

May/June 2016

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EVOLVING

The U.S. Green Building Council's Emerging Professionals program forms future sustainability champions.

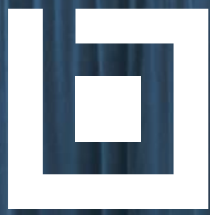
GREEN

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ON THE COVER

Workmen, 1933

F. Winold Reiss was a German-born American artist and graphic designer. In his mosaic mural *Workmen*, he depicts and honor the spirit of the workers who built Cincinnati. This segment of *Workmen* is one of 18 murals on display inside the historic Cincinnati Union Terminal.

Photographed by J. Miles Wolf

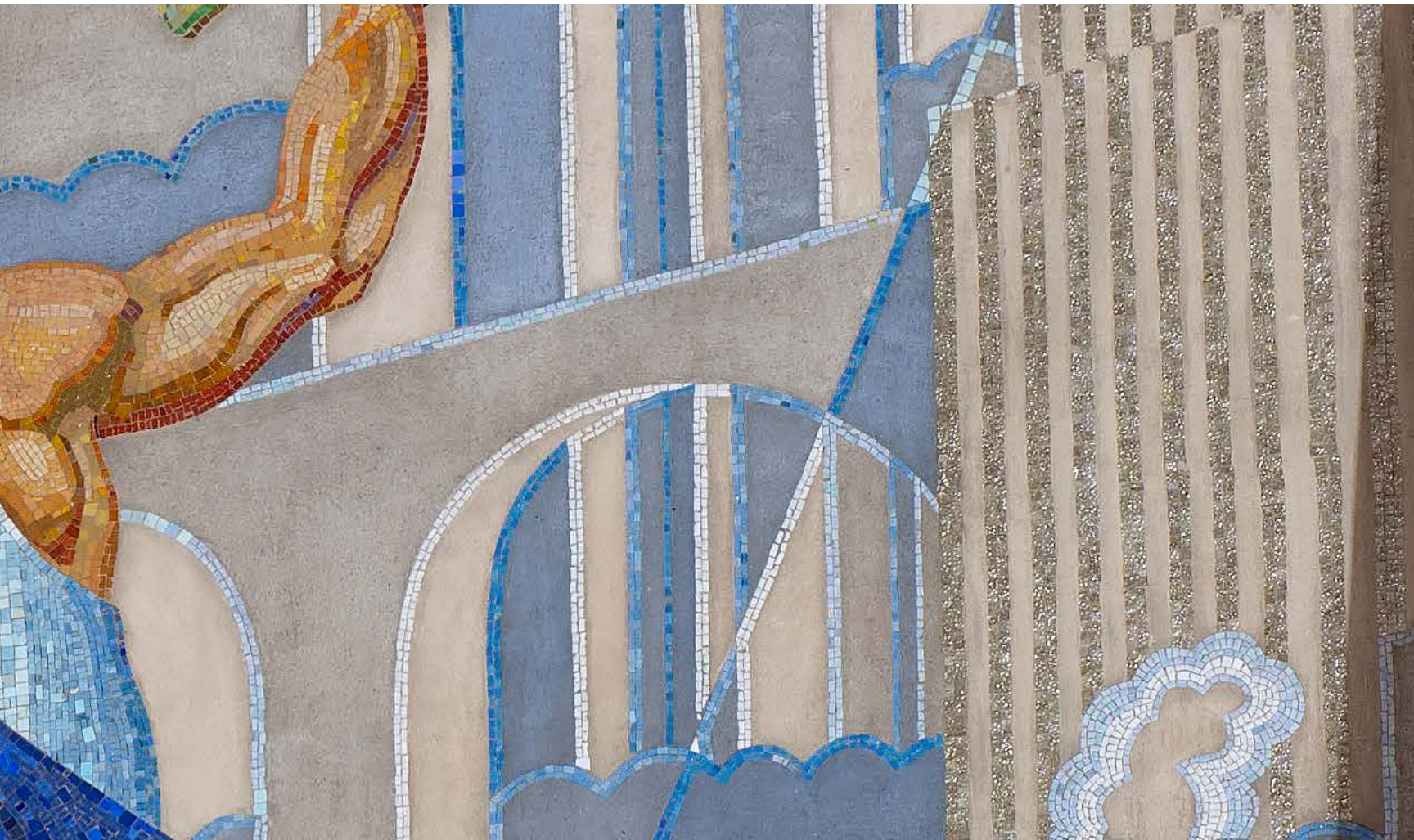


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World View

While the world watched, **One World Trade Center** grew in both height and symbolism, its 1,776-foot crystalline form bringing unmatched views back to Lower Manhattan. A redundant structural steel frame, the result of creative collaboration between **Skidmore, Owings & Merrill** and **WSP Cantor Seinuk**, ensures that its safety is as substantial as its stature. Read more about it in **Metals in Construction** online.

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Trees: 771
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CURRENT LEED STATISTICS

AS OF MAY 2016

Total commercial LEED projects globally ▶ **78,568**

CERTIFIED: **32,514**

CURRENTLY REGISTERED: **46,054**

LEED FOR NEIGHBORHOOD DEVELOPMENT: **444**

Gross square footage of LEED projects* ▶ **15.15 Billion**
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LEED for Homes Units ▶ **232,459**

*Excludes ND and LEED for Homes

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From Green Power to Economic Empowerment



MICHELLE MOORE
CEO at Groundswell

Michelle Moore is CEO of Groundswell, a nonprofit that builds community power to connect low and moderate income communities with clean energy through place-based programs in equitable community solar, affordable wind power, and energy efficiency.

A social entrepreneur and former White House official with roots in rural Georgia, Michelle is a relentless agent for change. Her accomplishments range from helping build the global green building movement to leading the sustainability team for the Obama Administration.

What does the sustainability movement look like from the perspective of economic equity? You might measure your response in how much affordable housing is LEED certified, or whether there's a cost premium for green. But if you're a family living in poverty paying 10 percent of your total income for dirty power, is the promise of sustainability accessible to you?

That's the question facing an estimated 16 million Americans who are paying more than 10 percent of their household income for electricity. The reality today is that working families pay more to keep the lights on despite falling prices and growing affordable clean-energy options. This burden isn't uniformly shared by region or by race. Forty-six percent of all households with high energy burdens are in the South, and 50 percent of all families struggling with disproportionately high power bills are African American. In many cities, the challenge is even more acute. In Jacksonville, Florida, for example, 14.5 percent of households living in poverty are paying \$200 or more per month for electricity. So what can we do?

First, it's important to understand that, while good public policy is an essential part of the solution, it's not the only answer. There's an important leadership role for the market, too, because new clean energy technologies tend to follow typical technology adoption curves. The visionaries behind LEED understood this dynamic for sustainable building practices, which has been fundamental to USGBC's successful strategy for market transformation. New clean energy technologies debut at the upper end of the market and are purchased by early adopters who can afford the premium. Then, as adoption grows, prices come down, and the once-new technology becomes economically accessible to everyone.

The thing is, energy isn't a luxury, it's a necessity. We can't afford the social cost of waiting for the benefits of affordable clean energy to trickle down to those in need.

Nearly 50 percent of America hasn't been able to switch to solar because they are struggling financially and don't qualify for financing, don't own their roof, or don't have a roof in the right location. Community solar radically expands access to affordable clean energy by allowing anyone to purchase locally produced solar power from a centrally located solar array.

Today, there are only about 100 community solar projects in operation around the country, but that number is about to boom. According to the National Renewable Energy Laboratory, community solar is on its way to becoming the single largest source of distributed renewable energy in America—outpacing rooftop solar and providing an up to \$8 billion investment opportunity. The problem is that most community solar models have the same barriers to access as rooftop solar.

Groundswell is developing an equitable community solar program that works for working families—complementing market leadership with nonprofit innovation. Through our partnership with Sustainable Capital Advisors, the model takes consumer credit scores off the table as an obstacle. It's one among a growing vanguard of solutions that will give everyone a seat at the abundant clean-energy table.

Community solar promises to be a game changer that means your next green building project could provide access to affordable clean energy to your neighbors who need it most.

LEED ON,



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28 EVOLVING



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ILLUSTRATIONS BY MELISSA MCGILL

ECO.SIN Confessions

Holley Henderson dispels the notion that environmentalists have to be perfect to be effective.

BY ALEXANDRA PECCI

Holley Henderson might be a vegetarian, but do not ask her to pass on bacon, especially if it is cooked by her mom. “Regardless of your carbon footprint, my mom’s bacon and grits can convert any vegetarian,” she says with a laugh and a subtle Birmingham, Alabama, twang. “I mean that woman can seriously cook.”

Being a bacon-eating vegetarian is not the only seemingly contradictory part of Henderson’s personality. Sure, she is a Leadership in Energy and Environmental Design (LEED) Fellow, an environmental building speaker and consultant, founder of the Atlanta-based H2 Ecodesign, and author of the book, *Becoming a Green Building Professional*. But she is the first to admit her own “eco sins.”

“I love a very long and very hot shower,” she says. In the car, she likes to turn on the heat, including the seat warmer, and roll the windows down.

She regularly confesses these sins for a reason: to dispel the idea that environmentalists have to be perfect in order to be effective. In fact, when she gives talks, she will often open by asking the audience to think about their own eco sins. “What do you do that’s really naughty, that you should not do relative to the environment?” she asks. Then, she proceeds to list her own sins.

The minute she does that, she notices the posture of the people in the room begins to change, to relax. The realization that she is not perfect—that no one is—can motivate people to make their own small changes.

“And then they begin to build on that and get excited about it,” Henderson says. “I just start saying, ‘What could you do? Everybody could do something, what could you do?’”

It is that friendly, down-to-earth, easy-going pragmatism that has led Henderson to be known as the “commonsense environmentalist” and to lend her green building skills and expertise to projects around the world that are as diverse as the LEED Platinum 1.5-million-sq-ft Enco Energy Complex in Thailand and the LEED Silver Pierce Chapel at Wesleyan College in Georgia.

Right: Holly Henderson, LEED Fellow.

PHOTOGRAPHY BY BERI IRVING



But what does commonsense environmentalism mean? It means just what it sounds like: environmentalism that makes sense in the real world and is balanced with practical needs and expectations. For instance, Henderson says it is all fine and good to install water-saving automatic faucets. But if no one can get water to come out of them, they don't make sense.

"I don't really care if it's environmental or not. I don't care if it's saving money. I don't care if it's saving water," she says. "If it doesn't function, it doesn't work, it's not the right solution."

Henderson strives for a good environmental, social, and economic balance in every project she tackles, and rejects the idea that sometimes the environment should be a priority at the expense of the other two ideals.

