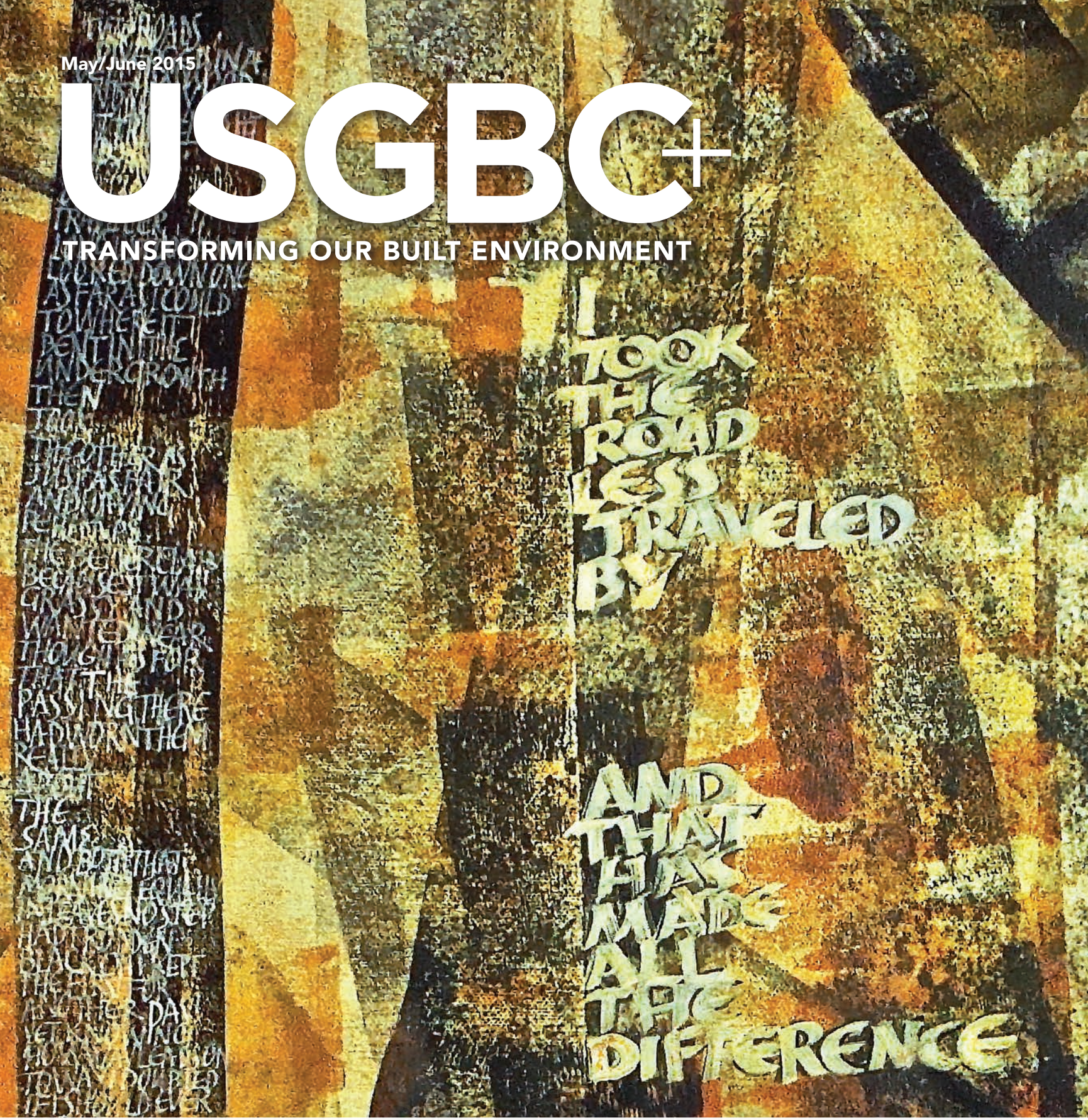
May/June 2015

USGBC+

TRANSFORMING OUR BUILT ENVIRONMENT



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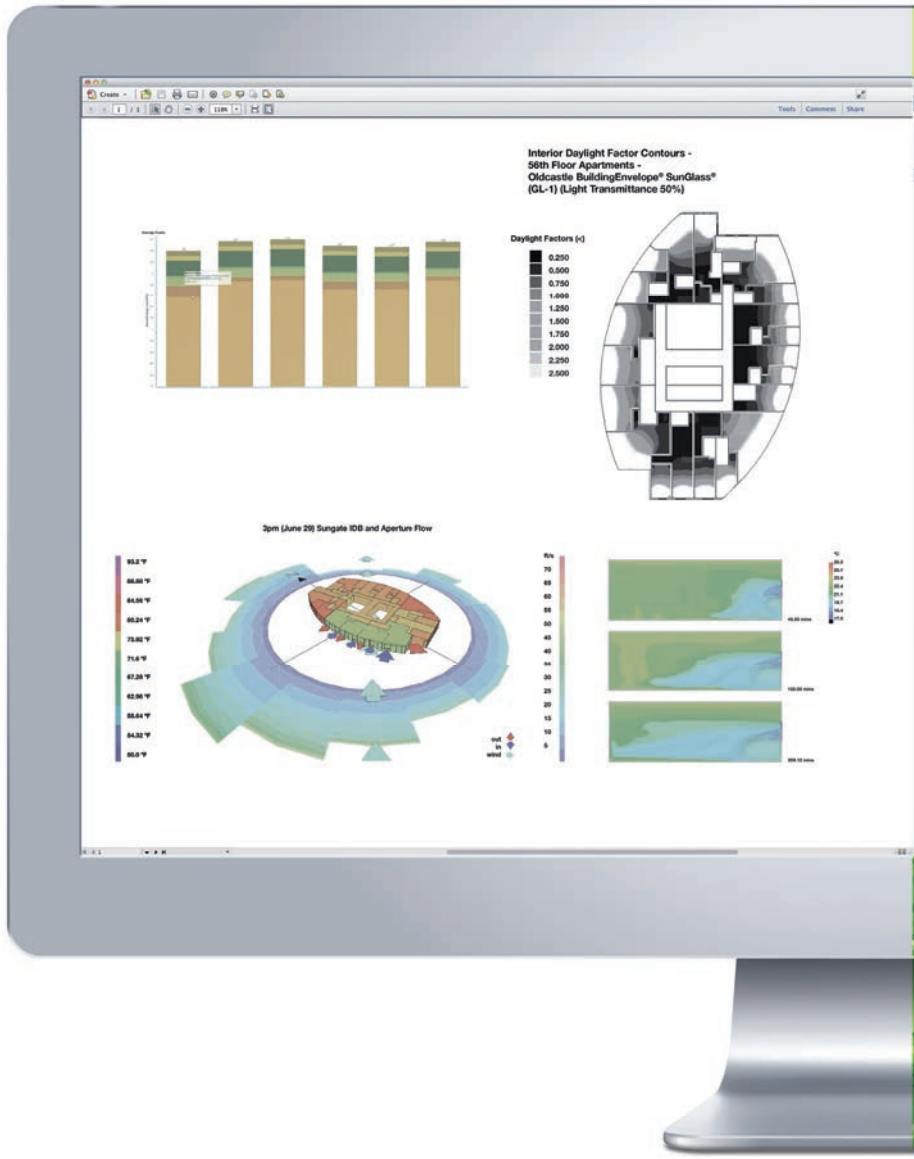

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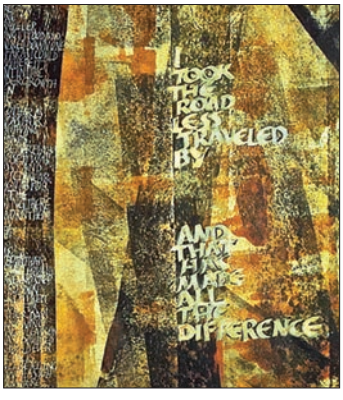
ON THE COVER

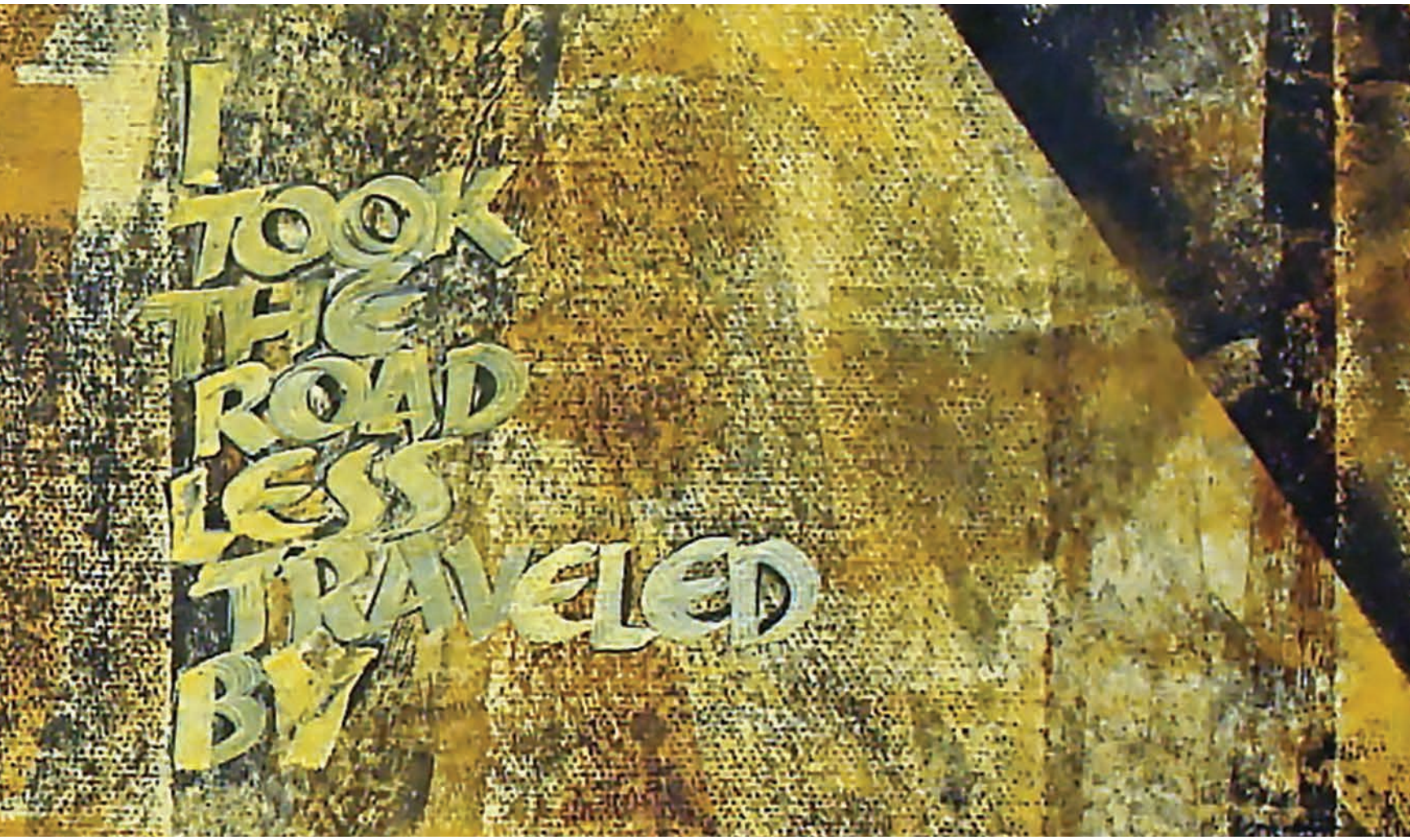
The path to sustainability can be analogous with Robert Frost's poem, *The Road Not Taken*. For those choosing the path of sustainability it has made all the difference.

Sandra Wagner is a professional lettering artist based in Indianapolis, Indiana. She created her interpretation of Frost's poem, *The Road Not Taken*, with hand-painted rice papers collaged onto canvas with acrylic paint added using both brush and rollers.

Credit: © Sandra Wagner



Features



PAINTING BY SANDRA WAGNER

LEED On

LEED Impact Categories

Departments

USGBC+

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CURRENT LEED STATISTICS

AS OF APRIL 2015

Total commercial LEED projects globally ▶ **70,224**

CERTIFIED: **27,752**
CURRENTLY REGISTERED: **42,472**
LEED FOR NEIGHBORHOOD DEVELOPMENT: **420**

Gross square footage of LEED projects* ▶ **13.4 Billion**
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LEED for Homes Units ▶ **189,881**

CERTIFIED UNITS: **77,347**

*Excludes ND and LEED for Homes

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Elevating Design Performance

ANDY COHEN, FAIA
Co-CEO, Gensler

As we approach Gensler's 50th anniversary, we look back at many important and transformational collaborations with global-shift thinkers. In particular, we celebrate our tremendous partnership with the U.S. Green Building Council (USGBC). USGBC's tools are integral components to our firm's everyday practice, which currently includes more than 800 LEED-certified projects and nearly 1,300 LEED Accredited Professionals.

