Award-Winning Coverage of Sustainable Construction, Products and Lifestyles

GREEN BUILDER®

July/August 2018 / www.greenbuildermedia.com

HARD CHOICES

In our annual Eco-Leaders issue, we honor a short list of building manufacturers who are facing Climate Change head on.

Green Builder® Media presents

SUSTAINABILITY Symposium 2019

THE DESERT SHALL BLOOM:
SOLUTIONS FOR A VERDANT PLANET

February 18, 2019
9:00 am – 5:30 pm

Artemus W. Ham Concert Hall
University of Nevada Las Vegas
Las Vegas, Nevada

A sincere thank you to our generous sponsors and partners for helping to make the Symposium possible!

Green Builder Media is delighted to announce the Sustainability Symposium 2019: The Desert Shall Bloom. For anyone who cares about green building, sustainable innovation, and climate action, this is truly a can't miss event.

Brimming with vision and ingenuity, the agenda features global leaders including:

- A welcome message from **Jeff Bridges**, Academy-Award winning actor and climate activist (yes, 'The Dude'!)
- **General Wesley Clark (ret.)**, four-star general, former Army Chief of Staff, Presidential advisor, and fervent climate action advocate
- **Bill Walton**, NBA All-Star icon and passionate sustainability enthusiast
- **Susan Kucera**, award-winning Director, Cinematographer, and Producer of eco-films including "Breath of Life" and "Living in the Future's Past" (co-produced with Jeff Bridges)
- **Gwen Migita**, Social Impact & Inclusion Vice President and Chief Sustainability Officer, Caesars Entertainment
- **Ron Jones**, Founder/President Green Builder Media and industry provocateur

NEW THIS YEAR! Green Builder Media will celebrate our annual Home of the Year Award winners, and our expanded Sustainability Award winners, at a festive dinner on February 17 at 6:00 p.m. at the exclusive Mr. Chow in Caesars Palace. Our renowned awards program recognizes the industry's most authentic, advanced, beautiful, sustainable projects and the professionals who design and construct them.

Space is strictly limited and by reservation only, so reserve your seat today! General admission for the Sustainability Symposium is $350. Register before October 1, 2018 using the Code EarlyBird and you'll receive a $100 discount. Tickets for the Sustainability Awards gala are $150.

To register for the Sustainability Symposium 2019: The Desert Shall Bloom, go to www.greenbuildermedia.com/desert-shall-bloom-2019

To enter a project into Green Builder Media's Sustainability Awards, go to www.greenbuildermedia.com/11th-home-of-the-year-call-for-entries

EDITOR'S NOTE

The Inside Scoop

By Matt Power
Editor-in-Chief

As Businesses Adjust, Americans Barbecue

The old reality seems to be collapsing around us. Can business-style planning convert Neros into Heroes?

IT'S EASY TO GIVE UP on our fellow humans these days. We're killing off most of the other large life forms on Earth. Heat waves, spurred on by runaway climate change, have nearly reached a temperature in Las Vegas where composite plastic decking begins to melt (**https://bit.ly/2v2Dhtn**).

It's not like we have no solutions at hand. Researchers inform us that we could reverse, or at least mitigate, this fast-unfolding global disaster. But to do so, we would need to change our behavior: Stop eating meat, have fewer children, build every home net-zero or better, stop buying palm oil, fly less and embrace urban lifestyles.

I'm increasingly of the mind, however, that people don't change until they have to. Worse, when they do curtail one destructive behavior, they often tally up their "green dividend" and spend it on other environmental indulgences.

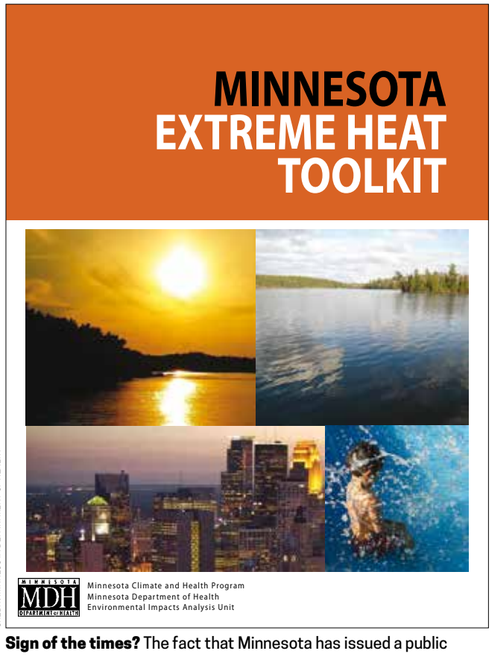
Unless—and oh, what a whopper of an "unless"—change is thrust upon them.

The same, oddly enough, is not always true of corporations. Business entities sometimes take existential threats more seriously than individuals. Their executives schedule regular meetings where they look at troubling trends and change course.

That's not to say all corporations are responsible. Many do much more environmental harm than good. But the companies selected for this year's Eco-Leaders recognition are out in front, among the first to "wake up" to the dire environmental threats facing all of us.

We're fortunate to work in the building industry, with its clear pathways toward sustainability. Shelter is a survival need, not a frivolous commodity. And almost every building product—from insulation to smart thermostats to bath fans and solar panels—has the potential to make housing more efficient.

As progressive companies embrace more-conscious use of resources and more-efficient products, they may not turn America's millions of Neros into heroes. But they'll be extending their own viability and relevance. **GB**



CREDIT: MINNESOTA DEPARTMENT OF HEALTH

Sign of the times? The fact that Minnesota has issued a public health guide on how to survive extreme heat shows how bad the situation has become—and how much worse is on the way.

With **great power** comes **great ventilation**

The next generation WhisperGreen® Select™ assures you'll meet code on every project. Field testing shows that .375" static pressure more accurately represents installed performance. While most fans don't have the power to overcome the .375" level, WhisperGreen® Select™ is purposely engineered for it.

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New grille design integrates a dimmable LED chip panel and night light. **CA Title 24 and JA-8 compliant!**

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REINVENTING VENTING

Panasonic is reinventing venting and helping green builders design beyond code

For green builders, "green" is more than just a trendy buzzword. Those who walk the talk know that building healthy, sustainable homes requires a passionate commitment that brings big responsibility.

Green building is not a passing fad. Based on the 2017 Zero Energy Residential Study, *Green Builder* recently reported that building starts of net-zero energy homes saw annual growth of 70%, more than doubling prior year performance. Yet, a legitimate green home needs builders and products that deliver on the promise of quality and performance.

2018 ECO-LEADERS Green Builder® Media

Panasonic®

Green builders declare: healthy indoor air quality is essential

One absolute for making healthy living a reality: good indoor air quality (IAQ). At a recent IAQ conference, some of the nation's leading green builders ranked the indoor air we breathe as important to our health as the food we eat. Who can argue?

Yet, contrary to popular belief, all ventilation fans are not the same. Testing by Lawrence Berkeley National Laboratory shows nearly half of all installed fans fail the required airflow standards outlined in ASHRAE 62.2.

For 25 years, Panasonic has developed innovative solutions that promote better indoor air quality and healthy home building. On their mission to help traditional home builders and installers meet code, they are enabling green builders to design beyond code to comply with the nation's strictest green building standards.

Now we know why Panasonic engineers its fans to perform beyond the minimum 0.1" and 0.25" static pressure benchmarks. All its ECM-motored fans are tested to overcome static pressure at the 0.375" level, more common on typical installations.

Their legendary ECM motor with SmartFlow technology provides optimum CFM output regardless of complicated duct runs, expelling unhealthy air and moisture quickly. This helps builders meet code and deliver healthy homes. Pick-A-Flow airflow selector lets you choose the CFM required to handle the job, ranging from 50-150 CFM depending on the model, giving you control over the home's indoor air quality.

That's Panasonic precision ventilation. Builders get the CFM rating they need and genuine installed performance. Backed by field-verified results, builders say Panasonic IAQ solutions help simplify design and installation, comply with green building codes and standards, and reduce callbacks.

REINVENTINGVENTING.COM

Building Data's New No. 1 Source: The Web

One in four consumers now get home improvement info off the internet.

THE INTERNET IS NOW the main way consumers obtain information about home improvement materials, surpassing the tried and true method of word-of-mouth from friends and family. And home improvement retailer websites are the most used online source of that data, according to a report by marketing firm Kleber & Associates.

Compared to a previous K&A study conducted nine years ago, online has jumped from 17 percent to 24 percent, moving it from third to first place in terms of resources. Reports tailored to customers were the only other resource to experience growth—rising from 4 percent to 7 percent.

On the other end of the spectrum, friends and relatives, through word-of-mouth, dropped from 23 percent to 20 percent in how often it was used as a resource. Materials such as books, magazines and home improvement television shows have also declined as key information resources.

The study notes that younger people in general use the internet more to gather information, with millennials being far more likely to use multiple online sources in their research. Generation X internet users have similar online research patterns, albeit less frequent. Members of more-mature generations—baby boomers and the Silent Generation—are the least likely to use how-to videos when researching.

CREDIT: CLAUDIO VENTRELLA/ISTOCK

Changing attitudes. Instead of family friendly Q&A, consumers now prefer to surf the web to get info about home improvement materials and green building trends.

From a marketing standpoint, these findings make the internet, professional consultations with contractors and consultation with friends and family by far the most important resources for communicating information and interest around building materials, the study notes. **GB**

'Super Wood,' Stellar Performance

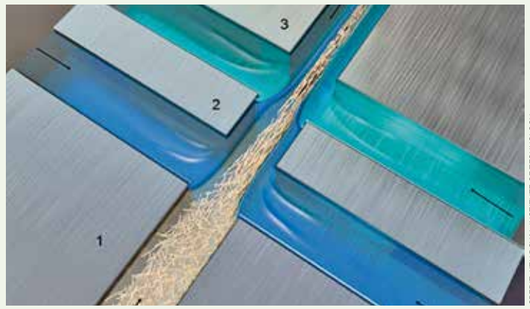
This modified biomaterial could become world's strongest building product.

SCIENTISTS AT KTH ROYAL INSTITUTE OF TECHNOLOGY in Stockholm have created a new biomaterial that they say turns regular wood into a "super wood" that is stronger than steel. The finding may one day change the way homes, multi-family residences and other structures are built, according to the institute.

The new densified wood—with a tensile strength four times more than steel and eight times stiffer—surpasses spider silk as the world's strongest biomaterial, KTH lead researcher Daniel Söderberg says. The fibers' strength exceeds that of metals, alloys, ceramics and E-glass fibers.

"This new engineered material can be used in many items including planes, cars and even furniture," Söderberg says. Additional research could lead to the product being used on larger structures such as residential and commercial buildings, he adds.

A study on the findings appears in the science journal *ACS Nano* (**https://bit.ly/2AoKcsb**).



CREDIT: KTH ROYAL INSTITUTE OF TECHNOLOGY

Natural power. Scientists have released data on a "super wood" made of compressed microfibers that rivals steel in terms of strength and durability.

KTH is not the first team this year to announce creation of a "super wood." In February, researchers at the University of Maryland released a report about a densification process that creates a structure that is 12 times stronger than regular lumber. **GB**

Study: Insulation Rising

With a boost from stricter building codes, the insulation market is expected to reach $70 billion by 2024.

RISING CONCERN pertaining to global warming along with high electricity bills will drive the overall insulation market to a record $70 billion by 2024, and to $36 billion in the residential market, according to a study by Global Market Insights (GMI) Inc.

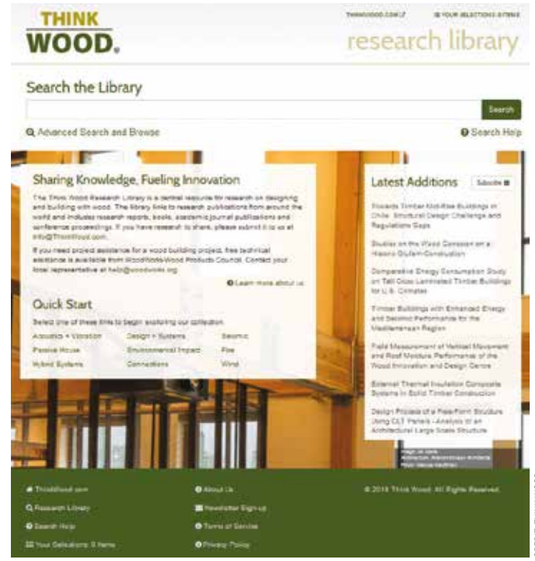
In addition, implementation of more stringent building codes to promote energy-efficient building construction by adding or replacing insulating materials in residential and nonresidential structure will drive industry growth. And, increasing adoption of new building techniques offering superior performance in line with upgraded building regulations will propel the product penetration rate, according to the study.