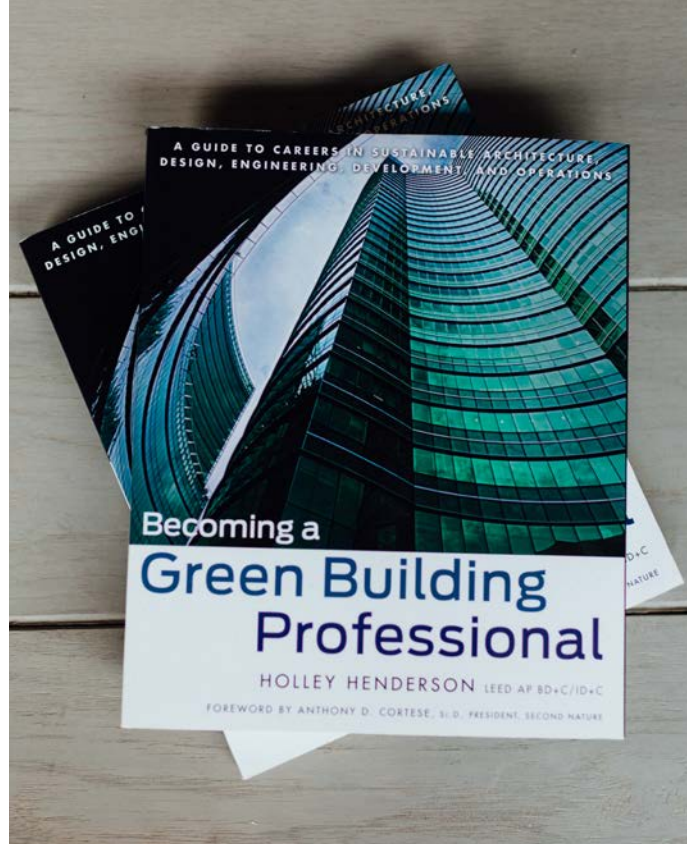
"I might be a weirdo environmentalist by saying that, but I really don't think so," she says. She understands that for people to really adopt environmentalism, it has to fit into their lives, not the other way around.

Practicality is not the only thing Henderson looks for in helping her clients achieve their green goals. She also encourages them to find a personal connection to environmentalism. She insists that everyone has a connection to the environment, regardless of whether they realize it.

"I think it's important for our teams that we work with to know their story," she says. "I think when people understand their story and their conviction around it, they're able to better communicate it." For instance, maybe a client has a daughter with asthma or an elderly parent with chronic obstructive pulmonary disease (COPD), maybe they are avid recyclers at home. Henderson remembers one client who was ultimately moved by seeing a mattress floating down the river outside his home.

"That's really the connection," she says. "Once they personalize it—that's up to the CEO level and everywhere in between—they own it; they can begin to achieve more."

Henderson's own story starts in the art and architecture world, trying her hand at jobs ranging from designing large-scale public works projects to being a United Way



ambassador. However, nothing fully stuck for her until she remembered how much she loved her environmental science class at Auburn University, and eventually founded the sustainable design studio at TVS (now tvsdesign).

"I think I've always had a distinct sense of purpose. I tend to go to the grocery store with vigor.

Life's a sponge, and every day I'm trying to wring it out," she says. "It sounds so cliché, but I can make a difference...I guess I looked at environmentalism as stewardship, responsibility."

As she encourages companies and the people who run them to discover and connect with their own environmental stories, Henderson finds that her clients often evolve in their environmental goals. Whereas at first they may simply consider "going green" a way to respond to their customers' expectations or market trends, they quickly want to do more and push their goals even further.

"What I'm constantly amazed at, and excited by, and what gives me hope is that once they get into the process, they get really excited by it," she says. "They want more."

Although she finds apathy disheartening, Henderson believes that the best way to combat it is by making that personal connection. To that end, she says that she will work with clients that do not have a perfect lifecycle or footprint, clients that others in her field would not dream of working with.

"I'm one of those environmental consultants that will work with anyone," she says. "Everyone deserves to be helped, and I want to help them. And sometimes I prefer those jobs because they need the most help."

She recalls being in a meeting with one of those companies when one of its employees started to talk about what an avid recycler he was at home. "I almost started crying. It's the revealing of those stories that they don't even know are inside them that makes me excited," she says. "I can help someone foster that story and what that story leads to...multiplying hands is probably my most motivating thing." ●

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JOURNAL OF COMMERCE

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HEALING Hospitals

HDR Inc. designs an Army Medical Center with sustainability and wellness in mind.

BY MARY GRAUERHOLZ

The global architectural firm HDR Inc. was in the middle of designing a new military hospital in Fort Belvoir, Virginia, in 2007 when news broke about substandard conditions at Walter Reed Army Medical Center. The news that some of the U.S. Army's wounded veterans were being treated in a moldering, dilapidated setting launched an investigation and a directive from Congress that both hospitals be transformed into "world-class medical facilities."

"We were right in the middle of the design process with the Department of Defense on Fort Belvoir. It was quite a firestorm, a tumultuous time," says Jeff Getty, RA, LEED AP, an architect in HDR's Arlington, Virginia, office.

While conditions at the Walter Reed facility, then located in Washington, D.C., developed into a scandal, there was a very positive result that would direct the design of military hospitals going forward.

"It certainly awakened a lot of people in the Department of Defense to a lot of things they weren't cognizant of," Getty says. "There's a great sensitivity now to treating these folks [wounded soldiers] with great care."

Today Getty is the lead design architect of the Fort Bliss Hospital Replacement, a \$1 billion project that will replace the current hospital, the William Beaumont Army Medical Center at Fort Bliss. The new medical center, in El Paso, Texas, will embrace the highest principles of healthcare architecture: a patient-centered, world-class complex that incorporates U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) guidelines and evidence-based design (EBD), as well as a Sustainable Return on Investment (SROI) philosophy. An original HDR concept, SROI estimates the value of a project by assigning a monetary value to every cost and benefit, including economic, social, and environmental.

By weighing the effect of every aspect of military hospitals on patients, their families, medical staff, and the environment, the Fort Bliss facility will be a paragon of healthcare settings for treating active soldiers, veterans, and their families. Scheduled to open in 2018, the hospital will showcase sustainability, smart technology, and energy-saving features in a visually comforting, patient-centered setting.

In summer 2018, HDR plans to apply for LEED Silver certification in two areas: LEED for Healthcare for the center's hospital and clinic, and LEED for New Construction for ancillary structures, such as the administration building and the central utility plant.



When combined with environmental and financial benefits, the SROI net present value of HEPA filtration and hydrogen peroxide vapor cleaning increases the total benefits to roughly \$38 million and \$121 million, respectively.



Top: Jeff Getty, lead design architect of the Fort Bliss Hospital Replacement.



Middle: Mark Meaders, sustainability manager for HDR.



Bottom: Erin McMillan, HDR project architect.

Mark Meaders, LEED AP BD+C, a sustainability manager in HDR's Dallas office, says that HDR's effort toward sustainability and design—putting people and the planet first—is based on a simple but hard-hitting mantra: “Our resources are not infinite. With the exception of the sun's energy and wind, they are finite.”

Meaders is leading the Fort Bliss project's sustainability efforts for HDR, an award-winning global firm with roughly 1,500 employees. HDR has examined countless components that will create a state-of-the-art Fort Bliss medical facility, featuring 127 inpatient rooms with smart room technology and plenty of natural light.

HDR employed a leading-edge strategy to identify products with reduced toxins for the project, helping to avoid toxic chemicals such as heavy metals, phthalates, and perfluorinated compounds. The principle of material transparency—requesting that building product manufacturers disclose the materials in their products—provided a great assist.

“HDR, as well as many design firms, is placing a big focus on health and wellness, material transparency, and minimizing, or eliminating, chemicals of concern,” Meaders says. Options are much more plentiful today, he adds, than when the design started in 2010.

HDR's holistic approach is focusing on sustainable building materials with recycled content and certified wood, and materials from regional sources. Many inpatient rooms will be equipped with ceiling-mounted lifts and rubber flooring, to ease physical stress for patients and medical staff. Inpatient rooms will be cleaned with a hydrogen peroxide vapor system to eliminate pathogens like the MRSA bacteria, avoiding the use of toxic cleaners.

Energy-efficient measures will be featured throughout, including high-efficiency centrifugal chillers with variable speed drives, and passive energy reduction through reflective roofing systems and shading devices on exterior windows.

Another exciting component is the addition of eight simulation labs, including an operating room, and seven classrooms, all aiding in research and staff education. “Research is part of world-class design,” says Erin McMillan, an HDR project architect who has been helping to execute Getty's vision. “The simulation areas will show whether a premise of design actually panned out.”

The U.S. Armed Forces has been a significant partner in making strides for sustainability and patient-centered



The goal of HDR's Fort Bliss project team is to design a world-class medical facility in support of our veterans and their families.

care in a truly world-class setting, Meaders says. "The military has a big focus on energy and water efficiency and independence, resiliency, climate impacts on design, and other factors," he says. "I believe this project is an excellent example of such efforts."

Locating technology, materials, and other strategies that are cost competitive—one aspect of SROI—is imperative, Meaders says. But the SROI concept goes much further to determine the real cost of each part. SROI analysis converts to dollars all relevant incremental social, environmental, and financial impacts of a structure, including air and water quality, waste reduction, and human health, as well as financial impact (such as the cost of labor).

"All the analysis that went into the SROI measures was unique and forward-thinking," Meaders says. "I have not worked on another project that has performed that level of analysis."

A geothermal energy system was not pursued after a 6,000-ft test well showed the water was not hot enough for the planned system. Likewise, a plan for a reclamation plant to clean wastewater for irrigation and other nondrinking uses also was not feasible.

Grounds will be planted with natural grasses and indigenous plants, instead of a traditional grass lawn, creating a beautiful desert landscape under a breathtaking open sky. Drought-resistant trees will dot the site, measuring more than 16 million square feet, as well as native shrubs, perennials, and succulents.

Two overarching goals have guided the project, Getty says. "The first one is to improve the lives of patients to make better outcomes and better care," he says. "The second is to improve staff satisfaction and health. It's all about caring for patients and staff." Inherent in that philosophy is, Getty adds, "being a responsible steward of environmental concerns and protecting resources."

Meaders concurs that the environment must take center stage in the Fort Bliss project. "It is our duty and responsibility to manage and conserve natural resources for future generations," he says. "It is also our responsibility to leave the Earth a better place than when we got it from our parents and grandparents." ●



CLEANER, FASTER, Friendlier

Brownfield remediation's third generation comes of age.

BY KATHARINE LOGAN

Brownfield cleanup, long a quagmire of cost and uncertainty, is undergoing a paradigm shift. As regulatory agencies put away their big sticks and facilitate collaborative, market-driven solutions instead, brownfield redevelopment is emerging as cleanup's main driver.

"What we're seeing is the maturing of a third generation in brownfield remediation," says James Maul, president of Maul Foster & Alongi, a consulting firm integrating environmental engineering with planning and community development.

In brownfields' first generation, regulatory agencies drove cleanup for cleanup's sake, with no consideration for economic or community context. In the second generation, elements of proposed redevelopments crept in for cost savings: pathways or building foundations, for example, might form part of the cap on a contaminated site.