Whether we're designing a new workplace interior for an up-and-coming law firm, or finishing one of the world's tallest high-rises in the Shanghai Tower, the sustainable design partnership with USGBC has been extremely valuable to Gensler and our clients. The Shanghai Tower broke various records and far exceeds expectations for design excellence and user experience—but its LEED Gold target was a vital measure of success from the project's inception.

Our founder, Art Gensler, was instrumental in the dialogue that gave birth to many of the green building programs that have become a cornerstone of the industry. Since then, our firm has partnered with many developers and investors to realize the life cycle value of LEED as a return on investment tool. This tradition of engagement will continue in the 21st century as we focus on elevating design performance for the direct benefit of our clients and our communities. LEED's value is easy to justify: It helps us quantify meaningful and measurable performance opportunities by guiding our clients from where they are now to where they want to be.

Today, business is evolving more rapidly than ever and our world is becoming increasingly complex. To address this, we need a more comprehensive way of understanding the changing global economy and adapting to it. Where do we go next? After many conversations among our global leadership and teams, we believe the next opportunities in sustainability lie in resilient communities and net-zero design—two vital arenas that address global climate and demographic and resource shifts in order to transcend the building efficiencies of today. These aspirations for zero energy, as well as water conservation and waste reduction design, are embraced by the new USGBC offerings.

In addition, Gensler's robust research program and its client engagements around the globe are making strides toward a healthy workplace—building people-centered places and creating regenerative urban environments through a new level of collaboration. Emerging metrics and perpetual feedback will help Gensler unlock hidden environmental, social, and economic value and make the holistic goals of our clients achievable. The community that USGBC as well as Global Green Building Councils have heralded is imperative to the growth and education of a design community that is proactively anticipating the needs of the global population and our planet.

Our commitment to these passionate stewards of the environment and quality of life remains steadfast. It's a mission we all share.

CONTRIBUTORS

28 DYNAMIC

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

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ILLUSTRATIONS BY MELISSA MCGILL

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Forward THINKING

ADVANCE offers low-cost strategies with high-impact results when greening our communities.

BY JEFF HARDER

In between changing out light bulbs and installing photovoltaic arrays, sustainability runs along an entire spectrum. And maybe, says Ryan Snow, a member of the U. S. Green Building Council's (USGBC) Community Advancement Team, an organization needs a little guidance to move from recycling program to lighting retrofit to Leadership in Energy and Environmental Design-(LEED) certified building. "Maybe they have an interest in sustainability, but they need to have a few wins along the way to say, 'There's something here—there's value to this,'" says Snow.

Tangible progress and integrated sustainability underpin ADVANCE, a new platform focused on audiences that stand to benefit from the same practices that LEED-certified building science professionals have long understood. By engaging with partners, tapping into volunteers' expertise, and hashing out low-cost strategies to deliver high-impact results, ADVANCE furthers USGBC's grand ambitions of green buildings for all within a generation by bringing sustainability down to a scale suited to the places we value.

With USGBC's ongoing transformation of its volunteer strategy, individuals and affiliated organization can now make even greater strides in greening their communities. There is a new demographic for USGBC to address beyond the traditional builders, architects, and engineers—that includes faith leaders, community activists, and career-building millennials. "We've been talking with folks in these organizations for a while, and we've found that they look to USGBC and LEED with a lot of reverence when it comes to green building, but they're working in a very different space and haven't found USGBC to be approachable," says Snow.

In response, the Community Advancement Team created ADVANCE, a framework focused on educational and cultural institutions, neighborhood and homeowners associations, community-service nonprofits, faith-based facilities, and affordable, senior, and independent housing. It's built around four phases: START, PLAN, FOCUS, and LEAD. The START phase centers on making connections with local groups, and starting a conversation that contextualizes sustainability to a community's needs and values. Next, the PLAN phase involves convening at high-energy launch events, evaluating assets, then crafting specific goals and strategies to achieve them during the PLAN Builder workshop. During the FOCUS phase, those strategies are put into practice to achieve practical results. And LEAD, the final phase, ensures these entities receive recognition for their sustainability successes through LEED, ENERGY STAR, and other industry certifications.

It's a path designed to adapt to a regional, national, and global scale, and ADVANCE provides partners with tools,

Associate director of the USGBC Illinois Chapter Katie Kalunzy works with ADVANCE volunteers. Photo: Marc PoKempner

from workshops to reference guides to mobile apps, to meet partners' needs. Along the way, ADVANCE taps into the revamped USGBC volunteer network and provides specific, time-bound roles for all interested professionals. Shane Gring, a community developer at USGBC, says, "ADVANCE provides opportunities for emerging professionals and students to gain critical sustainability project experience, while also creating an outlet for experienced professionals to serve, establish leadership, and support the development of new markets." And while a new incarnation of the platform will be released later this year, last winter, a handful of USGBC chapters answered the call to test out the program and help their partners meet a broad set of sustainability goals. The results have already begun to resonate.

Minnesota

Whether restoring foreclosed properties through its Dynamic Green Homes program, showing business owners how to incorporate sustainability into their workplace cultures, or making healthy learning spaces into living lessons in environmental stewardship as part of the Green Schools Coalition initiative, USGBC's Minnesota chapter has long been reaching beyond green building's usual suspects to bring sustainability into new domains. "We've really been focusing on how to grow our organization beyond architects, engineers, and the rest of the audience that USGBC and LEED started with, and we've looked for projects based around community engagement," says Sheri Brezinka, executive director of USGBC Minnesota. "Being an alpha pilot for the ADVANCE platform was a natural fit."

As part of its community outreach, the Minnesota chapter already had an ADVANCE partner in mind: four buildings in ISD 191, a Minnesota school district covering the municipalities of Burnsville, Eagan, and Savage. The district has a long-standing interest in sustainability, and last year they hired Taylor Hays for a newly created green schools liaison position. The district is continually looking for ways to reduce operating costs through green building practices, Hays says, especially since those savings trickle down into the classroom. "All of the money that we save on operations goes back into our general fund," she says. "Doing everything to save energy is the right thing to do, but we can also pay another teacher's salary or buy new textbooks with that money."

At January's day long PLAN Builder workshop—where the Minnesota chapter's network of experts met with the district's head of facilities, lead custodians from a handful of schools, product manufacturers, and representatives from local utility companies at the district's offices—reducing

Left: District 191 works hard to save money and protect the environment through programs such as the "Battle of the Buildings" competition that encourages students to lower energy use, reduce waste, and conserve water.

operations costs at four of ISD 191's buildings was the main target. Using LEED for Existing Buildings: Operations and Maintenance (LEED EB: O&M) criteria as a guide, the groups set goals and brainstormed different sustainability strategies that could be applied within the district.

Today, Hays says ISD 191 aims to reduce energy usage by 10 percent by June 2016, and it's exploring ways to make each building's water and energy consumption data available throughout the district, harnessing the spirit of competition to drive down energy use. ("You know the building that uses the most energy is probably going to be motivated to make some changes," Brezinka says with a laugh.) Additionally, the PLAN Builder workshop also enlightened the district about rebates from utility companies to help defray the costs of an upcoming recommissioning of several of its buildings.

In light of this success, USGBC Minnesota already has more ADVANCE partnerships in the cards, targeted at a second school district, a neighborhood association, and a house of worship. Besides suiting a variety of communities, the ADVANCE framework converts sustainability from a vague concept into an actionable plan. "There's a big chasm between being interested in having a sustainable place to live, work, or go to school, and knowing how to create that," Brezinka says. "ADVANCE puts it into a step-by-step model, and brings all of these ideas together to create something that's implementable—and you don't have to be a LEED AP to see how the pieces fit together."

Chicago

On the surface, it was an unlikely pairing: ENERGY STAR Portfolio Manager and Jock Jams. But considering the setting—the ENERGY STAR Benchmarking Jam, an ADVANCE event in which volunteers from the USGBC Illinois chapter and other organizations helped the Chicago Housing Authority vet energy performance data from a portfolio of its senior housing facilities—a soundtrack of kitschy 1990s dance anthems made sense. "Data can be pretty nerdy," says Katie Kaluzny, associate director of the USGBC Illinois chapter. "That made everything a little more fun."

Sustainability has been a priority through Chicago's last two mayoral administrations, and in 2013 the city passed the Chicago Energy Benchmarking and Transparency Ordinance. The initiative calls for roughly 3,000 of the city's largest buildings—commercial, municipal, and residential buildings larger than 50,000 square feet—to gather and report quality energy performance data phased in from 2014 to 2016. Additionally, the ordinance requires properties to verify energy data with a professional every three years. "It impacts one percent of Chicago's buildings, but it accounts for 20 percent of the city's building energy use," Kaluzny says.

Since the launch of the ordinance, the USGBC Illinois chapter has been heavily involved in training and education efforts to get buildings in the city up to speed. With help from the American Institute of Architects (AIA) and the local American Society of Heating, Refrigerating, and Air-

Left: Participants in January's day long PLAN Builder workshop in Minnesota. Right: Katie Kaluzny, associate director of the USGBC Illinois chapter. Photo: Marc PoKempner

Conditioning Engineers (ASHRAE) chapter, USGBC Illinois put into place a pro bono data verification program to link building science professionals with community nonprofits, faith-based groups, and affordable housing developments working to meet the guidelines of the ordinance. And when USGBC's Community Advancement Team approached Kaluzny looking for ADVANCE pilot candidates, the chapter had begun talking with the Chicago Housing Authority about volunteering its expertise to verify data for a portfolio of 39 senior living facilities in the city.

"It was a win-win: we had some buildings where we needed some oversight, and they had a bunch of volunteers who had expertise but needed some more experience to feel comfortable with the process," says Ellen Sargent, director of sustainability initiatives for the Chicago Housing Authority.

So in February, a mix of junior and senior volunteers from USGBC and ASHRAE convened with Sargent, capital improvement staff, and asset managers. "Basically," says Sargent, "every table in the room had experts on what the buildings needed to do, and every table had experts on the energy efficiency side of things." For the first part of the day, the volunteers from USGBC and ASHRAE pored over performance data, confirming and correcting each piece of information while simultaneously gaining greater insights into the demands on the buildings themselves from their housing authority peers. Later in the day, the conversation went beyond the numbers: Volunteers learned more about the particulars of the housing authority's portfolio, then brainstormed a variety of ways to weave sustainability into the facilities, from using green building materials, to implementing water and energy-saving strategies, to figuring out how to work sustainability into the lifestyles of their tenants. "Energy is one piece of the sustainability puzzle, but we thought, what are the different opportunities we could look at across the portfolio?" Kaluzny says. For example, after the workshop's attendees learned that plenty of seniors rode their bikes or used buses to get around and connect with the city outside their home, the snowball of ideas included exploring ways to encourage safe cycling and provide improved access to public transportation.

For the Chicago Housing Authority, the partnership that played out over the day had immediate benefits. Beyond having stronger metrics, the agency learned that many of the buildings in the portfolio meet or are close to meeting ENERGY STAR certification for existing multifamily housing. In the future, volunteers could help put those strategies into action to achieve that certification, which is also a prerequisite for the housing authority's ambitions of reaching LEED EB: O&M certification.

All in all, Kaluzny says, ADVANCE went beyond the city's benchmarking guidelines to get everyone on both sides of the partnership more invested in success. "In every place, the outcomes from ADVANCE will be different, but the goal is the same: provide some tools to reach out to communities that need assistance, and produce meaningful results." ●

Beyond PLATINUM

SUNY's College of Environmental Science and Forestry opens the doors to its Gateway Center—an unparalleled model of green building design.

BY KILEY JACQUES

I remember telling them the building had to be beyond Platinum," says Dr. Cornelius "Neil" B. Murphy, Jr., senior fellow for environmental and sustainable systems at SUNY's College of Environmental Science and Forestry (ESF) in Syracuse, New York.

In 2008, when interested parties began laying out what they envisioned for the school's new Gateway Center, they met with Architerra, a Boston-based boutique firm specializing in high-performance sustainable building design. "We were considering architects," recalls Murphy, who was ESF president at the time the building was planned and constructed, "and I remember the discussion of what we would require as a minimum for the building: 'Given you are the College of Environmental Science and Forestry, it's likely you'll want a green building.'" Yes, the planning committee agreed, it needs to be green. Leadership in Energy and Environmental Design (LEED) Silver certification was subsequently proposed. "I remember us saying, 'No, that's not sufficient.'" LEED Gold certification was then put on the table. "Again, we said, 'No, that's not what we want.'" It had to be Platinum. It had to be beyond Platinum.

Chief among the projects proposed in the college's Climate Action Plan, the Gateway Center is a giant step toward the ultimate goal: carbon neutrality. The building, which formally opened in September 2013, is both a hub for campus activity and a teaching tool that demonstrates sustainability. As the 2014 fall semester commenced, the center was fully operational and had established itself as the focal point of campus activities.

According to Murphy, the center was built, in major part, "to educate our students about how to put their education to practical use." To that end, the design included features that would evoke questions from students and visitors about how it works. In addition to housing faculty, student, and staff activities, "The building itself had to teach," he says. "I think that was a guiding philosophy."

Among the factors that helped the building achieve LEED Platinum certification are its site selection—repurposed land that had been a parking lot near the college's main entrance, development density and community connectivity, public transportation access, water-efficient landscaping, optimized energy performance, onsite renewable energy, construction waste management, recycled content in materials and resources, indoor environmental quality, stormwater design, and heat island effect. To aid in the effort, neighboring Syracuse University donated a 15-foot strip of property for SUNY's use and also granted a 15-foot easement.