CREDIT: BRETT AND SUE COULSTOCK/FLICKR

Busier days ahead. In the next few years, the need for all forms of residential insulation is expected to be far greater than their already impressive levels, according a new market study.

The residential market will grow due to a "positive application outlook in residential buildings offering proper insulating requirements and sufficing the building codes laid by the regulatory bodies." There will also be an increasing demand for products that enhance energy efficiency and assist in energy conservation, the study notes.

The study resembles findings from another GMI study from February. That one predicted the rigid spray polyurethane market to surpass $1.1 billion by 2024. The growth will be the result of growing demand for energy-efficient and green residential and commercial buildings. Also, regulations require improved ways to cover cracks, gaps and holes in walls and ceilings, improvements that reduce air infiltration and improve performance. **GB**



CREDIT: THINK WOOD

Knowledge base. The Think Wood Research Library offers more than 900 articles and reports on research and design topics pertaining to the performance of wood in construction.

What's Wood Good For?

According to a growing research library, plenty—and there's more to come.

THE THINK WOOD RESEARCH LIBRARY, an online research tool on the benefits of lumber in construction, now offers more than 900 pieces of research to aid architects, engineers and other industry professionals in building safe, high-performing buildings.

According to a release from the association, certain topics such as fire safety lack research on how wood performs as a construction product. "While the fire performance of mass timber has been studied for many years and is broadly accepted for prescriptive design uses, more industry research and resources are needed to evaluate the material's structural fire safety when it is used for taller buildings or used with new mass timber technologies," says David Barber, fire safety engineer and principal at ARUP Libraries, a contributor to the site. "We are proud to help bridge this knowledge gap."

The research library also houses case studies, reports and research papers on a range of other design topics, including acoustics and vibrations, energy and environment, and building codes and cost.

The library (**https://research.thinkwood.com/**) was launched in 2017 in response to a call by industry experts and media for greater research on lumber usage, according to Think Wood. **GB**

Correction: Draft copy was mistakenly printed in these articles in the May/June issue. The corrected versions appear below and on page 9.

THE EVOLVING ROLE OF ASSOCIATIONS

APA – The Engineered Wood Association

There's more to this trade group than mere handling of wood.

"APA takes a hands-on approach to product and assembly testing. Evaluating conditions that replicate real-world construction scenarios often involves recreating similar conditions, and then using technology to induce stress, define weakness and identify critical design considerations. By repeatedly performing these tests, we are able to provide credible, definitive guidance and instruction to builders, designers, and regulatory officials on our wood product assemblies and their application in construction scenarios."

Ed Elias, President, APA - The Engineered Wood Association

FOR MORE THAN 80 YEARS, APA – THE ENGINEERED WOOD ASSOCIATION – has focused on helping the industry create structural wood products of exceptional strength, versatility and reliability. Combining the research efforts of scientists at APA's 42,000-square-foot research center with the knowledge gained from decades of field work and cooperation with its member manufacturers, APA promotes new solutions and improved processes that benefit the entire industry.

APA is a nonprofit trade association that has grown and evolved with the engineered wood industry. APA was founded in 1933 as the Douglas Fir Plywood Association, and was later recognized as the American Plywood Association. In 1994, APA changed its name to APA – The Engineered Wood Association to better reflect the range of products manufactured by APA members and the international scope of the Association.

Its members are well-known manufacturers whose mills produce the majority of the structural wood panel products made in North America, plus a host of engineered wood products, including glued laminated timber (glulam), wood structural panels, wood I-joists and structural composite lumber.

APA has a long and extensive history in building codes and standards development activities. It serves as the secretariat for the standing committees of U.S. Product Standard PS 1 for Structural Plywood, the consensus softwood plywood standard, and Voluntary Product Standard PS 2, the U.S. harmonized performance standard recognized under the U.S.-Canada Free Trade Agreement. APA has developed many performance standards over the years, including plywood siding, wood structural panel and sheathing, glulam, wood I-joists, rim board, and cross-laminated timber (CLT). APA issues *APA Product Reports* designed to help manufacturers expedite market entry of their products.

APA provides builders, designers and specifiers with a wealth of information, from basic construction instructions to highly technical data, for a variety of residential and commercial building applications. APA's Help Desk, Resource Library, and field representatives provide a diverse range of support—from the basics of building structurally sound floors, walls, and roofs to recommendations for complying with stringent energy and code requirements to special design considerations for areas prone to extreme conditions, such as high wind, seismic activity and moisture intrusion.

APA and APA EWS trademarks are the manufacturer's assurance that the engineered wood product conforms to manufacturing and product performance standards shown on the trademark. The mark appears only on products manufactured by APA members committed to APA's rigorous program of quality inspection and testing.

FACTS

NUMBER OF MEMBERS: 172

MEMBER BREAKDOWN: Engineered wood product mills in 23 states and seven provinces

HEADQUARTERS: Tacoma, WA

WEBSITE: www.apawood.org

NUMBER OF ACTIVE SITES: N/A

KEY SERVICES OFFERED: Development of performance standards for building products and tools; creation of product reports to help engineered wood product manufacturers expedite market entry of their goods; provide highly technical educational resources to residential and commercial building professionals; free on-site consultancy services on the latest construction techniques and code requirements pertaining to engineered wood.

MISSION: APA has focused on helping the industry create structural wood products of exceptional strength, versatility and reliability. Combining research efforts of APA scientists with knowledge gained from decades of field work and cooperation with member manufacturers, APA promotes new solutions and improved processes that benefit the entire industry.

CREDIT: APA – THE ENGINEERED WOOD ASSOCIATION

Picture perfect. Numerous informational tools have helped Sukonik Building Company complete projects such as this ultra-modern, two-story residential home.

ROLE MODELS

The Sukonik Building Company, Limerick, PA

BROTHERS JON AND NEIL SUKONIK were already enthusiastic about energy savings for their homebuyers. The goal of the co-owners of Sukonik Building Company **(www.sukonikhomes.com)** in Limerick, Pa., was to economically build a structurally sound home with the meticulous detail they were known for, while simultaneously minimizing energy costs.

The Sukoniks knew efficient equipment and lighting, as well as proper air sealing and mechanical design, would play a role in meeting their goal. They also knew they needed to put more insulation into their homes without adding costs or jeopardizing structural integrity. But they needed extra advice on framing.

Advanced framing techniques would enable them to improve the energy performance in their homes by increasing the volume of insulation. The increased insulation would also help the Sukoniks meet more-stringent energy codes and gain an advantage over their competition.

APA engineered wood specialist Mary Uher met with the Sukoniks and their architect/build teams, as well as the local code officials, to walk them through advanced framing techniques and provide consultation as needed. The additional training in green building became an important part of the Sukoniks' construction philosophy and crucial to improving energy efficiency.

The APA offered other benefits. There was a wealth of information, from basic construction instructions to highly technical data, for a variety of residential and commercial building applications. And, APA's Help Desk, Resource Library and field representatives provide a diverse range of support—from the basics of building structurally sound floors, walls and roofs to special design considerations for areas prone to extreme conditions, such as high wind, seismic activity and moisture intrusion.

CREDIT: APA – THE ENGINEERED WOOD ASSOCIATION

Building brothers. Neil Sukonik (left) and Jon Sukonik (right) used advice from APA – The Engineered Wood Association to improve home framing techniques and gain a stronger foothold in their local market.

"APA's members benefit from our work in the field as we strengthen the engineered wood market through training and education," APA Marketing Communications Manager Heather Rasmussen says. "When our member mills' products are properly specified and installed, customers are happy with the results."

Green Builder Takes Gold (Again!)

Hello, readers—

Green Builder® Media has enjoyed many successes since its inception in 2005. It hasn't always been easy, but we've earned awards, produced extraordinary events and demonstration projects, and amassed an amazingly committed audience of like-minded thought leaders and influencers. That's why it's exciting and humbling when our team is recognized for its tireless work. *Green Builder* magazine's "Best Residential Trade Magazine" award for the sixth year in a row from the National Association of Real Estate Editors (NAREE) is no exception.

The NAREE judges celebrated *Green Builder* as "a cleanly designed, straightforward and easy-to-read magazine about how houses can be realistically green without breaking the bank."

Creating something out of nothing is hard, and developing Green Builder® Media's portfolio of offerings has been a long and somewhat arduous road. Our company has certainly evolved since the unveiling of *Green Builder* magazine in January 2006.

When we launched, we carefully doled out information about green building products, practices, programs and certifications to a sometimes skeptical readership. But over time, the market transformed—awareness grew about the realities of climate change and diminishing resources; the recession altered the world's perception of expensive and dirty energy; and extreme weather brought issues like resilience and risk mitigation to the forefront—offering us the ability to advance our message, increase our impact and expand our reach.

Almost thirteen years later, we've grown our boutique business into North America's leading media company focused on green building and sustainable living. We have worked assiduously to be the leading edge of innovation, offering advanced editorial and pioneering ideas to our readers so that we could methodically shape a national dialogue about important sustainability topics and push the boundaries of our collective imagination. We know that whatever we can envision, our friends, colleagues and readers—pioneers in sustainability, themselves—will help us manifest.

Reinforcing the power of our mission-driven content, our editor-in-chief, Matt Power, also received a gold award for his article, "The Promises and Pitfalls of Plastics in Construction," in our November 2017 edition. NAREE judges called it "a comprehensive look at how plastics, which are such a detriment to the environment, can be used in a constructive manner for building materials. It's not a cheerleading story for the plastics industry but instead a well-sourced, well-written story about the topic. The photos, graphics and numbers help tell the story."

Power says receiving the awards from fellow journalists at NAREE "is terrific affirmation that we're doing work that resonates."

He adds that he was especially pleased about the plastics piece, as it's important for the building industry to get involved with solving the plastics crisis—and soon.

"What's exciting about winning this award now is that we're breaking all the rules," Power continues. "We're taking the magazine in directions that no other B2B magazine has dared—not just reporting events, but dishing out predictions about the future and influencing the market today with our editorial as well as our market insights. The American Dream is about to flip completely upside down as sustainability and resiliency become cost effective and necessary. We're thrilled to be heralding the shift."

What's next for Green Builder® Media? We'll continue to put out innovative editorial covering a broad spectrum of sustainable living topics, including Internet of Things, smart home technologies, energy efficiency, intelligent water, indoor air quality, resiliency, renewables and clean mobility solutions.

On behalf of the Green Builder® Media editorial and production team, I offer you, our loyal readers, a heartfelt thanks for our continued success year after year. I look forward to continuing this wild journey to the frontiers of sustainability with you.

SARA GUTTERMAN
CEO, Green Builder® Media

What's next for Green Builder® Media?

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MISSION STATEMENT: "Our mission is to effect meaningful, positive change for a better world. As advocates for sustainability, we provide mind-expanding information that catalyzes and inspires commitment to sustainable living."

