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ON THE COVER
Together We Can

Inspired by jigsaw puzzles, the wonderfully creative imagination of the students at the Abbey School in Farnham, Surrey—a special needs school for 11-16-year-olds—used tiles to depict the school motto.

Courtesy The Abbey School

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Unique Leadership Platforms

When we set out to develop this issue of USGBC+, we chose the theme: leadership platforms. Each of us has a unique leadership platform—a set of values and beliefs for which we stand. Our platform may be known to others, or it may just be a quiet presence that guides our daily lives.

In thinking about leadership, one of the things I’ve always thought of as the definition of a leader is someone who inspires purpose and progress but more importantly, someone who uses their leadership platform to make things better.

By that definition, every single member of the USGBC community is a leader.

USGBC and its 12,000 member companies, the more than 20 billion sq-ft of LEED projects, the hundreds of committee and community members, the volunteers, the 201,000 LEED Accredited Professionals (APs) and the 25,000 Greenbuild attendees are all inspiring purpose and progress and making things better. Whether it’s creating a new and innovative fixture that saves water, developing alternative materials that are healthier for people, identifying a new strategy designed to reduce cooling costs, or helping to educate the future green building industry—we are all making things better.

Having been with USGBC for more than 15 years, I have seen the rise of green building up close. More than 20 years ago, USGBC started as a vision, and today it is an unparalleled global brand of sustainability and is responsible for anchoring one of the most important environmental movements of our time.

I have firsthand knowledge of the leadership that makes up our community. I have seen the committed volunteers who come to Greenbuild every year and dive right in to make the show a success. I have seen the amazing committee members who have so much knowledge and information, dedicating hours of their time every week to committee meetings to make LEED the best green building program in the world.

I have seen the newly integrated USGBC communities who have worked really hard to unite and to speak with one voice, leading the movement nationwide! I have seen the LEED APs and LEED Green Associates from all over the world who have studied so hard to pass their exams so that they could be a part of the story. They are all true leaders and they are all part of the USGBC leadership platform.

But what exactly is USGBC’s leadership platform? If I had to spell it out, I would sum it up in three points:

- Leave the world a better place by reducing the environmental impact of our buildings, homes, and communities.
- Make the benefits of green building accessible and available to as many people as possible.
- Foster an environmentally and socially responsible, healthy, and prosperous world that improves the quality of life for everyone.

This leadership platform guides us in our everyday activities at USGBC. Everything we do is looked at through this lens. We also need the right tools and platforms in place to succeed. That’s why I’m looking forward to this year’s Greenbuild conference, which also happens to be one of USGBC’s largest platforms. We have an amazing lineup of educational sessions on LEED v4, materials, human health and water issues, to name a few. We are also in the thick of planning USGBC’s signature events: Waterbuild, the International Summit, the Communities & Affordable Homes Summit, the Women in Green Power Breakfast (which I am hosting this year!) and the Executive and Leadership luncheons.

You want to see innovation? Experience leadership in action? Execute on your leadership platform? Then I’ll see you at Greenbuild Boston this November!
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Look deeper, build smarter with the U.S. Green Building Council’s LEED® Green Associate credential.

GO.USGBC.ORG/GREEN-ASSOCIATE
Sustainability at institutions of higher learning is increasingly evident around the globe, and USGBC’s LEED Lab has played a significant role in that achievement. The interactive, multidisciplinary immersion course is designed to transform the academic environment to prepare students for 21st-century careers in sustainability.

In the course, students learn the principles of LEED and receive actual project experience by assessing the performance of existing facilities on their campus, facilitating the complete LEED Operations and Maintenance (O+M) process with the goal of achieving certification. LEED O+M ensures that the building is operated in a sustainable way and that the systems are well maintained. The LEED Lab effort originated with a pilot course created and taught by Patricia Andrasik at the Catholic University of America, and officially launched in January 2014. Today, LEED Lab courses are offered in 25 academic institutions including nine international universities.

Two campuses in particular are leveraging LEED Lab beyond the classroom: the University of California (UC) Merced and the Panamerican University in Mexico.

UC Merced, University of California
Established in 2005, UC Merced is the youngest campus in the world-class University of California system that was founded in 1869. The university has set a goal of certifying all of its buildings to LEED, and to date, all 17 of its newly constructed buildings on campus have earned LEED certification. The goal of LEED Lab is, in part, to additionally certify those buildings under LEED O+M and become the first college campus to do so.

As significant as those accomplishments are, it’s the level at which students are engaged in the certification process that earns UC Merced its unique reputation as a leader in sustainability in higher education. They are using LEED Lab as a starting point for teaching, and then go on to implement campus-wide policies and practices.
Assistant Director of Sustainability Mark Maxwell has been part of all efforts related to LEED since the school’s inception. He managed all of the university’s LEED-certified new construction projects and now helms LEED Lab, which was introduced at UC Merced in the fall of 2015. “LEED Lab is the perfect opportunity to have students work on projects directly with the goal of certifying the buildings,” says Maxwell, adding that the class falls under the auspices of the Engineering Service Learning program, which includes a range of projects that students take on in conjunction with various nonprofits. LEED Lab is a year-long program broken into two semesters, which means each semester brings a new group of students from all grade levels and disciplines to the table.

In the first year, the class targeted the LEED Gold Classroom and Office Building (COB), a flexible classroom, academic support, research, and office facility. The inaugural group of 15 students broke into three teams that included a project manager and three team leaders. Each team addressed the six credits and prerequisite of the LEED Sustainable Sites credit category, authoring summaries for each (a student-initiated project). Those summaries served as a template that mapped out what was required to earn each credit, how long it took, and the number of points that could be achieved. Using that master template, the second-semester group tracked the building’s performance. Part of LEED Lab students’ responsibilities include continually updating that information. Additionally, after taking LEED Lab, students are prepared to sit for the LEED AP O+M exam, though they are not required to pass in order to complete the course.

LEED Lab’s first year yielded LEED Silver certification for COB under LEED O+M, and the class is now targeting the LEED Gold Science I Building for LEED O+M certification. The hope is that each year of UC Merced’s LEED Lab will work toward another dual-certified building.

The students participating in LEED Lab are pursuing diverse courses of study; Maxwell names mechanical engineering, biology, material science and engineering, computer science, bioengineering, and business among them. “You’re getting all these different majors,” he notes. “Sustainability reaches everything that we do.”

Student response to the course has been profound. “Students have expressed surprise at how involved green buildings can be—how far in depth they go.” Maxwell feels that because they are learning about both the construction and operations side of green buildings, they are developing a deeper understanding of sustainable design. And it goes beyond the classroom, filtering into their personal lives and decisions. Maxwell explains: “It makes them more conscientious when they are out buying stuff. It gets them thinking about sustainable products. When they are throwing away trash, they are a lot more aware of what they are throwing away. It really hits home. This class has become very popular.”

“We are living up to the commitment of our late chancellor, Carol Tomlinson-Keasey,” says Maxwell. “Her vision was that this campus was going to be sustainable...
from the ground up—from the time we built our buildings and infrastructure . . . to when we started operating the buildings, and in the academics and in everything we do.”

Sustainability awareness begins with student and employee orientations at UC Merced. There are student-led campus organizations whose mission it is to educate the general student body, faculty, and staff about sustainability. There are also carbon-neutrality fellows, Global Food Initiative fellows, and a program that has students working on roughly 30 energy-related projects. Furthermore, the school’s Green Lab program implements sustainable practices and technologies in laboratory buildings. “There are multiple ways in which we reach out [to the campus body],” says Maxwell. So thorough are their efforts that they even have an online dashboard that provides real-time data on energy and water consumption of each building, while also tracking their usage history through LEED Lab.

Sustainability is clearly a big part of the school’s identity—the entire campus community is aware of it. For LEED Lab students, that awareness is only heightened. “I want to keep this movement going,” says Maxwell. “I would like all of this knowledge and experience to transfer over to the students because they are the leaders here, they are going to lead the next generation. Without us doing this, there wouldn’t be a movement of students going out and promoting green building and green operations.”

Currently, the campus serves 7,300 students. A plan to double in size by 2020 in order to accommodate 10,000 students has been dubbed the “2020 Project.” Also by 2020, the campus has pledged to consume zero net energy, and produce zero waste and zero net greenhouse gas emissions. “We are currently on the path to get there. We are going to get there,” says Maxwell determinedly. “We are living up to the commitment that our original chancellor made—and then some. We are going above and beyond. We never thought we would be having these classes that use the built environment. Basically our campus is a living laboratory for sustainability and everybody is on board with it.”

**Panamerican University**

Mexico’s Panamerican University is another forward-thinking, green-minded institute of higher learning. And its adoption of LEED Lab signifies the program’s ever-lengthening reach.