The integrated high-performance center features a green roof planted with rare native plant species from eastern Lake Ontario dunes and alvar pavement barrens from the northeastern end of the lake. The roof hosts many research

Dr. Cornelius B. Murphy, Jr., outside the Gateway Center at SUNY's College of Environmental Science and Forestry.

and demonstration projects, and serves as a teaching tool for water resource engineering classes. "It's the synthesis of what is being taught in that course," notes Murphy.

In addition, the Gateway Center—with its Trailhead Cafe, ESF College Bookstore, and a large promenade full of tables where students study, eat, and hold discussion groups—combine for a space that feels intended for them. Furthermore, three large conference rooms, when opened up, accommodate 400 visitors. Also, a portion of the renowned Roosevelt Wild Life Collection is now permanently on display. The Office of Undergraduate Admissions and Outreach—the two departments that have the most contact with the public and make the first impression—have also found a home in the center. In short, it is the college's very epicenter. "I think the focus on student space but also outreach to the community really dictated the functions that would be served by that building," says Murphy.

Of particular note is the combined heat-and-power system (CHP), which generates significantly more energy than is consumed by the Gateway Center. (It supplies the campus with 60 percent of its heating needs and 20 percent of its electrical power.) The system serves not only the center but also four other buildings on campus. Though, Murphy notes, "We need another operating year before we can say if it achieves the energy savings that we would anticipate."

The idea for the center really began with the students—there wasn't "a holistic space that we could call our student space," explains Murphy, who shares the students' mantra: If you are going to teach green, you have to be green. "They absolutely love it," he says of student response to the building. Also needed was a place that would literally serve as the gateway to the college. "We wanted this building to meet both of those needs. We wanted it to be a special gateway and a special space for our students." ("Special" is a word Murphy uses often in reference to the center.)

Originally a college of forestry established in 1911, ESF's planning committee wanted to use as much wood in the building as possible—they aspired to displace structural steel and replace it with glulam beams and other wood applications. "It's very important to us, given our history, to show how wood can be used in a large modern green building," Murphy explains. Douglas firs from the Pacific Northwest form beams; other veneers are made of timber from New York State forests. The effect is a striking architectural composition of natural elements.

The city of Syracuse has a number of LEED-certified buildings, but this was to be a building that would better connect the college with the greater community. Or, as Murphy puts it, "The Gateway Center was to demonstrate to the community what an extraordinarily designed building can do, and have it be a place where the community would want to visit." It has proven to be exactly that. "Most of the goals we set were achieved," notes Murphy. The primary construction material is wood; the school's history and roots are reflected; and a state-of-the-art bioclimatic shell exemplifies the entire mission. "It provides a high-performance space that optimizes indoor environmental quality," affirms Murphy.

Left: Students outside the Gateway Center. The Center holds a portion of the Roosevelt Wildlife collection.

Right: Its heat and power system generates more energy than is used.

Back when the idea for the Gateway Center was taking shape, there were no existing LEED-certified buildings on campus, though ESF did renovate a former chemistry laboratory building, which now houses engineering facilities, to achieve LEED Silver certification. Since then, a new residence hall has been LEED Gold certified, and the school conserves energy in several other buildings on campus by lighting and adding high-efficiency motors, photovoltaic systems, and operating some of the campus vehicles using a biofuel system fed by student-produced biodiesel. The energy and sustainability projects that are part of the Gateway Center and the rest of the campus form a core of resources that ESF relied on in developing a new bachelor's program in sustainable energy management. It has become one of the fastest-growing majors on campus.

Currently, the Campus Climate Action Committee—made up of several faculty, half a dozen students, representatives from the physical plant and from Syracuse University, and several administrators—recommends and implements different activities with the ultimate goal of reducing the school's carbon footprint. "It's a cross-section committee," notes Murphy, saying they are now looking at designs for a new academic research building that will include as many sustainable features as possible. Also on tap is a second CHP facility—the goal, once again, being carbon neutrality.

Many members of the ESF campus community were involved in the Gateway Center's making, particularly Michael Kelleher, who is now a faculty member but then served as ESF executive director of energy and sustainability. Kelleher put together a proposal—funded by the New York State Energy Research Development Agency—that resulted in a million-dollar grant, which helped support the CHP system. Additionally, the chair of the environmental and forest biology faculty, together with a faculty member in the landscape architecture department and Kelleher, presented a proposal to the New York State Environmental Facilities Corporation; a resulting half-million-dollar grant helped fund resources for the green roof.

When it came to the building of ESF's Gateway Center, there was no shortage of enthusiasm, no lack of drive or vision. And just about everyone played some kind of role. "I probably led the need for this project to be special," says Murphy. "I tried my best to reflect the ethos of our students and what I thought our community needed from this project." The building is the very picture of his success. ●

Keeping PACE

Unlocking the potential of the green economy through energy efficiency.

BY DAN OVERBEY

The residual effect of the recession has exposed the flaws in our current economic models. Domestically, the building design and construction industry has been disrupted, and as various sectors have struggled for recovery, many are taking a closer look at the broader notion of a "green economy," one that simultaneously promotes environmental responsibility and economic growth.

The potential of the green economy is staggering. According to a recent study by the Rockefeller Foundation and DB Climate Change Advisors, the United States is at the cusp of a $280 billion investment opportunity over the next decade—an opportunity that could yield more than $1 trillion in energy savings. If maximized, retrofits and building upgrades could generate over 3 million jobs and save the atmosphere from 600 million metric tons of carbon emissions per year.

An environmentally conscious investment opportunity that could create jobs and lower energy demand should be a winning proposition. However, there is an impediment to fully unlocking the potential of the green economy: the initial outlay of investment capital.

"It takes funds to invest in capital improvements," says David Gabrielson. "In this prolonged economic recovery, neither homeowners nor facility managers have a tremendous amount of money available for deep energy upgrades."

Gabrielson is the executive director of PACENow, a nonprofit organization dedicated to proliferating the green economy through an innovative financing model known as Property Assessed Clean Energy—or PACE. The model enables owners of residential, commercial, and industrial properties to obtain low-cost, long-term property improvement loans for renewable energy and energy efficiency with little or no upfront cost.

The idea seems simple enough and the benefits are enormous for both the property owner and local community. PACE programs can enhance the value and efficiency of existing buildings, save substantial amounts in utility costs, and promote green job creation within the building design and construction industry.

"PACE started out as this idea in California in 2008," recalls Gabrielson. "State-by-state legislation followed. Within two years, half of the states had PACE-enabling legislation." According to Gabrielson, the idea of PACE went viral around the country in the residential sector. In fact, PACE was named one of *Harvard Business Review's* 10 breakthrough ideas of 2010 and *Scientific American*'s top 20 ideas that can change the world.

The lobby bar in the DusitD2 Constance Pasadena hotel in Pasadena, California, used a $6.8 million PACE bond to finance an energy upgrade.

Then, the innovative financing model started to lose its luster under the scrutiny of lenders.

First conceived in the residential sector as a lien on the property, a conflict emerged about whether a PACE security interest should be considered a property tax (since it is associated with a property, not an individual) or a loan (since the lien pays back a fixed amount of funding). If considered a tax, a PACE lien would be repaid before a mortgage in the event of foreclosure—something Fannie Mae and Freddie Mac found unacceptable. Due to opposition from the Federal Housing Finance Agency (FHFA), which saw PACE programs as a threat to the unsteady housing market, most residential PACE initiatives quickly dried up.

It seemed as though emerging PACE programs would be dead on arrival, but in several states PACE was already evolving in response to regional market pressures and an expanded definition of what constitutes energy-related improvements. In Florida, for example, the scope of PACE-eligible improvements was adjusted to encompass retrofits for "hurricane hardening" that would increase the resilience of a structure. In drought-stricken California, the energy implications of water usage were leveraged to considerably expand PACE eligibility.

Today, the Golden State benefits from a competitive marketplace of about a dozen different PACE providers. For instance, the Sonoma County Energy Independence Program (SCEIP) provides financing for over 90 different improvements across both the residential and commercial sectors. In fact, PACE is witnessing a burgeoning force for nonresidential properties. Gabrielson points to the renovation of the DusitD2 Constance Pasadena as just one of several recent success stories in California. The hotel used a $6.8 million PACE bond to finance a comprehensive energy upgrade that included new heating and air-conditioning equipment, LED lighting, a water system overhaul, and insulation. These upgrades will help the property reduce its electricity consumption by over 200,000 kWh and water use by over 3 million gallons annually.

The Michigan adopted a PACE statute in December 2010. It allows financing for a wide range of energy and water performance upgrades on commercial, industrial, multifamily, and private nonprofit buildings. The statute also paved the way for Lean & Green Michigan, a statewide PACE program that any municipality or county can join for free. "It is an open market program, meaning building owners can work with any clean energy contractor and any PACE lender

Left: Charlene Heydinger, executive director of Keeping Pace in Texas. Photo: Michael Stravato

they wish," explains Andrew Levin, president of Lean & Green Michigan. "So far, 17 local governments representing 48 percent of Michigan's population have joined Lean & Green Michigan, making it one of the largest statewide open market PACE programs in the country."

Lean & Green Michigan has announced its first group of PACE-financed projects and is currently considering or processing projects worth more than $50 million. Among them, the Michigan Public Services Commission (MPSC) and property owner Saginaw Plaza Ltd. have teamed up with Levin through his consultancy firm, Levin Energy Partners, and contractor Ameresco to complete the first PACE project for a state agency in the United States—a retrofit of the MPSC headquarters in Delta Township, near the state capitol, Lansing.

As Michigan's regulator of energy utilities, energy efficiency is important to MPSC. However, its headquarters is located in a privately owned building. This exemplifies what Levin calls the "split incentive" problem common in many types of commercial buildings where the best interests of the tenants (i.e., lowering utility costs rather than building improvements) are at odds with those of the property owner (i.e., improving the building rather than lowering utility costs). The nature of PACE in Michigan is designed to address this issue. "As a property tax payment in Michigan, PACE allows the building owner to share the costs with the tenants, who are already reaping the benefits. It's a win-win all the way around!" states Levin. The $488,000 investment in energy conservation measures and onsite renewable energy is projected to yield approximately $800,000 in energy savings and tax benefits over the next two decades. "Without PACE financing, the MPSC project simply would not have happened."

Deep in the heart of Texas, lawmakers passed a landmark statute in 2013 that authorized municipalities and counties to work with private sector lenders to finance improvements using voluntarily imposed contractual assessments on the property by the owner. Simply stated—Texas figured out a way to make PACE tax neutral.

"It passed in one session—it's like it was meant to be," recalls Charlene Heydinger, executive director of Keeping Pace in Texas (KPT). Both the legislature and business community saw an entirely voluntary PACE model as a business opportunity. "Not only did it have bipartisan support, it was advocated for by both the Texas Association of Business and the Sierra Club."

"The timing for a conservative legislator to focus on water and energy conservation could not have been better," Heydinger noted. Much like California and other regions, Texas is reeling from perpetual drought conditions compounded by a growing population. She points out that Texas has seen an average of a thousand people move to the Lone Star State every day for the past four years. "The economy is rising."

Heydinger and KPT see a prime opportunity for PACE to unleash the green economy in Texas and provide the rest of the U.S. with the framework for deploying private-sector-driven PACE programs. KPT's first goal was advocating for PACE-enabling legislation in Texas. Now, the organization assists counties and municipalities with implementing locally administered PACE programs. In order to achieve this goal, KPT organized a group of more than a hundred stakeholders. "A state-managed PACE program was not an option in Texas," recalls Heydinger. "Private lenders had to step up."

The lending associations supported the pro-business statute. "The best way to address agricultural water issues is through rural communities. We needed to bring small, local banks to the table," says Heydinger.