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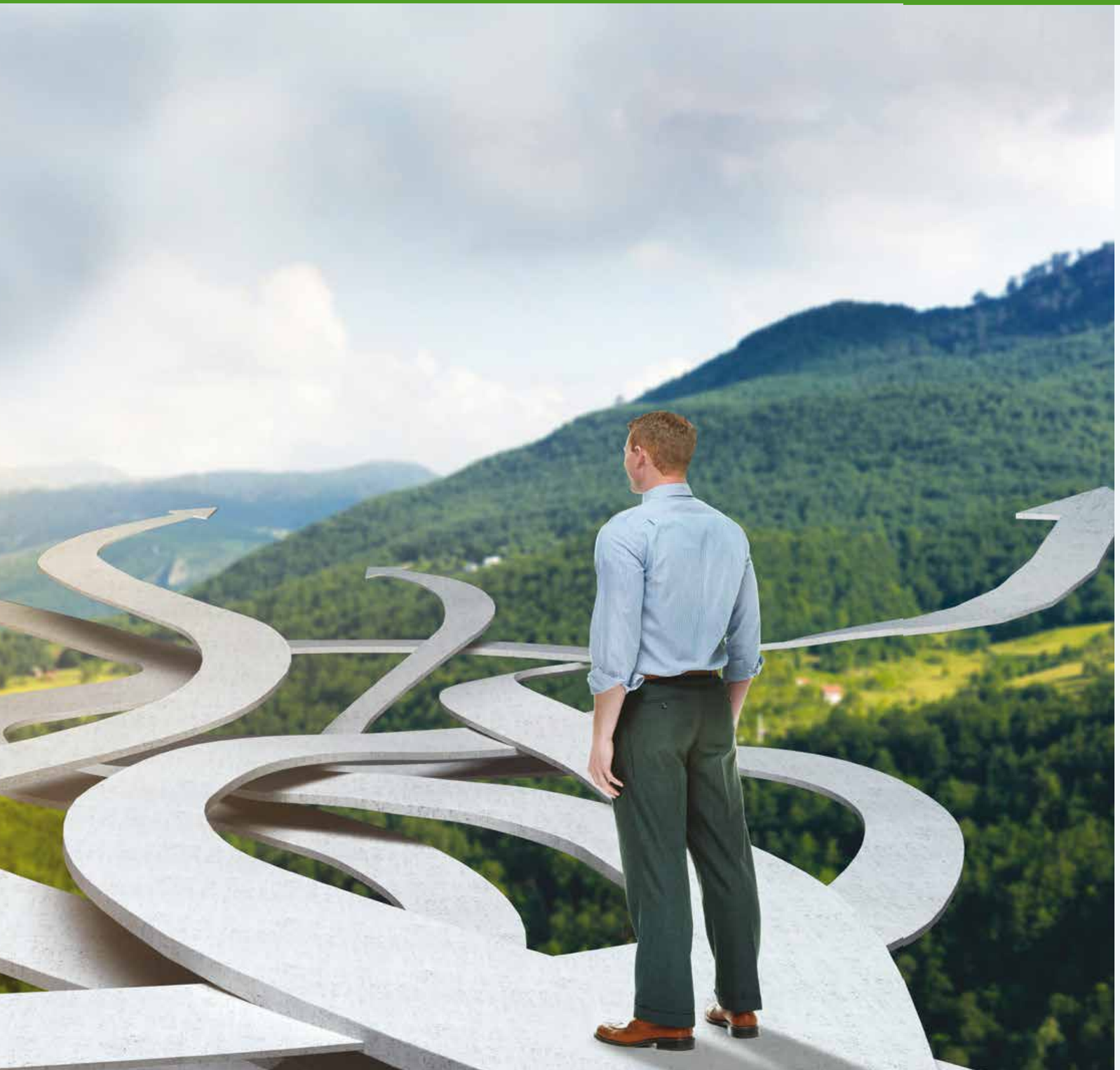
HERE'S A SAMPLE OF WHAT'S INSIDE

"It's not just about the environment and climate—it's about people in the environment. If we can keep that in mind, we'll be better builders for it." **(PAGE 35)**



2018 ECO-LEADERS
Green Builder® Media

Hard Choices

This year's Eco-Leaders face a growing list of environmental challenges.

BY ALAN NADITZ AND GREEN BUILDER STAFF

WHAT'S THE NO. 1 WAY TO PROMOTE SUSTAINABILITY? For this year's Eco-Leaders, the answer is to focus on the task at hand, and do a better job–in terms of product design, transportation and manufacturing. For consumers, the benefits are many: Lower water bills. More-efficient heating. A lighter electric load. Cleaner indoor air. Less landfill trash. All come with a big "thank you" to the folks who set them on a greener path.

Some of the environmental trendsetters are veterans to our annual list, offering new examples of how they're leading the charge against climate change and other eco-hazards. Others are newbies making the roster with their innovative green efforts.

There are the two surfers who turned a part-time job into a world-renowned bamboo furniture company. The porcelain tile manufacturer with a knack for reusing its product. A chemical-free wood flooring maker. And more.

This year's list also features a number of companies that are making continued progress in their efforts to take charge of how they handle the environment, or that are fringe businesses that you may or may not realize have ties to green building.

And then there are the change makers, corporate trailblazers who have personal reasons for leading the ever-growing green vanguard.

All these stories make for quite a full house. In an industry that relies upon how sustainably homes are built, that's a very good thing.

Specs-tacular. Hampshire College met its goal of building the R.W. Kern Center, a green classroom and administration facility, partly due to product Declare labels provided by ASSA ABLOY.

CREDIT: ROBERT BENSON

ASSA ABLOY Door Security Solutions

How safe is that building component? Just read the AADSS label.

*ASSA ABLOY Door Security Solutions offers a wide selection of door and hardware brands, as well as the services of consultative door opening experts for contractors, builders and end-users in multi-family, commercial, retail, government and institutional facilities. The parent company (**https://bit.ly/2osPXXg**) has 47,500 employees in 70 countries and is based in Stockholm, Sweden. The North America headquarters is in New Haven, Conn.*

IN KEEPING WITH its environmentally focused ideals, Amherst, Mass.-based liberal arts school Hampshire College wanted to construct a new, sustainably sensitive classroom and administration facility.

According to ASSA ABLOY officials, the R.W. Kern Center at Hampshire College was constructed in accordance with the Living Building Challenge (LBC), the built environment's most rigorous sustainability performance standard.

The intent of the LBC is to build structures free from harmful chemicals, protecting those who live and work within, builders, workers who produce the building materials, and the environment as a whole. To achieve this, a structure must avoid building products—including door openings—containing Red List chemicals, such as alkylphenols, asbestos, lead, mercury and wood treatments with creosote.

> "With global reach comes global responsibility. Sustainability is an important element in innovation, sourcing, production, employee development, in applying ASSA ABLOY's products and solutions, and in relation to external stakeholders."
> Amy Vigneux, director of sustainable building solutions, ASSA ABLOY

Achieving this goal requires selection of building products with transparency statements that openly list material ingredients. Finding products with transparency labels can be a challenge, according to ASSA ABLOY.

ASSA ABLOY helped the construction firm building the Kern Center, Wright Builders, by providing Declare labels that list material ingredients for its products.

"The labels allow architects, designers, specifiers and builders to know immediately whether or not the product will meet most green building guidelines, including the Living Building Challenge," says Andrew Solem, assistant project manager for Wright Builders. ■

They're an Eco-Leader because...

- ASSA ABLOY ensures suppliers are audited for their practices, products are designed with efficiency in mind, and manufacturing sites are reviewing their overall carbon footprints each year. This is done in addition to achievement of industry standards such as ISO 14001.
- Electrified solutions have been designed and delivered to use less energy and, in some cases, can be offered as a complete regenerative product—pulling no power from the grid.
- Exterior opening solutions offer superior protection against the transmission of heat and cold, providing efficiency, savings and overall load and footprint reduction.
- Door and accessory products have been GREENGUARD Gold certified, demonstrating low levels of chemical off-gassing—important for the health of people inside the built environment.
- As a way to support the greater demand for human health and product transparency, hundreds of ASSA ABLOY products offer information regarding their environmental and human health impacts, in the form of EPDs, HPDs and Declare labels.

AZEK Building Products

Heavily recycled content means lighter environmental impact.

AZEK Building Products develops premium, low-maintenance exterior building products. Available worldwide, the company's product lines include AZEK Deck, Rail, Trim, Moulding, Porch, Pavers *and* Adhesives, *as well as capped wood composite decking and railing under the* TimberTech *name. AZEK Building Products (**https://azek.com/**) is a division of The AZEK Company, headquartered in Chicago.*

AS THE LOW IMPACT DEVELOPMENT (LID) water management approach continues to become a norm, projects involving retrofits include a difficult task: applying LID practices to fully developed urban areas.

There's no disagreement by officials at the Living City Campus (LCC) at Kortright in Vaughn, Ontario. Operated by the Toronto & Region Conservation Authority (TRCA), LCC serves as an educational hub where people gather to learn research, demonstrate and become inspired by technologies and practices that help build sustainable city regions. But implementing LID measures for stormwater runoff were difficult due to limited space around the facility.

> "AZEK owns proprietary, state-of-the-art manufacturing that turns recycled plastics into high-performance materials, allowing us to accept materials that most manufacturers cannot work with."
> Bruce Stanhope, vice president of research and development, AZEK Building Products

TRCA opted to test a variety of stormwater management methods within the campus parking lot, including the use of permeable pavement. AZEK *Permeable Pavers*, made with up to 95 percent recycled tires and various plastics, were installed in a 1,200-square-foot section of the parking area.

According to AZEK officials, ongoing tests have evaluated the pavers' effectiveness for runoff and water quality control, maintenance needs and how they endure Ontario's climate. Two years later, they have "shown excellent runoff reduction, with the highest surface infiltration rate of all the interlocking paver products examined, as well as good water quality."

The Sustainable Technologies Evaluation Program (STEP), which is conducting studies on the use of permeable pavements, concurs with AZEK. "Not only are these permeable alternatives as strong as conventional types of pavement, but when properly installed and maintained, they can last for over 20 years," STEP notes. "[And] by providing opportunities to infiltrate stormwater, these technologies help to remove pollutants, replenish groundwater resources and reduce the risk of flooding and stream channel erosion." ■

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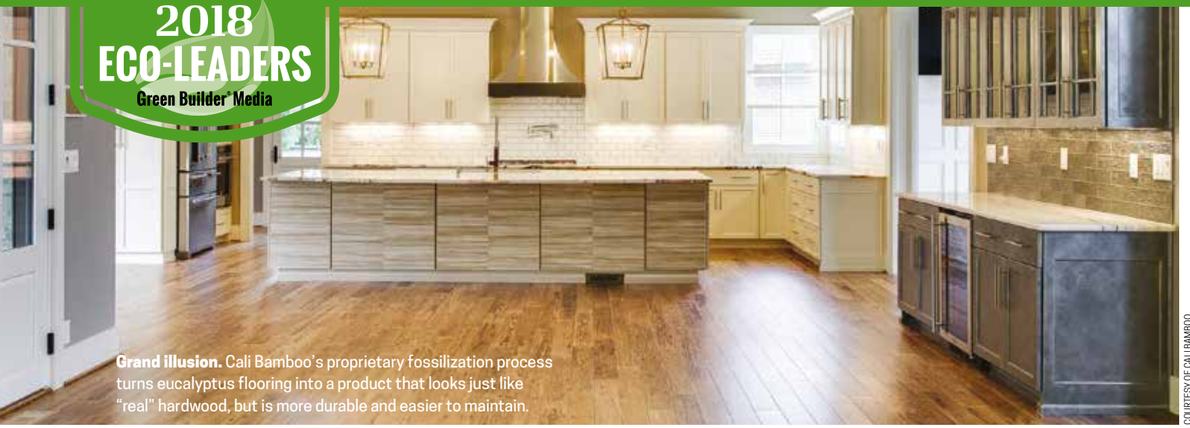
COURTESY OF AZEK BUILDING PRODUCTS

Rain guard. If you're wondering where your old tires went, just look below your feet, where more than 1.6 million became composite pavers to help control stormwater runoff in 2017.

They're an Eco-Leader because...

- AZEK Building Products' proprietary, evolutionary manufacturing process transforms recycled plastics into high-performance materials that manufacturers can readily work with.
- The company has strengthened its commitment to reduce plastic and rubber pollution every year, with its key product *TimberTech* on a path towards a 100 percent recycled core.
- AZEK *Composite Pavers* are made from up to 95 percent recycled materials. In 2017, 49 million gallon-sized containers and more than 1.6 million tires were used to make the product.
- AZEK Building Products decking saves more than 100,000 trees annually as a sustainable alternative to wood decks and house trim.



Grand illusion. Cali Bamboo's proprietary fossilization process turns eucalyptus flooring into a product that looks just like "real" hardwood, but is more durable and easier to maintain.

COURTESY OF CALI BAMBOO

Cali Bamboo

This manufacturer maintains a high, educational profile.