In the third generation, the most polluted sites have been dealt with, and most of the thousands of brownfields that remain will never rise to the top of the environmental priority list. What's driving cleanup of these sites is their economic and community value. Often occupying desirable, in-town locations, blighted sites have the potential to contribute to their community's green space, density, employment, tax base, morale, health, and perceived viability. "In the third generation of brownfield cleanup," says Maul, "the development is the remedy."

Key to this trend, which has been maturing in the Pacific Northwest over the last decade or so, is a reduced level of uncertainty around brownfield transactions and liabilities. Public sector leadership in both Washington and Oregon has generated a suite of tools to allow market forces to deal confidently with contaminated sites. Statewide programs provide funding for planning, market analysis, and community engagement so brownfield cleanup gets wrapped into a larger value proposition.

Right: Brownfield development is providing opportunities for the city of Portland, Oregon.





Above and right: The landfill site before it was capped by an artificial-turf athletic complex.

“The reality is local government leaders don’t wake up in the morning and say, ‘How do I manage my environmental liability?’” says Jim Pendowski, manager of Washington’s Toxics Cleanup Program. “Their priority is making their community a better place to live.” An example of how Washington’s Department of Ecology (ECY) helps make the link between those two objectives clear is the Integrated Planning Grant, a small investment that enables a local government to explore what its brownfield cleanup would involve, and what benefits its community would gain. Just as importantly, the integrated planning process gives local leaders a positive experience of working with ECY, and builds relationships that facilitate change.

The cleanup of a 40-acre defunct wood treatment facility on Lake River in the Port of Ridgefield, Washington, helped pioneer the collaborative paradigm characteristic of third-generation projects. When the Pacific Wood Treating Corporation went bankrupt in 1993, it abandoned hundreds of thousands of gallons of wood-treating chemicals, thousands of tons of hazardous waste, severely contaminated soil and groundwater, and toxins migrating along the aquifer toward the Ridgefield National Wildlife Refuge. With the Environmental Protection Agency (EPA) gearing up to list the site for mandatory cleanup, the Port of Ridgefield found itself liable for the entire cost of remediation.

Facing the prospect of bankruptcy to achieve even a minimally cleaned site that would remain a fenced blight in the middle of town for years to come, the Port approached ECY. “For [ECY], it wasn’t just about cleanup,” says Maul, who

helped the municipality strategize a solution, “it was also about maintaining the viability of the community.”

ECY negotiated a voluntary, but no less rigorous, cleanup that would keep the project out of the cumbersome federal system. And when the Port struggled to fund the work, ECY began to innovate to get the job done. It funded half the initial cleanup phase, for example, dependent on matching funds from the community. And when the Port could not immediately come up with its share, ECY agreed to front the money on the strength of the Port’s grant and appropriation prospects. “I can’t emphasize enough how innovative it was for a regulatory agency to do this,” says Maul. “It took a lot of courage for them to think outside the box like they did.”

Today, the wood treatment site has been cleaned to a higher standard than could have been achieved under the first-generation paradigm. The surface chemicals and contaminated structures have been removed, the soil cleaned, and some 30,000 gallons of recalcitrant chemicals extracted from the groundwater with an innovative steam-enhanced technology. The preserved wildlife refuge is one of two refuges nationwide piloting a new paradigm for what such places can be. And long-range planning decisions made in the context of the collaborative cleanup have helped make the Port of Ridgefield the fastest growing community in the state. “Ridgefield shaped our thinking,” says Pendowski. “It showed us how looking more broadly can pull our environmental agenda along.”

Across the river in Astoria, Oregon, the transformation of a leaching landfill into a new sports complex



Right: Columbia Memorial Hospital's new 18,000-sq-ft comprehensive cancer treatment center and specialty clinic. Rendering: Petersen Kolberg & Associates (PKA) Architects

demonstrates how a public-private partnership can harness the momentum of multiple agendas. Over 30 years ago, Oregon's Department of Environmental Quality (DEQ) ordered the city of Astoria to prevent leachate flowing from its landfill into a nearby creek and wetland. Astoria closed the landfill, but capping it properly was more than the city could afford. The leaching landfill dragged on as an expense, liability, and risk.

Meanwhile, Astoria's Columbia Memorial Hospital needed to expand but could not. With the Columbia River on two sides of the city, and the Coast mountain range behind, developable land is scarce, and the hospital was landlocked—except for the high school's football field right next door. So Columbia Memorial made a proposal: If the hospital provided most of the \$8 million to close the landfill properly and redevelop it as a sports complex, could the hospital have the old sports field for its expansion?

Winner of a Phoenix Award for this innovative solution to a blighted site, the development has given the school district a new 17-acre sports facility capable of hosting regional and state athletic events, with the potential to generate revenue from rentals. The hospital has a site to expand its services, including a cancer diagnosis and treatment center so that patients will no longer face a 45- to 90-minute drive for treatments elsewhere. And, of course, the landfill no longer leaches.

"The redevelopment actually wound up enhancing the landfill closure," notes Tim Spencer, DEQ's project manager. The sports field, with a membrane liner beneath it, is a much more sophisticated cap over that portion of the landfill. The

athletic building roofs reroute rainwater so it cannot absorb into old waste. And project details designed to monitor and vent methane gas generated in the landfill ensures the site's ongoing safety.

"The idea that we could do more than simply stop polluting, that we could end up with something that is an asset to the community, is very clear at Astoria," says Spencer. "We're all learning from it."

The land constraints that drove Astoria's brownfield solution also play out on a larger scale in the city of Portland, Oregon. For Portland, as for Astoria, sprawl is not an option. "All our opportunities for growth already lie within the city limits," says Lisa Abuaf, Central City Manager at the Portland Development Commission. "We can't expand, so brownfields are the opportunities for achieving the city's objectives."

Some of the city's most significant brownfield opportunities stretch along its riverfront, where former industrial lands are finding new life as contemporary urban developments on the leading edge of green. The first phase in the rehabilitation of Portland's south waterfront, for example, has enabled Oregon Health Sciences University, one of Portland's largest employers, to expand within the city, developing the first large medical building to achieve Leadership in Energy and Environmental Design (LEED) Platinum certification, and partnering with two other universities to develop the COTE Top Ten-winning LEED Platinum Collaborative Life Sciences Building, all part of the university's larger commitment to environmental leadership.



The first new building in the Zidell Yards redevelopment, the Emery apartments, is LEED Silver.

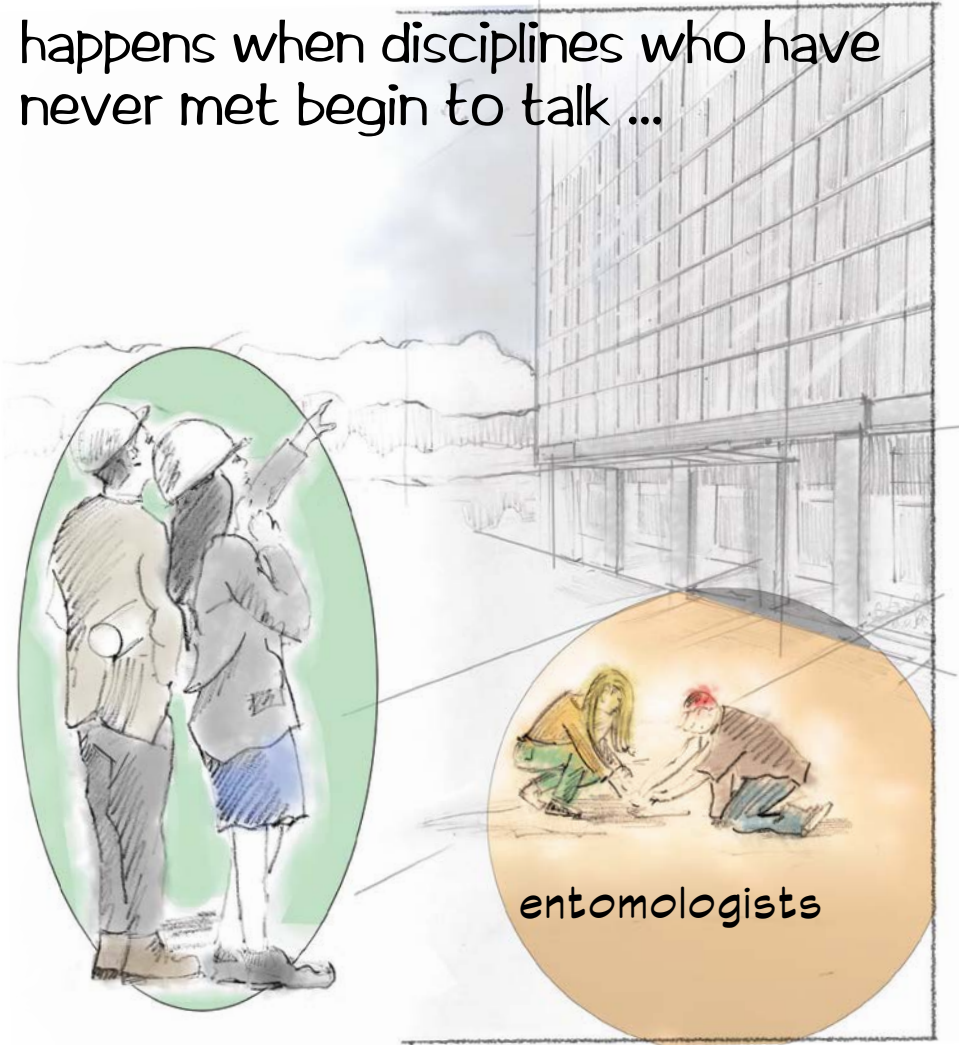
Next up, on the south waterfront is Zidell Yards, a 33-acre former ship-wrecking site. After an award-winning remediation removed contamination hot spots, capped remaining residue, and created new habitat for salmon along the riverbanks, this site now constitutes the largest privately owned bare-land waterfront parcel in Portland. The City of Portland has reached a development agreement with the site's owner—a family business with deep roots in the city—that will govern the site's transformation into a projected 1.44-million-sq-ft mixed-use neighborhood. Prioritizing density, transit, district energy, green infrastructure, LEED certification of buildings, affordable housing, public open space, and a construction contract requirement for the inclusion of minority and women

apprentices, the development agreement exemplifies the city's approach to brownfield redevelopment as an opportunity for sustainable city building.

In addition to its city building priorities, Portland sees in brownfield redevelopment a chance to cultivate and market the expertise of the city's green development practitioners. As economics drive more brownfield redevelopments, and as more jurisdictions adopt a collaborative paradigm, this exportable knowledge base can expect to find a wide market. In China, for example, the need for both arable land and urban growth is highlighting the redevelopment potential in contaminated urban sites. "Internationally and into the future," says Maul, "brownfield redevelopment will drive the majority of cleanups." ●

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Opening Doors to **RECYCLING INNOVATION**

The invention of former New York City recycling head Ron Gonen, the Closed Loop Fund tackles how to reuse products and packages as part of the supply chain of the manufacturing process.