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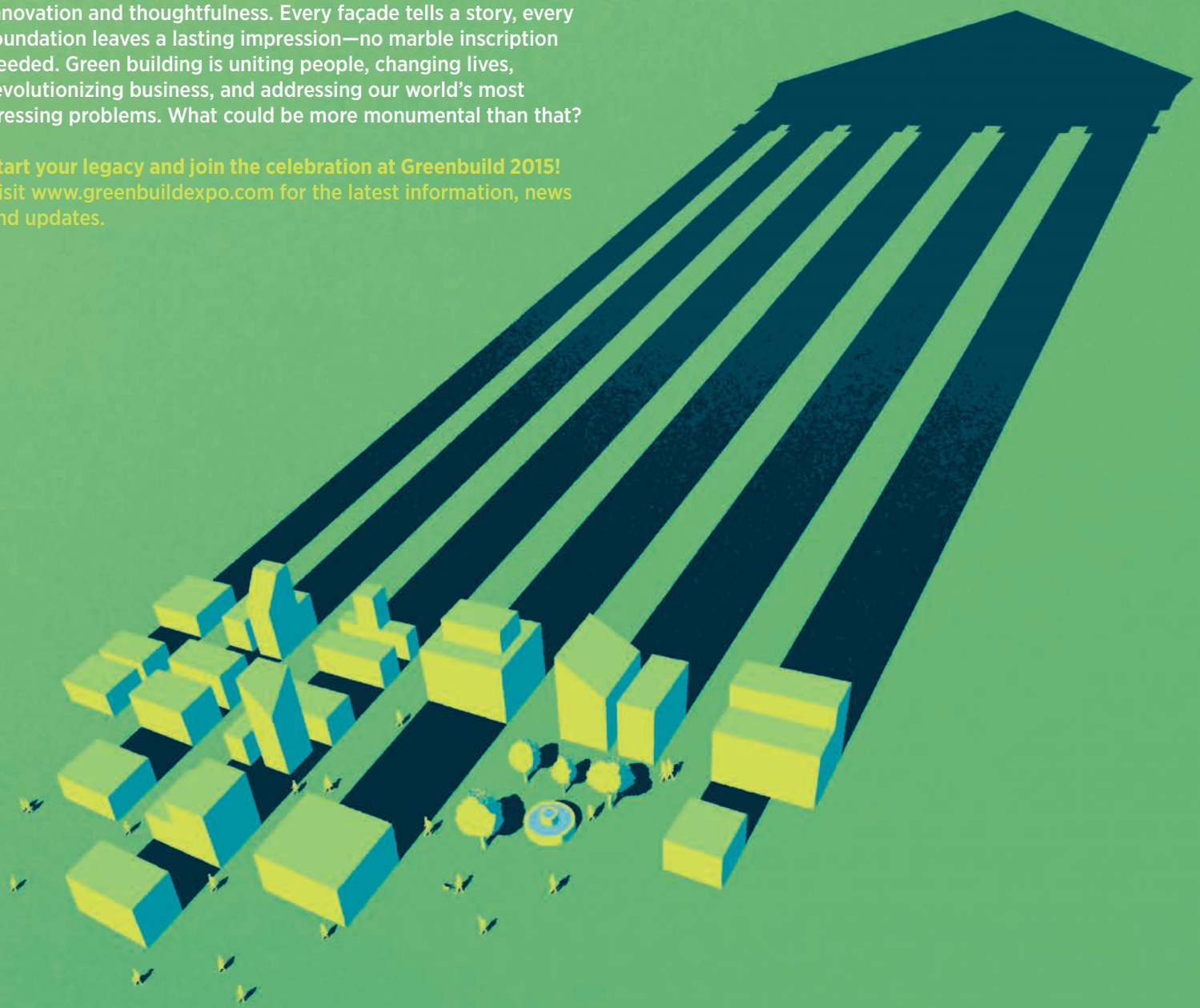

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Left: David Gabrielson, executive director of PACENow.

With roughly 1,200 municipalities scattered throughout Texas, KPT quickly realized that in order to sustain the success of PACE in Texas, issues of scalability and regional adaptation would have to be reconciled with the need for user-friendliness. "A statewide PACE program didn't seem realistic," recalls Heydinger. "We've always held that PACE programs should respond to regional issues so that lenders, contractors, and property owners would only need to learn one system."

This confluence of concerns for uniformity, user-friendliness, regionality, and scalability prompted KPT to develop a uniform standard for private-sector-driven PACE programs—a tool kit—aptly dubbed "PACE in a Box." It was developed over the course of nine months by more than 130 business leaders. "The private sector designed it, so the business community has a great deal of confidence in it," says Heydinger. In March, Travis County established the first PACE program under the KPT standard. The county approved a contract to engage a 501c3 nonprofit PACE administrator.

With a next-generation PACE framework in place, the lending environment in Texas is ripe for the green economy. Yet the statewide business community still lacked a strong outlet to establish significant business opportunities for engineers, construction contractors, commercial lenders, and investors interested in eligible energy efficiency and water-conserving improvements.

The Central Texas-Balcones (CT-B) Chapter of the U.S. Green Building Council recognized the many disconnects between markets across the largest state in the contiguous U.S. and took initiative to remedy the situation. "We thought we needed a platform to bring green building professionals together," states Scott Gerhardt, the CT-B Chapter Chair.

The CT-B Chapter hired a consultant to conduct research and develop an internet-based resource that could serve as an online marketplace where project teams could easily find green building suppliers, designer, contractors, and other service providers. "The USGBC membership body represents a diverse cross section through the industry," says Gerhardt. "A comprehensive umbrella resource made a lot of sense."

Gerhardt recalls an important conversation with leaders from the other three Texas chapters during a USGBC leadership conference last year. "They saw a clear need for such a resource but none of them felt they had the means for such an undertaking." Over the past several months, all four Texas chapters came together to support the green building industry in all regions of the state through the Texas Green Building Marketplace (texasgreenbuildingmarketplace.org).

"Through the general cooperation and collaboration for the marketplace, it became apparent that different communities had different strengths," explains Gerhardt. The marketplace is the embodiment of a business-driven platform equipped to help regional networks grow organically, much like the PACE in a Box framework.

As Gabrielson has seen firsthand through PACE programs across the country, "Simple, local models are the key ingredients for success." Much like KPT's PACE in a Box, the Texas Green Building Marketplace is the product of commerce-oriented initiatives and private local mechanisms that are unlocking the potential of the green economy and providing the design and construction industry with new, innovative economic models that benefit both business and the environment. Heydinger attests, "Things grow more organically in Texas. The more the merrier." ●

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Measure of Success

The LEED Dynamic Plaque keeps score on a building's behavior.

WRITTEN BY **MARY GRAUERHOLZ**

We hit Gold!!!" The email, accompanied by a smartphone photo of a sleek-looking Leadership in Energy and Environmental Design (LEED) Dynamic Plaque, landed in the employees' inboxes at the San Francisco office of DPR Construction, headquartered in Redwood City, California, last September. Joe Nguyen, IT field engineer at DPR, was psyched to see the score increase—he had been waiting for this. The excitement in the office was palpable. Seeing the results of DPR's work to track and improve its new net-zero energy office's performance, and in near real time at that, was big news.

Human behavior can change the status quo, and Nguyen and his colleagues had witnessed this profoundly.

Buildings, like people, can change. Contracting and expanding, getting healthier or sicker, structures can support the health of its occupants and the environment—or drain it. "A building is alive," says U. S. Green Building Council (USGBC) chief product officer Scot Horst. The LEED Dynamic Plaque, now in the early stages in commercial properties, is Horst's brainchild, rooted in his years working on the LEED rating system. "This is not a new idea," Horst says, "The LEED Steering Committee began talking about this concept in 2006."

Humans are visual animals, and Horst knew the first step was a prototype that people could see. He gathered a team in San Francisco—not only the traditional building designers and operators, but software engineers from Building Robotics, the West Coast design firm IDEO, and a mathematician with

Previous spread, left page: Scot Horst, chief product officer of USGBC. Photo: Ryan Smith; Right page: The LEED Dynamic Plaque. Photo: Emily Hagopian

Left: Natural light and an open floorplan encourages collaboration within the USGBC headquarters cafe. Photo: Ryan Smith

a PhD in artificial intelligence. "It wasn't people who just know buildings," Horst says. "It was people who know software." It was a diverse team and a diverse approach of looking at a rating system.

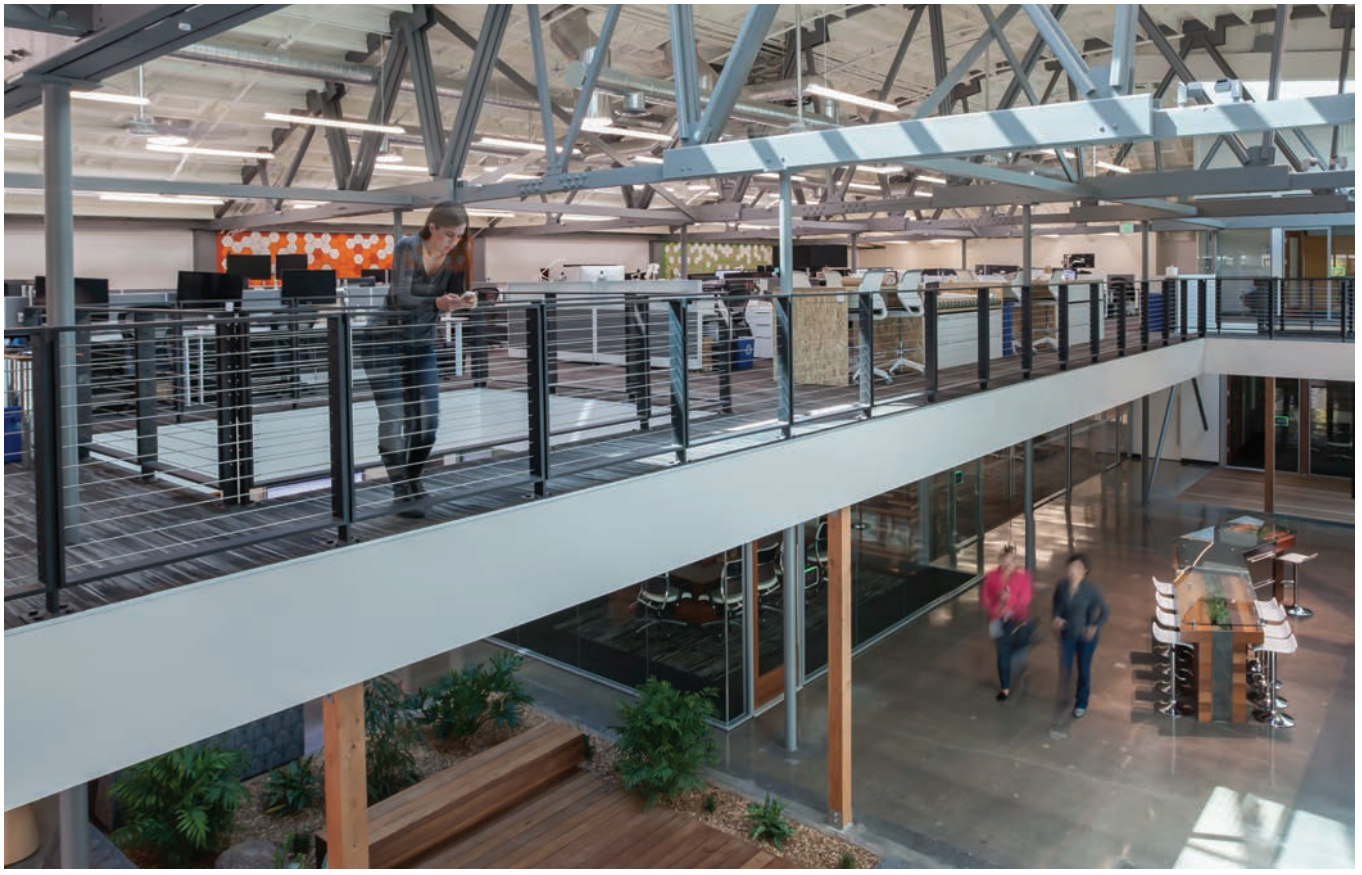
Suddenly, the LEED Dynamic Plaque raced from concept to a tool with the potential to turn the measurement of sustainable building practices on its head. Transparent, dynamic, and understandable, the LEED Dynamic Plaque evolved into an interactive system that engages everyone in a workplace organization, by demonstrating in clear terms how the organization is faring on different "racetracks."

Horst suggests an analogy. "It's like a diet book and a scale," he says. "LEED is kind of like a diet book, telling you what to do to be healthier. The LEED Dynamic Plaque is like the actual scale measuring the results."

The LEED Dynamic Plaque's display, about 18 inches in diameter, is the same size as a traditional LEED plaque. From there, the similarities are few. When performance data is input to the LEED Dynamic Plaque, a score updates on five tracks: energy, water, waste, transportation, and human experience. Working on an annual rolling average, it allows for seasonal adjustments, making the data verifiable. As Horst says, employees "get to see it and own the score."

Sleek and somewhat futuristic looking, the LEED Dynamic Plaque has accomplished a tall order: showing systemic change—not flash-in-the-pan spikes—with a phenomenal visual component. Perhaps best of all, the platform leverages existing technology.

"Essentially, we're separating strategies from results and measuring the outcomes," Horst says. "It's not




The LEED®
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Left, top: Open catwalks connect second floor work spaces. Photo: Emily Hagopian

Left, below: The first ever LEED Dynamic Plaque installed in USGBC's front lobby. Photo: Ryan Smith

what you did to try to improve, it's what you actually improved." Another big gain, Horst says, is the LEED Dynamic Plaque's ability to track progress in all LEED buildings, no matter what system they originally certified to. "One of the longest-standing criticisms of LEED, which we've taken seriously," he says, "is that we haven't measured the performance of these buildings. The LEED Dynamic Plaque is for recertifying all LEED buildings. It has the biggest influence on new construction projects—which typically do not continue to engage with LEED after achieving certification—and requires recertification every year."

There are 50 projects worldwide with a LEED Dynamic Plaque, a number that is actively growing every week. While building managers may work behind the scenes to review the complex data that the LEED Dynamic Plaque is gathering, the display itself has a tangible, hands-on quality that is one of the platform's biggest calling cards.