*Cali Bamboo manufactures and promotes the use of sustainable building materials as viable alternatives to traditional wood-based products. The company (**www.calibamboo.com**) specializes in composite decking made of reclaimed wood fiber and recycled plastic, eucalyptus flooring and engineered hardwood flooring made with a sustainable wood core. Cali Bamboo is headquartered in San Diego and has distribution centers in Los Angeles, Pennsylvania, South Carolina and Hawaii.*

CONVENTIONAL HOUSEHOLD PRODUCTS and services have never been on Cali Bamboo's agenda. The company's founders, Jeff Goldberg and Tanner Haigwood, didn't even plan to go into the business of turning bamboo into furniture. That epiphany came in 2003, when the two men took up part-time work in Hawaii chopping bamboo to help pay for a year-long surfing trip.

Bamboo, they realized, is the fastest-growing plant on Earth and is rapidly renewable. It can be continuously re-harvested every three to five years without damage to the plant or its surrounding ecosystem. It could also help reduce global warming and save animal habitat loss—the No. 1 cause for extinction.

> "I see Cali Bamboo doing today what a lot of people in the industry are trying to do. I think we are leading this fantastic industry into its future, and it's very exciting to be on the front side of that."
>
> Doug Jackson, CEO and president, Cali Bamboo

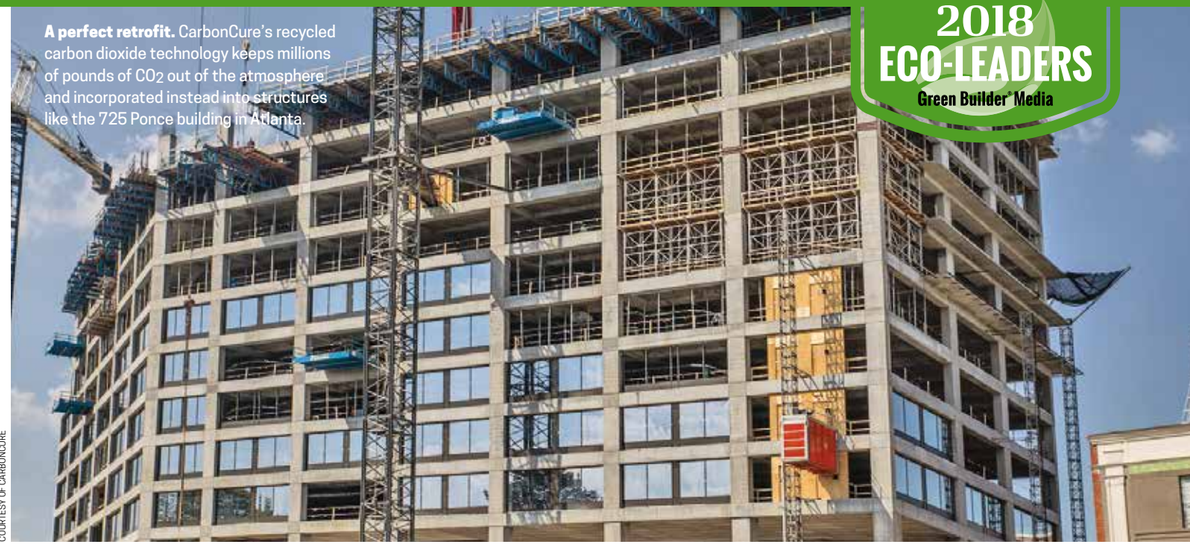
Fast-forward to 2018, when Cali Bamboo made Inc.'s list of 5,000 Fastest Growing Companies for a 10th straight year. Attribute much of that growth to television, which is the company's best friend. Cali Bamboo's products have appeared on *Extreme Makeover: Home Edition*, MTV's *Real World*, DIY Network's *House Crashers*, *The Vanilla Ice Project*, Animal Planet's *Treehouse Masters*, and the Travel Channel's *Hotel Impossible*, to name a few.

The company returns the favor. It regularly donates to community nonprofits, sometimes in unorthodox ways: In 2016, Cali Bamboo sponsored a Green Against the Machine benefit concert that raised more than $10,000 for local charities. That morphed into the Endless Summer Session in 2017, which raised $20,000 more.

"This isn't just about making a quality product—although that certainly helps," Cali Bamboo President and CEO Doug Jackson notes on the company's website. "Cali is in this very unique position where, despite our omnichannel reach today, we have spent almost 14 years fostering a close relationship with our customers. That relationship enables us to anticipate needs and trends faster, and keeps their satisfaction at the forefront of everything we do." ■

They're an Eco-Leader because...

- In its 14-year history, Cali Bamboo's promotion of sustainable building materials has saved more than 1 million trees by using renewable materials instead of traditional lumber, kept more than 50 million pounds of CO_2 out of the atmosphere, and saved more than 21,000 acres of habitat by diverting logging in natural forests.
- Recent green product lines include *TruOrganics*, a composite decking that combines reclaimed wood fiber with recycled HDPE plastic to create a decking product that never has to be sanded, sealed or stained; *GeoWood*, which layers sustainable bamboo over a limestone composite core to create an easily installed, maintained and budget-friendly flooring; and a recently launched a line of sustainably made area rugs, woven out of highly renewable jute fiber, upcycled fabric from the garment industry, and PET yarn made out of recycled drinking bottles.
- Cali Bamboo is an active sponsor of environmental non-profits such as the Surfrider Foundation, to which it donates thousands of dollars each year to support the organization in its protection of the world's oceans, waves and beaches.



A perfect retrofit. CarbonCure's recycled carbon dioxide technology keeps millions of pounds of CO_2 out of the atmosphere and incorporated instead into structures like the 725 Ponce building in Atlanta.

COURTESY OF CARBONCURE

CarbonCure

What's strong becomes stronger with this recycled, retrofit technology.

*Established in 2007, CarbonCure is headquartered in Dartmouth, Nova Scotia, where it manufactures its retrofit technology. The company's (**www.carboncure.com**) technology—an affordable retrofit to existing concrete plants that recycles waste carbon dioxide to make stronger, more environmentally friendly products—is installed in more than 90 facilities across the United States and Canada.*

CARBONCURE'S LARGEST SINGLE impact on the built environment to date occurred at 725 Ponce, a 360,000-square-foot commercial building in Atlanta designed by architectural firm Cooper Carry, Inc. In this project, CarbonCure's partner Thomas Concrete used the *CarbonCure Technology* to recycle CO_2 into 48,000 cubic yards of ready mix concrete. Concrete is the most abundant man-made material in the world. But cement, the critical ingredient that gives concrete its strength, is responsible for up to 7 percent of the world's CO_2 emissions.

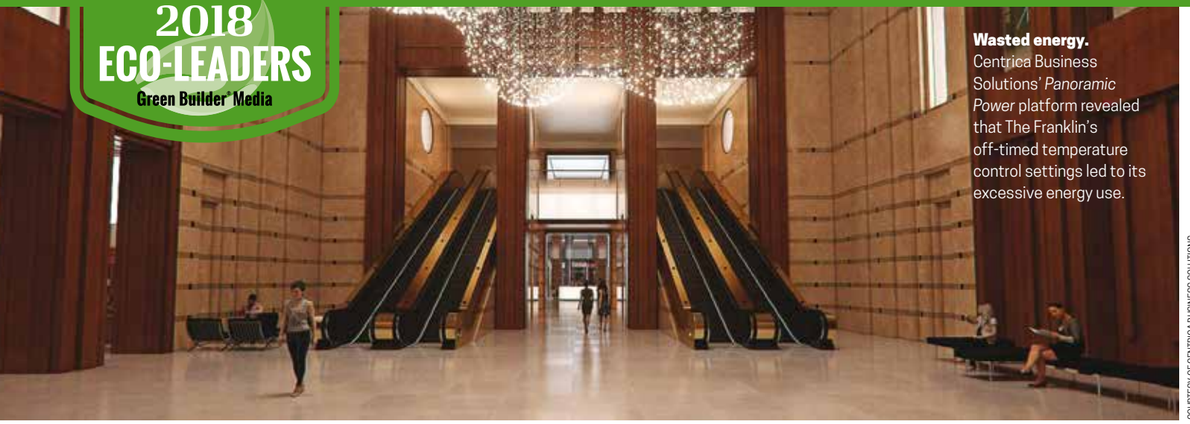
> "CarbonCure's mission is to reduce the carbon footprint of the concrete industry and lead the global initiative to repurpose waste carbon dioxide into products that benefit society."
>
> Robert Niven, CEO and founder, CarbonCure

In collaboration with structural engineering firm Uzun+Case and general contractor Brasfield & Gorrie, Thomas Concrete optimized the concrete delivered to this construction project for enhanced performance and sustainability. As a result of this collaborative effort, the-*CarbonCure Technology* enabled a carbon footprint reduction of 1.5 million pounds of CO_2. This is equivalent to the amount of CO_2 sequestered by an acre of forestland over 800 years. Construction on 725 Ponce began in 2017 and is expected to be completed in late 2018.

CarbonCure Technology has been used to reduce the carbon footprint of notable developments, including MGM National Harbor in the Washington, D.C., area. Since the launch of its ready mix application in 2015, the *CarbonCure Technology* has been used in more than 1 million cubic yards of concrete supplied to construction projects across North America, resulting in more than 20 million pounds of CO_2 saved. ■

They're an Eco-Leader because...

- Since its inception in 2007, CarbonCure embarked on a mission to reduce the carbon footprint of the concrete industry. The company now finds itself leading a global initiative to turn waste carbon dioxide into beneficial products. Concrete products have been identified as having the single-greatest potential to fulfill the demand of the emerging beneficial re-use of CO_2, which is expected to be a $1 trillion industry by the year 2030.
- Many of CarbonCure's producer partners have transparency documents, such as EPDs and HPDs, that can help contribute to a project's LEED certification. The carbon footprint reduction can also be recognized through the LEED program.
- CarbonCure is a finalist in the $20 million global NRG COSIA Carbon XPRIZE Challenge, and a three-time recipient of the Global Cleantech 100 award.



Wasted energy. Centrica Business Solutions' *Panoramic Power* platform revealed that The Franklin's off-timed temperature control settings led to its excessive energy use.

COURTESY OF CENTRICA BUSINESS SOLUTIONS

Centrica Business Solutions

This historic company's green influence is everywhere.

*Centrica Business Solutions helps customers gain competitive advantage from energy by building intelligent end-to-end energy solutions that power performance and resilience. The company is North America's No. 1 natural gas supplier and second-largest power supplier. Centrica Business Solutions (**https://bit.ly/2MYvYti**) is part of Centrica plc, a two-century-old international energy and services company headquartered in Windsor, United Kingdom.*

WHEN TISHMAN SPEYER, owner of The Franklin in Chicago, engaged a service company to perform monitoring-based commissioning services, the property's annual energy use exceeded 40 million kWh. After establishing HVAC data integration protocols, The Franklin's engineering personnel were alerted to operating anomalies that could lead to excessive wasted energy. Centrica Business Solutions' PowerRadar mobile application enabled the site engineering team to view the same daily and weekly performance data available to service company Sieben Energy Associates.

> "Through our unique combination of deep expertise and broad range of solutions, we help organizations around the world take control of their energy with new distributed energy sources and technologies."
> Jorge Pikunic, global managing director of Centrica Business Solutions

Speyer's service company began using Centrica's Panoramic Power sensors and communication bridges to monitor power draw to the property's fan-powered boxes from 98 electric panels. The company's analytics platform, PowerRadar, revealed that the majority of tenant floors consume electricity during unoccupied hours and that nighttime setback controls were keeping the floors at unnecessarily warm temperatures at night.

The monitoring revealed that The Franklin was unnecessarily heating the property during unoccupied hours, while year-round heating tendencies led to simultaneous heating and cooling in the summer.

The switch to occupancy-based power use resulted in a 3-million-kWh reduction in annual energy use, and a savings of more than 7 percent of the property's historical annual energy consumption. ■

They're an Eco-Leader because...

- Centrica's responsible procurement program includes use of its purchasing power to embed high social, ethical and environmental standards across its supply chain.
- The company partners with facility and operations managers to understand the impact energy has on their businesses—from supplying tools that monitor all energy consuming devices and making recommendations on when to curb use, to providing energy solutions to best match their sustainability needs.
- Centrica improves the sustainability of the built environment by empowering customers to manage costs, improve operational efficiency, enhance resilience and reduce CO_2 emissions.
- The company offers end-to-end energy services across a range of areas, including energy insight, energy efficiency, demand response, combined heat and power, solar + storage, and power generation.

Grand reappearance. Old bathroom tile gets a new look, courtesy of Crossville Inc.'s porcelain recycling capability.