BY ALEXANDRA DELUCA

In his office near New York City's Union Square, Ron Gonen takes to a whiteboard for a quick geography lesson. His sketch of the United States, pinpointing major cities, is soon overwhelmed as he draws route after route showing how trash is trucked around the country looking for landfill space.

"NYC garbage goes to landfills in South Carolina, Pennsylvania, and Ohio," Gonen, a former deputy commissioner of recycling and sustainability for New York City's department of sanitation, says. "Toronto pays to send its garbage to Michigan. Sacramento sends its garbage to Utah."

These are just a few examples, he says, of an unfortunate ecosystem that not only trucks tons of recyclable waste to landfills across North America but one that eliminates local jobs as well. "The great thing about recycling is that when you recycle, local industry has to process it as opposed to when you send to a landfill!"

It is an evolving—emphasis on the gerund—time in the recycling industry, which has expanded in recent years with multiple players entering the market, from massive multinational and national billion dollar companies to small, family-owned businesses. The last decade has also seen significant innovation enter the field—such as optical sorters, which recognize and sort different materials, Radio Frequency Identification (RFID) tags to identify products, and trucks using fully automated arms. But there is room for improvement. A 2015 report by the Natural Resources Defense Council and As You Sow found that the United States recycles only half of discarded packaging and 34.5 percent of municipal waste.

Enter the Closed Loop Fund, founded in 2013, which describes itself as a "social impact fund investing \$100 million to increase the recycling of products and packaging," with goals of creating more than 20,000 jobs locally, diverting more than 20 million tons of waste from landfills, and eliminating 50 million tons of greenhouse gas by 2025.

Right: Co-founders Ron Gonen and Rob Kaplan. Photo: Neil Landino





Created by some of the United States' most well-known consumer brands, the Closed Loop Fund is providing zero and low-interest loans to cities and recycling companies to improve recycling infrastructure.

Photo: Brent Lewin/Bloomberg via Getty Images

"I had been thinking for a while about how to organize the largest consumer goods companies in the world to collate their capital in one place that could then be used to solve systemwide obstacles [in recycling], which they would benefit from if they were eliminated," says Gonen, the fund's CEO and co-founder. "The issue I had was the amount of capital required from each of these companies was going to be challenging to access because it would require CEO or top executive sign-off. To get that from the top consumer goods companies—some of whom are rivals or in different industries—was going to take years."

That is where Rob Kaplan came in. Now a managing director at the fund, Kaplan was, at the time, leading product sustainability at Walmart, "which was seeing a lot of bottom-line benefits from recycling but saw limitations in the infrastructure that existed. They wanted to know what needed to be done to build out that infrastructure since they saw such a bottom-line benefit to recycling," Gonen says.

Together, Gonen and Kaplan worked to build out the fund in two years, amassing 10 backers from some of the largest retail consumer goods companies in the world, such as PepsiCo, Coca-Cola, Unilever, 3M, and Colgate-Palmolive, each with a \$5 million minimum investment. Gonen says the 10 investors saw the "tremendous promise in the financial product, and in most cases our argument was compelling enough to sign off on a large investment."

Thus far, Closed Loop Fund has made seven investments in the recycling industry. It has invested in recycling equipment for a facility in Chicago; recycling carts for Portage County, Ohio; and trucks and carts for a facility in the Quad Cities region of Iowa. QRS Plastics, a facility in Maryland that processes hard-to-recycle plastics—numbers 3 to 7—from recycling companies on the East Coast, also received backing from the fund.

From public companies to municipalities, the investments vary in location as well—with a focus on increasing the recycling infrastructure in previously underserved regions. "In

the Northeast and Mid-Atlantic there is good infrastructure. On the West Coast and Pacific Northwest, there is fairly good infrastructure," says Gonen. "The infrastructure is generally not as good in the middle and in the south of the country." When evaluating potential investments—the fund has received more than 160 applications—Gonen says they ask themselves a few integral questions: Can this project scale? How many tons will it divert? Can it provide the needed reporting? Can it pay back?

"We are representing capital from some of the world's largest consumer goods corporations that want this material back in their supply chain, so we need to invest in projects that will provide significant amounts of material back in the supply chain," he says.

Closed Loop Fund is also looking to invest in a solution for the building industry that could use recycled glass as a replacement for fly ash, which goes into cement. It also could help solve a big obstacle in the recycling industry: Currently there is no market for recycled glass, which is hurting profits at recycling companies. "This is an opportunity for the building industry to become much more sustainable. Rather than using a byproduct of coal, you are using recycled glass," Gonen says. "So we are working on [an] investment in the two companies that have that technology, and Google is looking at potentially being the first to use it in their buildings."

It is Gonen's hope that as things improve on the technology side of recycling, they will also improve where recycling begins—at the individual level. "The macro issue is that business and citizen don't recognize the cost of not recycling," Gonen says. "The cost of not recycling is not, unfortunately, 'I didn't do the right thing.' You pay to send it to the landfill."

"People say, 'I know it's the right thing to do—I should do it,'" he says. "What we need them to say is, 'Of course I recycle. I don't want my tax dollars being used to send things to a landfill! If we can overcome that obstacle, then behavioral change happens in a major way.' ●

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TOMORROW'S LEADERS



Previous spread: Google lounges are often meeting hubs for creative thinking. Photo: Eric Laignel

Right: Audi Banny, director of corporate sustainability initiatives at Estée Lauder.

USGBC's Emerging Professionals program forms future sustainability champions.

WRITTEN BY **JEFF HARDER** | PHOTOGRAPHED BY **NEIL LANDINO**

Speaking from Google's offices at 111 Eighth Avenue in Manhattan, Molly Zinzi's voice swells with enthusiasm as she talks about her employer's latest sustainability efforts: reducing storm-water runoff, using ice storage tanks to alleviate strain on the city's electricity grid, and driving efforts to reduce its carbon footprint from 30 percent down to 50 percent by 2050. "We're aligning our sustainability goals with the sustainability goals of the city," she says.

Five years after first joining Google, Zinzi has risen to become facilities manager for the tech company's three-building, 1.2-million-sq-ft Manhattan campus. But getting to where she is today started more than a decade ago, sitting around a table and clinking glasses with other sustainability-minded peers at a Mexican restaurant in the West Village. "We were really just trying to connect some of the dots and get people who were thinking about the same things in the same room," she says.

Those were the early days of what became New York City's Emerging Professionals program. Since its inception in the early 2000s, the U.S. Green Building Council's (USGBC) community-based program has been connecting emerging and young professionals from across industries, giving sustainability-curious newcomers access to education, networking opportunities, and project experience. And for the first generation of Manhattan-based Emerging Professionals, the skills and relationships from those early days have been a springboard to becoming today's green building

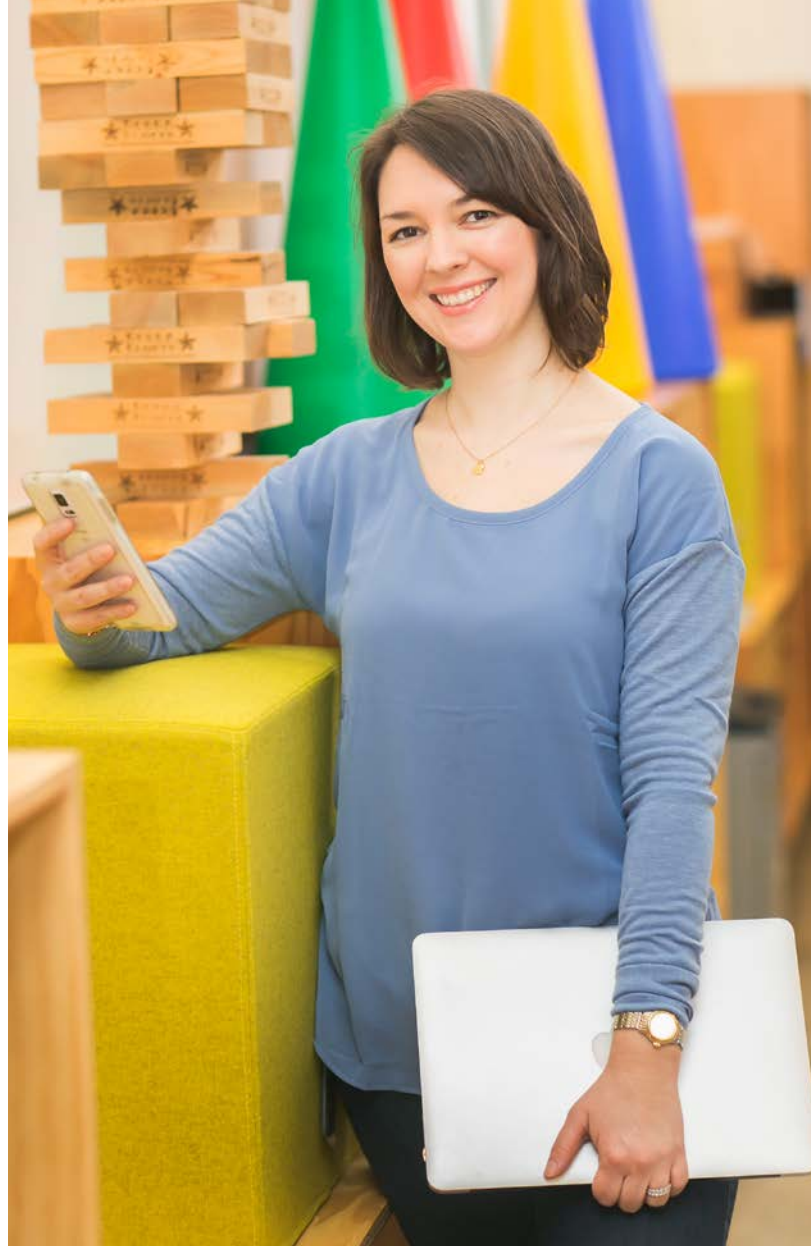
leaders. "A large part of my career's success was tied to my involvement as an EPer," says Audi Banny, director of corporate sustainability initiatives at Estée Lauder Companies and one of the co-founders of Emerging Professionals in New York City.

In 2004, Banny was still a student at the School of Visual Arts when she attended a quarterly meeting of the USGBC's New York chapter, Urban Green. Sustainability was a burgeoning movement, and Banny was eager to soak up all the knowledge she could, but she had a hard time deciphering the terminology peppering sentences—and she suspected that some of her peers were scratching their heads too. She raised her hand and asked about programs aimed at individuals like her, whose passion for green building surpassed their fluency in the industry dialect. "To this day, [sustainability] is consistently evolving," Banny says. "Back around 2003 through 2006, so much was happening and there was so much to share that we really thought, 'How can we share this information in a way that's fun, engaging, and it doesn't necessarily limit who our audience is?'"