During the initial planning to both develop and retrofit the young campus to incorporate green practices, the university looked to LEED as their benchmark standard. They also used recommendations made by the Bovis construction firm to work toward Master Site credits. LEED Lab was implemented in order to train the campus’s operational team in LEED O+M requirements, develop LEED-related technical skills, and cultivate a “LEED culture” on campus.

As the school moves forward with the greening of their campus, using LEED Lab as their primary tool, their buildings will be more energy efficient, use less water, and employ recycling practices to improve waste management.

The university’s deep commitment to sustainability and environmental stewardship is evidenced in the voices of its rector, general secretary, teachers, and students—all of whom
value the role LEED Lab is playing in transforming their

*The university is just 50 years old,* notes the rector, 

Dr. Santiago García. *We are thinking about the next 50
years. The university doesn’t work by itself. . . . We need to
relate with the public sector, the private sector, with the
world, and with the ecology. At the same time, we need
to be more effective in the way we operate the university. 
Everyone cares about the green way of thinking and being a sustainable organization."

With respect to the decision to introduce LEED
Lab to their curriculum, UP-IPADE General Secretary
Rafael Chávez says: *"When we were thinking of the
new development, we realized that we wanted to pursue
sustainability not only in the buildings but as something that
students have as part of their education and part of their
lives when they leave the university." From the start, they
valued LEED standards and centered their efforts around
them. *"Before we even put in the first stone, we had in mind
that we wanted to create a place that meets LEED’s green
goals," he adds.

Mauricio Ramirez, head of sustainability at Bovis and
a LEED consultant, views LEED Lab as a tool for making the transformation a reality. He recognizes the campus

community as one that wants to move in a new direction and
believes they now have a way forward, using measurable practices. He sees this as defining the way to redo the

campus and believes the right way is the green way. He also
believes using LEED Lab has the value of integrating the

community of teachers and students in the discussion of
green practices and building operations.

Dr. Alejandro Ordóñez, Engineering School Dean,
appreciates the ways in which the program helps keep the
university in step with changing times while facilitating real-
world understanding of the implications of those changes.

Currently, LEED Lab exists only in the engineering
department but faculty are looking for ways to engage

students who are pursuing other fields. *"The challenge is
trying to figure out how to engage law, philosophy, pre-
med students, etc."* notes Ordóñez. *"We are thinking about
creating a class that would have students [from other
departments] work in teams on a single project."*

LEED Lab instructor Rodolfo Cobos has witnessed firsthand the ways in which the course fosters an
understanding of and appreciation for sustainable practices. His vision is to have it “become part of the students’ DNA, so
that they will pursue it the rest of their lives. . . . It’s more than
a theory in class, it is a theory in practice."

Mexico’s Panamerican University adopted LEED Lab to help create a more energy-efficient campus.
LEED Lab student Francisco Sierra illustrates the program's efficacy and reach: “Doing the waste audit [showed me] the kind of negative impact we are having on the environment right now. It makes me want to do something about it—not only here, during my stay at the university, but also in my outside life. It definitely sparked new interest. I had heard about LEED before but now I am doing the courses to get the LEED Green Associate credential. And I know, here in Mexico, we have a lot of opportunities to grow in these sustainable areas because we are still quite far behind compared to the U.S. and other countries. But I don’t think that’s a bad thing; I think it is an area of opportunity.”

Ramirez notes that the University has realized the overall societal shift that sustainability represents, and its effect on many different components to campus and community life including energy, water, waste management, air quality, community engagement.

“It is critical for the university to take the lead and show consistency between the classroom message and everyday campus life—rejoining [the] efforts of academia, with the operational team and university community will facilitate and accelerate this relevant social change,” says Ramirez. ●

LEED Lab waste audit on the Panamerican University Campus.
Lendlease strives to bring innovative ideas to life.

BY ALEXANDRA PECCI

When it comes to recycling, wallboard isn’t easy stuff to handle. It’s incredibly sensitive, losing its recyclability when it breaks into crumbs or powder, or even when it’s mixed with other waste. As a result, it often falls by the wayside in recycling efforts.

But Geoffrey Brock, LEED AP BD+C, ID+C, ND, sustainability director at the global construction and property firm Lendlease, was eager to change that. After all, he points out, wallboard makes up 20 percent of construction waste, and can actually make up the majority of waste for interior projects.

“We’re talking the magnitude of hundreds of tons of waste,” he says. “It means something more than just recycling at the office.”

Despite the imperative, the desire, and the important idea, he had trouble getting a wallboard recycling initiative off the ground.

“I was not very successful because I was operating within a silo…only gaining minimal buy-in,” he says. “I was a young, naïve project manager who was trying to change the world.”

Getting off the ground
Where do great ideas go if they’re not nurtured? Do they fizzle out and die away? And conversely, what happens when they’re coaxed and cultivated into something truly innovative?

Lendlease is trying to answer that last question, and is putting its findings into practice with its Innovation program, a multi-pronged effort launched in March 2016 to bring innovative ideas to fruition from within all corners of the company. As a global company with projects across the world, the people at Lendlease innovate every day.
“Innovation is part of our core values,” says Kelly Benedict, senior vice president of Innovation and Customer Focus. But at the same time, “There was a real honest reflection that some of those innovations probably stay within a project team.”

Not sharing ideas can also lead to duplicative efforts. For instance, through the Innovation program, the company discovered that it actually had three different drone experiments happening worldwide. Now, they’ve created a centralized drone steering committee to share best practices and technological advances, resulting in a Lendlease Americas project to use drones for safer, more efficient building and inspecting of telecom towers.

Centralizing the drone experiments accomplishes many things: reducing redundancies within the company, curating the best ideas from across business units, and ultimately, improving worker safety.

“We are connecting a lot of dots within the organization and fostering a lot of collaboration through this innovation channel,” Benedict says.

The science of innovation
The company realized it needed a disciplined approach and formal framework for ensuring that new ideas would not only see the light of day, but also ensure that they would solve real problems, add value, and align with strategic goals of company.

At the heart of the program is the Innovation Pathway, which Lendlease developed with an Australian innovation company. The pathway provides a scientifically based process for bringing new ideas from conception to implementation. Like the scientific method that provides the basis for all science research, the Innovation Pathway includes different stages through which new ideas must progress, including brainstorming, validation, experimentation, and implementation.

“It’s just like we learned in grade school,” Benedict says. “There is a science to everything.”

She adds that the pathway isn’t meant to be onerous—quite the opposite—but simply ensures that ideas are properly vetted before they’re implemented.

“Ideas now have a faster track and a more scientific way to be supported and heard,” she says.

Putting a formal pathway in place also allows people from across the company to participate in the innovation process, get the proper support for bringing their ideas to life, and make sure that the entire company can benefit from an idea.

Ideas from everywhere
There are many avenues for Lendlease’s employees to contribute new ideas, whether they’re generated organically or via events like group hackathons and ideation sessions that get people’s creative juices flowing with exercises that ask, “What would Oprah do?” or “How do you make Charlie Sheen president of the United States in 24 hours?” before breaking into small groups to tackle specific business problems. An online platform called the “Innovation Station” also allows employees to submit ideas and track their progress.

However the ideas are generated, though, employees work with innovation guides who are specially trained employees who help their coworkers hone in on customer needs and brainstorm, coach them along the Innovation Pathway, and eventually create larger awareness throughout the company by getting the ideas on meeting agendas and in front of executives. These innovation guides—33 people in all, who do this work in addition to their regular jobs—are stationed throughout different geographic and business units and are also tasked with leading innovation sessions.

Another phase to bringing a new idea to fruition is presenting it to Lendlease’s Advisory Forum, made up of executive leaders, which reviews ideas and awards seed
funding from within the company to conduct experiments on the ideas that are most promising. Benedict, who chairs the forum, says the forum reviews about two projects per month and within the first year awarded $42,500 to seven ideas. More are in the works.

From seed to fruit

“This experimentation phase is very iterative and you need to continually check the process,” Benedict says, describing one app-based experiment that didn’t generate the right data and was scrapped in favor of a new solution. “It’s just like having guiderails…it just allows us to really ask the right questions, make assessments, and really manages this in a way that’s not just subjective.”

The experiments are consistently creating solutions that solve business challenges. One enlisted outside experts, like safety professionals and firefighters, to help develop a refined framing and installation process that allows windows to withstand up to 100 pounds of pressure and help prevent child falls. It’s being installed in one of their projects now.

The window project illustrates not only the benefit of the innovation program to Lendlease’s customers—helping to keep its residents safe in Lendlease-constructed buildings—but also shows the value of collaboration and bringing together people from disparate areas of the company. For instance, Brock notes that he was invited to sit in on one of the innovation sessions for developing the window solution.

“That is a business unit that I would normally have no interaction with at all,” he says. “We have different sectors, different product types, different challenges…but it’s bringing us together as a company.”

Other experiments result in the company seeking patents, one example being a “smart ladder” to prevent falls by sounding an alarm when used improperly and a “live alert” that helps prevent electrical shock for people working on live electrical panels. Both of these solutions are important for keeping workers safe on the job.

