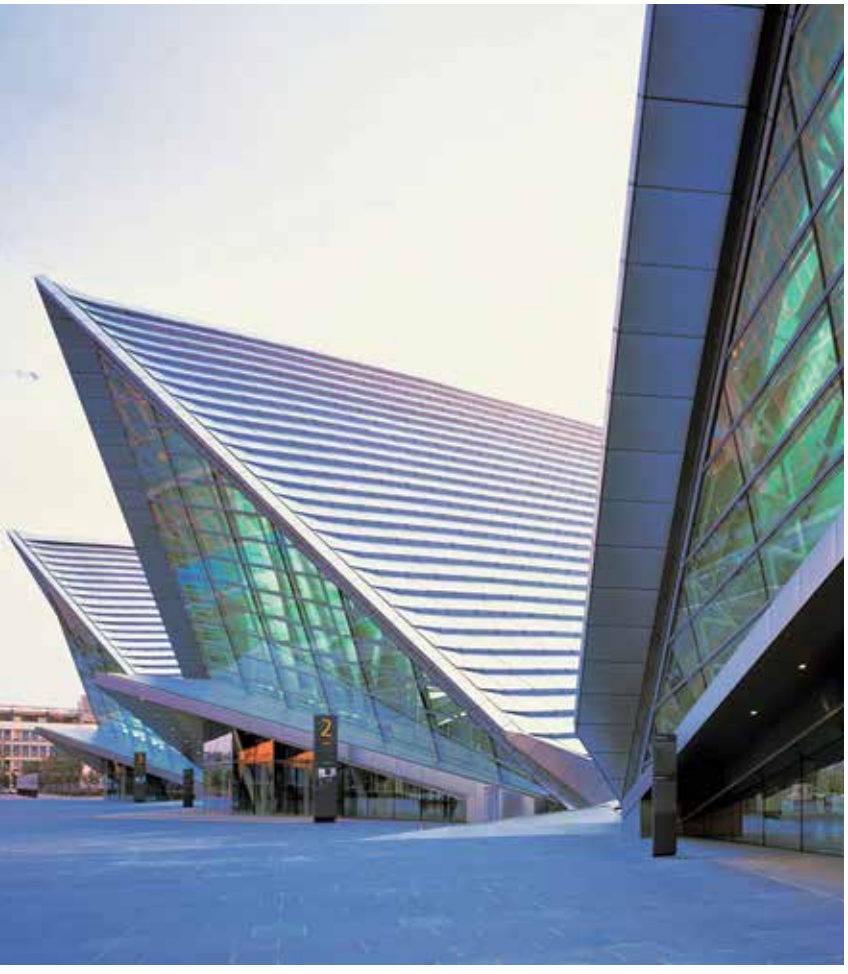
Five million square feet of hotel space—including Five Star Sheraton Incheon Hotel, and the stunningly gorgeous and traditional Gyeongwonjae Ambassador Hotel—has been built. An additional 10 million square feet of space is public space including the architecturally distinctive Convensia Convention Center, designed by KPF.

Currently, about 65 percent of the planned 100 million square feet of Songdo has been built on the

**Below: The Convensia Convention Center is the first convention center in Asia to achieve LEED certification.**

**Right: A focal point of Songdo IBD's environmentally focused green space program is an 18-hole championship golf course designed by Nicklaus Design.**

**Middle and far right: Chadwick International School Songdo is Korea's first LEED-certified school and serves as the international branch of the Chadwick School in Palos Verdes, California.**



1,500 acres of reclaimed land—basically tidal flats filled with sand—and none of those claimed lands received LEED-ND, planners said.

Among intense international competition, the Secretariat of the Green Climate Fund was one of the first organizations to demonstrate support of Songdo by locating there in 2013, with 60 people currently on two floors, soon to expand to five. A dozen nongovernmental international organizations followed, according to Songdo executives, filling the 33-story G Tower.

Though the situation is different from conventional office leasing deals with long-term leases and high rents, its importance is both symbolic and economic, according to Songdo proponents. Not only are there jobs but also employees who need homes, and the NGOs typically host hundreds of conferences at local hotels annually.

Stanley C. Gale was selected to receive the Sustainable Cities Award, a global award designed to recognize the commitment Gale has made to green development. He was also given an honorary citizenship of South Korea.

Gale says, "The Sustainable Cities Award is a critical step in emphasizing the importance of the impact of new grand-scale development on climate change. In addition to the building materials, the underlying tech infrastructure that links all buildings can facilitate positive outcomes like a dramatic reduction in energy use because the system gives individual residents the power to monitor and moderate how they consume energy," he explains.