"You walk in the front door, you see it, and you see what the score is and how it breaks down," says Eric Lamb, executive vice president of DPR Construction. DPR, with 2,800 employees and offices in 20 locations, became the fifth workplace to install a platform's Dynamic Plaque when it was hung in DPR's San Francisco office in May 2014. The announcement last September that the building had hit Gold was trumped in April by news that the building needed to improve its score by just eight points to reach a Platinum performance score.

DPR's San Francisco office was designed and built with innovative and sustainable strategies, such as photovoltaic panels on the roof and walls filled with plants to freshen the air. "We wanted to create a kind of living laboratory," Lamb says of the San Francisco location, which was the city's first net-zero energy building. "We did it the first time to prove to ourselves it could be done. It was very successful."

DPR expects the San Francisco office to be generating more energy than it has needed by this summer. "We anticipate being net positive at the end of one calendar year of operation, likely in June 2015," says Ted van der Linden, the director of sustainability at DPR.

Lamb first heard about the LEED Dynamic Plaque last year, from Debra Gondeck-Becker, the Construction Industry Leader for Honeywell Building Solutions. The two were gathered at the National Institute of Building Sciences conference in January 2014, when Gondeck-Becker began talking about the new LEED Dynamic Plaque. Gondeck-Becker had been inspired by Horst's unveiling of it at Greenbuild in 2013.

The Honeywell Enterprise Integrator, the company's building management system, was already in thousands of facilities, collecting and analyzing data on such factors as energy and water use, and indoor air quality. Gondeck-Becker recalls her thought process: "If companies already have the data, why not power the LEED Dynamic Plaque with it?" So, Honeywell staff expanded the technology to pull the information from buildings and feed it, via the cloud, to the LEED Dynamic Plaque system, in near real time.

The LEED Dynamic Plaque development team—Mika Kania, project manager; Gautami Palanki, senior consultant, building performance; Gretchen Sweeney, vice president of LEED implementation; and Dhruv Gami, director of technology—have spoken to hundreds of people about how they can engage with the LEED Dynamic Plaque, particularly those in commercial real estate. One of them is Jessica Long, sustainability manager with The JBG Companies, headquartered in Chevy Chase, Maryland. JBG is an investor, owner, developer, and manager of real estate property in the Washington, D.C., metropolitan area with a portfolio of about 23 million square feet of office, residential, retail, and hotel space.

LEED Dynamic Plaques hang in two JBG properties, the National Cancer Institute in Rockville, Maryland, and U.S. Department of Transportation in Washington. "This was an option for us because we do have a goal of sustainable buildings across the portfolio," Long says.

Mika Kania knows the power of the LEED Dynamic Plaque, simply by keeping an eye on the one hanging in USGBC's front lobby: the first one ever installed. "Having the physical display in a lobby when they're entering a building and seeing it every day, people notice whether the performance score has gone up or down," Kania says. "It's meant to create occupant engagement." She recalls a time last year, when USGBC's LEED Dynamic Plaque dipped to Gold from Platinum after a waste audit. "People started to notice,

Ted van der Linden, director of sustainability at DPR. Photo: Emily Hagopian

and wondered why the score had changed and what we could do to get the numbers back," she says. "Our facilities team made some extra signage next to garbage receptacles and composting bins. We saw an increase, and we were back up to Platinum."

For Renee Loveland, the sustainability manager for Gerding Edlen in Portland, Oregon, the LEED Dynamic Plaque is an easier and clearer way to access a structure's environmental sustainability than the traditional LEED recertification process. Gerding Edlen, which specializes in real estate investment and development focused on sustainable properties, has 65 LEED projects in its portfolio. The LEED Dynamic Plaque hangs in one of those properties, the historic Dexter Horton building in Seattle, which is currently reading Gold. Using the LEED Dynamic Plaque to track the building's real-time performance, Loveland says, "makes it a simple conversation."

"It can be onerous to track and gather all the data," Loveland says of traditional LEED for Existing Buildings (LEED EB) certification. "The LEED Dynamic Plaque is very performance based. It doesn't consist of a lot of paperwork. It's more focused on the results you're getting."

The fact that the occupants of the Dexter Horton building can see the results on the LEED Dynamic Plaque is exciting for Gerding Edlen, Loveland says. "They can use their smartphone to track the performance data. We're excited the LEED Dynamic Plaque allows us to show our tenants that their daily actions really do affect building performance and that they have a direct role in the certification outcome."

The Paharpur Business Centre (PBC) in New Delhi, India, a LEED Platinum building, has set sustainability as a bottom-line expectation. "Green building is like a high school degree; you have to have it," says CEO Kamal Meattle. "The LEED Dynamic Plaque allows every organization to keep its sustainability goals focused on a continual real-time basis and not merely resting on the laurels of a one-time green certification. It surely is about staying relevant at all times. PBC has always believed that sustainable business is sensible business."

The PBC experience gets to the heart of the LEED Dynamic Plaque. "It makes a building whole," Horst says. "Making it whole means you can't separate the landlord from the tenant and expect things to work. You can't separate the designer from the manager." Everyone has a part to play.

Jessica Long, sustainability manager with the JBG companies. Photo: Ryan Smith

The resulting sense of pride and engagement in a workplace is a very real extension of the LEED Dynamic Plaque. For some, it becomes personal. Dhruv Gami recalls Horst approaching him about developing the LEED Dynamic Plaque. "Obviously, to make his vision a reality, it was clear technology would play a pretty significant role," Gami says.

Gami recalls, chuckling, that he and his team started on a different plane than Horst. "It took me quite a while to realize how big Scot's thinking was," Gami says. "He was visualizing and thinking blue sky. We were thinking, what can we do with all of this? How do we make it move the needle without a lot of complex work? What can we do to leverage pieces that already exist, like water meters?" Gami and his staff did their part to devise a seamless system architecture that, with the eye-catching display, leverages a solid existing technology platform.

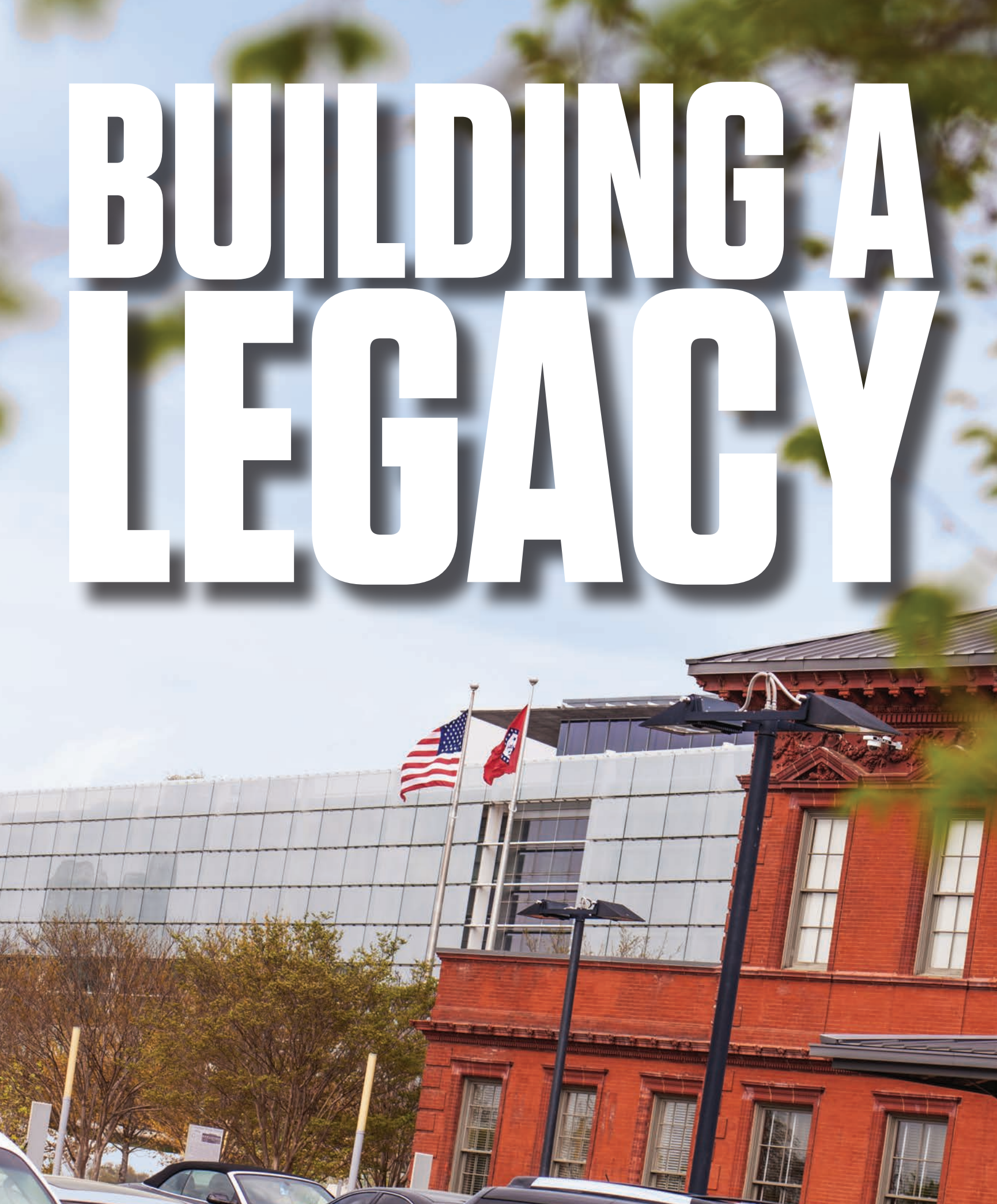
"I'm supremely proud of what we accomplished," Gami says. "I'm so excited about it. I feel like a lot of new parents who show pictures of their new babies. I pull out a picture of the LEED Dynamic Plaque and tell them how much I love it."

Since its introduction at Greenbuild, held in San Francisco in 2012, the LEED Dynamic Plaque continues to forge new ways of thinking that started with LEED. "We have design principles," Horst says. "One, my favorite, is to 'make the invisible actionable.' Everyone's thinking, how do we engage occupants in a building? The LEED Dynamic Plaque shows them when they're doing worse and when they're improving, and that engages them."

Highly technological yet so outwardly simple, the LEED Dynamic Plaque is joining a legion of products whose value couldn't be fully appreciated until they were experienced. Today, the early adopters of the LEED Dynamic Plaque, and the growing number of workplaces around the world that are following suit, are pushing the LEED Dynamic Plaque toward a new standard. Did anyone consider how great it would be to have a car that didn't require manually cranking the motor until they heard of it and then tried it?

Gautami Palanki, USGBC senior consultant, building performance, and a trained architect, explains the evolution of the concept to reality by relating a comment by a designer whose company has two LEED Dynamic Plaques in its offices: "For the industry, this is the next best thing to sliced bread."

BUILDING A LEGACY




THE CHOCTAW ROUTE
UNIVERSITY OF ARKANSAS
Clinton School of Public Service

At the William J. Clinton Presidential Center and Park, one building from the past and another from the present anchor a campus designed with an eye toward the future.

WRITTEN BY **CALVIN HENNICK** | PHOTOGRAPHED BY **ARA HOWRANI**

Sitting amidst the volumes in the reading room at the Clinton School of Public Service in Little Rock, Arkansas, James "Skip" Rutherford and Debbie Shock take turns passing the credit back and forth for the Leadership in Energy and Environmental Design (LEED) plaque hanging on the front of this building and the one inside the Clinton Presidential Library and Museum not 100 feet away.

"One day during the early parts of construction, Debbie came to me and said, 'Are you familiar with this LEED program?'" recalls Rutherford, the dean of the Clinton School, a two-year graduate program affiliated with the University of Arkansas. "I said, 'No, what is it?' She was the one that pushed this."

Shock, the director of operations and facilities for the Clinton Foundation, notes that Rutherford, as the foundation's original president, oversaw the development of the campus. She says that the green buildings wouldn't have come to fruition without his leadership.

But both Rutherford and Shock agree that the final word came from the man whose name is on the front of both buildings—the forty-second president of the United States. "He immediately got the concept," Shock says of Clinton's quickness to embrace green development.

"I just said, 'Look, this is the right thing to do, short term and long term," recalls Rutherford. That, apparently, was all Clinton needed to hear.

The official function of presidential libraries is to preserve the records of the office, but the libraries also serve to literally cement the legacies of the presidents. The museum exhibits, of course, tend to present the leaders in a positive light (Herbert Hoover's role in the Great Depression, for example, is summed up at his library in Iowa with the arguably generous exhibit title "From Hero to Scapegoat"). But the buildings themselves also shape the image each visitor will walk away with. Most presidents will never join Washington and Lincoln on the National Mall, and so it is these museums—scattered from the Nixon and Reagan libraries in California to the Kennedy Library in Boston—that act as the lasting monuments of the modern presidency.

The planning for these libraries takes years, and every decision is carefully weighed, from where to locate them (Clinton considered placing his library near his alma maters of Georgetown or Yale but ultimately picked Little Rock, hoping to spur economic development in his home state) to their design (the long and narrow Clinton Library, situated along the bank of the Arkansas River, is meant to evoke Clinton's promise to build a "bridge to the 21st Century").