COURTESY OF CROSSVILLE INC.

Crossville, Inc.

Instead of being tossed into the landfill, discarded porcelain tile gets a second life in homes and offices.

*Crossville Inc. is a U.S.-owned and operated manufacturer of award-winning tile collections for residential and contract applications. The company's collections are sold through traditional distribution nationwide. The company, with manufacturing facilities in Crossville, Tenn., only produces porcelain tile. Crossville, Inc. (**https://crossvilleinc.com**) is a wholly owned subsidiary of Curran Group, a privately owned holding company.*

THE JOHN C. Kluczynski Federal Building, designed by Mies van der Rohe in the late 1960s, is an epic Crossville project in Chicago: It marks the time the company determined it could recycle fired porcelain materials that were previously installed—including porcelain fixtures, such as sinks and toilets.

Crossville was selected as tile manufacturer for the redesign of the 45-story building's 78 public restrooms that hadn't been updated since 1974. The project required a portion of existing porcelain tile and all existing porcelain fixtures to be recycled to create new porcelain tile. These would be installed in the restrooms from which the materials had originally been harvested.

Ultimately, more than 57,000 square feet of recycled tile were installed in the toilet room floors and floor-to-ceiling along the rooms' wet walls. An estimated 200,000 pounds of porcelain material were diverted from landfills to create new tile for this project.

> "In our practices, processes and products, we're committed to improving the built environment and everyday experiences for employees, customers and partners. Crossville is the domestic tile industry leader in sustainability."
> Lindsey Waldrep, vice president of marketing, Crossville Inc.

Upon learning of its capabilities to recycle fired porcelain fixtures, Crossville launched a recycling partnership with sanitary ware manufacturer TOTO USA, thus achieving status as a net consumer of waste. The company has since recycled more than 114 million pounds of fired porcelain waste that would have gone to landfills. ■

They're an Eco-Leader because...

- As the only large-scale tile manufacturer capable of recycling fired porcelain, Crossville can recycle previously installed tile harvested from demolitions and tile scraps that result from samples cutting and trimming during installation. It can also recycle other porcelain items, such as toilets.
- Crossville produces its *Sustainability Report*, the only such report by a tile-only manufacturer in the U.S. This third-party, GRI- and ISO 2600-based report meets requirements of LEED V.4 MRc3 Credit. The report provides a full GRI Index, enabling readers to easily access key data and details, in adherence with G4 requirements as defined by GRI.
- All products by Crossville hold Green Squared certification. Green Squared is the industry standard developed by the Tile Council of North America to denote products that are responsibly manufactured and that hold necessary technical specifications to be certified as green.
- Crossville is the first U.S. tile manufacturer to achieve production of large-format tile on site, manufacturing of tile with certified recycled content, certification for waste recycling programs, distribution of a complete line of large format gauged porcelain tile panels, and designation as a net consumer of waste in the domestic tile industry.

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Hunter Industries, Inc.

When it comes to sustainability, Hunter is definitely in control.

*Hunter Industries is a global manufacturer and provider of products and services for the residential and commercial landscape irrigation, agricultural irrigation, and outdoor lighting industries, as well as a provider of custom manufacturing and dispensing technology services. Founded in 1981, the privately held company offers thousands of products that provide resource-efficient solutions for the industries that they serve. Headquartered in San Marcos, Calif., Hunter Industries (**www.hunterindustries.com**) holds more than 220 product patents and 80 trademarks.*

ONE OF HUNTER Industries' core values is social responsibility, a philosophy that carries over to its manufacturing process. According to Hunter Industries Corporate Social Responsibility Manager Bryce Carnehl, the company has been tackling waste-reduction challenges for years with a "double-pronged mitigation and minimization approach" as it moves toward a goal of becoming a zero net waste facility.

The company is largely a plastic injection molding manufacturer. Waste is generated during the manufacturing process in the form of "cold runners," or extra pieces of plastic resulting from channels in a mold. "In the past two years, we have invested in our regrind process, during which we collect cold runner material, clean and grind it on site, mix it with virgin material, and then use it to build new products," Carnehl says.

> "We are dedicated to finding a balance between the People we impact, the Planet we affect, and the Profits we earn."
> Bryce Carnehl, corporate social responsibility manager, Hunter Industries

Hunter has also implemented a manufacturing process called "zero cell," that involves collecting waste from one molding machine and automatically feeding it to an adjacent machine to mold parts from the waste material. The company also continues to invest in "hot runner" molds that do not generate cold runner waste.

The philosophy also goes out to other manufacturers. In 2018, Hunter Industries introduced the Ann Hunter-Welborn Circle of Excellence Award to commend recipients by highlighting their sustainable actions. "Our overall goal of creating a resilient and sustainable industry can only be accomplished by creating partnerships where we can share ideas, challenge actions and encourage others to follow," Carnehl says. "We hope this annual award inspires others in our industry to also make decisions today that positively affect tomorrow." ■

COURTESY OF HUNTER INDUSTRIES

It's a grind. Hunter Industries' plastic regrind process enables injection molding waste to be combined with virgin material to make new products, keeping it out of landfills.

They're an Eco-Leader because...

- Since 2012, Hunter Industries has published its *Corporate Social Responsibility (CSR) Report* to share the company's journey toward sustainability with its stakeholders. The report provides a "transparent and honest summation of our goals and stories around finding a balance between People, Planet and Profit, including our successes and challenges."
- The company continues research and development efforts centered on innovative solutions that maximize water and energy savings, such as its Low-Energy Precision Application (LEPA) bubblers, or its Wi-Fi enabled Hydrawise sprinkler controllers.
- Hunter's wide range of technological expertise allows it to have significant impact on companies in numerous industries, including golf course irrigation, custom manufacturing, landscape and architectural lighting, agricultural, horticultural, industrial, and wastewater irrigation, and sustainable washroom dispensing systems.

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COURTESY OF INGERSOLL RAND

Complete control. Upgraded building controls helped Ingersoll Rand reduce energy use by the equivalent of 26 million unburned pounds of coal and powering 1,750 homes for one year.

Ingersoll Rand

Sustainability has many facets—as this company's portfolio shows.

*Ingersoll-Rand plc specializes in creating comfortable, sustainable and efficient environments. The $14 billion company and its family of brands—including Club Car, Ingersoll Rand, Thermo King and Trane—help enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. The company (**https://company.ingersollrand.com**) is headquartered in Davidson, N.C.*

AS PART OF its global "Climate Commitment," Ingersoll Rand committed to a 35 percent reduction of its greenhouse gas (GHG) footprint from its own operations by 2020. To deliver on this goal, the company targeted a 10 percent increase in energy efficiency from a 2013 baseline—and has achieved the goal in 2018, two years ahead of schedule. This milestone reduces energy use and the company's impact on the environment, and enhances sustainable value for its customers.

Part of this effort called for Ingersoll Rand to conduct an energy audit of its own large facilities and upgraded air conditioning systems, building controls and lighting. It also eliminated energy leakage from its compressed air systems while measuring, validating and reporting the results. It reduced energy use by 109,000 MMBTUs and electricity consumption by 22,000 MWh, which is the equivalent of not burning 26 million pounds of coal and powering 1,750 homes for one year, according to the company.

> "Environmental, social and business sustainability are core to how Ingersoll Rand operates as a company, from the efficiency of our facilities and product offerings to the diversification of our workforce."
> Scott Tew, executive director of the Center for Energy Efficiency and Sustainability, Ingersoll Rand

Ingersoll Rand also replaced electricity generated from fossil fuels with that produced from renewable resources—another key factor in addressing climate change, as well as creating long-term value for Ingersoll Rand employees and its customers.

In addition to on-site renewable energy sources, Ingersoll Rand has signed a power purchase agreement (PPA) for approximately 100,000 MWh of wind power annually. The wind farm is in Baylor County, Texas. The PPA replaces 32 percent of the company's U.S. electricity use with green energy, and reduces U.S. Scope 2 GHG Emissions from Electricity by 32 percent. This is the equivalent of recycling 26,000 tons of waste instead of sending it to a landfill, and preserving 600 acres of U.S. forests. ■

They're an Eco-Leader because...

- More than 90 percent of Ingersoll Rand's product portfolio addresses demands for greater energy efficiency with lower greenhouse gas (GHG) emissions in buildings, homes, industrial spaces and transport markets around the world.
- The company's EcoWise portfolio of products is designed to lower environmental impact with next-generation, low-GWP refrigerants and high-efficiency operation. The products must be at least five percent more efficient than the minimum standard, where standards apply.
- Ingersoll Rand has a 2020 goal to generate five percent of revenue from products that meet world class environmental criteria: water, electricity and fuel consumption from the use of the product.
- Trane, an Ingersoll Rand brand, recently worked with the Science Museum of Minnesota and lowered the building's carbon footprint and reduce its energy costs. The project exceeded expectations by surpassing its original goal of 75 percent of hot water heat savings since installation and by decreasing the amount of energy supply used in the community. In the future, the implemented smart design practices and energy-efficient systems are projected to save the museum more than $300,000 in annual operating costs.

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mafi

When it comes to natural wood flooring, this company sets a gold standard.

*mafi has specialized in sustainable practices for manufacturing wood for more than 35 years, serving residential, commercial, hospitality and health care industries. The company (**https://bit.ly/2LGHTzY**) delivers to more than 55 countries worldwide by using local sales partners that sell directly through architect and designer specifications.*

FOR WOOD FLOORING maker mafi, sustainability starts at home. The company's primary product comes with a lot of "no"—no chemicals during production, no out-of-area wood sources, no long-term damage to area forests. But one restriction stands out: no finishes on mafi flooring.

According to company officials, mafi wood is designed to be left open and without finishes. What this does is filter the air; water and wood work to remove toxins in the air during the drying process. The flooring can withstand washing with hot water and soap, but polyurethane or other hard surface finishes can't be used, because they would trap the water in the wood below that finish.

> "Products and their ingredients have effects on our well-being. mafi opts for production of natural wood floors purely with wood, white glue and our natural oils."
> Walter Lourie, technical sales manager, mafi

"Think of a cutting board. It cleans with only water and soap and we eat off of it every day," says Walter Lourie, mafi's technical sales manager. "Our floors are working the same way. Every day, we take toxins from the built environment. Wood also works to remove electronic smog from our cell phones and computers."

Several scientific studies also indicate that wood relaxes our senses by doing nothing more than smelling the fragrance, Lourie says. Once a hard surface or coating is placed on wood, it stops that action. "mafi has never used chemicals or hard surfaces for any product in over 100 years," he notes. "Allowing wood to remain natural helps everyone around it." ■

COURTESY OF MAFI

Nothing wasted. mafi's production facilities are zero waste, utilizing all facets of a wood log during creation of its flooring.

They're an Eco-Leader because...

- mafi recently completed a program that recycles all of its waste from production into pellets that heat its buildings and wood-drying facilities.
- Its facilities are zero waste, all products are local and no chemicals are used during production.
- The company's floors are produced from trees grown in a local forest, and it plants a new tree for every one it harvests.
- mafi has been certified for low-emitting materials and passed the California air quality test requirements. mafi is Declare labeled Red List Free from the International Living Future Institute.
- It won the Global Energy Award in 2011. It was selected as the floor provider for Delos' New York headquarters; Delos is a leader in sustainable design consultation.

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Navien

For this condensing tech leader, water is a very hot topic.

*Navien is a developer of condensing technology and worldwide producer of items for the plumbing and HVAC sectors. Its flagship residential products are condensing tankless water heaters, boilers and combi-boilers. Navien North America (**www.navieninc.com**) headquarters is in Irvine, Calif. The company's parent, KD Navien, is headquartered in Seoul, Korea, along with its manufacturing plant, which is the world's largest single-boiler facility.*

THE CULVER COVE Resort and Conference Center is an 80-unit hotel-condominium complex located near Culver, Ind. Originally, hot water was supplied from three utility rooms, each with six 100-gallon tank-type heaters. Circulating pumps and mixing valves were required to prevent scalding. Rich West, executive director of Culver Cove, was looking for a more efficient hot water system to reduce energy costs, especially during low demand periods.