Shortly after that meeting, Banny co-founded Urban Green's Emerging Green Builders program (the name changed to Emerging Professionals in 2010) as a subcommittee of the chapter's communications committee. It was among the first of a few fledgling groups that had sprouted up in other USGBC chapters around the country with the same simple ambition: spread the green gospel to students, recent grads,



Molly Zinzi, facilities manager at Google.



and young professionals through monthly meetings, special events, and a casual atmosphere in which lectures gave way to networking over happy-hour drinks. In short order, the group had its sponsors in Erica Godun and Susan Kaplan—experts in architecture and sustainability, respectively—and developed bylaws and structure. Their get-togethers attracted attendees from across the spectrum—architects, engineers, designers, project managers, even lawyers—and brought them face to face with USGBC board members, executives, and other seasoned sustainability veterans. “You weren’t just learning about green buildings, you were engaging with peers who had been in the industry for 10 to 15 years or more,” Banny says.

Zinzi was a School of Visual Arts student when Banny, her friend from school, invited her to join the group in 2005. It was good timing: Zinzi was working on her senior thesis project, a center for green design modeled on the American Institute of Architects center in the

West Village, and was looking for a glimpse of the real-world sustainability marketplace. To that end, the group welcomed guest speakers to its monthly meetings to lecture about different aspects of Leadership in Energy and Environmental Design (LEED) as well as green products and technology. The group—about a half-dozen strong at this point—also brainstormed realistic ways to incorporate sustainability and LEED into projects they were tackling at their firms. “We all came together around the fact that we had a passion for sustainability, even though we really didn’t know how to practice it day to day yet,” Zinzi says. “We were just trying to figure out how to make sustainability part of our everyday jobs, not just something we were doing outside of our jobs.”

In time, as green building migrated into the mainstream, the Emerging Professionals program grew from a few friends into a small crowd. “Just with the growth of the industry, there was a lot more interest from young professionals to get involved,” says Keith



Keith Amann,
director at YR&G
and co-leader of
the Design and
Construction team.

Amann, who joined Emerging Professionals in 2007 after taking a job at the Manhattan-based sustainability-consulting firm YR&G (and who, like all the others interviewed for this article, served a two-year stint as a program co-chair). Attendance grew from numbers you could count on two hands to more than 50, and those numbers spiked even further at events that the group organized from scratch, like a career fair at the World Trade Center complex in Lower Manhattan, and partnering with the Fashion Institute of New York for a popular, recurring eco-fashion show featuring designer ensembles made from green fabrics and materials.

“That was a really great way to get together around sustainability—a subject that’s really important—but to bring some relief from the rest of the day-to-day stuff we were doing,” Zinzi says. “It was about just having the freedom to do something different, sparking new conversations, and showing other EPer as they came into the organization...that you can do whatever you

want: just form a committee, get a sponsor, make it happen.” The New York Emerging Professionals program also hosted a local contest to whittle down designs for the nationwide Natural Talent Design Competition. At Greenbuild in 2010, a team from the New York chapter won out against all other entrants with a design for a single-family affordable home that was constructed in New Orleans as part of the city’s posthurricane rebuilding efforts.

As the years passed, growing families and greater work responsibilities have meant that the aforementioned Emerging Professionals had to exit the program, even as they all remain friends. But along with fattening up their Rolodexes and padding their resumes, something else happened: the Emerging Professionals alums became in-demand authorities on green building and sustainability. Banny, for example, works on projects geared to positively impact Estée Lauder Companies energy, waste, and water efficiency.

Emily Kildow,
sustainability
manager for Taconic
Management
Company.



Emily Kildow—who joined the New York chapter’s Emerging Professionals program back in 2005, shortly after moving to the area from Colorado—says all those extracurricular hours spent growing the program and bringing events from concept through fruition became a proving ground for her project management abilities at a time when most young professionals are trying to prove their mettle in entry-level positions. “You’re doing something where you’re willing to put forth a lot of passion and have the longevity to show how you can grow within an organization,” says Kildow.

Additionally, the professional networks they’ve cultivated over more than a decade have paid off in ways big and small. Kildow’s current role as sustainability manager for Taconic Management Company, the property managers for Google’s building at 111 Eighth Avenue, came in part from the relationship she forged with Zinzi during their days as Emerging Professionals. “When I found out Taconic needed a sustainability manager, Emily was the first

person I thought of and the first person I called because I knew the caliber of work that she did,” Zinzi says. “I had seen her progress throughout her career and I knew what she was capable of doing.”

In time, the emerging professionals of yesterday eventually became today’s leaders. “I see that playing out now, nine years after first getting involved,” says Amann. Today, as a co-leader of the design and construction group at YR&G, he manages projects dealing with sustainability across the entire lifecycle of an array of buildings in the United States and abroad, from serving as a LEED coordinator to performing commissioning and energy-modeling services. “Many of the people I became close friends with are decision makers at their firms, and some of those friends also happen to now be business partners, clients, collaborators on projects,” Amann continues. “If you aren’t thinking about young professionals in terms of their potential, you’re selling them short. You never know who someone is going to be in the future.” 🌱



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Green Standard



Colgate-Palmolive strives to become a leader in sustainable building practices around the world.

WRITTEN BY **MARY GRAUERHOLZ**

Previous spread: Interior of Colgate offices. Vance Merolla, Colgate-Palmolive's director of environmental sustainability.

Right: Lori Michelin, Colgate's vice president of global sustainability and environmental, occupational health, and safety.

Photos: Neil Landino

Amid the lush beauty and natural wonders of Vietnam is a surprising level of pollution. A booming population, rapid industrialization, water pollution, and choking urban traffic—combined with the effects of climate change and other factors—have left the country and its 91 million people with significant health and environmental issues.

The good news in Vietnam, and other countries facing similar challenges, is that any positive effort can make a difference. Colgate-Palmolive, a global company that began in 1806 as a soap and candle business founded by William Colgate in New York City, is showing how progress can be made when it comes to building green, anywhere in the world.

A company action plan, called the 2015 to 2020 Sustainability Strategy, includes a "Commitment to Sustainable Buildings," which outlines an ambitious goal: to achieve U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification for all of its new buildings around the world. In the process, Colgate is establishing some impressive "firsts." In Vietnam, a Colgate factory located outside of Ho Chi Minh City is the first LEED-certified building in the country, helping to push Vietnam toward a more sustainable future. A new LEED Gold plant in India that manufactures oral care products is the company's first LEED-certified building in that country.

Although the last six years have seen a 40 percent growth in LEED-certified industrial facilities, the growth is slower than in other LEED sectors. But the potential for positive change is huge.

"It's a little newer, a little harder to do," says Vance Merolla, Colgate-Palmolive's director of environmental sustainability. "But the impact can be enormous." Colgate has more than 50 manufacturing and research facilities and employs more than 37,000 people worldwide. Merolla directs Colgate's global initiatives on energy, climate change, and water and waste reduction, and is responsible for Colgate's commitment for all new global manufacturing facilities to become LEED certified.

By definition, industrial facilities use a great deal of water and energy, as Merolla points out, making them the perfect space type for strategies aimed at reducing use of natural resources and containing emissions. Colgate currently has 10 LEED-certified facilities and 11 more LEED projects underway. "It's a way to show that it can be done, and done cost effectively," says Merolla, of making sustainable buildings the rule rather than the exception. It also has the potential to change the culture of construction. As Merolla says, "It helps to educate and inform the industry."

The company's commitment applies to both existing and new construction. "In existing sites around the world, we're continuing to look for ways to save water and energy," Merolla says. "For a new facility, relating to LEED, it means ensuring we're building with conservation in mind; ensuring that when we design it, we set water and energy performance goals." One such goal the company has set its sights on is to reduce manufacturing water intensity by half, compared to its usage in 2002. The amount of water (and related energy) saved as a result translates to one metric ton of product.



Colgate's efforts to certify industrial facilities began in 2007 with a pilot project in Morristown, Tennessee, says Mike Corbo, Colgate's chief supply chain officer. "It worked," Corbo says, "and it worked so well that we made a global commitment that every factory, technology center, warehouse, or office building that we construct, will be LEED-certified." Corbo oversees the company's global end-to-end supply chain activities in its efforts toward sustainable practices and sustainable, LEED-certified buildings and plants.

Colgate's sustainable intentions are woven throughout their 2015 to 2020 Sustainability Strategy, which is built on three pillars: people, performance, and planet. Each has measurable goals that align with Colgate's overall business objectives, including targets to conserve water and reduce Colgate's impact on climate and the environment. Among the many goals, the company pledges to:

- Reduce manufacturing water intensity to half of its 2002 use levels
- Replenish water withdrawn in highly stressed regions
- Increase supplier participation in the company's water stewardship program
- Partner with local and global organizations to bring clean water to underserved areas of the world
- Promote water conservation awareness to all the company's global consumers
- Responsibly source forest commodities to reach zero net deforestation
- Promote use of renewable energy and reduce absolute greenhouse gas emissions from manufacturing by 25 percent, compared to 2002 use levels
- Reduce manufacturing energy intensity by one-third of its 2002 use levels
- Cut manufacturing waste (measured in per ton of product) sent to landfills in half, compared to 2010 levels, working toward a goal of "zero waste"
- Partner with key suppliers, customers, and consumers to reduce energy, greenhouse gas emissions, and waste

"Today, countries like Vietnam and China are rightly asserting their role as 'the world's factory,'" notes USGBC CEO and founding chair Rick Fedrizzi. "But it's also here that exponential growth is disproportionately contributing to climate change, so it's not surprising

that Colgate is deploying some of its most innovative sustainable building techniques here."

The plant in Ho Chi Minh City, which manufactures toothbrushes, earned LEED Silver for New Construction. Highlights include a 50 percent reduction in potable water landscape use and a 20 percent reduction in baseline indoor water use. The building's indoor environmental quality was also well ranked, with 90 percent of occupied space having quality/daylight views.

"The benefits of a LEED building extend beyond just the company and the employees inside," Corbo says. "Companies embracing LEED practices can help influence an entire industry and establish local green building capabilities. Our manufacturing facility in Vietnam, the first LEED-certified building in the country, was good for the greater community, because it developed skills in sustainable building construction for everyone who worked on that site. These are skills they could then take to other projects in the country."

The company's commitment to LEED construction is engaging thousands of employees in sustainability, Corbo says. Colgate's portfolio of LEED-certified manufacturing sites to date have been designed to reduce energy use by 17 to 24 percent, carbon emissions by 16 to 27 percent, and water usage by an average of 44 percent.

Lori Michelin, Colgate's vice president of global sustainability and EOHS (environmental, occupational health, and safety), says the company began valuing thoughtful business practices long before the 21st century.

"Sustainability is more than just a project or initiative at Colgate—it's an integral part of everything we do," Michelin says. "Long before sustainability and social responsibility practices became a basic cost-of-entry for companies, Colgate recognized that how we do business is just as important as what we do." Improving operational efficiency has been a focus for decades, she says.

When indoor air quality is poor, health suffers. "Our commitment to LEED buildings is a big part of that, as it provides healthy, well-lit, comfortable working environments for our people," Michelin says.



Colgate's Ho Chi Minh City plant, which manufactures toothbrushes, earned LEED Silver for new construction.

Employees have been a big part of the effort, Michelin says. "The 2015 to 2020 Sustainability Strategy was a cross-functional, cross-divisional effort, with people all over the Colgate world coming together to look at the current and future landscape—to look at what we were doing and where we wanted to go—and to [make] commitments to take us to the next level."