And in fact, one partner of Songdo, Cisco Systems, Inc., is an American multinational technology company headquartered in San Jose, California, that's wiring the entire city of Songdo, as well as using the benefits of everything from teleconferencing for educational purposes to technological monitoring for health benefits and studying volunteers' lives to perfect mobile phone–controlled home appliances.

Though building cities—even ones certified as LEED-ND—might seem highly counterintuitive to the idea of sustainability, Gale says that from the outset, a commitment to sustainability was built into Songdo's foundation.

"Many measures and technologies have been taken to ensure that," he says. "In addition to the building materials, I would like to emphasize that the underlying tech infrastructure that links all buildings can facilitate positive outcomes like a dramatic reduction in energy use because the system gives individual residents the power to monitor and moderate how they consume energy.

"It is both the built environment and the citizen empowerment that sets Songdo apart. For example, the trigenerator is very good at removing the waste that would normally be a liability and turning it into an asset," he says. "And that treated waste becomes graywater that then can irrigate plants."

Songdo's latest victory on the international stage was hosting the Presidents Cup 2015 golf tournament at the Jack Nicklaus Golf Club Korea, which opened in 2010 and is pursuing LEED for New Construction (LEED-NC) certification for the clubhouse. It was the first time the tournament had been held in Asia (and the Asians came a stroke or two from winning the event).

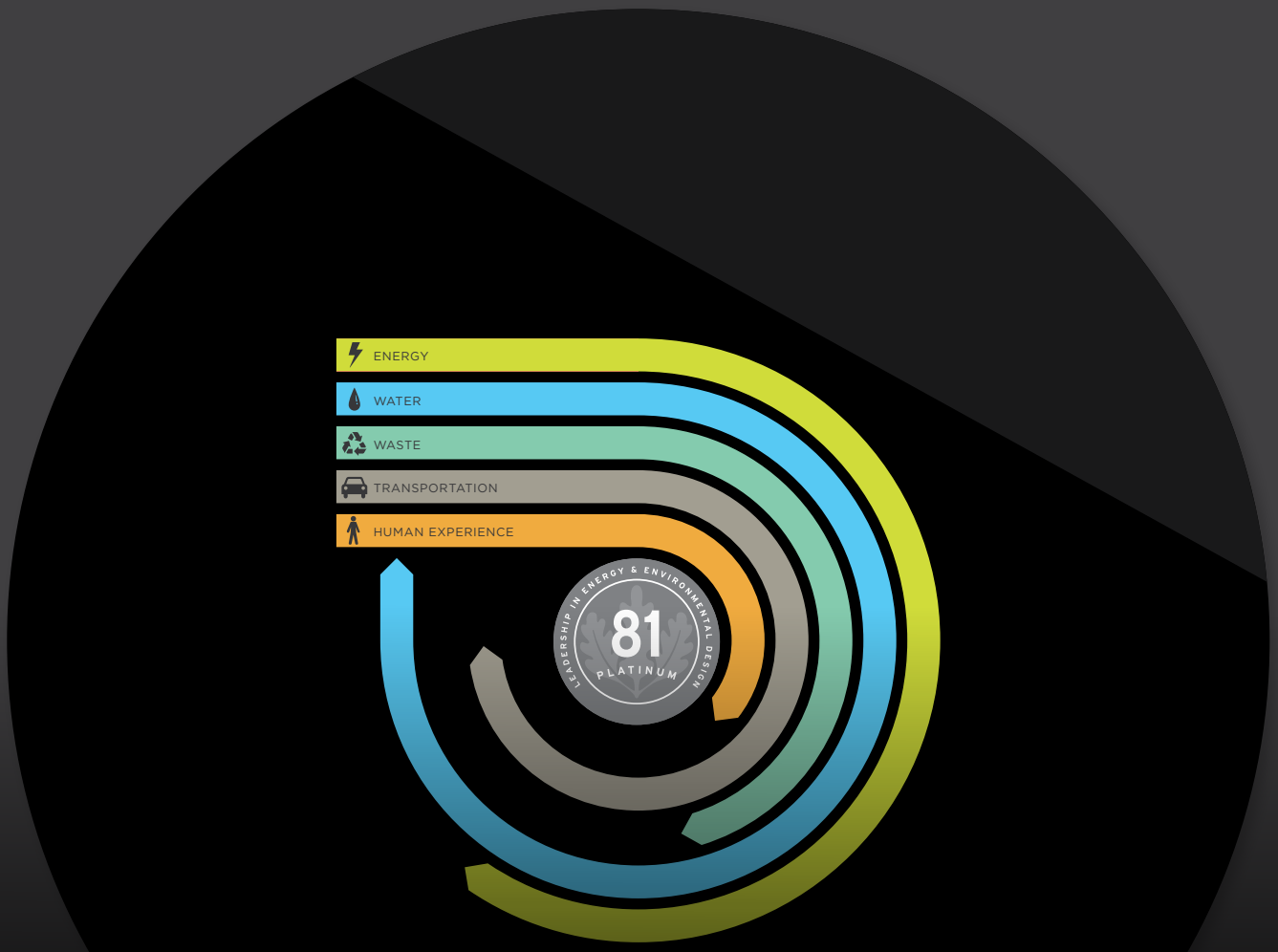
And the list of eco-friendly buildings continues, with 22 million square feet LEED-certified, including the silver 68-story Northeast Asia Trade Tower, the tallest tower currently in Korea, designed by KPF. The other buildings include 14 projects comprising 119 buildings—83 residential, 26 retail, 9 commercial, and 1 educational.