> "Navien's mission is to provide customers with the ultimate comfortable living environment through energy efficient products by using innovative technology to create a healthier environment for our future generations."
> Ann Woodard, senior marketing manager, Navien

West worked with Mike Lambert of Mid-City Supply in Elkhart, Ind., and Clark Boyles of P-M & Associates in Indianapolis. They recommended installation of five cascaded *Navien NPE-240* units for about one-third of the complex—about 24 to 26 units of one to three bedrooms each. Lambert and Boyles worked with Jason Richards, owner of A+ Plumbing, Heating, Cooling Inc. in Bremen, Ind., to work out details for sizing, designing and installing the system.

Another huge factor in selecting *Navien NPE* was the internal recirculating pump and buffer tank, which assure an uninterrupted flow of hot water. "We have noticed a decrease in our energy cost from NIPSCO, our local gas supplier—a real dollar savings every month," West remarks. "I also have seen a decrease in our domestic water use." ■

COURTESY OF NAVIEN

Well armed. Navien's goal is to efficiently develop energy-saving products for the HVAC and plumbing sectors.

They're an Eco-Leader because...

- Navien partners with other companies to develop ever-more-sustainable versions of its products. Those partnerships have resulted in innovations that expand Navien's product lifespan, reduce its energy consumption and CO_2 emissions, and provide cleaner water—all of which benefit the customer.
- The corporation has expanded its business areas to zone control systems, ventilation systems, home network systems, and various other focuses that provide customers with a more pleasant and greener living environment.
- Recent innovations include its NCB Series, the industry's first residential combi-boiler strong enough to support whole-house heating and hot water supply. It also unveiled *NaviLink*, the industry's first Wi-Fi-enabled temperature control unit for tankless water heaters, combi-boilers and gas-condensing boilers.

Open air. A Panasonic indoor air quality system helped turn custom green builder Panorama Homes into an award winner for most innovative builder from the Home Builders Association of Central New Mexico.

COURTESY OF PANORAMA HOMES

Panasonic Eco Solutions

Masters of ventilation and airflow.

*For more than 20 years, Panasonic Ventilation and Indoor Air Quality (IAQ), a segment of Panasonic Corp. of North America (**https://bit.ly/2jL2XoE**), has specialized in high-performance, code-compliant indoor air quality (IAQ) solutions that remove moisture and pollutants from residential and commercial spaces. Based in Newark, N.J., Panasonic North America is the principal North American subsidiary of Osaka, Japan-based Panasonic Corp.*

PROFESSIONAL BUILDERS face several IAQ challenges in the homebuilding process before, during and after a home or set of homes is built. A reliable ventilation partner to counteract building and lifestyle sources of air contamination is a primary driver in any home ventilation plan.

Panorama Homes, a custom green homebuilder in Albuquerque, N.M., needed an energy recovery ventilator (ERV) system and ventilation fan to install in several newly constructed single-family homes. Volatile organic compounds (VOCs) are especially common in newly built homes, from using products such as paints, sealants and coatings.

> "Panasonic has developed its long-term vision for environmentally sustainable management. In the company's Environment Vision 2050, Panasonic pledges that its products and activities will generate more energy than they consume."

With this in mind, Panorama Homes felt it was crucial to select a competitive, high-performing ventilation system and fan that could bring in enough fresh air to dilute these harmful indoor pollutants and create an easier breathing environment for the families that were about to grow up and make memories in these new homes.

Working with Panasonic, the builder determined that the Panasonic *Intelli-Balance 100* ERV system and Panasonic *WhisperGreen Select* vent fan delivered the perfect combination of powerful, precision ventilation and efficiency to install in several newly constructed single family homes.

As a result, the *Intelli-Balance 100* ERV and *WhisperGreen Select* vent fan improved IAQ by effectively lowering the concentration of VOCs by 92 percent.

As the building industry continues to understand its role in providing homeowners with clean air and safe homes, IAQ solutions make it easier for builders to comply with stringent ventilation codes and increase productivity. They also make the world a healthier place to live. ■

They're an Eco-Leader because...

- In the past two years, as part of an ongoing effort to promote a safe and secure society powered by clean energy, Panasonic has developed new environmental technologies that create, save, store and manage energy more efficiently. Particularly, the company has focused on the development of fuel cell technologies that utilize next-generation solar cells and hydrogen derived from clean energy.
- By switching to LED lighting, Panasonic factories are targeting zero CO_2 emissions to be complete by the end of fiscal 2019. The company has also expanded its use of factory energy management systems by adding PV power generation systems in all company business sites by 2020.
- All of its vent fan-only models are RoHS approved. Restriction of Hazardous Substances Directive (RoHS) restricts the use of six substances in the manufacturing process: lead, mercury, cadmium, hexavalent chromium [CR(VI)], polybrominated biphenyls (PBB), and polybrominated diphenyl ether (PBDE). The production facilities that build Panasonic fans have been recognized by the International Standards Organization (ISO), as being among the highest quality factories in the world.

Turning point. Enhancements such as a state-of-the-art smart assembly line has helped Rheem be more productive and sustainably focused.

COURTESY OF RHEEM

Rheem

Devising innovative ways to improve water heating and HVAC efficiency.

*Rheem is a manufacturer and vendor of sustainable water heaters and HVAC systems. The company (**www.rheem.com**) is headquartered in Atlanta and operates five manufacturing facilities across the United States. Its products, sold by independent distributors and select retailers, meet residential and commercial needs.*

RISING ENERGY COSTS have significantly impacted the U.S. restaurant industry, which uses five times more energy per square foot than other commercial buildings, according to Energy Star. Gary Stovall and Wyatt Kaundart, franchisors of steak house Western Sizzlin', have experienced these pains first-hand.

The 9,500-square-foot Towson Avenue Western Sizzlin' in Fort Smith, Ark., offers daily buffet services, but the building is more than 30 years old. The amount of energy used on air conditioning and water heating is immense. On average, Western Sizzlin uses approximately 2,100 gallons of hot water.

> "At Rheem, we strive to integrate sustainable thinking into our operations and products to help make it easier for customers to live comfortably while also living more responsibly."
> John Fitzgerald, executive vice president of operations, Rheem

Rheem piloted the *H2AC Rooftop Unit* featuring eSync integration technology at this location. The industry-first system takes the heat removed from the restaurant by the HVAC system—which would normally be ejected into the atmosphere—and uses it as an efficient source for heating water.

"Before we began working with Rheem to install the *H2AC Packaged Rooftop Unit*, I never would have imagined that we could use our A/C system to, essentially, generate free hot water," Stovall says. "Given the amount of food that we prepare and customers that we serve every day, having such an efficient way to heat water has significantly impacted our operations."

In the first year after Rheem installed the integrated air and water system, Western Sizzlin' saved nearly $5,670 on its gas utility bill. The restaurant hit the payback point on its system in during the second year. The savings are especially significant, considering the 12.3 percent increase in the cost per cubic foot for natural gas. ■

They're an Eco-Leader because...

- The company's line of *EcoNet*-enabled, inverter-driven heat pumps and air conditioners only run to meet demand, versus the typical on or off settings. They are up to 54 percent more efficient than traditional cooling designs.
- Rheem has also turned its energy-saving efforts inward by remodeling its five-decade-old Fort Smith, Ark,. commercial air conditioning site. Upgrades include a new smart assembly line for HVAC products, which yields greater flexibility, efficiency and quality; switching to energy-efficient lighting throughout the entire plant; and storing finished goods indoors in a dedicated area, which allows the storage process to be less wasteful.

Fuel cell forerunner. The Toyota *Mirai*, one of the world's first mass-produced hydrogen fuel cell electric vehicles, now accounts for 80 percent of all such automobiles sold in the United States.

COURTESY OF TOYOTA MOTOR CORP.

Toyota

The auto giant has relentlessly improved hydrogen fuel cell technology.

Automobile manufacturer Toyota has been a part of the cultural fabric in the U.S. and North America for 60 years, and continues to advance sustainable, next-generation mobility through its Toyota- and Lexus- branded vehicles. This includes its breakthrough hybrid, the Toyota Prius. *In North America, Toyota (**www.toyota.com**) operates 14 manufacturing plants, employs more than 47,000 people, and sells 2.7 million cars and trucks at its 1,800 North American dealerships.*

TOYOTA MOTOR NORTH America, Inc. plans to build the world's first megawatt-scale carbonate fuel cell power generation plant with a hydrogen fueling station to support its operations at the Port of Long Beach. The Tri-Gen facility will use bio-waste sourced from California agricultural waste to generate water, electricity and hydrogen.

When it comes online in 2020, Tri-Gen will generate approximately 2.35 megawatts of electricity and 1.2 tons of hydrogen per day, enough to power the equivalent of about 2,350 average-sized homes and meet the daily driving needs of nearly 1,500 vehicles. The power generation facility will be 100 percent renewable, supplying Toyota Logistics Services' operations at the Port and making it the first Toyota facility in the world to use 100 renewable power.

> "To go beyond zero environmental impact, Toyota has set six challenges. These challenges, whether in climate change or resource and water recycling, show commitment to sustainable development with society."
> Kevin Butt, general manager of environmental sustainability, Toyota Motor North America

Tri-Gen is a key step forward in Toyota's work to develop a hydrogen society. In addition to serving as a key proof-of-concept for 100 percent renewable, local hydrogen generation at scale, the facility will supply all Toyota fuel cell vehicles moving through the port, including new deliveries of the *Mirai* sedan and Toyota's heavy duty hydrogen fuel cell class-8 truck, "Project Portal." To support these refueling operations, Toyota has also built one of the world's largest hydrogen fueling stations with the help of French industrial gas supplier Air Liquide. ■

They're an Eco-Leader because...

- Toyota Motor North America recently launched "Project Portal," a hydrogen fuel cell system designed for heavy-duty truck use. The zero-emission class-8 truck proof-of-concept has completed more than 4,000 successful development miles, while progressively pulling drayage-rated cargo weight, and emitting nothing but water vapor. Executives view the project as the possible future of big-rig trucking.
- In April, Toyota was named one of the top 10 companies with the most Leadership in Energy and Environmental Design (LEED)-certified retail locations. While the list includes retailers from various industries, Toyota is the only automotive brand to be included in the top ranks.
- Toyota Motor Company North America is working toward meeting the four parts of its 2050 environmental challenge: Reduce greenhouse gas emissions from operations and establish longer-term targets to achieve zero emissions by 2050, and lower vehicle emissions 90 percent; conserve natural habitat and partner with third parties to protect globally recognized hotspots; establish a data-tracking system to annually track the amount of packaging used; and reduce water withdrawals from North American operations by incorporating waterless manufacturing technologies and adopting water-conservation and recycling technologies to achieve 100 percent recycled water use by 2050.

Hot line. Uponor's pre-insulated, flexible piping was just the thing needed for a quick install—and an improved heating system—at Wolf Ridge Environmental Learning Center.

COURTESY OF UPONOR NORTH AMERICA

Uponor

For this heating and cooling systems provider, it pays to be flexible.

*Uponor North America is part of Uponor Corporation, a leading global provider of systems and solutions for hygienic drinking water delivery, energy-efficient heating and cooling and reliable infrastructure. Uponor Corporation operates in 30 countries, with a sales network covering more than 100 countries. Uponor North America (**https://bit.ly/2zWTZzr**) is headquartered in Apple Valley, Minn.*

WOLF RIDGE ENVIRONMENTAL Learning Center in Finland, Minn., was the first environmental learning center nationally accredited as a K-12 school. More than 15,000 people all over the region stay at the facility for several days to immerse themselves in developing the knowledge, skills, motivation and commitment to create a quality environment.

In 1996, the team at Wolf Ridge chose an Uponor *Ecoflex* pre-insulated pipe system to efficiently heat various facilities throughout the 2,000-acre campus. The flexible nature of the product enables *Ecoflex* to bend around trees and boulders, minimizing disturbance to ground cover and vegetation.

> "Uponor addresses the key environmental issues of our time through leadership in innovative ideas and sustainable solutions to ensure the well-being of people and the planet."
> Bill Gray, president, Uponor North America

In 2017, Wolf Ridge once again turned to Uponor *Ecoflex* to complete a renovation project. The facility is currently the first organization in Minnesota pursuing full certification for Living Building Challenge (LBC), a program, advocacy tool and philosophy that defines the most advanced measure of sustainability. Therefore, choosing sustainable products was absolutely essential, according to Wolf Ridge Executive Director Pete Smerud. "We referred to LBC's Red List chemical guide when choosing our products for the renovation," Smerud explains. "The Red List is a list of products that are deemed bad for the environment and human health. PEX pipes are not on that list, but CPVC and PVC pipes are. One of the greatest things about Uponor is they know their products' ingredients because they manufacture the products themselves."