One important way the company is implementing its strategy is through its Product Sustainability Scorecard. The scorecard program, begun in 2012, helps the company measure improvement across seven areas that impact the planet: responsible sourcing and raw materials, energy and greenhouse gases, waste, water, ingredient profile, packaging, and social impact. "The results are validated by a third party, so we can definitely say if a product is more sustainable than its predecessor," Michelin says. "In 2015, 85 percent of our products had an improved sustainability profile, and we're going to continue to focus on this through 2020."

The stakes, of course, are high. "Operating in today's world requires an enhanced focus on conserving finite resources and maintaining the well-being of our planet for generations to come," Michelin says. "Given increased consumer and community expectations, a company really cannot prosper long term without a sustainable mindset."

As a USGBC Platinum member, Colgate is leading by example in other ways too, such as sharing information. In 2012, Merolla and representatives of other multinational industrial companies, including Kohler, Intel, and Fiat-Chrysler, formed the USGBC LEED User Group: Industrial Facilities. "It's a way to gather information, build a network, and engage more manufacturing companies," Merolla says.

Colgate is reaping benefits for its commitment to sustainability and LEED construction. "Being committed to green manufacturing has enhanced our operational efficiencies and provided safe and healthy environments for our employees," Corbo says. "It has also brought us significant cost savings, especially our reduction in energy and carbon over the years, in large part thanks to LEED, which has allowed us to make the products consumers rely on, with a smaller environmental footprint."

"A lot of countries have building codes that only minimally address energy efficiency, water use, and waste generation," Merolla adds. "By using LEED, we're saying we're going to exceed what the regulations require. We're not necessarily waiting for governments to write building codes or standards for sustainability. It makes sense in terms of sustainability and in our business." 🌱

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THE "NEW" DEAL

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WRITTEN BY **CALVIN HENNICK**

3.35 million. Keep that number on hand, in case anybody suggests that the aims of sustainability are incompatible with economic growth. It's the number of U.S. jobs—according to the U.S. Green Building Council's (USGBC) 2015 Green Building Economic Impact Study conducted by Booz Allen Hamilton—that will owe their existence to green building by 2018 (up from just under 200,000 jobs created directly or indirectly by green building in 2005).

If that number slips your mind, mention 15.1 percent. That is the annual projected growth rate for green construction between 2015 and 2018—a number that outpaces the projected growth for general construction, just as green building growth has outpaced conventional construction growth over the past several years. Leadership in Energy and Environmental Design (LEED) residential growth is forecasted even higher, at 31.1 percent annually, due in part to low historical market penetration.

Or, if that is not enough, reach all the way up to \$284 billion, the projected total annual impact of green construction on Gross Domestic Product (GDP) by 2018.

Organizations across a number of sectors have steadily come to the conclusion that green practices are good for their bottom lines—lowering energy and water bills, improving employee health and productivity, and building up a reservoir of goodwill among customers and other stakeholders who value sustainability. The Green Building Economic Impact Study shows that sustainable practices are not just good for individual businesses, but for the economy as a whole. This fact stands in sharp contrast with the popular (in some

circles) narrative that green initiatives are job killers, achieving environmental gains only at the expense of economic growth. But the numbers do not lie.

Statistics alone, though, do not tell the complete story. To fully understand the impact of green building, you need to speak with some of the millions of men and women—from solar panel sales teams to sustainable construction consultants, from manufacturers of low-VOC paint to green cleaning contractors, from architects and engineers to landscapers and HVAC installers—whose jobs have either been created or forever changed by the new green economy.

Here are three of them.

ART FRAZIER

**Director of Facilities Management & Services
Spelman College**

You will not find “sustainability” anywhere in Art Frazier’s job title. Just in his job.

“A few years ago, the president and chief financial officer took a walk, and at the end of that walk they decided to add responsibility for all noncurricular sustainability initiatives to my job description,” Frazier says.

Frazier has been at Spelman, a historically black women’s college in Atlanta, since the fall of 2007. In addition to his other duties as facilities management director, Frazier manages green construction on campus, handles the school’s environmental reporting, and serves as co-chair of Sustainable Spelman, the

Previous spread: The mural features a line from Spelman's theme song; this phrase is seen often around campus and in articles on the school website.

Below: Art Frazier. Photo: Stan Kaady





college's sustainability initiative aimed at engaging the community in authentic conversations to increase awareness, knowledge, and action on campus.

The evolution of Frazier's role is reflective of a shift that has occurred on the campuses of universities and other institutions across the country over the past decade, with many of those organizations adding previously nonexistent sustainability-focused positions, or adding sustainability responsibilities to the portfolios of existing staff members.

"We try to incorporate sustainability into people's jobs," Frazier says. "For example, our custodians, they're doing green cleaning, using nontoxic chemicals, and making sure we maximize recycling. We don't just have this one person who [is responsible for sustainability.] It becomes everyone's responsibility."

Frazier, a licensed architect, oversaw construction of Spelman's first new building in the 21st century, the Beverly Daniel Tatum Suites, a 303-bed residence hall that opened in 2008 and was certified LEED Silver in 2010. In that same year, the school adopted a policy that all new buildings and substantial renovations must be built to at least LEED Silver specifications. A

number of colleges and universities across the country have implemented similar policies, increasing the need for staff that are either solely focused on, or at least significantly experienced with, sustainable development.

In 2012, the school completed renovations to Laura Spelman Rockefeller Memorial Hall, a residence hall originally built in 1918. In 2015, the college opened the new Reed Hall, home to a campus wellness center that includes a gym, activity room, and swimming pool. Both of those projects achieved LEED Gold.

Frazier has had a lengthy career in development, and he's seen firsthand how the increased emphasis on sustainable building in recent decades has changed the real estate and construction job market. He began his career as a commercial architect, and then moved on to a job at a firm that worked primarily with institutional clients such as research laboratories and colleges. Later, he worked as an owner's representative, before beginning his time in academia—first at Emory University, and then at Spelman, with a stint as a consultant in between.

During the first half of his career, Frazier says, he noticed a marked difference in the way that



Spelman College plans a 50 percent reduction in baseline greenhouse gas emissions by 2031 and intends to achieve carbon neutrality by 2056.

his commercial clients and his institutional clients approached development. “My commercial clients were interested in money,” he says. “A number of the projects I worked on were spec office buildings. Developers wanted the lobby and the bathrooms to look pretty so they could lease out the building and then sell it. They didn’t care whether it had quality systems. They were building 10- to 20-year buildings. When I started doing projects for institutional clients who were self-operating and self-maintaining these buildings, they were thinking about institutional-quality systems that conserved resources.”

He adds: “The [institutional] buildings that I was designing from 1990 to 1997—if there had been LEED back then, those buildings would have been certified.”

Institutional developers have continued to enhance their sustainable development initiatives as the market expands and costs for efficient systems and green technologies lower. But, like many observers, Frazier has also noticed a shift in the mindset of commercial developers, as those builders have moved on from short-term thinking to begin considering the total cost of ownership of the buildings they develop.

“They’ve been able to sell [sustainability],” Frazier says. “I see articles all the time, where they’re able to lease these spaces faster than other spaces. It’s become a part of what they are selling, along with the aesthetics. In the end, somebody has to pay that operating cost. Clients look at it and say, ‘Do I want to move into this gas guzzler, or do I want to move into this economy car?’”

Working at a college, Frazier has a front-row seat to the ways in which the new green economy has changed career prospects for young people. One of his former students, for example, is pursuing a career in environmental law. But, he notes, women of color are still underrepresented in the sustainable development world, as they are in many technical and professional fields.

“It is very helpful for our students to see people like them in this field doing these things,” Frazier says. Last year, students invited three Spelman alumnae working in sustainability-focused careers to come to campus and speak over three nights. “To hear them and see that, to see someone like themselves,” Frazier says, “they felt a little closer to it.”

Right: Jackie Henke. Photo: Joel Laino

Below: TD Bank has opened more than 100 LEED Stores and corporate offices and was the first to open a net-zero energy bank location in the United States in Ft. Lauderdale, Florida.

JACKIE HENKE

Energy and Sustainability Innovations Director
TD Bank

The story of how Jackie Henke ended up in the job she has begins with the story of the job she does not have.

As a child, Henke left a visit to the zoo in tears, appalled at the conditions in which the animals were forced to live. Several years later, when her class took a field trip to the Bronx Zoo, she begged her mother to call the school and say she was sick to get her out of it. Her mother refused, and Henke made the trip with her classmates. This time, she was not horrified, but instead pleasantly surprised at the changes since her last trip. The zoo felt to Henke less like a prison and more like a faithful replication of the animals' native habitats.

"It felt like you were a guest in their world," Henke says. "From that point on, I said, 'What do I need to be

involved here?'" She eventually went to graduate school at MIT—first earning a master's degree in architecture, and then another in civil engineering—with hopes of one day designing zoos and aquariums. But, Henke says, "Life happens and careers evolve."

She went into construction, hoping to pick up some of the knowledge and skills she would one day need to design world-class artificial habitats for animals. While working for Turner Construction, she noticed that plans called for a project to be built to LEED specifications. Henke read through the plans, which included skylights and environmentally friendly materials. However, she still did not fully understand what LEED was all about, so she asked her boss. "The project manager said, 'That's a great question, thanks for asking it. Now go and answer it,'" she recalls. "That's how I became the green champion of our Boston office."

Henke began leading "Toolbox Talks" where she would educate workers about LEED generally, or





about specific LEED credits, to make sure they knew what they needed to do to keep the project on track for certification. "You might think sealant is sealant, or white paint is white paint, but it's not," she says. "You have to make sure subcontractors are selecting the right materials."

As time passed, Henke found herself more immersed in the world of green construction and real estate development, and her dream of designing zoos and aquariums gradually faded away. In 2010, she began working for TD Bank in a sustainability role. Her job titles and duties have changed as the bank's real estate and sustainability strategies have matured, and now she leads a team of three people focused on green innovations.

"We've cleared out a lot of that low-hanging fruit that people talk about," Henke says. "We've got the base of the portfolio. All the quick wins are done. Now we're looking at how to dive into that deeper greening, and what are those next steps."

It is a path Henke could not have predicted for herself back on that day in high school when she visited the zoo, because big banks simply did not employ sustainability directors 25 years ago. While she may never design an aquarium, her career path has given her a way to marry her twin passions of development and sustainability, and she still stays connected to zoos, volunteering as a member of the advisory council for Zoo New England.

"It gave me that ability to make an impact on the environment," she says. "I was always the kid who would recycle. It was a way to take that way of thinking and apply that to a job, where I know that every day, my actions can leave the environment in a better state than when I started that morning."

Henke's own career illustrates how quickly the green economy is evolving. "During my interview, someone asked, 'Where do you want to be in five years?'" she recalls. "I said, 'If we do it right, we won't need this role in five years. We'll have moved on to something else.'"