Songdo already has the first LEED-certified exhibit hall in Asia, the Convensia Convention Center; the first LEED-certified residential tower in Korea (called Central Park 1); the first LEED-certified hotel in Korea (Sheraton Incheon); and the Chadwick International School, the first LEED-certified school in Korea, whose administrators take great pride in their facility.

And Gale has alluded to the fact that there may be other cities to be built on his horizon—perhaps rolling out as many as 20 new cities across China and India in the next few decades, using Songdo as a model, each one faster, cheaper, better.

"When completed, projected in 2020, 65,000 people will live in Songdo IBD and 300,000 will work there daily," Gale says. "In terms of size of IBD, we often say that is compatible to Downtown Boston and its wider business.

"But we are always evaluating new-city development opportunities elsewhere and continue to be in demand for our master planning experience," he continued, pointing to the massive Meixi Lake District new city in China, which is currently under development.

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# Three-Part Solution

## A food bank, plus a demonstration garden, plus an outdoor classroom equals a recipe for feeding the capital's hungry.

By Kiley Jacques

There's a misconception about hunger in D.C.—one that suggests it's only the homeless who use food banks. "It's an expensive city," notes Susie Westrup, LEED AP BD+C, manager, Paladino and Company as well as Greenbuild 2015 Legacy Project co-chair. "There are [approximately] 700,000 people in D.C. who don't know where their next meal is coming from." The fact is many working lower- and middle-class families visit food banks for supplemental groceries to make ends meet.

One of those food banks is the Capital Area Food Bank (CAFB), with headquarters in Northeast D.C.

This year alone, CAFB distributed 42 million pounds of food (the equivalent of 35 million meals) to 540,3002 people living in D.C. and six surrounding communities. Through direct service and a network of more than 500 partner agencies, CAFB feeds the hungry—though its mission goes far beyond the distribution of dry goods. To date, CAFB has implemented multiple measures aimed at nutrition education and skills training—all of which began with an onsite Urban Demonstration Garden.

In 2012, staff decided that a hands-on food growing experience would benefit the community. Toward that end, the demonstration garden was built and has had that very effect since beginning operations. The garden is used to teach gardening and nutrition basics to agency partners, who in turn, bring those lessons back to their own communities, where they disseminate the information further. Most of the garden's produce is given away to food assistance partners; the primary focus of the garden is to demonstrate effective urban farming practices.

With both the food bank and the garden operating at full speed, it became clear a third element was needed—a classroom. Enter Greenbuild 2015 and the Legacy Project. As the

**The flexible, multipurpose studio—an "Urban Food Studio"—will provide the CAFB with an all-season space for gardening, cooking education classes, and workshops.**

garden lacked a designated space for key education programs, a flexible, multipurpose outdoor structure was proposed and dubbed the "Urban Food Studio." The sheltered classroom will provide the CAFB an all-season space for gardening, cooking classes, workshops, and events. It will also give garden volunteers a much-needed place to eat and rest.