Brock’s wallboard recycling initiative has also gotten off the ground. He started before the formal Innovation program began, and since, has put his project through the pathway.

“It helped create an atmosphere within the company that this is something that is supported,” he says.

His breakthrough for success was teaming with a wider group of manufacturers, processors, and sorting facilities that commit—together—to keeping wallboard scrap separate on job sites and creating a larger infrastructure to support it. When these competitors and collaborators work on the same goal, a large volume of wallboard can be diverted to a sorting facility and ultimately, made into new wallboard.

“It convenes all those members together so we could tackle this challenge as an industry,” Brock says. Now, Lendlease is segregating wallboard for recycling at two large-scale commercial projects in Manhattan, including a “massive residential tower,” and they keep adding projects, looking specifically to expand to northern California.

He also adds that other sustainability projects are in the early stages of the innovation pathway, including developing ways to reduce water and electricity usage on construction sites, something that’s often overlooked. “It’s typically only looked at in existing buildings, not buildings under construction,” Brock says.

The effort has the potential to help not only with sustainability but with saving money, too. “We know it’s significant because we’re tracking it,” he says. “If we change the way we’re doing things we’re going to have a big impact.”

“Working for a big company sometimes it seems like it’s hard to do new things,” Brock adds. But the Innovation program is changing that for projects like his wallboard recycling initiative, and others as well. “It certainly allowed it to gain support within Lendlease, which in turn helps support the greater mission.”

“Everyone doesn’t have to be their own respective pioneers,” he says.
Data centers power our digital lives, using immense amounts of energy to connect people and information around the world. Now, LEED is helping the world’s top data companies find new paths to energy efficiency.

BY LORNE BELL

If you’ve ever left a running laptop on a surface for too long, you know the kind of heat that it can generate. Now imagine that amount of heat magnified by ceiling-high server towers that fill buildings the size of football fields. Data centers are designed to run 24 hours a day, every day of the year.

Powering and cooling these information hubs requires massive amounts of energy—consider that one data center can use as much energy as a small town. Cumulatively, data centers across the U.S. used 70 billion kWh of electricity in 2014, according to Lawrence Berkeley National Lab’s Data Center Energy Usage Report. That’s about 2 percent of the nation’s electricity, the same amount used by some 6.4 million U.S. homes.

To mitigate the environmental and financial costs, companies such as Apple, Facebook, and Digital Realty Trust are turning to the U.S. Green Building Council’s (USGBC) Leadership in Environmental and Energy Design (LEED) rating system. While LEED standards have been available to guide the sustainable design and construction of data centers for years, a new adaptation in LEED v4 specific to the space type is addressing the unique needs and circumstances these projects face.

The new data center guidance was crafted with input from and for the big data industry, a process that began in 2012. “We were starting to see this growing section of the market with more and more data centers out there, but our LEED certification numbers weren’t reflecting that,” says Corey Enck, vice president of LEED technical development.
So, Enck and his colleagues convened a working group of more than a dozen data industry leaders—data company owners, developers, designers, and contractors—and asked a simple question: What are the barriers in the LEED ratings system that are preventing data centers from certifying?

The group responded enthusiastically, pointing to data centers as energy intensive facilities unlike any other building covered under LEED. For one, the energy requirements of data center equipment surpass the requirements of even large commercial buildings’ equipment. Data centers also have far fewer occupants than commercial or residential buildings of similar size, so LEED credits for indoor air quality were often irrelevant. And water efficiency can be a significant factor in data centers’ sustainability profile, as cooling systems often circulate water to regulate indoor temperature.

“Data centers have so many nonstandard energy uses,” says Enck, “that LEED didn’t have the baseline for those projects to show how they’re actually saving energy.”

Out of the group’s work came two adaptations with modified benchmarks for data centers’ unique characteristics and challenges. The adaptations apply to new (LEED for Building Design and Construction) and existing (LEED for Operations and Maintenance) data centers, and focus on four key areas.

First, data centers can now more easily evaluate their energy models to earn LEED credits. The new guidelines take into account Power Usage Effectiveness (PUE), a data industry measure that tracks IT equipment energy loads as a proportion of a data center’s overall energy use. By incorporating PUE, the data centers adaptation allows owners, developers, contractors, and LEED reviewers to readily observe energy and cost savings.

Next, the commissioning credits require a commissioning agent with experience in overseeing data center design and construction. This ensures a fair commissioning process suited for data centers’ unique design elements.

USGBC also adapted LEED’s Indoor Environmental Quality (EQ) credits for data centers’ low occupancy rates. Under this category, thermal comfort credits do not apply as broadly to data centers’ spaces, and enhanced indoor air quality credits no longer require filtration of the outside air to be at the same level required for other LEED-certified buildings.

Finally, the new Cooling Tower Water Use Reduction credit addresses water in cooling towers, which are often used to moderate temperatures in data centers’ server rooms. The new benchmark acknowledges data centers’ large cooling capacity and provides LEED credits for achieving water efficiencies within these systems.

The new adaptation is already having an impact on the market. Under LEED v2009, data centers comprised just 3 percent of LEED-certified projects. Under LEED v4, that number jumped to 15 percent of projects certified under BD+C are data centers.

LEED for data centers comes at a pivotal point in the data industry, which is seeing exponential growth in global demand. According to Cisco, annual global IP traffic will reach 3.3 zettabytes by 2021. In 2016, the annual rate was just 1.2 zettabytes. Put simply, by 2021, households will consume almost three times as much online data as they did five years earlier.

At the same time, data centers are actually becoming more energy efficient by experimenting with new technologies and sustainable designs. They’re locating buildings in cooler climates, replacing central heating and cooling plants with ductless distribution systems, and improving IT hardware to allow servers to function at temperatures of 85°–90°F, rather than the typical 70°F. LEED-certified data centers are both fostering energy
efficiencies and incorporating benchmarks, such as sustainably sourced construction materials, diversion of landfill waste, and stormwater recapture to provide backup water supplies.

The results? While data center energy consumption grew 90 percent from 2000 to 2005, it only grew 24 percent from 2005 to 2010. Despite a boom in new data center construction, data center energy use grew by only 4 percent from 2010 to 2014. And LEED-certified data centers are reducing their overall environmental impact in the communities where they're built.

For Apple, LEED-certified data centers are part of the company's commitment to powering corporate buildings and retail stores with 100 percent renewable energy. In 2010, only 16 percent of Apple's buildings were fueled by renewable energy. That number is now at 96 percent, and all of Apple’s data centers run entirely on renewables.

That includes a fleet of LEED Platinum data centers in Oregon, Nevada, and North Carolina. At Apple's Prineville, Oregon, facility, wind and micro-hydro projects generate 99 percent of the data center's energy load. In North Carolina, Apple's LEED Platinum data center generates 60 to 100 percent of its daily energy use from solar arrays and biogas fuel cells. To cool its servers, the facility uses outside air and a waterside economizer at night and during cool-weather hours, which allows the chillers to be turned off 75 percent of the time.

Facebook is also taking advantage of the energy-efficient and sustainable strategies of LEED. The social media company opened its first LEED Gold data center in 2011, and the project (also located in Prineville) used 27 percent recycled material for the building's construction. The 300,000-sq-ft facility also recycled 83 percent of its construction waste, diverting 530 tons of waste from landfills.

The center itself includes energy-efficient servers, and the heat generated by its servers is used to heat the data center's office space. The building features a low-energy evaporative cooling system, which uses central Oregon's high desert setting and low humidity to eliminate traditional air conditioners.

Overall, the Facebook Prineville center uses 70 percent less water for cooling purposes than an average data center and 28 percent less energy.

Facebook has since opened several other LEED-certified data centers, including the company's first European data center in Lulea, Sweden, in 2013. The 300,000-sq-ft LEED Gold facility uses hydro power and taps the region's frigid climate to cool its servers. That means big savings, according to California-based DPR Construction, which has
built several Facebook data centers and collaborated on the Lulea facility.

Christopher Gorthy, project executive at DPR, says even incremental improvements in data centers’ massive power loads can make a significant impact.

“If you have a 100,000-square-foot data center, it may draw millions of dollars in power in a year,” says Gorthy. “If you save 1 percent of that power, you’ll literally save hundreds of thousands of dollars per year. So, it’s not just the right thing to do from an energy standpoint, but also for the bottom line.”

Since 2006, DPR has built $4.8 billion in data center projects, representing nearly 20 percent of the company’s overall revenue. “Companies want them built faster and faster,” says Gorthy, “so we’re building them at lightning speed. We just completed a 650,000-square-foot data center shell in less than seven months.”

One of DPR Construction’s clients is San Francisco’s Digital Realty Trust (DRT), which develops and manages 145 co-location data centers across 33 global cities. Colocation centers house more than one data company, so DRT uses LEED Core and Shell, which is designed for projects for which the owner or administrator has control of the design and construction of mechanical elements but not the tenant fit-out. In this way, DRT ensures basic energy efficiencies and sustainability benchmarks for construction materials, landfill diversion, and water use, and has set a goal of building only LEED Silver data centers.