Ecoflex's flexibility enabled the construction crew to install 300 feet of PEX pipe a day. "I give Uponor *Ecoflex* two thumbs up," Smerud says. "Truly, I have no concerns because it's performed so flawlessly for us for years." ■

They're an Eco-Leader because...

- In 2018 alone, Uponor has solidified its role as a thought leader in the mega-trend areas of water and climate change. For example, in April, Uponor sponsored the 2018 Next Generation Water Summit, with leaders presenting on Uponor's latest intelligent water products to help achieve water conservation and reuse in the arid Southwest. In May, the company hosted a multi-partnered Executive Sustainability Summit to explore how Minnesota companies can take a leading role in addressing issues such as global warming, resource depletion and disruption of the supply chain.
- The company also signed a 10-year contract to participate in a pilot program with Xcel Energy to meet sustainability goals through renewable wind and solar resources. Uponor reduced CO_2 by 10 percent in 2017 and anticipates a 26 percent reduction in 2018, along with wind and solar energy use increases of 20.5 percent in 2017 and a projected 41 percent in 2018.
- Uponor also has a new sustainability strategy to develop and differentiate the United Nations Sustainable Development Goals (SDGs) for Clean Water and Sanitation, Decent Work and Economic Growth, Responsible Consumption and Production, and Climate Action.
- Uponor North America will focus on becoming Green Office certified by the end of 2019. The main focus areas will include energy, employee behaviors, and waste and recycling. The company also completed its transition to ISO 14001: 2015 environmental management system in June 2018.
- In 2016, Uponor partnered with Belkin International to form the water company Phyn, to help consumers handle water needs and help solve major challenges facing the global water supply. The company recently unveiled its *Phyn Plus* smart water assistant + shutoff, which notifies homeowners of leaks via an app and can shut off water in the event of a catastrophic leak. This new device is expected to have a large impact on the 1 trillion gallons of water wasted annually worldwide.

COURTESY OF RENEWW HOUSE/WHIRLPOOL CORP.

Better than the original. The ReNEWW House, a joint project of Whirlpool Corp. and Purdue University, demonstrated the feasibility of renovating a 1920s dwelling to meet or exceed new home efficiencies, while maintaining the charm and character of an older home.

Whirlpool Corp.

The home appliance giant has a 'ReNEWW' approach to energy savings.

*Whirlpool Corp. is the world's leading global manufacturer of home appliances, with $21 billion of 2017 sales while operating in nearly every country around the world. Those appliances are designed to be energy efficient and eco-friendly. The company's (**http://whirlpoolcorp.com/**) North American portfolio of brands includes Whirlpool, Maytag, KitchenAid, Jenn-Air, Gladiator and others.*

WHIRLPOOL CORPORATION, ALONG with Purdue University, has transformed an existing classic home near Purdue's campus into a world-class research laboratory and sustainable living showcase. That project is known as the ReNEWW House.

Retrofitted Net-zero Energy, Water & Waste (ReNEWW) represents the aspirational vision for the project: to convert a home, originally built in 1928, to one that has offset its energy use with solar power, rely only on locally available water sources, and to have waste-handling systems in place that prevent any household waste from going to the landfill. All of this had to be accomplished without changing the home's historic nature.

> "Our sustainability journey is centered around one goal: Improve the quality of life for consumers everywhere. We focus on sustainable innovations that benefit our consumers and our world."
> Ron Voglewede, global sustainability director at Whirlpool Corp.

Since the ReNEWW House is in a heating climate with many cloudy days, the home underwent a massive energy retrofit to address energy consumption and storage. This included new appliances, insulation, HVAC, water heater, lighting, windows, doors, siding and roofing. In addition, a drainline heat recovery system was added to recover waste energy from the shower drain and use it to heat incoming cold water. Finally, to get to net-zero energy, a solar thermal (PVT) system was added to the roof, to generate as much energy in one year as is used inside the house.

In addition, the old, outdated water-using fixtures and appliances were replaced with new, water-efficient Kohler fixtures and Whirlpool appliances. Rainwater harvesting and filtration was installed onsite for all potable water applications. And, in an effort to offset potable water usage for toilet flushing, a CleanBlu greywater treatment system was installed on site. After all these improvements, the water consumption dropped to roughly 21 gallons per person, per day—a 75 percent reduction in water usage.

ReNEWW House is providing valuable insights for Whirlpool's homebuilder collaborators and customers on technologies that enable sustainable living. It also helped accelerate development of the next generation of ultra-high efficiency appliances—ones that increase core performance while lowering their impact on the environment and cost to operate. ■

They're an Eco-Leader because...

- Whirlpool Corporation is one of the largest Fortune 500 consumers of on-site wind energy in the United States. In the U.S., Whirlpool Corporation has installed wind farms at several of its Ohio facilities to allow use of renewable energy in manufacturing. The company has wind farms in operation at Findlay, Ottawa and Marion, and has additional projects ongoing at its Greenville manufacturing facility.
- Collectively, the company expects to generate enough clean energy to power more than 2,400 average American homes per year.
- Whirlpool continues to optimize and innovate to reduce appliance energy and water consumption, and help consumers reduce their own environmental footprints without compromising performance.
- Since 1998, Whirlpool Corporation has received 38 Energy Star Awards for continued commitment to energy- and water-efficient products. This is more than any other appliance manufacturer in the United States and Canada.

Honorable Mention

DRITAC FLOORING PRODUCTS

Operating under the motto "It's easy being green," DriTac Flooring Products, LLC (**www.dritac.com**) offers a full lineup of environmentally friendly adhesives, underlayments and other installation products for the flooring industry. The Clifton, N.J., and City of Commerce, Calif.-based company also specifically and selectively sources high-quality raw materials for use in designing, developing and manufacturing every eco-friendly product formula, a corporate mission statement since it began serving the flooring adhesive industry several decades ago.

PHOTO: DRITAC FLOORING PRODUCTS

MAKING PROGRESS

- The manufacturing process for several of DriTac's products relies upon use of renewable and sustainable raw materials. The company actively works with architects, builders and developers to address the well-being of the environment.
- To reduce the overall carbon footprint of installations, DriTac offers a line of zero-VOC, zero-solvent and independently tested products that have been certified by the Carpet and Rug Institute's Green Label Plus Program for Indoor Air Quality.
- DriTac manufactures its adhesive products in direct compliance with all mandated regulations and requirements at the federal, state and local levels. This includes working directly and proactively with the Occupational Safety and Health Administration (OSHA) and the New Jersey Department of Environmental Protection (NJDEP).

GREYTER WATER SYSTEMS

Utilizing a philosophy of "Reused water is smart water," Greyter Water Systems (**www.greyter.com**) specializes in providing H_2O recycling solutions that help builders, developers and municipalities create water-efficient communities. Headquartered in Toronto, the company plans to open a U.S. facility in Sydney, Neb., in 2019.

PHOTO: GREYTER WATER SYSTEMS

MAKING PROGRESS

- The company's residential flagship product, the *Greyter HOME*, is billed as the first out-of-the-box household greywater system. The unit recycles shower and bath water for flushing toilets or irrigation, and ultimately cuts indoor water consumption by about 25 percent. The system meets NSF 350 standards.
- Greyter's efforts to boost water conservation has helped preserve resources in water-stressed regions—those with water scarcity or access issues. It also results in reduced water demand and treatment loads on aging infrastructures, and generates savings for water treatment facilities due to less water to supply and treat.
- Within its own practices, Greyter uses tanks made from recycled plastic and a regenerated activated carbon for its final polish.

NEWLAND

Newland Communities (**www.newlandco.com**) is a geographically diverse private developer of planned communities in the United States. The company specializes in comprehensive residential and urban mixed-use master planning, with expertise in large-scale single-family and multi-family new home communities. Newland's projects are tailored to meet the National Green Building Standard (NGBS), a certification that addresses green components such as energy efficiency, air and water quality, water conservation and site design. Headquartered in San Diego, Newland and its affiliated companies are currently developing and managing nearly 30 projects in 13 states.

PHOTO: NEWLAND

MAKING PROGRESS

- Newland's sustainability program identifies and shares best practices across its communities nationally, as well as track and continuously improve upon progress towards its sustainability goals.
- Other sustainability efforts include preservation of open space, unique environmental features and historical sites; support of reforestation and habitat creations; and incorporating stormwater best practices and energy efficiency certification programs into residential and commercial design guidelines.
- The company also engages with local communities on education and information on best sustainability practices.

NV ENERGY

PHOTO: NV ENERGY

NV Energy is a public utility that generates, transmits and distributes electric service in northern and southern Nevada. The Las Vegas-based company (**www.nvenergy.com**) services more than 1.2 million customers and a state tourist population of more than 43 million annually, and also provides natural gas to more than 165,000 citizens in the Reno-Sparks area.

MAKING PROGRESS

- In 2016, NV Energy unveiled its *PowerShift* website to help consumers find ways to save on their bills. Customers can use the site for information about rebates on air conditioning, smart thermostats and energy-efficient lighting.
- NV Energy offers a Free Smart Thermostat program, which can save homeowners up to $100 on home energy per year. The mobile app allows users to access their thermostat remotely.
- The company's *PowerShift* energy advisors make house calls when they visit a home to inspect lighting, insulation levels, seals around doors and windows and more. The resulting customized assessments help customers to learn inexpensive ways to increase energy efficiency, save money and potentially receive free energy-saving products.
- Between 2005 and 2015, NV Energy helped Nevada triple its in-state renewable production and reduce carbon emission in the electricity sector by 44 percent. That means more clean energy with nearly 50 projects statewide—enough renewable energy to power more than 1 million homes at once.

OWENS CORNING

Owens Corning develops, manufactures and markets insulation, roofing and fiberglass composites that save energy, and improve comfort in residential and commercial buildings. The company's glass reinforcements business makes thousands of products lighter, stronger and more durable. The Toledo, Ohio-based manufacturer (**www.owenscorning.com**) employs 19,000 people in 37 countries and has been a Fortune 500 company for 63 consecutive years.


PHOTO: OWENS CORNING

MAKING PROGRESS

- Owens Corning has exceeded its 2020 environmental footprint reduction goals in primary energy, water and fine particulate, and is on track to meet target numbers for reductions in greenhouse gas and toxic air emissions.
- In 2015, the company entered into Power Purchase Agreements that enabled generation of new wind capacities in Texas and Oklahoma. Both wind farms came online in late 2016, generating 1.1 million megawatt hours of electricity per year.
- The company's EcoTouch and Thermafiber insulation products are certified by SCS Global Services as being made with 100 percent wind-powered electricity. Thermafiber is also North America's first formaldehyde-free mineral wool insulation.

WELLS FARGO

Wells Fargo & Company is a diversified financial services company with ties to the green building industry. The San Francisco-based company (**www.wellsfargo.com**) recently pledged $200 billion in financing to sustainable businesses and projects by 2030, with more than 50 percent focused on clean technology and renewable energy transactions.

PHOTO: WELLS FARGO

MAKING PROGRESS

- In 2015, the U.S. Green Building Council recognized Wells Fargo as the green building leader among financial institutions for its implementation of Leadership in Energy and Environmental Design (LEED) standards, the last time it made such a designation.
- As of the end of 2017, 28 percent of the institution's total square footage in leased and owned buildings—more than 30 million square feet—was LEED certified. The company is on track to meet its goal of earning LEED certification across 35 percent of its footprint by 2020.
- In 2017, Wells Fargo received its first WELL Building Standard certification for a 28,000-square-foot floor in San Francisco. WELL is an international building certification that focuses on the health and well-being of buildings and building occupants. The project was one of the first 50 WELL-certified projects in the world, and one of only 20 silver-certified projects completed globally to date. **GB**

2018 ECO-LEADERS
Green Builder® Media

CHANGE MAKERS

Meet the trailblazers who have made green thinking a lifelong effort.

BY SARA GUTTERMAN

IT REQUIRES PASSION, COMMITMENT and perseverance to shape the will of an organization, and it takes colossal effort to pivot the mission and priorities of a company. These Eco-Leaders have dedicated their careers to achieving greater levels of sustainability within their organizations and impacted meaningful change.