The Urban Food Studio is the brainchild of M. J. Crom, now-former food growing capacity coordinator at the CAFB, who wanted to bring gardening to the forefront of the community. With Greenbuild 2015 scheduled to take place November 18-20, 2015 in Washington, D.C., the Legacy Project Committee, the Greenbuild Host Committee chairs, and the U.S. Green Building Council (USGBC) staff members met last October to set up a process for determining just what the Legacy Project would be. Westrup and the group issued a RFP to the public for which they received 11 responses; they were ranked and ultimately narrowed down to four finalists. Attendees at their "Green Tie" event were asked to help determine which proposal should be this year's Legacy Project. "All four of the finalists were so great that it was very hard for us to come to a consensus," explains Westrup. "So we [decided] to let it be a vote." The food bank won the most votes. Interestingly, all four finalists were projects related to food security and food deserts in D. C. "The committee ended up picking one that [addresses] this relevant issue."

**Top: Susie Westrup at the demonstration garden at the CAFB. Above: Matthew Noe, LEED green associate at HKS architects, at the CAFB. Photos by Ryan Smith**

Furthering the food bank's mission, the Urban Food Studio will catalyze CAFB's aim to impact food security through education around the growing of healthy foods. "You can't teach 700,000 people, and 700,000 people can't make their way to the food bank, but they can go somewhere in their local community and they can learn how to do something down the road from where they live. That's why the 500-plus organizations CAFB is already working with are the target," explains Westrup.

Though they were already teaching in the garden, they were doing so with makeshift accommodations. "The outdoor classroom that is the Legacy Project is a shelter with a functioning kitchen—some of these classes will go beyond how to grow and [will demonstrate] how to cook a healthy meal," notes Westrup. "Then the partner organizations can do the same thing. It's this ladder of knowledge, a network that they can spread throughout the city." She points to the fact that many of those agencies don't have land on which to grow, so they need to be creative. People are learning how to build gardens in unconventional


**Volunteers put the finishing touches on the studio and surrounding grounds, which will help the food bank fulfill its mission of ending food insecurity.**

ways using limited means—maybe they grow in buckets or tubs or kiddie pools. "M. J., the head grower, teaches them how to grow on a budget with reused materials."

Staff from those agencies will arrive at the site—with its food bank demonstration, garden, and outdoor classroom—and learn how to build and grow a self-sustaining garden in their own neighborhood. The food bank can't supply all the people in D. C. who need food, but they can enable others to do so. "They are limited by their site, but in a way it's a much more sustainable method because they are teaching [other organizations] how locally grown food can come from these neighborhoods."

The garden was the first phase of how the land at the food bank was to be developed. HKS Architects—the firm that submitted the winning proposal in response to CAFB's need for an outdoor, sheltered structure for education and respite—had an existing relationship with the food bank. HKS helped bring to life the second phase—the food studio. "They are the ones who connected the dots," notes Westrup. "They won the bid and were given $10,000 by Greenbuild to bring them an outdoor teaching kitchen."

"It's a pretty simple structure," says Matthew Noe, a designer with HKS, describing the Urban Food Studio as having concrete columns, a metal frame, and a deck (donated by Ipe Deck) with permeable pavers. A berm wall was created with excavated soil to serve as an additional growing area, and there's a rainwater cistern and reclaimed-wood benches. They also received a grant from Community Forklift that they used to acquire reclaimed steel. A "living wall" for planting uses reclaimed pallets from the food bank, and a space was developed for growing shade and fruit trees.

"We tried to incorporate all these little elements that are semi DIY to inspire the community to do some of these things at home and to make it more sustainable or eco-friendly for urban gardening," explains Noe. In addition to all of what takes place under its roof, the building itself will serve as an educational tool. "We looked at how we can leverage a building to teach the community."