Along with its LEED certifications, the company recently procured 400,000 annual megawatt-hours of energy generated from a wind farm in Texas, and it now uses a pumped refrigerant cooling system that requires no water to cool its data centers’ server rooms. The system allows DRT to drastically reduce its data centers’ water use and earn Advanced Refrigerant Management credits toward LEED certification. More than 600 of the systems have been deployed across DRT’s portfolio, including data centers in drought-ravaged California, saving 350 million gallons of water each year.

For Aaron Binkley, director of sustainability at DRT, sustainable design and construction are helping data centers keep pace in an industry that seems to have no top speed.

“Our starting point is to build a building that treads lightly on the environment and holds us accountable to a high standard, and LEED provides a consistent standard,” says Binkley.
LEED: A LEGACY
Leaders across the globe have made LEED the most widely used green building program in the world. Leave your legacy today.
#LEEDlegacy
SAFEGUARDING BRAZIL
Opening: The Amazon rainforest, covering much of northwestern Brazil and extending into Colombia, Peru, and other South American countries, is the world’s largest tropical rainforest.

Right: The Amazonas Sustainable Foundation (FAS) and SDSN-Armenia network open registration for the second edition of Amazon Summer School. The goal of the project is to provide a learning experience on sustainability, educating leaders for change.

Protecting the Amazon’s tropical rainforests has become a multidimensional affair with global implications.

Written by Kiley Jacques

Brazil is at the forefront of the BRICS nations—Brazil, Russia, India, China, and South Africa—and is home to a valuable environment serving a global population. The largest remaining area of tropical forest in the world measures just over 410 million Brazilian hectares, which are under immediate threat. Despite a hike in deforestation due to an increase in soy and beef consumption, Brazilian President Michel Temer has announced a 44 percent slash to the federal science budget, which has scientists concerned on multiple fronts—including the fate of the country’s rainforests; the cuts include removing many safeguards to prevent deforestation, such as monitoring sensitive biomes and investigating illegal logging and burning operations. The announcement comes at a time when the need for environmental monitoring is considered more urgent than ever before. After two decades of forward movement, the fear is rolling back Brazil’s achievements, which include fighting deforestation, preserving indigenous lands, and establishing conservation areas.

Environmental Advocates

However, an ever-growing network of individuals, communities, and organizations are taking action on multiple fronts to protect it. Among them is Gabriel Ribenboim, consultant on Innovation for Sustainable Development at Amazonas Sustainable Foundation (FAS). He describes the nonprofit’s mission as promoting sustainable involvement, driving environmental conservation, and improving the quality of life for communities and users of protected areas in the state of Amazonas, which is covered almost entirely by the Amazon rainforest.

Green Initiatives

Launched in 2008, FAS set out to implement an environmental stewardship public policy, which Ribenboim explains is a mechanism for paying the local communities that serve 16 protected areas comprising 10 million hectares (home to 40,000 people). “They are the guardians of the forest,” he says, noting that their stewardship enables ecosystem services to benefit both the local peoples and the world. Once they join the program, participants sign an agreement stating they will not increase deforestation in their area, and FAS supports them with new technologies and methods for increasing productivity under a sustainable management system—applied to both plantation farming and logging.

Tied to this monthly cash payment is the idea of sustainable involvement, which refers to a set of participatory processes focused on strengthening
relations between local communities and local ecosystems by recognizing and expanding social connections and commitments—cultural, economic, spiritual, and ecological—in order to establish sustainability on all fronts. “There is no way of doing such things without involving local communities and supporting and empowering them,” says Ribenboim, adding that all FAS programs are focused on bringing poor and marginalized people to the table rather than “putting them on the menu.”

Maria Francisca, a resident of Sustainable Development Reserve (SDR) Uacari is one such participant. “The arrival of FAS really changed the community, and greatly changed the way I value the [local ecosystem] because I can produce, sell, and live in cooperation with nature,” says Francisca. “I’m going to leave nature for future generations, and there is nothing better than knowing that you work with sustainability in your own community.”

**Advancing the Cause**

To push their mission forward, FAS facilitates community meetings to help decide where to invest resources on a yearly basis. One of the goals of these meetings is to improve quality of life for local peoples by increasing access to education, transportation, and communication services. Income generation is another topic of discussion at these meetings. “We support them in improving the production chain of their region,” says Ribenboim. “There are between 18 and 20 main production chains such as logging, Brazil nuts, vegetable oils, tourism, fishing, and many others.”

Grassroots organizing is yet another way in which FAS works to protect the environment and support local peoples. It provides trainings and hosts two annual seminars to bring together representatives and leaders from remote protected areas as well as those from Manaus, the state capital. Discussions and courses are meant to help monitor and improve the program by reviewing rules and strategies. The hope is to increase participation. “This is a very important component that helps to empower the local communities and local leaders,” notes Ribenboim.

Ultimately, it was decided that more could be done. “We saw that we needed to improve in the health and education areas,” says Ribenboim. To that end, they formed partnerships with Brazilian and foreign research institutes as well as corporations such as Samsung. Efforts have resulted in the development of Conservation and Sustainability centers, which are built in remote areas to provide infrastructure for government-supported public services. Each center includes an education lodge, a transportation system for students to get to the school, a research center
used by researchers from around the world, and a healthcare facility. “There have been a lot of positive results since 2008,” notes Ribenboim. “We now have nine of those centers in nine protected areas. And we support school programs in all other reserves.”

Those positive results are reflected in the words of Roberto Brito de Mendonça, a resident of the Tumbira Community in the SDR Rio Negro: “FAS brought health and knowledge into the community, and I have had the opportunity to do activities other than take out timber—to take advantage of the forest in another way, and work on community-based tourism. It was an opportunity that changed my life.”

**Enter GBC Brazil**

This is the point at which the country’s Green Building Council (GBC) entered the picture. “When we met Felipe Faria, CEO of Green Building Council Brazil, we invited him to join us on a field trip so he could better know the communities and the work we are doing there. He was amazed and said he wanted to do something,” recalls Ribenboim. Together they brainstormed ideas about how GBC Brazil could work with FAS. They considered ways in which FAS could benefit from Leadership in Energy and Environmental Design (LEED) certification, and gave thought to how GBC Brazil could benefit from the partnership.

Two ideas emerged. One was aimed at protecting and restoring natural habitats, which, up until 2016, meant funding for the National Fish and Wildlife Foundation (NFWF). Today, FAS is in a position to receive similar funding through a pilot Alternative Compliance Path (ACP) for the Habitat Preservation and Restoration LEED credit, which was set up as an incentive to decrease deforestation. It gives LEED project managers the option of donating to FAS to earn one point toward certification. “We are now working on a strategy to disseminate information,” says Ribenboim. “We are working on a video and a website explaining how [the] ACP works and how we apply these funds.”

The second idea revolves around Reducing Emissions from Deforestation and Degradation (REDD+), a United Nations Collaborative program launched in 2008 that builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP). The idea was to extend the reach of that program. “We are doing a good job in one specific protected area—the Juma Sustainable Development Reserve,” notes Ribenboim, explaining that the Juma project is the result of a partnership with Merit International that enabled the establishment of the first internationally certified REDD+ project in the state of Amazonas.
Green Building Component

A year later, in partnership with the World Bank, FAS developed a methodology under the Verified Carbon Standard (VCS) that can be applied to all of their deforestation projects. “The World Bank asked us to merge our methodology [with those being used in the Congo Basin] so we could have a broader adherence and could [address] different kinds of deforestation to reach more diverse territories,” explains Ribenboim, noting a reduction in greenhouse gas emissions from deforestation as a direct result of the project.

After an initial review, it was determined that the methodology was too specific to the Juma project. It has since been expanded, such that any REDD+ project in the tropical rainforest can provide offsets. Additionally, the scope of carbon emissions has changed. Originally, offsets were strictly for electrical generation or consumption. Today, the ACP enables FAS to issue renewable energy certificates (RECs), which means LEED project managers can earn points by purchasing renewable energy to offset electricity-related carbon emissions.

“Here in Brazil we have a green building movement, and many of the big companies are doing their own emissions inventory based on the Global Reporting Initiative (GRI),” notes Ribenboim, explaining that part of the goal in creating the ACP was to force companies to supply a carbon emissions inventory for verification by a third party. Once verified, 100 percent of its emissions can be offset for two LEED points (or 50 percent for one point).

“The idea with LEED now is to have funds to apply to general schemes,” explains Ribenboim, adding that FAS’s annual report is meant to demonstrate accountability. “We want to really get this wheel rolling. We already have two buildings that are using the ACP.” The hope is that, in time, they will be able to designate all ACP-generated funds to one project to give it more specificity; that is, develop a project to its full potential to have the greatest impact. Ribenboim envisions the funds supporting one of the already implemented projects, one that could use further development.