As Clinton worked with Rutherford and Shock to plan his library, this process for the first time included serious conversations about energy efficiency. The U.S. Green Building Council's LEED standards weren't

Previous spread: The Clinton School of Public Service and the Clinton Presidential Library and Museum transcend time through sustainable buildings that reflect both the past and future. This page: James "Skip" Rutherford, dean of the Clinton School, and Debbie Shock, director of operations and facilities for the Clinton Foundation.

unveiled until 2000, when Clinton was winding down his time in office and only a year before ground broke on the library. When the building opened in 2004, it was one of the first LEED buildings in Arkansas—and certainly the first presidential library in the country to achieve the designation.

"When we were talking about LEED, most people didn't know what we were talking about," Rutherford remembers.

"For most of our contractors," adds Shock, "it was the first time they'd ever heard of it."

Rutherford acknowledges that the presidential library and museum is, by definition, at least partly about Clinton's legacy. But he says it was the future—not the past—that guided the former president's design decisions. "There are legacy benefits [to building green], though we didn't do it for legacy," Rutherford says. "We did it because it was the right thing to do. Legacy never came up when we were scrounging for points."

"He made the effort to place it in a blighted area in downtown Little Rock to revitalize the city," Rutherford adds. "So it wasn't just about his legacy, it was about Little Rock's future. That's more important to him, in terms of people having jobs, and museums, and arts centers, and restaurants, and quality of life. The school and the student projects are important to him. I think presidential libraries get a bum rap when people say they're all about legacy. There may be some that are. I can't say. But I can say, at this one, the legacy component is probably the least important thing to him."

When Rutherford first visited what is now the Clinton Presidential Center and Park in the late 1990s, the 30-acre site was a wasteland. Warehouse buildings sat dilapidated and abandoned, and snakes slithered through the tall grass. Packs of dogs, set loose by owners who didn't want them, roved the riverbanks, baring their teeth at anyone who came too close.

"It was a mess," recalls Rutherford. "There was trash. The train station [that now houses the Clinton School and Clinton Foundation offices] was under weeds. My crazy first thought was that I needed to go buy some trash bags. It was overwhelming."

"Nobody came over to this side of the freeway," says Shock.

"Oh, they did," Rutherford counters. "They'd just dump stuff."

Left: Former President Clinton chose to place his library and museum in a blighted part of downtown Little Rock in hopes of revitalizing the city.

On a sunny day in March, with the land just starting to come alive after a harsh (by Arkansas standards) winter, it's difficult to picture the site as it once was. The wild dogs are long gone, replaced by fishermen casting lines in the river, kids riding their bike along the trails, and even families sliding down the campus's constructed hills on sheets of cardboard.

Rutherford greets each person he sees with a "Hello!" so enthusiastic that it seems like he must personally know everybody in Little Rock. In his early 60s, he has graying hair and deep lines around his eyes, but his energy is youthful, and he has a reputation in Arkansas for a kind of quiet competence. He first met Clinton in 1974, when the future president was still a law professor, and has been among the legendary "FOBs" (Friends of Bill) ever since, alternating between stints as a public relations executive and various Clinton-related posts, including a spot as an advisor on the 1992 presidential campaign.

Shock came into the Clinton fold later, leaving a career in Denver to work for the foundation, but she speaks about the former president with a fondness and familiarity that suggests bona fide membership in the ever-growing club of FOBs.

Strolling along the boardwalk over the constructed wetlands on the campus (past the "Biggest Bat Box in Arkansas," according to a sign), Rutherford and Shock join a few families in pointing out the turtles swimming through the murky green water. "There'll be lots of babies in a couple of months," Shock remarks.

Just outside the loop of the boardwalk, an empty flask of Smirnoff slowly floats toward the litter trap that catches debris flowing into the wetlands. "Everywhere you go on this site, there is an environmental sensibility," Rutherford says, "and environmental education."

The park, wetlands, and trails provide a connection to the environment, but they wouldn't exist without the two buildings that anchor the campus: Choctaw Station, the red brick 1899 structure that houses the graduate school and foundation offices; and the modern glass-and-steel Clinton Library and Museum next door.

Although the two buildings opened on the same day in 2004, only the library initially went for LEED certification, in part due to the financial challenges of sustainably retrofitting a century-old train station. The library achieved LEED Silver certification initially, but it was recertified LEED Platinum in 2007—an effort aided by the addition of a green roof that

The 1899 Choctaw Train Station has been repurposed to house the graduate school and foundation offices.

"We've turned this place into an environmental showcase. It is a combination of the old and the new, and it shows that historic preservation, higher education, economic development, and concern for the environment can all work together." **–SKIP RUTHERFORD**

provides insulation and captures rainwater. The building also has more than 300 solar panels and bamboo flooring, and it was built with responsibly sourced materials. It also got a LEED point for the trolley that stops at the campus. In 2014 the building was recertified LEED Platinum.

On the first floor of the library, visitors can view the presidential limousine (and also buy miniature models of it, although a larger gift shop is located a five-minute walk into the downtown, part of the effort to revitalize the area). On the second floor, after watching a short video starring Clinton, visitors can sit in a recreation of the Cabinet Room and then wander among "alcove exhibits" on topics like the economy and foreign affairs. On the third floor, a roped-off replica of the Oval Office awaits, along with artifacts from state dinners, gifts given to the president (including Michael Jordan's present of … a statue of Michael Jordan), and gallery space for special exhibitions like one on presidential pets.

Above all this sits Clinton's executive suite, an apartment where the former president stays when he visits Little Rock—about once a month, Rutherford says. Partly for security reasons, and partly to protect Clinton's privacy, Rutherford won't allow the interior of the suite to be photographed, or even described in the media. But the apartment opens out onto the building's green roof, and students sometimes see Clinton step outside for fresh air.

On one side of the roof, a practice putting green is surrounded by blueberries and yellow roses, the favorite flower of Clinton's mother. On the other, a boardwalk winds through a garden of regional plants, as well as wind chimes and a solar-powered pipe organ. The roof is only four stories up, but in Little Rock, that's high enough to provide a fairly spectacular view—of the grounds and river below, and of the small-city skyline just across the interstate.

Choctaw Station may be more than a century older than the library, but its LEED plaque is a few years newer. Spurred by a federal stimulus grant, the school and the foundation transformed the historic building into a LEED Gold facility, installing features like low-flow toilets and waterless urinals, motion sensors for lights, and a highly efficient heating and cooling system. They also ramped up recycling at the building and implemented a green cleaning program. The changes have helped reduce energy costs at the building by around 50 percent, Rutherford says.

The building—which was once a stop on the Rock Island Railroad, but later housed a restaurant, church, and nightclub at various times—is the only remnant of the campus's bad old days as a dumping ground (aside from a former railroad bridge crossing the river that opened to the public as a pedestrian bridge in 2011). Original details like exposed wooden beams and a tin ceiling have been preserved, but the former "Colored" and "VIP" waiting rooms have been transformed into nearly identical teaching spaces. The open-air porch at the back of the building, where passengers once boarded their trains, has been enclosed in glass to create day-lit office space.

The combination of the newer LEED Platinum library and the historic LEED Gold former train station, together with the adjacent LEED Platinum headquarters of the charity Heifer International, has turned the once-desolate area into a cluster of sustainable development, where architects come to tour the buildings and take away ideas to implement on their own projects. In particular, Rutherford says, the greening of Choctaw Station shows that it's possible for even older buildings with development restrictions to be made energy efficient.

"We have a lot of people come through the building and say, 'How did you do it?'" Rutherford says. "And I say, 'When you have requirements based on historic preservation, and you have needs based on the environment, and you sit down and talk, you'd be surprised about what you can agree on.'"

"We've turned this place into an environmental showcase," he adds. "It is a combination of the old and the new, and it shows that historic preservation, higher education, economic development, and concern for the environment can all work together."

The Clinton Library, which sits next to the historical Choctaw Station, is a modern LEED-certified structure of glass and steel.

Austin Harrison and Maddy Salzman, two first-year students at the Clinton School, are researching and developing recommendations about energy-saving measures that also reduce asthma triggers.

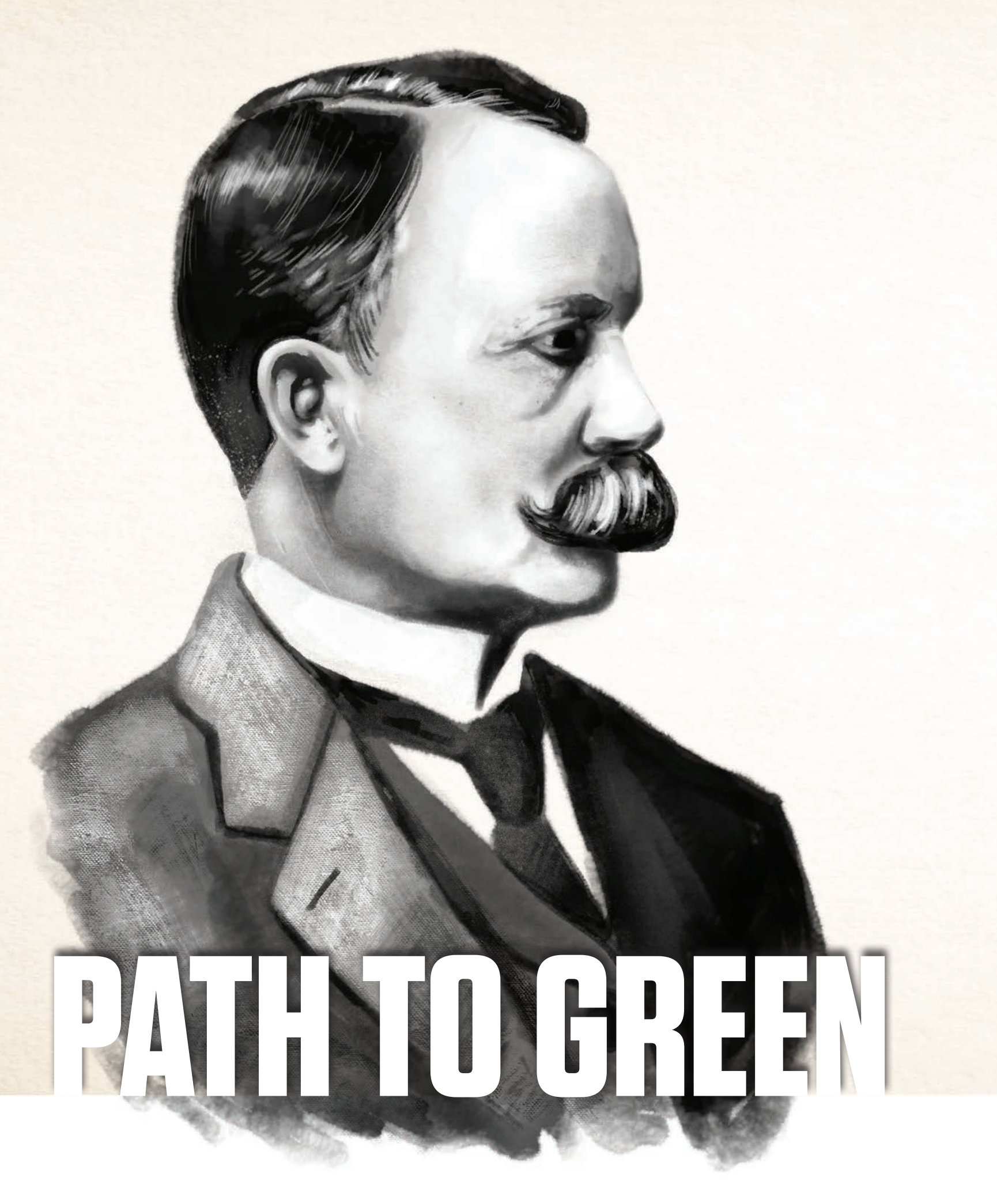
A tad ironically, it is the newer library that houses the memories of Clinton's past, while the older Choctaw provides space to the students and foundation staff who will carry the former president's legacy on into the future. The Clinton Foundation does extensive work combating climate change, and the Clinton School attracts a number of students interested in working on environmental issues—enough of them that Rutherford uses the building's LEED Gold rating as a "recruiting tool."

Maddy Salzman and Austin Harrison, two first-year students at the Clinton School, are part of a group working to research and develop recommendations about energy-saving measures that also reduce asthma triggers. Harrison says that, while Salzman is more focused on the environmental benefits of green building, he's more interested in cost savings, and the two of them "hold each other accountable."

These multiple appeals of energy efficiency, Salzman says, make the issue particularly exciting to work on. "It's really easy for people to get behind [energy efficiency]," she says. "It produces a lot of jobs. It usually saves people money. And it's good for the environment as well. So you can come at it from a lot of different political perspectives and see benefits."

Rutherford agrees that these multiple benefits of sustainable building cut across partisan lines—as evidenced by the fact that Clinton's Republican successor, George W. Bush, also pursued LEED Platinum certification at his library and museum in Dallas. "When you see presidents like Clinton and Bush [building green] because they want to, then it takes the politics out of it," Rutherford says. "People start recognizing that this is good for business, this is good for the environment, and it's good for the future of the country. What the LEED program has done is moved [sustainability] from the political spectrum to the architectural and construction spectrum, where people do it not because they have to do it, but because they want to do it."

So, will all future presidential libraries follow the Clinton model and make sustainability a priority? Rutherford hopes so. "That," he says, "would be a great legacy."