The remark proved to be prescient. Although the sustainability team at TD Bank has grown, her old role doesn't exist any more. It's been replaced by several others. In another five years, perhaps, each of those will be replaced by several more.

ANDREAS TSELEBIDIS

Director for Sustainable Concrete
Technology and Solutions
BASF

Some of the newest and most distinctive additions to New York City's skyline are held together by Andreas Tselebidis's contributions.

The 1,776-ft tall One World Trade Center and the nearly 1,400-ft tall 432 Park Avenue residential tower were both built with what Tselebidis calls "the most ecologic concrete ever used in a superstructure."

For many, the concrete used to construct buildings is largely invisible, something taken for granted. For Tselebidis, it is his life's work. And while it is easy to show off interior design touches such as recyclable carpet and locally sourced granite countertops, structural concrete is almost always hidden from view. But it can have an enormous environmental impact.

Tselebidis has developed concrete for use in skyscrapers that is both stronger and more elastic than typical structural concrete, and yet also takes up less volume. Additionally, the concrete uses less cement; more than 70 percent of it is made up of supplementary cementitious materials (SCM)—things like glass powder, steel slag, and fly ash (a product of coal combustion).

Thanks to Tselebidis's work, significantly fewer tons of concrete can be used to construct a skyscraper, helping to conserve resources and reduce the amount of heavy materials that must be shipped to jobs sites. And because the concrete is so largely composed of waste materials, it prevents those items from being landfilled.

"Less of this material needs to be produced, less of this material needs to be delivered, less of this material needs to be installed," says the Germany native, who moved to the United States in 2008. "The benefit is for planet Earth. We save a tremendous impact on greenhouse gases."

At the World Trade Center project alone, Tselebidis says, his concrete saved 15,300 tons of carbon dioxide in reduced cement use and delivery, compared to a more traditional structural cement. "It's 1.77 million gallons of gasoline that we saved, just for one tower,"



National LEED Construction Spending

2005	\$2.6 billion
2006	\$4.1 billion
2007	\$7.2 billion
2008	\$13.6 billion
2009	\$31.1 billion
2010	\$44.4 billion
2011	\$46.3 billion
2012	\$43.5 billion
2013	\$47.6 billion
2014	\$49.8 billion
2015	\$61.8 billion
2016	\$66.9 billion
2017	\$72.5 billion
2018	\$78.6 billion

Note: Figures for 2015 through 2018 are projections.

Total Impact of National LEED Construction on Labor Earnings

2005	\$2.8 billion
2006	\$4.2 billion
2007	\$7.2 billion
2008	\$13.4 billion
2009	\$30.4 billion
2010	\$42.9 billion
2011	\$43.8 billion
2012	\$40.3 billion
2013	\$43.4 billion
2014	\$44.7 billion
2015	\$54.2 billion
2016	\$57.8 billion
2017	\$61.5 billion
2018	\$65.5 billion

Note: Includes direct, indirect, and induced impact.
Figures for 2015 through 2018 are projections.

SOURCE: "Green Building Economic Impact Study," USGBC, September 2015.





Through BASF's Green Sense Concrete mixture optimization service, Eastern Concrete Materials was able to proportion an EF Technology® concrete mixture with 71 percent cement replacement. The mixture replaced Portland cement with the recycled materials, noncementitious fillers, and specialized admixtures to exceed all the performance targets specified by the One World Trade Center project stakeholders.

he says. "You take 1.77 million gallons of gasoline out of our environment. This was huge."

"At the end of the day, nobody is paying for the ecology of a product," Tselebidis acknowledges. "Most people try to see, is it economic, and if it is economic and it gives the benefit of being ecological, they love it."

But increasingly, environmental and economic concerns are one and the same. When a building project can use fewer materials, decrease shipping, or reduce energy and water needs, those changes have an impact on both the planet and a company's bottom line. Tselebidis predicts that this link will grow even stronger as climate change becomes a more pressing concern, leading politicians to enact cap-and-trade systems that will economically reward companies that reduce carbon emissions.

"Sustainability, in the future, will be more and more important for every project, in every industry," Tselebidis says. "This is becoming more of a focus worldwide. You have politicians coming more and more to an agreement that we have to do something. Otherwise, we will not be able to survive. If you look at China, you cannot walk outside without a mask. We have to stop this on a global basis."

Environmental advocates have been ringing this sort of alarm bell for years, but the economics may finally be catching up to the ethics. In Europe, Tselebidis notes, appliances that receive "A" ratings for efficiency sell well, while "C" appliances have disappeared from the market completely. Companies are increasingly using sustainability as a way to brand themselves and set themselves apart from competitors. And even in oil-producing countries like Saudi Arabia, Tselebidis says, clients are saying they want to build sustainably.

In short, the new green economy is being driven by the gradual realization by companies that environmentally irresponsible behaviors jeopardize not only ecosystems and endangered species, but also businesses themselves.

"Companies that are not addressing sustainability will not have the proper products in the market to serve the needs of customers and industries," Tselebidis says. "They will either vanish due to pressure from politicians, or form a society that is focusing more and more on sustainable products. If it's a car or it's concrete or it's the way we construct—if a business is not sustainable, if they cannot prove they are not wasting resources, I doubt they will survive." 🌱

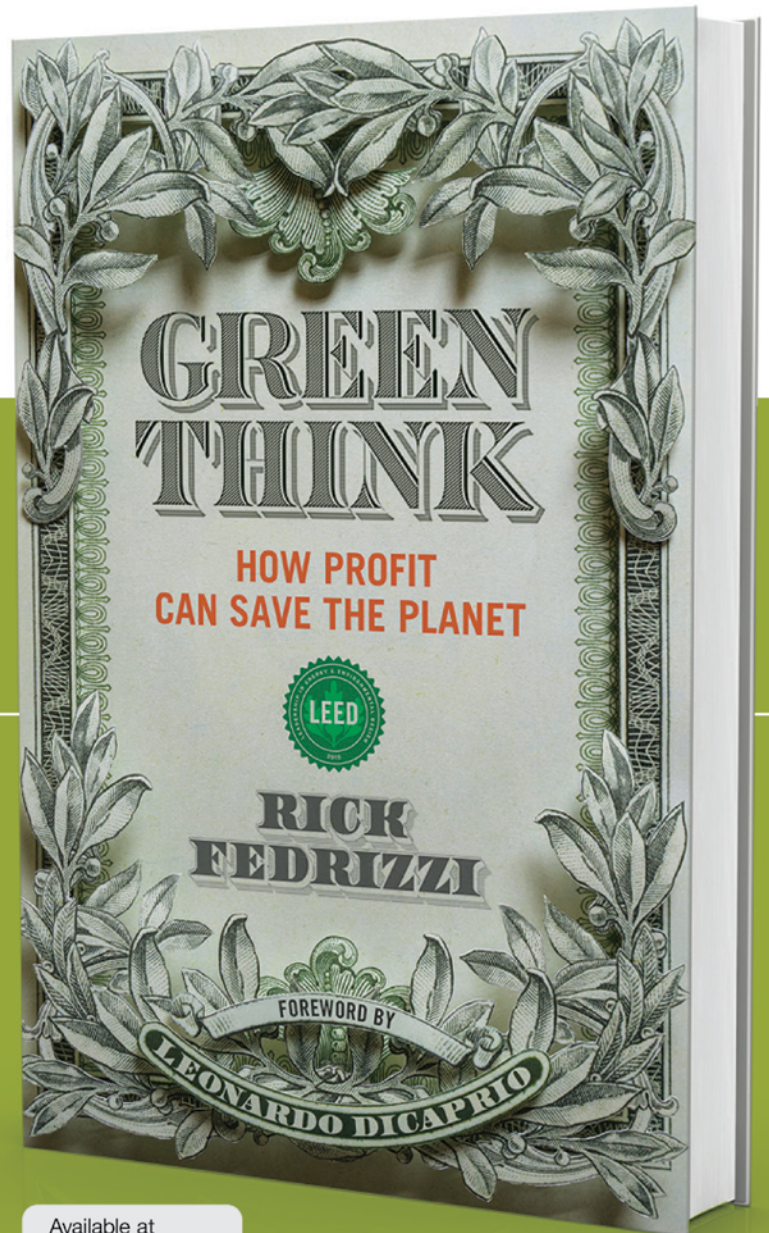
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CEO AND FOUNDING
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At the Table

USGBC-LA's Green Janitor Program reaches beyond energy-saving strategies to empower its employees.

By Kiley Jacques

It started with an initial conversation back in 2010 that sought to answer the question, "What could be done to promote operations and maintenance practices that focus on green building performance?" Enter the U.S. Green Building Council—Los Angeles (USGBC-LA) chapter's Vocational Green Class with Building Skills Partnership, which stemmed from the realization that janitors, supervisors, and operations managers have a significant effect on a building's functionality.

The development phase of the program was a long one. Determining what such a program should look like meant careful consideration of its participants and the curriculum necessary to provide results-driven, on-the-job training for employees responsible for the maintenance and operations of commercial buildings, Leadership in Energy and Environmental Design (LEED) certified or otherwise.

"It took us a good amount of time to come up with our strategy," says Dominique Hargreaves, executive director of USGBC-LA. "The core team has worked together for over five years to make this program come to fruition." That team includes: USGBC-LA, Building Skills Partnership (BSP), Building Owners and Managers Association (BOMA), and Service Employees International Union (SEIU). The group took cues from the Green Professional Building Skills Training program (otherwise known as GPRO), a national training and certificate program designed by USGBC's New York City chapter, Urban Green, which trains electricians, construction managers, and



the like. "We looked at their model [in terms of] how to create trainings, testing, and certification," explains Hargreaves.

The Green Janitors Program mission is to promote operations and maintenance practices that enable buildings to meet green performance standards, with special emphasis on energy efficiency and building health. "It's really critical that the janitors understand their role in building management and operations maintenance. It's the kind of thing that can be taught and it can be cultivated," says Hargreaves, adding that all of the work those employees perform on a daily basis shows up in utility bills,

water bills, etc. "They have a large impact on the building."

By 2014, the team had hammered out the logistics and put into motion a pilot program designed for eight buildings. There were 150 participating employees maintaining buildings belonging to companies like CBRE, Commonwealth, Equity, and JMB Realty, among others. The entertainment industry, in particular, has been very involved in the program. "We've really found a nice niche with studios," notes Hargreaves. "[That industry] is really a cornerstone of our economy and what makes our city interesting." SONY, Dreamworks, Paramount, and

PHOTOGRAPHY BY ADEEB HOWRANI

Left: Classroom instruction is given onsite at their place of employment.

Right: The program is designed to enhance coworker collaboration.

(soon) NBCUniversal support a strong cohort of certified janitorial workers. It is important to note that this program aids corporate responsibility goals like energy conservation and LEED certification. Buildings whose janitorial workers have completed the Green Janitors certificate program are able to apply for the LEED pilot credit IPpc81 for operators and service workers.