“This partnership with [GBC Brazil] represents a historic opportunity to connect a sector that is responsible for a significant share of greenhouse gas emissions with reduced deforestation in the Amazon,” explains Virgilio Viana, general director of FAS. “This is a practice that should be adopted in a broader manner by different sectors, and the fact that we have developed a mechanism for the construction sector has a very relevant historical symbolism. We hope it will become a successful instrument for both those who build and those who struggle to conserve the Amazon forest.”
Brazilian Nation

In 2006, Colombia, Brazil, and other developing countries approached the United Nations (UN) about then-named RED, and how it could work to provide global benefits. (The additional “D” was added to include degradation and the “+” refers to forest management, biodiversity, ecosystem services, etc.) “Things have been getting more exciting for us since the Paris Agreement,” says Ribenboim. “REDD+ is now again on the table but with more promises in terms of a worldwide method to support conservation.”

To date, Brazil is not part of the UN-REDD program. Though, when it was created in 2008, the state of Amazonas played an important role in both the UN and national discussions; and a bilateral agreement was made between some of Brazil’s Amazonian states, California, and Mexico. “There were a lot of things going on in terms of state discussions but the federal government was sitting back and watching—not making a solid effort to [support REDD+ projects] but also not burying them,” recalls Ribenboim. In time, agencies that supported REDD+ in Brazil put pressure on the government to start discussing its risks and safeguards. “We have a lot of discussions here on all levels—from state to federal . . . and more actions are being taken. We have a committee, a kind of task force, that the federal government put in place to analyze REDD+ schemes under the national approach.”

Ribenboim notes that things are uncertain on the federal front, but he remains optimistic with respect to “voluntary markets” that are working well, despite not having a fully developed national approach in place. Of FAS’s leading role in tackling the problems associated with Brazil’s deforestation, he says, “We were created as a new way of doing things in Brazil. . . . [and have] a strategy to keep things going. We have innovation in our DNA, we never stop inventing. . . We are an ongoing evolution.”

Education centers will be constructed to train and transmit scientific information on conservation efforts to local communities as well as to provide opportunities for the training of professionals specializing in biology, forest management, and environmental education, among other things.
For almost 25 years, ENERGY STAR and USGBC have joined forces to deliver more energy-efficient products, homes, and businesses. The results are all around us.

WRITTEN BY LORNE BELL
In 1992, the Environmental Protection Agency (EPA) launched a revolutionary program: a completely voluntary energy efficiency rating system for everyday home products. Instead of regulating the manufacturers of toasters, boilers, and air conditioners, the ENERGY STAR program grew its market through environmental awareness and the promise of lower utility bills.

The following year, 60 firms and a few nonprofit organizations gathered at the American Institute of Architects in Washington, D.C., for the first meeting of the U.S. Green Building Council (USGBC). While ENERGY STAR sought more energy-efficient home products, USGBC wanted a holistic rating system for energy-efficient homes and commercial buildings.

ENERGY STAR rolled out its energy performance systems for buildings in 1995, and when USGBC launched Leadership in Energy and Environmental Design (LEED) in 2000, the two programs brought energy-efficient, sustainable design to the mainstream.

“The evolution of the market has been centered around expanding expectations,” says Brendan Owens, chief of engineering at USGBC. “On making sure people are focused on outcomes that are more integrated than just, ‘What is the cheapest building I can build that satisfies the square footage and safety requirements?’ From a developer’s standpoint, that’s not enough anymore. It never was.”

Before ENERGY STAR and LEED, the prospect of paying more for an energy-efficient product or building was a nonstarter. But ENERGY STAR’s early market presence created “energy-efficiency advocates,” Owens says, and its brand recognition familiarized contractors and consumers with the energy and costs savings of LEED-certified buildings.

“The fact that there was a ready-made, industry-understood benchmark for us to leverage made our job easier,” says Owens.

ENERGY STAR and LEED have since become industry standards in energy efficiency and sustainability, respectively. More than 1.3 million homes have been ENERGY STAR certified since the program began. USGBC has seen a global boom in LEED registrations and certifications, with more than 90,000 LEED projects covering 19.1 billion square feet in 165 countries and territories. The two programs lead a green building industry that will account for more than one-third of construction jobs in the U.S. by 2018, and contribute more than $300 billion to GDP, according to a 2015 Economic Impact Study by USGBC, which was conducted by Booz Allen Hamilton.

The programs have also significantly reduced the environmental impacts of homes, businesses, and industries across the U.S. and the world. Twenty-five years after its launch, ENERGY STAR has saved consumers $430 billion on energy costs and prevented greenhouse gas emissions equivalent to 350 million vehicles.

LEED-certified buildings have been proven to use less energy and cost less to operate. Since 2000, LEED projects have diverted more than 80 million tons of waste from landfills, and by 2030 that number is expected to grow to 540 million tons.

Businesses in all aspects of real estate—developers, contractors, landlords, and homeowners—now seek both ENERGY STAR and LEED certifications for their projects. The two work in tandem to create spaces that are not just energy efficient, but improve the health, well-being, and productivity of occupants.

ENERGY STAR certification assesses a building’s energy use intensity (EUI), or the amount of energy consumed per square foot. That measure is compared to national data for buildings of similar use and size to create an ENERGY STAR performance score of 1-100. To earn ENERGY STAR certification, a building must achieve a score of 75 or higher, meaning it outperforms 75 percent of buildings when it comes to energy use.

LEED also takes into account energy efficiencies verified by ENERGY STAR’s certification. But LEED goes beyond energy use, layering in benchmarks for broader impacts on the environment and occupants such as indoor air and lighting quality, water-efficient...
heating and cooling, rainwater capture, sustainably sourced building materials, landfill waste diversion, and even proximity to public transportation, recreation, and green space.

The holistic combination of energy efficiency and sustainability means tenants and homeowners are willing to pay more for ENERGY STAR and LEED-certified buildings. In Los Angeles, a CoStar report found that while conventional buildings command an average of $2.16/square foot, tenants were willing to pay $2.69/square foot for ENERGY STAR certified buildings and $2.91/square foot for LEED-certified spaces.

Of course, utility savings and salability are just part of the picture. LEED-certified workplaces can decrease worker healthcare costs and increase their productivity. A U.S. Department of Energy study found that improving indoor air quality in a building reduces communicable respiratory diseases by 9 to 20 percent. And companies that adopt rigorous environmental standards are associated with 16 percent higher worker productivity, according to the *Journal of Organizational Behavior*.

For 2017 ENERGY STAR Award winners Verizon, Big Ass Solutions, EnergyLogic, Inc., and Salt River Project, the benefits of ENERGY STAR and LEED are well known. All four won the prestigious 2017 ENERGY STAR Award, and all four use ENERGY STAR and LEED to improve energy efficiency and sustainability for their companies and customers.

Dialing in the Savings

“Our utility bills are a huge annual expense item, so anything we can do to reduce our energy consumption is a good thing,” says Pam McKay, senior analyst for real estate operations at Verizon. “And since we have so many customers going into our retail stores across the country, we want to make those spaces as comfortable as we can, which is where LEED comes in, using materials that are better for the environment and for our customers.”

Verizon, a Gold-level member of USGBC, won the ENERGY STAR Partner of the Year Award for Sustained Excellence in Energy Management. The company operates more than 1,000 retail locations, and it made a public commitment to seeking ENERGY STAR certification for 100 percent of its eligible stores. Currently, the wireless giant has more than 220 ENERGY STAR certified buildings and more than 320 LEED-certified buildings. More than 30 stores are certified through both programs.

Verizon’s 1.4-million-sq-ft operations center in Basking Ridge, N.J., is also both ENERGY STAR certified and LEED Silver. The building uses temperature sensors and energy management systems to monitor heating, ventilation, and air conditioning performance. The company controls the facility’s lighting schedules; tracks maintenance and service requirements; uses air handlers with variable frequency drives for energy-efficient heating and cooling; and has installed energy-efficient light-emitting diode and fluorescent T-5 lights. The building also includes a SunPower 374KW photovoltaic system and five ClearEdge Power PureCell 400KW fuel cell systems totaling 2.0MW of power.

Those commitments to ENERGY STAR and LEED are paying off in more than bottom line energy savings at Verizon. In 2016, the company reached its long-term goal of reducing its carbon intensity by 50 percent, four years ahead of schedule. And Verizon is using the programs’ clout to help it stand out from the competition.

“One of the great things that both ENERGY STAR and LEED give,” says McKay, “is a tool to showcase our buildings and locations that are doing well. It helps us know where we are, not just compared to other Verizon buildings, but compared to the entire industry. So, the bar is always being raised.”
Keeping Cows Cool

Competition for green bragging rights has helped make ENERGY STAR and LEED successful across industries, and it’s been a motivating force at Big Ass Solutions, a Silver-level member of USGBC, since the company built its first “Big Ass” fans for Kentucky dairy barns in 1999.