PATH TO GREEN

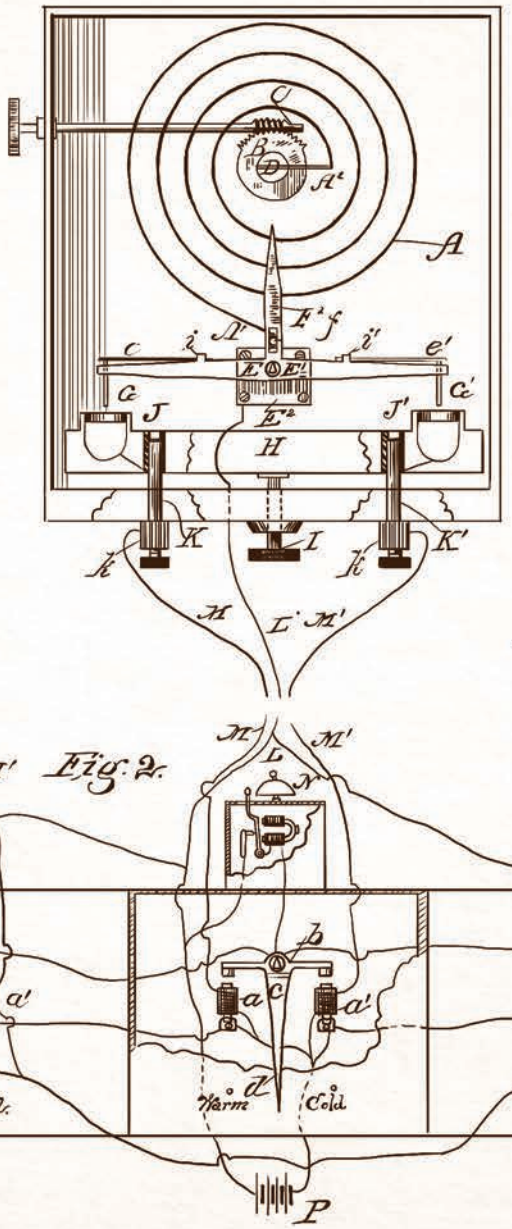
(No Model.)

W. S. JOHNSON.

ELECTRIC TELE-THERMOSCOPE.

No. 281,884. Patented July 24, 1883.

Fig. 1.



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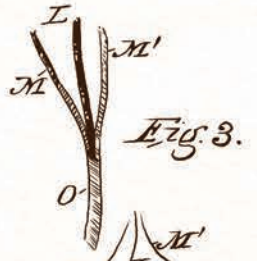

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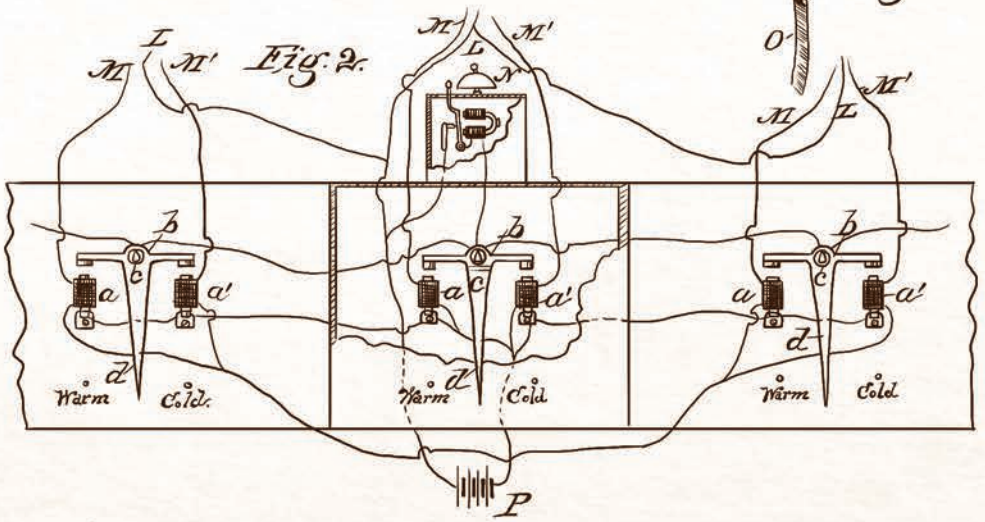

Witnesses:
E. G. Asmus
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Attorneys

Two industry giants take broad steps to continue on their sustainable journey.

WRITTEN BY **ALISON GREGOR**

The journey toward sustainable building and environmental stewardship is not just an individual one, but a collective one. And each company has its own unique story about the path to green building and environmental consciousness: when it started and why, how far the company has come, and how long the journey may end up being. Here's a glimpse of the "path to green" taken by two companies as seen through the eyes of their sustainability aficionados.

The path to sustainability at Johnson Controls, a global technology and industrial business, has been less of an odyssey than a commitment to stay true to the company's roots.

In the 1880s, professor Warren S. Johnson, the company's founder and namesake, invented and patented the electric room thermostat. His system of temperature regulation not only catalyzed development of the building control industry, but also created a means of saving energy and money in buildings. The idea of building efficiency was born, and so was the building efficiency business at Johnson Controls, the company's longest-running business unit.

"When did we start considering environmental aspects?" muses Clay Nesler, the vice president of corporate sustainability and a 32-year employee of Johnson Controls. "Every time we made a building control system smarter; for instance, when we added a piece of hardware or software to adjust temperatures so we could save energy at night. Those are things we started introducing into our products a long time ago."

Johnson Controls, which has its headquarters in Milwaukee, Wisconsin, has about 170,000 employees based in about 1,300 locations globally, many of whom create products designed to run buildings more efficiently, including heating, ventilation, and air-conditioning systems. A Fortune 500 company, Johnson Controls has developed, acquired, and divested other businesses over the decades and now has two other units besides building efficiency: power solutions and automotive experience. The company produces such products as batteries for traditional and hybrid electric vehicles as well as automotive seats and other interior components.

Nesler, a co-inventor on 12 patents and a mechanical engineer, says that building efficiency for the sake of comfort and customer savings, and building efficiency for the sake of the environment are not mutually exclusive goals, though it has been in more recent decades that Johnson Controls has evolved its company ethic toward sustainability and environmental stewardship.

Energy efficiency as an environmental ethic "started after the oil embargo in the mid-1970s," Nesler says. "That's when there was a very strong shift from making buildings more comfortable to concern about actually conserving energy. And that's when there was a big boost in investment in automated controls for buildings and more efficient equipment."

Over the decades, Johnson Controls has been involved in more than a thousand energy efficiency projects, which, combined, have reduced carbon

Previous spread: In 1895 Warren Johnson patented a pneumatic thermostat that was the first application for regulating heating systems, thus launching an industry focused on energy efficiency. Illustration by Tristan Chace. This page: Clay Nesler is the vice president of corporate sustainability at Johnson Controls and a 32-year employee of the company.

In 2010, Johnson Controls received LEED Platinum certification for four buildings on its expansive site in Glendale, Wisconsin.

emissions by roughly 21 million metric tons since 2000. The push toward building efficiency led quite naturally to an involvement in the development of sustainability in the building and construction industry.

"We were involved in the development of LEED [Leadership in Energy and Environmental Design] from the very first day," Nesler says. "We were one of the first members of the U.S. Green Building Council and had an employee very active on the board."

In 2010, the company received LEED Platinum certification for four buildings on its 33-acre corporate campus in Glendale, Wisconsin, which represented the largest concentration of Platinum buildings ever awarded on a single corporate site. The campus energy usage was reduced by 21 percent despite doubling the amount of space by adding 160,000 square feet.

That same year, Johnson Controls also launched the Institute for Building Efficiency (IBE), which studies

In fact, the company's Brengel Technology Center in Milwaukee was part of the original pilot program for LEED for New Construction and was certified LEED Silver in 2001. The 130,000-square-foot center was the first building to be recertified from Silver to Gold in 2004 in the LEED for Existing Buildings (LEED EB) pilot program.

"We now have a standard that any new facilities be LEED-certified anywhere in the world," Nesler says. "That applies to manufacturing facilities, office buildings, and any new construction or major renovation project."

technologies, policies and practices related to high-performance buildings and energy systems. Last year, Johnson Controls, in partnership with a global research organization called the World Resources Institute (WRI), introduced a Building Efficiency Initiative meant to expand the scope of the IBE's work to a global level.

"That's basically how we're taking our commitment to efficient and sustainable buildings and globalizing it," Nesler says. "With WRI, we're hoping to accelerate investment in energy-efficient buildings around the world."

Johnson Controls has now certified more than 2 million square feet of its own buildings to LEED and more than 20 million square feet for its customers, Nesler says. The company at one time had the largest number of employees certified as LEED APs and LEED Green Associates in the world, a number that currently stands at 995.

Molly Powell, a solutions program manager at Johnson Controls, is one of them, with a LEED AP Operations + Maintenance credential. Powell, who studied conservation and environmental studies at university, said a particularly rewarding project for her was the LEED certification in 2012 of Miller Park, the baseball stadium of the Milwaukee Brewers. The third Major League Baseball stadium ever to be LEED certified, Miller Park was particularly complicated to certify due to its retractable roof, said Powell, who managed the project.

"It was a lot of calculations that had to be done, and a lot of engineering work" to meet the special energy and ventilation requirements, she says. "I think Johnson Controls really demonstrated our leadership and commitment to energy efficiency and green building practices through this project right in our own backyard."

Like Miller Park, other energy efficiency projects handled by Johnson Controls have been growing in scope and complexity in recent decades. For instance, in late 2013, the company was awarded a 20-year contract by the Hawaii Department of Transportation to reduce energy usage by about 49 percent at 12 Hawaiian airports for a total savings of $518 million.

Johnson Controls has handled high profile energy saving projects such as Miller Park in Wisconsin.

Energy cost savings will fund the entire project over the contract term, instead of taxpayers.

"It's the largest project of its kind that we know of," says Nesler, detailing the replacement of 75,000 light fixtures, upgrades to HVAC equipment and controls and the installation of 8,100 solar photovoltaic panels. "It's a great example of the scale to which energy efficiency and renewable energy can be taken through energy savings performance contracting."

When it comes to environmental stewardship, Johnson Controls continues to lead through example,

The idea that developing a building to LEED standards is synonymous with developing a high-quality building of value for investors was an idea that began evolving in the mid-2000s. —ELIZABETH J. HEIDER

Nesler says. The company has reported its sustainability data since 2002 and follows the Global Reporting Initiative G4 guidelines, with additional reporting to the United Nations Global Compact Communication of Progress and the Carbon Disclosure Project.

For the past couple of years, the company has been asking more than 200 of its major suppliers to set sustainability goals and report progress to the Carbon Disclosure Project supply chain program. Johnson Controls is also providing training to help them do this and has expanded the program to include smaller suppliers.

"We wanted to take the best practices that we have developed and applied across our own facilities and take them to our small- and medium-enterprise suppliers who may be lacking the necessary resources or expertise," Nesler says. "It helps them reduce their energy use and costs while making them more sustainable and competitive, and it's been very well received. So we hope to expand this program over time and be able to help many more of our suppliers around the world become more sustainable."

Many of the world's builders have taken steps down the path to sustainability, though few are as large or have gone as far down that path as Skanska, the multinational construction group based in Sweden.

With about 58,000 employees globally and about $21 billion in annual revenue, Skanska has been involved in environmental management since the mid-1990s, and in 1998 published its first companywide environmental policy. It's an environmental record that served the company well when sustainable building came to the forefront in the United States in the late 1990s, says Elizabeth J. Heider, the chief sustainability officer at Skanska USA, an operating unit of Skanska.

Skanska USA joined the U.S. Green Building Council in 2000, the year that the LEED green building certification system was unveiled, Heider says. It was also around that time that the federal government was beginning to embrace green building and assess its potential impact on the government's portfolio.

"Skanska had a really fortuitous brand at that time—and even now—because we're a Swedish-held company," Heider says. "Our federal clients sort of looked at that and said, 'Well, you're a Swedish company, so of course you have to be greener than the average builder.'"

That perception of Skanska, which was not unfounded, probably gave the company a bit of a boost early on at a time when builders in the United States in general were still feeling their way in the field of sustainable building, Heider says. "We were able, I think, to pick up projects earlier than some others, so that allowed us to really break into the market early," she says.

Heider's own path to sustainable building also began early and with the federal government: In 1996, as a consultant, she conducted a green cost study done for the U.S. General Services Administration and, in that way, began growing intimately familiar with the business argument for sustainable building.

"There was a very strong value argument for building in a much more sustainable way," Heider says. "The value argument for sustainability has been a big part of my career at Skanska."

In the early part of this century, Skanska's institutional clients, universities and the federal government, were exploring that same rationale for building sustainably, "embracing the notion that they needed to start building in a more sustainable way because they were going to hold their projects for a long period of time," Heider says.

The idea that developing a building to LEED standards is synonymous with developing a high-quality building of value for investors was an idea that began evolving in the mid-2000s as well, she says.

"Oftentimes, our projects are sold to pension funds and other long-term investors, because they know they'll be a good quality, and the LEED mark is something that is now recognized as a standard of quality, so it's something we've used to communicate the value of the projects that we develop," Heider says.