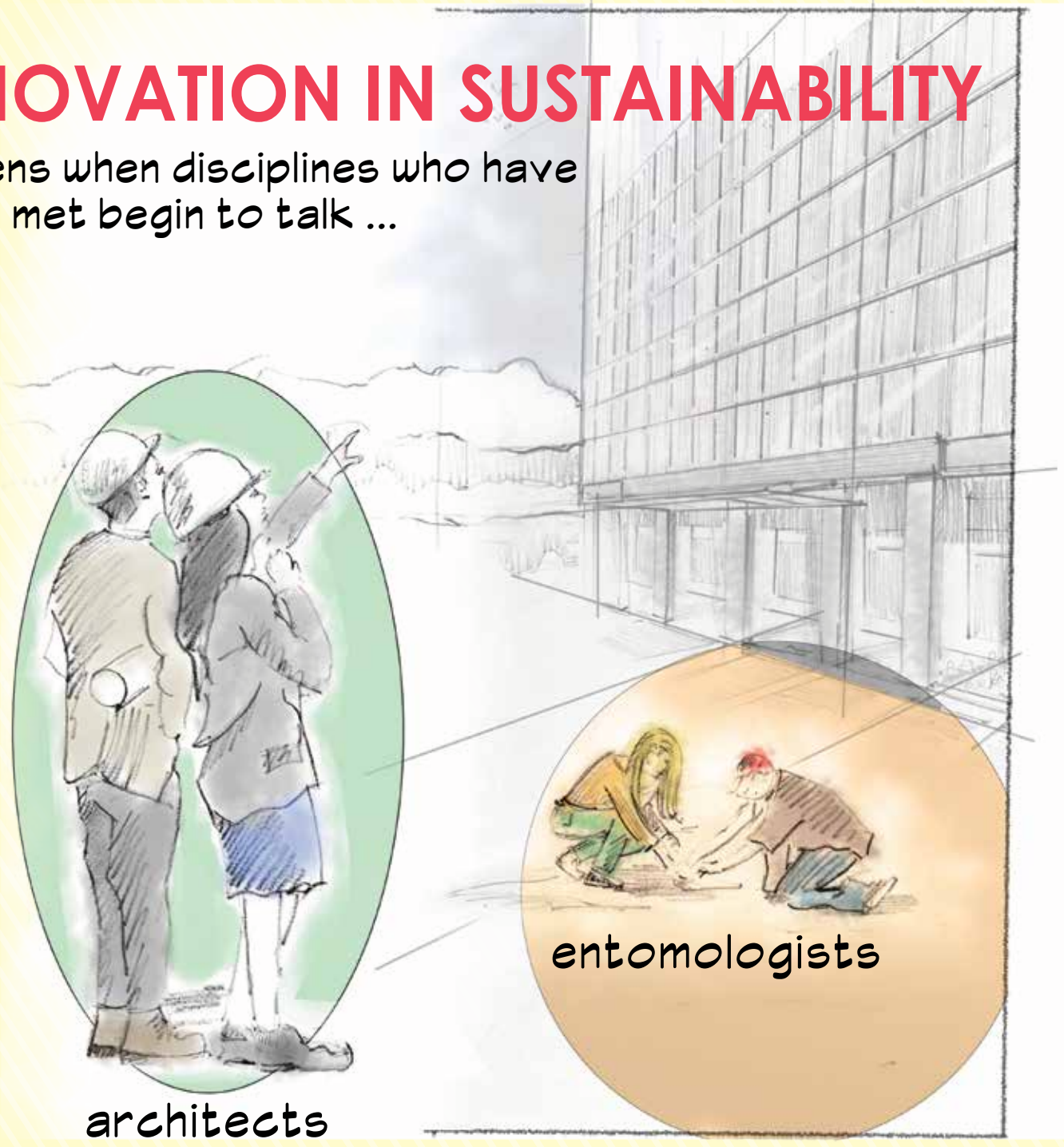
The structure will accommodate 30 to 40 people attending cooking and growing demonstrations and nutrition classes. "Growing your own vegetables is kind of the silver bullet to solving some of the issues surrounding hunger—there's a lot more nutritional value in that," says Noe. It is also meant as a respite for workers during hot months, as well as a potential space for donor events. "There is not a lot of shelter out there. It will be a really big add for the volunteers to have a place to rest." It will serve as a "flex space." It may even, in time, host schoolchildren for class field trips.

"It is a very exciting project for me," says Noe. "It's one of my favorites…the scale of it, how it is going to touch and affect so many people. It brings home the idea of what architecture and space can do and hopefully will do. I see great potential in this affecting not just the food bank but the entire area—a little pavilion where the community can [gather and] radiate out."

Westrup concurs, explaining how this is a model that can be replicated anywhere and everywhere. Comparing it to the Green Apple Day of Service, she views this year's Legacy Project as one of service. "I think as green building professionals," she says, "we often get tied to infrastructure and building versus this other element of sustainability, which is so important—the social well-being of our communities." ●

# INNOVATION IN SUSTAINABILITY

happens when disciplines who have never met begin to talk ...