These days, Big Ass Solutions does much more than keep cows comfortable. The Lexington, Kentucky based company builds energy-efficient fans and lighting for homes and industry, from agriculture to aviation, sports venues to restaurants and commercial spaces. It won the 2017 ENERGY STAR Excellence Award for Product Design, and 100 percent of its eligible fans were ENERGY STAR certified in 2016.

Christian Taber, principal engineer for codes and standards at Big Ass Solutions, says ENERGY STAR and LEED provide trusted, third-party validation for the company’s products and buildings.

“They allow us to quantify and give us the ability to say, ‘I built this energy-efficient product or building, and there it is,’” says Taber. “We take a lot of pride when our name comes up over and over again as the most energy-efficient products.”
Big Ass Solutions’ own facilities are a case study in the cooperative potential of ENERGY STAR and LEED. In 2009, the company opened a state-of-the-art, LEED Gold research and development laboratory. The 44,000-sq-ft facility is designed for the unique requirements and challenges of testing fans that are up to 24 feet in diameter. The ceilings are 60 feet high, and heavy curtains divide the space into quadrants and retract for testing the company’s largest fans. Inside, engineers build full-scale replicas of classrooms, offices, residential rooms, and warehouses to measure airflow and distribution in real-life scenarios.

The company used its own ENERGY STAR certified fans to achieve LEED credits on the project, including Minimum Energy Performance; Optimize Energy Performance; Minimum IAQ (indoor air quality) Performance; Increased Ventilation; Thermal Comfort, Design; and Innovation in Design. The building now uses 35 percent less energy than a non-LEED building and 58 percent less water, and its construction sent 51 percent less waste to landfill.

When installing Big Ass products for clients, Taber and his crew take a similar approach. Over the years, more than 40 Big Ass Solutions team members have achieved LEED Green Associate credentials, ensuring that fans and lighting work in harmony with clients’ ENERGY STAR and LEED-certified buildings.

“For us, making a great ceiling fan is one thing, but that fan needs to be part of a bigger system,” says Taber. “The building side of ENERGY STAR and LEED tells us if we fit well into the overall design strategy to provide the lowest EUI or dollars per square foot or CO2 per square foot, whatever the metric.”

Train, Measure, Repeat
The task of predicting and measuring those metrics falls to companies such as EnergyLogic, Inc., winner of the 2017 ENERGY STAR Partner of the Year Award for Sustained Excellence for Home Energy Rater. To date, the company has verified 22,000 ENERGY STAR certified homes and almost 1,000 LEED-certified homes in its home state of Colorado. Last year, Colorado built nearly 4,000 ENERGY STAR certified homes and 16 million square feet of LEED-certified space, placing second on USGBC’s annual Top Ten States for LEED.

In addition to home ratings and energy audits, EnergyLogic is an official LEED education provider and has a team of LEED APs that train developers and contractors to meet LEED certification benchmarks. The company estimates it saves Colorado consumers more than $5.6 million annually and reduces yearly carbon dioxide emissions by 132,000 tons.

While investing in an ENERGY STAR or LEED-certified home used to be for those with “deep pockets,” says Jala Curtis, director of marketing at EnergyLogic, public awareness has changed that dynamic. “Over time, consumers have become more educated, understanding that long term, it’s not only going to help with the value of their homes but also decrease their utility costs and make for a cleaner environment,” says Curtis. “In our work in residential space, we often work on certifying compliance pathways for both ENERGY STAR and LEED certification on the same project.”

EnergyLogic worked with USGBC to pilot a streamlined LEED for Building Design and Construction: Homes and Multifamily Lowrise certification for production builders who participate in the Department of Energy’s Zero Energy Ready Home Alternative Compliance Path program (DOE ZERH ACP). The DOE’s program requires ENERGY STAR certification as well as the EPA’s Indoor airPLUS and WaterSense certifications, meeting many, but not all, prerequisites of LEED.
The new production builder protocol means builders can bank the points associated with each program and apply them, along with some gap-filling measures, to LEED BD+C: Homes certification. The goal is to help production builders bring LEED’s holistic design standards—from energy efficiency to water conservation to indoor air quality and waste management—to the buyers.

Denver-based Thrive Home Builders was the first to pilot the USGBC production builder protocol that EnergyLogic spearheaded. The company builds some 240 homes each year, and they used the DOE ZERH ACP points to achieve LEED Silver for two new model homes in Westminster, Colorado. The builder now plans to use the same process to certify all of its new homes under LEED v4, building spaces that are energy efficient and sustainably sourced and that provide a healthy indoor environment.

For Gene Myers, CEO of Thrive Home Builders, the decision to seek both ENERGY STAR and LEED certification came down to his customers.

“There are lots of reasons builders give for not doing these programs,” says Myers. “But the market is way ahead of the industry. Our customers are looking for purchases of all kinds—from food to homes—and they’re voting with their dollars for products that are constructed in ways that are aligned with their values.”

Delivering a Message
From the outset, ENERGY STAR and USGBC have understood the need for exponential market growth to make a meaningful impact on our natural and built environments. Companies such as the Arizona-based Salt River Project (SRP), the nation’s third largest public power utility, have been invaluable in that process.

SRP won the 2017 ENERGY STAR Partner of the Year Award for Sustained Excellence in Energy Efficiency Program Delivery. The company delivers a wide spectrum of energy to clients, including solar, natural gas, nuclear, hydro, biofuel, and geothermal energy. It is also one of the largest raw-water suppliers in Arizona, delivering about 800,000 acre-feet of water annually to a 375-sq-mi service area and managing a 13,000-sq-mi watershed.

But it’s SRP’s energy efficiency training and education that has changed Arizonans’ understanding of the value of energy-efficient buildings. The utility educates jurisdictions, developers, and residents about energy-efficiency codes and the environmental and economic payoffs of ENERGY STAR and LEED certification. They also help contractors navigate their way through constructing buildings that meet those certifications’ rigorous standards. “These energy efficiency certifications work together to help builders and customers find the right path for their project,” says Sharon Bonesteel, senior policy analyst at SRP. “That’s why the [credentialed] designers are so important. They can look at those different paths and find the one that makes the most sense for their project.”

Since 2013, SRP has helped builders and homeowners achieve ENERGY STAR certification for more than 23,000 homes, saving almost 345,000 MWh of energy. The driving force behind those numbers is SRP’s ENERGY STAR incentives, which have increased buy-in from towns, developers, and residents across Arizona. That buy-in drives down the price of
sustainable design and construction. “The purpose of the rebates is to move the market and execute a plan where the result is higher demand for energy-efficient products and certifications,” says Bonesteel.

Next year, SRP plans to implement a LEED incentives program to help builders and homeowners “kick energy efficiency up to the next level,” she says, rewarding sustainable design elements like orienting a building to take advantage of natural heating and cooling or locating a development near public transportation. And as builders field more questions from consumers about ENERGY STAR and LEED certifications, the Southwest’s market for sustainable design and construction will continue to grow.

That march toward greater energy efficiency—a journey tied to an educated and values-based consumer marketplace—has been the cornerstone of ENERGY STAR and of USGBC for nearly a quarter of a century. And though government support for particular programs may ebb and flow, the market for sustainable design and construction moves steadily forward.

Left: Sharon Bonesteel of the Salt River Project.
Top: Theodore Roosevelt Dam was originally constructed between 1905 and 1911 to control the erratic flow of the Salt River and to harness the water for irrigation. Theodore Roosevelt Dam and the Roosevelt Lake it forms are considered perhaps the crowning achievements of SRP. Photo: Sara Robinson
Good news or bad news first? Actually, it doesn’t matter. “The good news is, green building has become huge,” says Rhiannon Jacobsen, vice president of strategic relationships at U.S. Green Building Council (USGBC). “The bad news is … green building has become huge.”

The green building boom is obviously good for the planet, but it has also created challenges, as organizations across a number of different industries struggle to apply sustainability principles to their own distinctive sets of needs.

That’s where LEED User Groups come in. The groups—USGBC-hosted peer collaboratives where stakeholders from organizations within a single industry can share challenges, opportunities, and best practices around green building—are driving greater adoption of the Leadership in Energy and Environmental Design (LEED) rating system and spurring new thinking about sector-specific innovations.

“If you’re designing a green industrial manufacturing plant, it is not the same as an office space,” says Jacobsen, who oversees the user group program for USGBC. “It is not the same as a retail space, it is not the same as a hotel. We needed to meet organizations where they were, and they needed to meet each other where they were. They’re able to talk to their peers and collaborate directly with USGBC and [Green Business Certification, Inc.], and we’re able to build out a leadership bench within various markets.”