In terms of training, janitors receive 30 hours of instruction, during which time they learn hands-on energy management and green cleaning techniques. The program is organized into seven modules. The first, introduction to building sustainability, examines topics like recycling, water conservation, and LEED certification—it is a kind of “buy-in to the program,” explains Hargreaves. The second is focused on green cleaning, which is five hours spent studying environmentally preferred cleaning agents. “This module is another kind of empowerment [tool] for janitors to try new products and see that they do work,” she says, making the point that the worst thing for a janitor is to receive a complaint that something is not clean. “So getting comfortable with new products that are better for their health and that of the environment, yet that are still effective, is really important.”

The third module is devoted to energy conservation. “Energy conservation is key and one of the reasons this program came into existence,” notes Hargreaves. Unlike most professionals who work in a commercial building, janitors really have eyes on energy waste and overuse throughout the building. During this



portion of the program they learn about plug loads and vampire energy, and they perform energy hunts, whereby they form teams to survey their respective buildings, floor by floor, to identify good versus wasteful practices. “The janitors are the eyes and the ears of a building,” she says. “They have a lot of knowledge about the building and its usage.” So training them on specifics

like energy waste and water strategies is helpful and another piece of the empowerment pie. They come away understanding why it is important to save energy and seeing themselves as potential agents for change.

The fourth module is a five-hour training on recycling and diversion, during which they learn why it is crucial to redirect waste away from landfills.



Left: Training manuals and materials are provided in each person's native language.



The fifth is health and safety, and runs for two hours. “It’s really critical that janitorial workers think about health and safety in the workplace because they do come into contact with all kinds of hazards,” notes Hargreaves. Water conservation is the focus of the sixth module—it runs for four hours and includes a “water hunt” that identifies possible conservation measures and areas in need of improvement in a given building. Finally, the last module is dedicated to review and testing.

Because the training occurs at their place of employment, participants are among their coworkers. It is taught in Spanish, though it can be taught in English as well. “They are more comfortable learning the material in their native language,” notes Hargreaves. They take two multiple-choice exams, a midterm and a final. Once they pass both, they have a graduation ceremony that includes a keynote speaker, and they receive a certificate and a pin, meant to be worn while at work, which demonstrates their “loyalty, allegiance, and pride.” The program fosters teamwork and gives people, many of whom have not received higher education, the opportunity to graduate.

Judging from surveys taken from building management staff, as well as the janitors themselves, it is clear their level of engagement and confidence in their skills have been greatly enhanced. Prior to this program, janitors did not necessarily understand why certain sustainable procedures or materials were required, or the kind of impact they could have on energy reduction and water consumption—and ultimately, human health—through their work.

“This has gone to a way more profound place than we had originally



At the completion of the course, each graduate receives a certificate and a lapel pin, meant to be worn while at work.

designed the program to do,” says Hargreaves. “It was designed to train and up-skill workers.” But beyond having expanded their knowledge, vocabulary, and skill set, they also absorbed what they learned on a personal level. Many of them now recycle at home and use green cleaning products, and they are more cognizant of energy and water usage in their homes. In short, the program helped them expand their concept of green cleaning to green living.

“All of that has [permeated] their family lives,” notes Hargreaves. “They have really taken this knowledge to heart as a better way of living and working. They also have a better understanding of their role in the building.” They now see how their work relates to green building standards, like LEED certification and ENERGY STAR. “They feel empowered because they know that what they do every day helps the environment.”

Feedback from managers has been very positive. In many cases, the janitors have exceeded expectations in terms of how much information they came away with, how much they retained, and how they are applying it to their work. “They were happy to see the workers’ confidence develop,” notes Hargreaves,

adding that their communication skills have also improved.

One such manager, Cristina Rosales, Pacific Corporate Towers (PCT) supervisor in El Segundo, says: “I’m glad that the staff attended the class because it gave me support and reinforced the changes that have been made in PCT to be a green building. There is a difference between me telling them what to do and them learning the importance of why.”

Lesbia Chinchilla, an employee in the Oppenheimer Towers and a graduate of the Green Janitor certificate program, notes, “Being part of the [program] has really opened my eyes as a janitor and as a consumer. I was aware of topics like the three R’s and water conservation but not to the extent that we learned in the class and how it applies to my work.”

In its totality, the program is also an example of social equality, whereby everyone participates in the management and maintenance of a building. Janitors, alongside building owners and managers, are empowered to actively engage in the goals of the LEED rating system. “I think the hands-on learning [portion] of the program really...helps them be more

informed and helps them come to the sustainability table,” says Hargreaves. “This program is empowering them to join the conversation.”

Now in its third year, the Green Janitors’ reach has spread from Los Angeles County to Orange County and San Diego. Expansion goals include statewide trainings. Furthermore, the team has pledged to train 800 janitorial workers by 2017 as part of the city of Los Angeles’ Sustainable City pLAN, which was released in April 2015. When encouraged to adopt the plan, USGBC-LA and its partners chose to focus on workforce development. Currently, they are signing up additional LA building owners’ employees for training. “The state of California is next,” says Hargreaves with conviction. The five-year plan sees the Green Janitors Program available across the country—they have already begun discussions with partners in Chicago and New York.

The vitality of their mission is clear, and summarized in Hargreaves’s own words: “You can design, build, and engineer the most efficient building but, when it comes down to it, it’s all about operations and how people use the building...it’s people that make buildings efficient.” ●

Affordable and Energy Efficient

Changes in the FHA's insurance rates foster sustainability in multifamily housing.

By Bryan Howard

For decades the Federal Housing Administration (FHA) has been helping individuals and families be part of the American dream of owning a home or property. FHA's role of insuring loans has helped millions of borrowers get better interest rates for both the purchase and refinancing of homes. Recently, the FHA multifamily lending program has taken a monumental step in signaling to the market the value of LEED-certified buildings.

In April the FHA Office of Multifamily Housing Programs announced a change that will benefit certain FHA-insured loans through reduced upfront and annual insurance rates. For new or renovated LEED-certified multifamily properties, annual rates will drop to some of the lowest levels that FHA is allowed to offer.

"By reducing our rates, this Administration is taking a significant step to encourage the preservation and development of affordable and energy-efficient housing in communities large and small. This way, hard-working families won't have to make the false choice between quality or affordable housing," said U.S. Housing and Urban Development (HUD) Secretary Julián Castro in announcing the changes.

This change is extremely beneficial to LEED-certified (and other green-certified) apartments and co-ops. Specifically, properties that certify with LEED and use FHA multifamily financing will have their insurance rates reduced from between 45 and 70 basis points



to 25. Similar moves from Fannie Mae demonstrate that reducing insurance rates for green certified properties can save projects hundreds of thousands of dollars over the life of a loan.

The scale of this change holds the promise of rapidly altering the landscape for new and rehabilitated apartments. The Office of Public Engagement at HUD estimates that in 2015, FHA originated nearly 1,000 multifamily loans, totaling \$10 billion and over 100,000 apartment units around the country. They expect to replicate similar numbers for 2016.

Families and individuals stand to benefit the most from these changes. Oftentimes residents of limited means spend a disproportionate amount of their monthly income on utility expenses. In 2014 the United States Bureau of

Labor Statistics reported that families with incomes in the lowest 20 percent spent nearly double the percentage of their income on heating and electricity than families in the highest 20 percent.¹ Building and renovating housing to be more energy- and water-efficient lowers monthly utility bills with the effective result of families retaining more take-home pay for discretionary expenses.

By incentivizing certification, HUD and FHA recognize the value third-party certification has in yielding quality places to call home that reduce operating costs, improve indoor air quality, and reduce overall impact on the environment.

For more information on the new financing options, please visit the websites of the Office of Multifamily at HUD and the Federal Register. ●

1. *Quintiles of income before taxes: Annual expenditure means, shares, standard errors, and coefficients of variation, Consumer Expenditure Survey, 2014 available at: <http://www.bls.gov/cex/2014/combined/quintile.pdf>.*



Left: U.S. Housing and Urban Development Secretary Julián Castro.

Right, top: Avena Bella incorporates solar power, energy-efficient heat pumps for heating and cooling, and a continuously running energy recovery ventilation system brings in fresh, filtered outside air. Residents have access to a community center, community garden, play area, technology lounge, swimming pool, and landscaped walkways between buildings.

Right: Built by EAH Housing with sustainability in mind, Avena Bella is an 80-unit affordable housing community in Turlock, California.



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Q&A

Alex Liftman,
Global Environmental Executive
Bank of America

As Global Environmental Executive for Bank of America, Alex Liftman is responsible for the company's environmental sustainability strategy. She oversees the bank's aggressive operational goals, its environmental business initiative, and its policy positions and philanthropic investments.

Q. What is the Catalytic Finance Initiative?

The Catalytic Finance Initiative (CFI) is a multipartner collaboration launched in September 2014 by Bank of America. The goal of the initiative is to stimulate at least \$10 billion of new investment into high-impact, yet hard to finance, clean-energy and sustainability projects. The initiative is focused on developing or advancing innovative financing structures that reduce investment risk, and thereby attract a broader range of institutional investors to these projects. Bank of America began the initiative with a \$1 billion capital commitment and asked others to join.

Q. What are the main goals of the Initiative?

The goal of the CFI is to demonstrate how we can accelerate and scale up investment into high-impact clean energy projects by making it easier for larger amounts of capital to be mobilized and invested. In general, we expect CFI to focus on large-scale renewable energy and energy efficiency opportunities, new financing structures for increasing energy access in emerging markets, and expanding the types of green bonds being issued to include green project bonds and green asset-backed securities as well as new corporate issuers in emerging markets. The CFI is also part of the bank's larger \$125 billion environmental business commitment that helps to address climate change and outsized demands on natural resources through lending, investing, capital raising, advisory services, and developing financing solutions for clients around the world.

Q. How has the partnership expanded?

On April 6, 2016, we announced the expansion of the CFI to an additional eight partners with a total commitment of \$8 billion. Partners joining the CFI include AllianceBernstein (AB); Babson Capital Management LLC, a subsidiary of Massachusetts Mutual Life Insurance Company (MassMutual); Crédit Agricole CIB; European Investment Bank (EIB); HSBC Group; International Finance Corporation (IFC), a member of the World Bank Group; and Mirova, a subsidiary of Natixis Group, all of which have pledged capital and expertise to develop and advance innovative financing structures for investments in clean energy and other sustainability-focused projects. In addition, the Aligned Intermediary, representing a group of long-term institutional investors, will collaborate on specific investment opportunities with members of the partnership.

Q. What has the partnership accomplished?

Examples of deals we have completed at Bank of America Merrill Lynch include:

- A partnership with the New York State Green Bank totaling \$800 million to enable a scale-up of energy efficiency financing;
- Arranging a \$204 million green project bond for wind developer Energia Eolica S.A. in Peru;
- Contributing to a \$100 million facility being structured with the Global Alliance for Clean Cookstoves to provide a new working capital facility for companies active across the clean cookstoves value chain; and
- Structuring and arranging a \$978 million green project bond to refinance Meerwind, an offshore wind project in the North Sea, Europe's largest ever renewable project bond.

 For the complete Q&A transcript, visit plus.usgbc.org.

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