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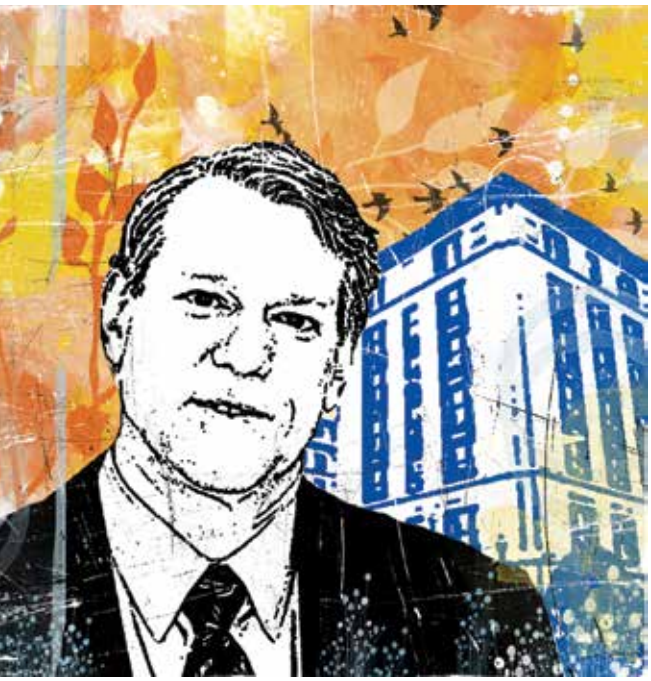

ILLUSTRATION BY MELISSA MCGILL

# Q&A

## Kevin Kampschroer, GSA chief sustainability officer and senior climate change adaptation official; federal director, office of federal high-performance green buildings

Kevin Kampschroer created the framework for which GSA responds to the challenges of greenhouse gas emissions reductions and the American Recovery and Reinvestment Act's mandate to move GSA's Federal building inventory toward high-performance green buildings.

### Q. What are the sustainability goals of the General Services Administration (GSA)?

GSA set goals for greenhouse gas (GHG) reduction, building energy efficiency, water efficiency, renewable energy use, percentage of green buildings, and GHG per mile for fleet. We benchmark these goals (and their subgoals) across the federal government. For example, one subgoal is purchasing a certain percentage of alternative-fuel and electric vehicles. Another is conducting energy audits every four years on each of GSA's larger buildings. Over the last 10 years, GSA reduced the energy intensity of our portfolio by 32 percent, and we've set a goal of another 25 percent reduction in the next 10 years. Since 2008, we have reduced building GHGs by 43 percent, and by 2025, we are committed to reaching 54 percent, with a stretch goal of 73 percent.

### Q. How many buildings does the GSA own and lease?

Currently, GSA manages just under 9,000 buildings, totaling 379 million square feet. Of that space, 51 percent is leased and 49 percent is owned. GSA owns about 1,500 buildings.

### Q. Can you share some statistics on the number of federal buildings working toward sustainability measures?

In one sense, all federal buildings are working toward sustainability. GSA's portfolio-wide goals affect every building. We are focused on targeting the best opportunities for improvement in water conservation, in energy reduction, in waste avoidance, and in improving the environment for the people who work in federal buildings. These focused efforts help increase impact on existing buildings while budgets in the federal government remain tight. GSA works diligently to maximize and leverage scarce capital—very few new buildings are being built, and very few whole building modernizations are being undertaken. And for the limited number of these projects, every one seeks very high performance across the sustainability spectrum.

### Q. How many federal buildings are LEED certified?

Within the GSA federal building portfolio, a little over 130 of the buildings we own are LEED certified, and also 400 leases are LEED-certified buildings.

### Q. What are some of the greatest challenges facing the GSA in terms of sustainability?

Complexity and capital are the greatest challenges facing GSA in terms of sustainability. As we develop high-performance buildings, they become more complex to use, operate, and maintain. We need to incorporate more disciplines, like behavioral economics and public health, to better understand how people use buildings, and how to tune buildings so people can be effective and healthy. We know we have opportunities to better utilize the buildings in our inventory, and we must pursue those opportunities. We will be increasing the value of buildings while reducing the number of them we need. We have to become more integrated with other disciplines (IT, for example) in a consistent manner.

**For more Q&A, visit plus.usgbc.org.**


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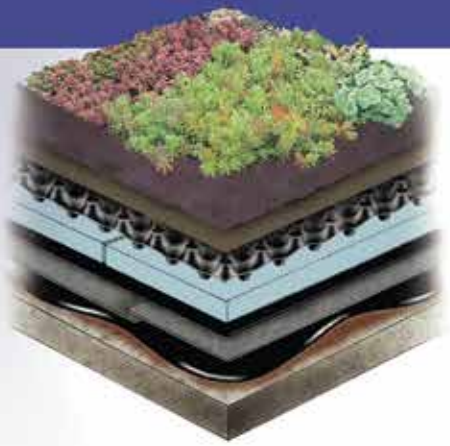

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