The LEED User Groups started in 2012 with the Industrial Facilities group. Based on that group’s success, the program has expanded to include half a dozen industries. The User Groups meet via conference call each month, and get together in person once or twice each year. Participants say the groups help them form new bonds within their industry, solve nagging problems, and amplify their voice.

“These are companies that are excited to be getting on the phone and talking with us, sometimes twice a month,” says Stephanie Mitchell, strategic relationships specialist at USGBC. “They’re excited to meet in person. They’re excited to participate in Greenbuild and participate in sessions that are directed to individuals in their sectors. It’s a different level of engagement.”

Origins

Around a decade ago, when Intel was first exploring ways to get its manufacturing facilities LEED certified, Taimur Burki says he had “no idea” what he was doing in regard to LEED: “I had taken some classes and read through the rating systems but the reality of trying to certify a semiconductor manufacturing campus, there was a huge learning curve.”
“It was much different than solely the normal focus of environmental engineering and compliance of focusing on air emissions, waste reduction and recycling, and water conservation and permitting, there was this huge section on energy and air flows which was not my background and I had to learn so much it was extremely humbling,” says Burki, now the global green building program manager for Intel.

At the same time, when project administrators came back to Burki with questions, he realized there were things they didn’t know, as well. Namely, Burki thought they seemed unaccustomed to working with industrial facilities. For example, Intel’s water conservation concerns centered mostly on things like wastewater reclamation and reuse, but LEED standards at the time were more focused on the efficiency of faucets and toilets.

“It was an ‘a-ha’ moment,” Burki says. “I realized they hadn’t dealt with semiconductor campuses that much.”

The experience gave Burki an idea. Perhaps the best way to learn about green practices for industrial facilities, he realized, was to talk to other organizations that built and operated similar buildings. At the 2011 Greenbuild conference in Toronto, Intel organized a dinner with around a dozen other organizations, hoping to kick off those conversations.

Now formalized as the LEED User Group: Industrial Facilities, the collective has been talking, learning, and sharing ever since. “The idea was, let’s share information and get better together,” Burki says. “One of the hardest things is getting hold of real data, real case studies, and being able to ask somebody, ‘Did that work as intended?’ We tend to know what we know, and we know how to do it well. But there’s all sorts of great information and new technology that other people try. If we all get together and share information, we can all get better together. That was the idea.”

**Sector-Specific Sharing**

Jefferson Thomas, director of Architecture and Technical Services for Virgin Hotels, says that participating in the LEED User Group: Hospitality and Venues is like having a “mini Greenbuild” every month, tailored specifically for the company’s industry.

“The USGBC staff members are out there to help you. They’re not trying to make it hard. Having direct contacts within USGBC that I feel I can call, and if they don’t know the answer, they can connect me to the right person. That’s invaluable,” says Thomas.

Thomas says he was also intrigued by a recent presentation on parking garage design. While attached parking is a necessity for most hotels being built today, Thomas says, those facilities may become obsolete...
long before the end of the useful life of a new hotel, depending how quickly car-sharing services and automation replace traditional car ownership. For this reason, some hotel chains are designing parking garages to eventually be adapted for other uses, or to serve many functions.

“If it’s incorporated into the hotel structure, you can’t demolish it, so you’d better put in the planning now,” says Thomas. “After that presentation, I’m changing our design standards. That’s the type of thing that a single corporation might not be thinking about, but the User Group opens you to new perspectives that would not typically come to mind.”

**Collaborating with Competitors**

One of the reasons that User Groups are unique is because organizations within a single sector typically see each other as competitors, and are reluctant to share insights with one another for fear of giving up a competitive advantage. But those walls begin to crumble when the conversation turns to sustainability, says Jacquelynn Henke, sustainability and innovation director for TD Bank, which participates in the LEED User Group: Retail and Restaurant.

“If we really all are working toward slowing climate change, why would I want to keep that a secret?” says Henke. “If I can share my lessons so someone else can scale their impact faster, that’s fabulous. We’re all working to reduce our environmental impact. If I can learn from you, and you can learn from me, that’s even better. I definitely feel a collaborative spirit.”

Thomas says that User Groups create a “common ground” for otherwise competitive companies. “When you have that common denominator,” he says, “it’s actually quite beneficial for us to learn from each other, rather than compete with each other.”

“When we did a kickoff event at Intel, our CEO came down to talk to us,” Burki recalls. “He said, ‘I don’t consider green technology to be intellectual property. We should all share and get better.’ I think all of us have that philosophy.”

“If you were going to ask us, ‘How do you make your products?’, no one’s going to give you that information,” Burki adds. “But if you say, ‘Have you tried off-grid solar light poles in your parking lots?’, we’ll say, ‘Yeah, we’ve tried them out, and it’s been great!’”

**Solving Specific Problems**

“Peer-to-peer learning is the only way the industry really moves forward,” says Sara Neff, senior vice president of sustainability for Kilroy Realty, a commercial real estate firm based in Los Angeles. “You have to be interacting with other people in the trenches who have figured out how to make things work.”
Even some of the answers gleaned from the User Groups that seem small can be incredibly valuable, because they allow companies to get things right the first time. For example, in the LEED User Group: Commercial Real Estate, of which Kilroy Realty is a member, participants picked each other’s brains about whether air quality testing should be outsourced or done by in-house engineers.

“Calibrating the air quality testing equipment can be tricky, it’s actually quite difficult, and if it’s not calibrated correctly, the data is meaningless,” Neff explains. “It’s better to spend the extra money [outsourcing] and not eat up all of your goodwill with your engineers by making them waste valuable time on tests that aren’t valid.”

“Unfortunately, because we are so spread out across the country, we don’t see each other all that often [outside of User Groups],” Neff adds. “Yes, we could call each other up and ask these questions, but it’s hard to do with our busy schedules. The User Groups are just one more opportunity to do that kind of sharing.”

Forging New Connections
Green building professionals are busy. Many of them act as the only people in their organizations responsible for sustainability—or else they have a small staff to manage—and accordingly, they can be skeptical of anything that places new demands on their time.

But Henke says that the benefits of participating in User Groups are definitely worth the time and effort. “You always wonder if one more hour spent out of your week on a conference call is going to be time well spent,” Henke says. “But after the first couple [of calls], it was very clear to me that it was.”

“You’re forming a really good network within your industry peer group,” Henke adds.

“You’re hearing the perspective of people who are building at the same scale as you are, and who are facing similar construction challenges and building challenges and opportunities. It’s great to be able to connect and talk about this more in depth.”

“It’s a nice calm time when you can have a conversation,” says Neff. “At Greenbuild, I have 8,000 people I want to see, and therefore I have 8,000 45-second conversations. Which is great. But [the User Group] gives you a chance to do a deep dive, which is not something I get to do very often.”

“I’m always looking to grow my network,” says Hatcher. “I think it would be great to develop a relationship where we can pick up the phone and call each other to talk through issues or information.”
While large green building events are good networking opportunities, Hatcher says, those events are often filled with people seeking business opportunities that don’t necessarily align with an organization’s goals. “The participants in the User Group are all in it for similar reasons,” she says. “We’re all coming at [sustainability] from the same place.”

A Pipeline to USGBC
One of the benefits of User Groups that participants mention most frequently is that the groups give them a way to quickly and easily communicate with USGBC when questions arise.

Hatcher, for example, says she hopes the group will be able to work with USGBC to complete some surveys or studies on the multi-family residential sector, which she says sometimes receives less attention than others.

Ian Knight, global site sustainability manager for Mars Incorporated, says he’s been impressed with the way participating in a User Group has made USGBC feel more accessible. “My impression of USGBC has been enhanced by knowing that they have this connection with users,” says Knight. “They engage, they listen, and they respond to concerns from organizations like ours, which I think is a credit to them.”

“Industrial facilities are a particular type of project,” Knight adds. “It’s much easier to build an office and comply with LEED and certify at a high level than it is with industrial facilities. Having a group to speak on behalf of organizations that are interested in deploying LEED for factories, and to compare notes, or to push back and say, ‘This part of the code isn’t working,’ I think is helpful. It gives more credibility if you have a group that says, we have an issue here or there.”

Learning Together
User Group participants say that peer collaboration has been especially useful during the transition to LEED v4. “It’s like starting over from scratch,” says Jennifer Taranto, director of sustainability for the global construction management and general contracting firm Structure Tone that belongs to another recently formed collective—the LEED User Group: Commercial Contractors. “There are new challenges that come with reeducating ourselves and the downstream supply chain, and trying to drive [changes] all the way down to the manufacturer.”

Taranto says the group “usurped” a recent conference call where a USGBC representative was walking participants through the construction waste management credit in the new LEED standards, which require three separate waste streams. “It was this eureka moment, where we all learned the same thing, and then we started to think through, ‘How are we going to do this?’” Taranto says. “We almost usurped what was happening on the phone call and went straight into problem-solving mode: ‘I can do this, but I can’t do that.’ ‘Do you know of manufacturers that have take-back programs?’ ‘How well do those work?’