Heider has played a role in helping the larger company at Skanska understand the business argument for green building. In building out the company's headquarter offices in the Empire State Building, a project begun in 2008, there was initially internal hesitation about the costs of trying to achieve LEED Platinum certification, Heider says.

"There was a group of us that said, 'We need to change that discussion from cost to value—what will

Elizabeth J. Heider is the chief sustainability officer at Skanska USA, an operating unit of Skanska.

Investors pushed for green building certification for the new university hospital in Stockholm, which Skanska is constructing.

the value be for us?'" she says. "We have to take a longer-term view on not only the initial costs but the operating performance."

After demonstrating to the company that the cost of achieving LEED Platinum, about $250,000, would be saved during the life of the 16-year lease, Heider and her group got the go-ahead. And it was well worth it, she says.

"As it turned out, we recouped the additional investment that it cost us to get to LEED Platinum in the first five years of the lease," Heider says. "Over the life of the lease, we've saved half a million dollars in energy costs."

(Another fringe benefit that Skanska most likely received in its offices from achieving LEED Platinum, in which 16 of the 44 points achieved had to do with environmental air quality, is that sick leave went down by 15 to 18 percent during the first two years of occupancy, Heider says.)

By 2009, Skanska had embraced the concept of LEED so thoroughly that the company's global chief executive at the time, Johan Karlström, made a commitment that every project done by Skanska globally would be developed to LEED Gold or better, Heider says.

For instance, Skanska is constructing a university hospital in Stockholm's suburbs, called the New Karolinska Solna, and as the world's largest public-private partnership hospital, it will achieve multiple green building certifications because investors require it. However, it will also be one of the first university hospitals in the world to be LEED certified.

Skanska "certainly was on the leading edge in terms of helping to inform the international strategy [regarding LEED], which wasn't that well-baked at the time," says Heider, who joined the U.S. Green Building Council board of directors in 2008 and served as its chairperson in 2012.

The new hospital in Stockholm will be the world's largest public/ private partnership hospital.

Skanska USA now has 182 projects that have achieved or are seeking LEED certification. Its commercial development unit has about a dozen projects in various phases, all LEED Gold or better, for a total of about 12.5 million square feet of space. In this country, about 455 Skanska employees are accredited as LEED APs, Heider says.

However, the company has by no means reached the end of the path to sustainable building, Heider says.

"The opportunity to do more has become even more challenging," she explains. "We've managed to wring out a lot of the low-hanging fruit, and now we're looking at, how do we really transform the supply chain to deliver more environmentally responsible materials to market, and how do we drive this even deeper into the process of building so that we also bring along the subcontractors with us?"

The area of building performance, which is substantially affected by the human occupants of a building, is another area that still needs research, Heider says. Building data collected and analyzed in digital format, often called building information modeling or virtual building, should help in that realm as we continue quantifying more and more data.

"We haven't yet closed the loop on building performance," Heider says. "So many of the projects developed in the United States, most of them in fact, and certainly the large ones going through LEED certification, are one-off. Very seldom do you have a whole field of the same building that's being built, so how do we know how these buildings are actually performing?"

Heider says that Skanska will continue to work with the U. S. Green Building Council to answer the questions she's raised as the green building industry evolves. "Skanska's provided me with really fertile ground to pursue not only how we build in a way that is better, but also is more sustainable," she says.

Peer Power

USGBC's Performance Excellence in Electricity Renewal (PEER) program takes LEED-like strides toward transforming power systems.

By Kiley Jacques

"PEER came out of an effort led by Bob Galvin who used to run Motorola," explains PEER Program lead John F. Kelly. "The 2003 Northeast blackout made people aware of how important electricity is to the economy, to the whole country." The bottom line: The power industry was in need of major transformation, much like the building industry of the late 1990s. Hence development of the Performance Excellence in Electricity Renewal program—the nation's first comprehensive, consumer-centric, data-driven system designed to measure performance and improve the regulation, design, and operation of sustainable power.

Galvin assembled a team of industry leaders who initially thought policy reform was the ticket. Ultimately, however, they realized it was beyond difficult, given integral changes would need to be made on a state-by-state basis. At that point, they looked to LEED as an example of industry transformation; they viewed it as an advanced learning system.

John F. Kelly, PEER Program lead. Photo: Marc PoKempner

"LEED was the best model we could find of systemic transformation," notes Kelly. "We think the reason is that LEED focused on transforming the professionals, the people, instead of the policies, standards, or codes."

Thus, in 2010, Kelly met with LEED's chief of engineering, Brendan Owens, to develop a similar approach for the electricity system. The team learned from Owens that he wished initial LEED efforts had started with a more measure-driven and outcome-focused premise. "That was one of [PEER's] fundamental principles," says Kelly, "—to focus on capabilities that are measurable and that matter to the customer."

After five years of research spent looking at LEED's six levels of performance, the PEER team established their own comprehensive set of principles, which drove how they would select criteria for measuring performance. "Just about everyone we talked to in the industry—from mayors to public service commission leadership and staff to owners of industrial facilities and commercial buildings to microgrid owners—they all thought about four areas of concern unanimously," notes Kelly.

The result of all that legwork is a system that measures: reliability and resiliency, energy efficiency and environment, operational effectiveness, and customer engagement. This last category was put in place to address the fact that, currently, there isn't a

John Kelly and team establish their own comprehensive set of principles for measuring performance. Photo: Marc PoKempner

supply-demand correlation—even when demand goes up, the price doesn't change; there's no curve, which means it is very inefficient. In other words, customers do not receive a price signal so "they just use what they want whenever they want." Kelly speculates this lack of correlation costs "probably double" what it should.

To address the issue, PEER developers came up with the idea for customer contribution, which looks at how the consumer can contribute services back to the grid; when demand is high, a price signal is sent out. Subsequently, customers reduce their load. (The idea came out of the way LEED buildings lower their demand when the grid is stressed). This type of incentive system has started to emerge in PEER.

With the mission of measurability in mind, each of the four categories includes criteria for which customers receive points. Points are also given for actual performance and capability. For example, with respect to environmental responsibility, PEER assesses the impact of electricity generation and transmission and encourages the adoption of clean energy. The criteria in this category address energy efficiency, air emissions, resource use, renewable energy credits, and power delivery impacts. "Right now most states use metric percent renewable system as a metric for how green their system is," explains Kelly. "But percent renewable is a technology—it doesn't tell you anything about the carbon footprint or the energy efficiency performance." With PEER, points are given for actual efficiency in terms of carbon pollution, water consumption, and solid waste. "The percent renewable may affect those performance outcomes, but points are given for actual outcome, not the technology used," notes Kelly.

Beyond environmental impact, of course, consumers expect high-quality service from their electricity provider at competitive rates. The intent of the operational effectiveness category is to assist in the identification and elimination of wasteful spending through performance benchmarks. Electricity costs, microgrid contribution, general operating expenses, capital spending or investment, and indirect costs are all analyzed. Customers who demonstrate operational effectiveness have a competitive advantage, in that eliminated waste means lower distribution charges. Kelly notes, that contrary to popular belief, higher reliability doesn't necessarily mean higher rates. "PEER helps customers get to the point of being able to offer levels of performance not before thought possible while also lowering operating costs."

As LEED did for the building industry, PEER offers new ways of thinking about energy systems. Now, for the first time, LEED and PEER give professionals a comprehensive understanding, "almost like a whole language," of what sustainability is. "People are seeing how taking one action can result in addressing a handful of environmental concerns," says Kelly. PEER adherents are beginning to design and operate much more efficiently and effectively, using a set of tools and strategies that achieve unprecedented levels of performance.

As industry professionals adopt PEER systems, better policies and

University of Texas Hal C. Weaver Heating and Powerstation II. Photo: Michael Stravato

standards follow. "It's like having an army out there that's really trained on a much more effective way of designing operating systems," enthuses Kelly. To date, there are two levels of professional PEER training: Fundamentals are designed for everyone, and provide basic understanding of all the performance criteria. "It gives them a new way to think about electricity delivery," says Kelly. Advanced course graduates get a certificate of completion for a much more technical program during which they apply PEER to a project—they implement and score it, and "really use it in their professional lives." The aim is to develop PEER users, who can go apply it for others. Last year's advance program served 15 trainees. Kelly predicts 30 to 40 this year, and 100 the next. "We're hoping to really grow that army of the PEER advanced."

Kelly's vision for PEER includes thermal distribution in addition to electrical, and that it follows a trajectory similar to LEED's. As Version II and Version III come out, he anticipates it will continue to improve. In 10 years, he foresees 50,000 PEER professionals using it for a range of projects, even if those projects are not PEER certified. "That's how the transformation starts to happen," says the forward-thinking Kelly.

The University of Texas in Austin is the first PEER-certified campus in the country. "They are an outstanding performer in terms of all of the PEER criteria," notes Kelly. "Their leadership was dedicated to sustainable energy delivery, and had been working on it for 15 years." Interested parties hadn't seen anything in the marketplace that they wanted to model until they saw PEER. "They immediately understood how important it was to have a system like this," notes Kelly. "They wanted to be one of the first PEER-certified projects so that they could be a shining example of [an institution] that applied all the criteria, and how they could drive such good performance." Today, their operating budget has been cut in half—from $40 million to $20 million—and their reliability is the best in the country.

Southern California Edison has been working on the demand-response credit—they helped LEED get it into the marketplace. "It's been a very successful part of the credit," notes Kelly of the school's PEER-related efforts. In fact, their environmental policy precisely demonstrates PEER's own mission, as they "assure accountability for environmental compliance while fulfilling our mandate to safely provide reliable and affordable electric service in environmentally responsible ways."

Finally, there is the policy initiative enacted by the City of Chicago, which applied PEER to energy procurement. (The city can buy power for all residential customers.) They used the energy efficiency and environmental category in their specification when they went out to bid and evaluate suppliers—they negotiated by demonstrating improved performance at the same cost. "They were not willing to pay more for their power, but they offered the contract to the supplier with the best PEER score," says Kelly. Ultimately, they even eliminated coal from their system. ●

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Q&A

Helen Kessler, FAIA, LEED Fellow

President of HJKessler Associates, Adjunct Professor at Northwestern University

Helen is addicted to continuous learning, has been a leader of green building projects for over 30 years, and currently runs a sustainability consulting practice that focuses on green building, LEED, and energy efficiency. She is a past USGBC Illinois Chapter Board member and has received numerous awards, including the chapter's prestigious "Intent to Matter" and Chapter Leader awards.

Q. How and why did you get into green building and LEED?

My final project in architecture school in the mid-1970s was a solar house, and my first job after graduation included doing research on passive solar heating and cooling systems and designing passive homes. In 1991, I became deeply involved with the nascent American Institute of Architects Chicago Committee on the Environment. At the time, I was consulting on energy efficiency and lighting design projects. As a committee, we actively debated green building and, more than anything, we wanted to work on a green building project. Eventually we had the opportunity to work on the first municipal LEED Platinum project in the country.

Q. What is the coolest project you've worked on recently?

One of my favorite projects was the Sarah E. Goode STEM Academy. This is one of four prototype Chicago public high schools. The other three achieved LEED Gold; Goode achieved LEED Platinum at lower first cost than all of the other buildings! The big difference—it used a different heating and cooling system—ground source heat pumps—which allowed duct sizes to shrink dramatically, allowing the building height to also shrink. By eliminating the giant ducts, the overall mechanical system, including the geo-exchange wells, actually cost less than the baseline.

Q. How would you define the intersection of adaptive reuse and LEED?

I've worked on many adaptive reuse and historic renovation projects where we could get LEED points for keeping much of the original building (walls, structure, floors, etc.). Adaptive reuse projects are usually located in established (often dense) neighborhoods with transit, giving them an automatic edge with respect to LEED points. In addition, we often need to upgrade the building envelope insulation and the windows. This, together with the fact that LEED provides two extra points for energy savings, can result in a major energy savings boost (i.e., more LEED points!).

Q. What's next for green building?

My dream is that we will all be embracing a regenerative design process. This isn't about regenerative buildings, which actually cannot exist, but about a new way of thinking, a new mindset, a new process for designing projects. It will include more stakeholders in the design process and will embrace more than single buildings even if the initial focus is on a single building. It will seek to spark the imagination of communities, likely in ways not yet considered. It will require owners and other design team members to think outside the box, to think of their projects in the context of the larger systems surrounding them, including the community and the region. It will be inspirational and communities will continue to regenerate beyond the design/construction of individual projects. It will embrace nature as the context for social and economic systems.

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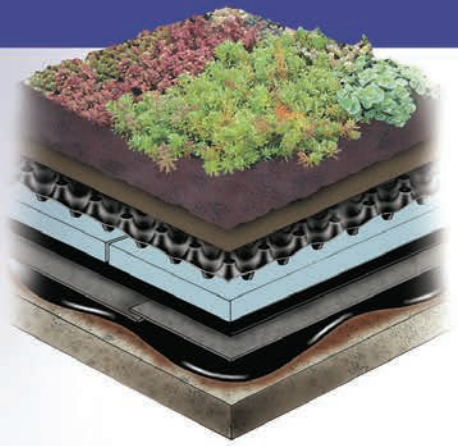

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