“At the end of the day, all of our companies have a vested interest in green buildings,” Taranto adds. “But we know that the rating systems can sometimes be a pain point for our clients, who either don’t understand them or lament the costs. We want to make that process as painless as possible. Having everybody come to the table and discuss what they have done that’s worked well, or what they wish they would have done differently, has been really helpful.”

Above: Ian Knight of Mars, Incorporated.
Below: Jennifer Taranto of Structure Tone.
Students at Boston Latin School, established in 1635, are constantly reminded that their school is steeped in history. Every student learns Latin, a holdover from a long-ago time when the “dead” language was thought to be a necessary foundation for rigorous academic study. And when students enter the school’s auditorium, they look up at the walls and see the names of alumni luminaries who also appear in their history and literature textbooks: Ralph Waldo Emerson, John Hancock, Samuel Adams.

But while the school’s illustrious past is a point of pride, its current students are focused squarely on the future.

The school and its Youth Climate Action Network (Youth CAN) were named a 2017 Best of Green Schools honoree at the U.S. Green Building Council’s (USGBC) Green Schools Conference and Expo in Atlanta in March. Youth CAN was founded in 2007, and its efforts have resulted in a 28-panel solar array at the school, 350 trays of vegetation on the school’s green roof, a zero-sort recycling program that reduced waste by 50 percent, and a lighting retrofit that saves the city an estimated $33,000 in energy costs annually. Perhaps even more importantly, the students who lead and participate in the program have become highly engaged on environmental issues, even hosting an annual sustainability summit at MIT.

“It’s very much student led,” says Phoebe Beierle, green schools fellowship manager at USGBC. “These kids have blown me away over and over. They know what they’re doing is important, and they’re having fun solving problems together.”

Youth CAN traces its beginnings to—of all places—an eighth-grade history classroom at Boston Latin. Teacher Cate Arnold (who received “Coolest Teacher in the World” designation from the USGBC for her sustainability efforts at Boston Latin and traveled to Antarctica with the organization 2041 to study climate change) wanted her students to evaluate how the media covers controversial issues. So she showed her class the Al Gore climate change documentary “An Inconvenient Truth,” and then asked the kids to look at news coverage of climate change.

“They were appalled,” Arnold remembers.

Students wanted to take some sort of action, and decided to form a student club. Arnold held an initial information session at the school, expecting at first to draw a handful of interested kids. Instead, around 90 showed up.

**Latin Lessons**

Students at the country’s oldest public high school are organizing and advocating to combat climate change.

By Calvin Hennick
Within four months Youth CAN had held its first sustainability summit. A decade later, the students have all turned over twice, but the group continues to give kids a voice on climate and sustainability issues, as well as a platform to push for the greening of their own school building. The students have proven adept at organizing, fundraising, advocating, capacity building, and even marketing. One came up with a pitch-perfect tagline to describe Youth CAN’s efforts: “The Oldest School, The Newest Thinking.”

The centerpiece of the group’s work is the annual summit at MIT, which this year drew 240 kids from 37 different schools. After a keynote address, students broke out into workshop groups, where they learned about topics like renewable energy, youth activism, and social justice. Thirty exhibitors participated, with some just-for-fun activities sprinkled in with the more serious and educational. Greenovate Boston, an initiative of Mayor Marty Walsh to engage Bostonians around climate change, the Boston GreenFest show, and a regional composting and garden club all participated in the event, which also included a photo booth, face painting, live reptiles, and featured a performance by a clean energy-focused hip-hop act.

“It’s a really fun event,” says Ariana Rauch, who will be a junior at the school in the fall, and who has participated in Youth CAN since she was in eighth grade. “It’s great to lead a bunch of youth in environmentally themed activities and make them more aware of impacts on climate. I think it definitely educates and informs other students. They might know that climate
change is bad, but they don't know how they can work to solve the problem.”

Beierle says that teens respond better to events put on by their peers. She recently attended an event for kids that mostly featured seemingly endless speeches by adults, she says, which quickly bored the young audience.

“It’s so fun to see youth-planned youth events,” she says. “If you’re planning an event for young people, you’ve got to have entertainment. You can’t expect them to sit in their chair the whole time.”

Youth CAN’s reach isn’t limited to other teens. The students have made presentations to Boston’s mayor and school superintendent, and the Environmental Protection Agency, and have even traveled to Washington, D.C., to lobby their representatives in Congress.

“The advocacy and planning are important for me as a person entering society,” says Yanxi Fang, who will be a junior at Boston Latin in the fall. “I feel like youth as a whole are generally less valued than adults [by government officials], probably because we can’t vote. I think what youth have to do is show up in numbers. With a large group of people being active and being present at events, that shows that these future voters deeply care about this issue.”

Arnold estimates that Youth CAN students have brought more than $400,000 to the school and community through fundraising, grants, and competition prizes. Those efforts have resulted in tangible green improvements to the school, including the installation of water bottle refilling stations, a “living wall” in the cafeteria, and a hydroponic growing lab made from a recycled shipping container.

The group’s most ambitious project, which garnered national attention—including a Today Show spot—is a green roof for the school. Organizers of a French sustainability conference saw the Today Show segment and paid to fly a group of Boston Latin students and teachers to France to present at their event.

Students worked with design professionals to draft plans for the roof, which included outdoor classrooms, a greenhouse, and small wind turbines. The design was made part of the school’s strategic plan and capital campaign, but it likely would have cost around $5 million to build out, and as of now the green roof is limited to vegetation trays and solar panels.

A number of former Youth CAN participants have gone on to careers in sustainability, and some have even come back to present at the group’s annual summit. But even for alumni who pursue other careers, their experiences stay with them.

“Personally, I don’t plan on entering a field surrounding climate change or the environment,” says Jia Yu, a rising junior at the school and a Youth CAN participant. “However, I feel like it’s really important to be an involved citizen [on climate issues], and to make sure we don’t fail future generations.”
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Felipe Faria graduated with a law degree in 2004 and completed a master’s in economic and corporate law at Fundação Getúlio Vargas in 2007. He spent three years as the civil court negotiator in the city of Barueri in the state of Sao Paulo. Currently, Felipe is the CEO of the Green Building Council Brasil, an organization that has accelerated the greening of Brazil’s construction industry, making it one of the top five markets in the world for LEED and influencing large-scale projects such as the 2014 FIFA World Cup and the 2016 Olympic Games.

What is your greatest fear? Honestly, my greatest fear is a syringe. Which historical figure do you most identify with? Historical figures inspire me a lot. I would name Joan of Arc. Her determination, courage, and faith are impressive. Which living person do you most admire? Mr. Zé Luiz. He is an unknown hero who lives in a village located [in the] Amazon rainforest. He has an unbelievable ancestral knowledge and awareness about what really matters during our journey of life. And a two-hour conversation with him is enough to transform a life in a good way. What is your greatest extravagance? Purchasing an overpriced ticket during the 2014 World Cup quarterfinals in Brazil. What is your favorite journey? I love to travel around Brazil and I have amazing memories traveling abroad with great people from the green building movement. It is not easy to choose a favorite one. However, an experience that everybody needs is to visit the Amazon rainforest. What do you consider the most overrated virtue? Prudence. Sometimes we need to assume risks. Which words or phrases do you repeat most often? “Be the change that you wish to see in the world” – Mahatma Gandhi. I love this phrase. What is your greatest regret? I regret not continuing to practice martial arts, surfing, soccer, and piano. I now suffer when I return to any of these activities—especially when I play soccer against someone who is 15 years younger than me. No matter how busy we are, we always need to make time to spend with family, friends, and practice our hobbies. Which talent would you most like to have? I would like to sing. What do you consider your greatest achievement? My greatest achievement—alongside the 10 years spent working at Green Building Council Brasil—has been that green building has become the best business model in the Brazilian construction industry, no matter the sector or market segment. If you were to die and come back as a person or thing, what do you think it would be? A big migratory bird such as an eagle. I love the idea of visiting different places. Birds have a strong sense of fidelity. Birds also have a free and independent life, without being egocentric. What is your most treasured possession? My experiences are so far my most treasured possessions. For that reason, I force myself to make time to enjoy friends, places, hobbies, and family. Surrounded by good people you will have the best experiences. What do you regard as the lowest depth of misery? Ego. What is your most marked characteristic? Optimism. Who are your heroes in real life? Anyone who will teach me how to be the change that I wish to see in the world. What is it that you most dislike? Popular media vehicles that allocate a huge space in their channels to cover negative news instead of spending more time promoting and supporting those who are making positive changes for the benefit of all. What is your motto? A unique light beam is enough to put away various shadows. Keep your mind strong, be perseverant, and nourish positive thoughts and objectives. One person is enough to change the world, so imagine a group of professionals and companies that work collaboratively to focus on green buildings and communities. What will you have them put on your tombstone? Busy! Planning his return to Earth.
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