THE MAKERS

SCOTT TEW, Executive Director, Center for Energy Efficiency and Sustainability (CEES), Ingersoll Rand

If there's a problem having to do with corporate sustainability, Scott Tew likely knows how to solve it. As the founder and executive director of Ingersoll Rand's Center for Energy Efficiency and Sustainability (CEES), Tew has spent nearly a decade crafting corporate sustainability programs for almost every aspect of the company.


The green veteran. Ingersoll Rand Executive Director Scott Tew has no problem spreading the word about corporate sustainability, such as during this session with Laura Turner Sydel at the recent Sustainability Symposium 2018.

Tew has helped Ingersoll Rand reduce emissions, cut resource use, eliminate waste, develop innovative products, and engage employees in active discussions about how the company can continue to exceed its sustainability goals.

"Holistically integrating sustainability into a company is tougher than it sounds," says Tew, "because you do a lot of hard work upfront for future rewards. It takes a lot of patience, and there is no immediate gratification."

Despite—or perhaps because of—all the hard work, Tew is delighted by the outcome. "Ingersoll Rand has made the boldest commitment to climate action of any industrial company," he proclaims. "We have completely rethought how we do what we do, and how to solve customer problems."

When he is not conjuring up exciting new sustainability strategies, Tew has his hands in the dirt. As an 8th-generation farmer, he is always planting something. He is particularly proud of his plums, persimmons, figs and heirloom bulbs.

INGRID MATTSSON, Director of Brand and Corporate Social Responsibility, Uponor

If the world ran on heart and spirit alone, Ingrid Mattsson would be empress. Mattsson's zeal for profitable sustainability and commitment to protecting the planet makes her a unique individual in corporate America. Whether being recognized as an Exceptional Businesswoman by Twin Cities business publications or winning the coveted Carlson-Holohand Award for her exceptional service to the hydronics industry, Mattsson consistently displays refreshing curiosity and exuberance.


One (loud) voice. Uponor Corporate Social Responsibility Director Ingrid Mattsson makes profitable sustainability and a commitment to protecting the planet her dual responsibility.

Mattsson joined Uponor (then known as Wirsbo) in 1995, at a time when women were scarce in the mechanical contracting industry. Her passion for doing the right thing advanced the company's branding and marketing initiatives. Together with three colleagues, she co-founded Uponor's North American Sustainability Team, assisting in the development of the company's blended-values approach.

"I love the entire process of working with the Uponor team to define and enhance our commitment to sustainability," Mattsson says. "I'm incredibly proud of Uponor's stewardship. The company truly takes care of People, Planet and Profits—all of which are important for the future of our business and the environment."

For Mattsson, sustainability and spirituality are inherently connected. The child of two immigrants, Mattsson grew up on a farm and learned to respect and care for the Earth at an early age. "As I continue to learn about what's happening to the planet," she notes, "I can't help but make sustainability a top priority."

An accomplished speaker and singer, Mattsson uses her voice to inspire, entertain and educate those around her. When not working, you can find her in the garden, behind a microphone, or on a plane winging her way to her next adventure.

EARNEST MORGAN, Director of Business Development and Sales Excellence, Emerson Commercial & Residential Solutions

Whether it's in a board room or a social setting, Earnest Morgan embodies politeness, professionalism and refinement, which contributes to his success in balancing the needs of the multiple stakeholders that he interacts with every day.

Morgan's passion for sustainability emerged early in his career, when he worked with the National Trust for Historic Preservation to address the myriad issues facing historic downtowns. It then evolved when he was

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Clean power king. Emerson Commercial & Residential Solutions Business Development and Sales Excellence Director Earnest Morgan throws his personal energy behind development of… green energy.

appointed (and confirmed by the state Senate) to the Board of the Minnesota Pollution Control Agency (MPCA), where he helped develop policy that protected the state's water, air and land resources.

At Emerson, Morgan is most proud of the company's Grind2Energy initiative, which transforms food waste from an environmental challenge into renewable energy. "It's a sustainable game changer for food retailers and services, and a great alternative to landfills and traditional compost programs," he says. He is also active in the development of the award-winning Sensi *Wi-Fi Thermostat*, Copeland *Scroll Compressors*, and ceiling fans that provide homebuilders a path to zero-energy-ready homes.

What's next for Morgan? Leveraging smart devices to address predictive maintenance that changes how we think about home repairs.

FRANK O'BRIEN-BERNINI, Vice President and Chief Sustainability Officer, Owens Corning

If you've been in the building industry for any length of time, it's likely you've come across the drum-playing, solar-installing, bike-riding head of sustainability for Owens Corning.

After 35 years with Owens Corning, Frank O'Brien-Bernini is more excited than ever about his work. His genuine interest in making a positive difference in the world permeates everything he does, and his supportive, "human in scale" approach has resulted in his development of comprehensive corporate sustainability strategies for the company.

Staying in rhythm. Owens Corning Vice President and Chief Sustainability Officer Frank O'Brien goes from keeping in step with the company's sustainability efforts, to keeping the beat during his down time.

In support of the company's ambitious 50 percent greenhouse gas reduction goal, O'Brien-Bernini has led Owens Corning to becoming one of the largest industrial purchasers of renewable energy, with a mix of on-site solar and 250 MW PPAs of new wind capacity.

When not focusing on enhancing Owens Corning's sustainability efforts and high-performance products, O'Brien-Bernini dreams of time travel. "I'm fascinated by the ingenuity of past inventors, and even more intrigued by what's to come," he says.

To get on his good side, host him and his lovely wife, Mary Rose, to a dinner of eggplant parmesan and Chianti.

THE BUILDERS

C.R. HERRO, Vice President of Innovation and Sustainability, Meritage Homes

It's impossible to be in the building industry and not know C.R. Herro. His deep grasp of building science makes him one of the most visible—and credible—professionals in our sector.

Herro prides himself on being a disruptor. With a 25-year history of leading new business development for multi-billion-dollar construction companies, Herro has proven his expertise in successfully piloting uncharted waters.

As vice president of Innovation and Sustainability for Meritage Homes, Herro has worked closely with CEO Steve Hilton to incorporate energy efficiency, water conservation, healthy indoor air quality, smart home automation and renewables into the company's portfolio of communities throughout the country.

Top of mind these days for Herro? Tackling the business case for zero-energy homes. "On a total cost basis, zero energy is a great solution for the average homebuyer," Herro says. "But, we need to figure out how to evolve the processes for [real estate agents], appraisers and underwriters, so that they can properly value zero energy at the time of a transaction."

Marketing maverick. Meritage Homes Vice President of Innovation and Sustainability C.R. Herro has made the marketing of green homes his No. 1 priority.

Herro also believes that dramatic changes need to be made in the energy sector to avoid wasting trillions of dollars in outdated infrastructure. He is endeavoring to crack the code on load management by leveraging thermal storage (oversized water heaters, thermal mass, pre-cooling and pre-heating) and behavioral incentives based on time-of-use price models.

To take a break from the brainy work of solving the world's building science problems, Herro hangs out with his American Bulldog Penelope and Blue Nose Pitbull Bessie.

GENE MYERS, Founder/CEO, Thrive Home Builders

When it comes to innovation in housing, Gene Myers is the Pied Piper. As a long-time green builder, founder and CEO of Thrive Home Builders, and board chairman for the Energy and Environmental Building Alliance (EEBA), Myers has solved the riddle of building high-performance, healthy homes.

The Colorado-based six-time winner of the Department of Energy's Grand Award for Innovation, Thrive (previously known as New Town Builders) was the first production builder to deliver "solar standard" homes, build net-zero communities, and use Colorado beetle-kill lumber in the construction of its homes.

Master of evolution. Thrive Home Builders CEO Gene Myers believes embracing change is the key to a stronger, more eco-friendly future.

According to Myers, the secret to Thrive's success its culture. "Anyone can build net-zero communities," says Myers, "but not everyone can cultivate the culture that we have at Thrive. Our people are committed to continuous improvement. Change is generally hard for most people, but we have a culture of innovation." Myers asserts that the company's collaborative atmosphere creates a highly desirable work environment, which is essential in an industry plagued by labor shortages.

Next on the to-do list for Myers? He is currently focused on evolving Thrive from a homebuilder into a land developer, so that the company can design its own communities with the goal of optimizing orientation, resource use, renewables and other key infrastructure elements. He is also dedicated to delivering affordable, efficient and healthy housing solutions to markets along the Front Range.

Water is a key area of concern for Myers. "In a West that is on fire and experiencing extreme drought, surely we can be better stewards of water," he says.

Myers has a unique perspective on the role that builders should play in the marketplace. "All builders are environmentalists," he claims. "We just happen to deal in the human environment. We want the species to thrive and prosper. It's not just about the environment and climate—it's about people in the environment. If we can keep that in mind, we'll be better builders for it."

To take a break from enhancing the culture at Thrive, Myers heads to the slopes for some backpacking or downhill skiing.

THE DOERS

BILL FAY, Coalition Director, Energy Efficient Codes Coalition

Bill Fay has spent nearly four decades building coalitions and finding ways to create common ground between diverse stakeholders—namely the national government, environmental community, manufacturers and consumer groups. As a long-time Washington, D.C., insider, Fay has mastered navigating the choppy—and often contentious—waters on the Hill, bringing Democrats and Republicans together to get things done.

Fay was the executive director of the Clean Air Working Group, established in conjunction with the Business Roundtable and National Chamber of Commerce, where he headed up efforts to reauthorize the Clean Air Act.

Peace keeper. Making opposing sides in Washington, D.C., work together on environmental matters is one of Energy Efficient Codes Coalition Director Bill Fay's key skills.

"When I joined the campaign, the impasse between the environmental community and the business community was so intense that the Clean Air Act had expired and was kept alive by annual extensions," he recalls. "But as the discussions evolved, it became clear that the business and environmental communities were 80 percent aligned. By creating policy based on that 80 percent, we were able to meet the majority of our objectives and enact a law that has profoundly improved our nation's air quality."

Since 2007, Fay has run the Energy Efficient Codes Coalition, a broad-based alliance of energy efficiency advocates that work to advance the development and adoption of building energy codes.

Today, Fay is focused on getting mayors to incorporate building energy efficiency in their climate action plans. "Mayors instantly recognized the myriad benefits of efficiency to homeowners, tenants, their community power grids, and national energy and climate security."

Fay thinks extensively about how to bring civility back to Washington. "Public policy works when you can find common ground," he says. "There is no easy solution to address the polarity and paralysis we're experiencing. The only way is to sit down together with open minds, listen to each other, and develop consensus. That's how we'll forge a pathway forward and reestablish a functional system."

When he's not inside the Beltway, you can find Fay and his wife, Lee Ann, on the Amalfi Coast or cruising on a riverboat along the waterways of Europe.

GWEN MIGITA, Social Impact & Inclusion Vice President and Chief Sustainability Officer, Caesars Entertainment

As Social Impact and Inclusion Vice President and Chief Sustainability Officer for Caesars Entertainment, Gwen Migita has turned the hospitality giant's corporate sustainability program into an art form. Migita oversees Caesars' corporate social responsibility strategy and policy through the People Planet Play framework, an overarching program that encompasses CodeGreen, the company's award-winning global environmental sustainability strategy.

As a female Asian American Pacific Islander member of the LGBTQ community, she places a particular emphasis on the impact that sustainability has on human beings. "Sustainability can be an equalizer between socioeconomic classes and gender, along with other marginalized groups in our society," Migita asserts. "The complexity of the various areas of sustainability has an end result on human beings. It's the impact on reducing marginalization that I find fascinating."

In the U.S., there's a correlation between lifetime earnings and where someone grows up, she continues. "Access to nutritious food correlates with educational performance, and education is an equalizer for socioeconomic issues," Migita says. "I get excited about sustainability and the clear impact it has on social justice and overall on society."

An avid adventurer, Migita loves to travel and learn about different cultures. "Growing up in Hawaii, I was constantly exposed to a number of cultures there," she says. "I've been to about 30 different countries." Her global experience is essential, given that she oversees programs for 50 resorts and 70,000 employees worldwide.

When not conjuring up new sustainability strategies for Caesars, she and her wife, Cuc, and their two young children Max and Ava, spend time visiting family in Olympia, Wash., and Hawaii.

Human hospitality leader. Caesars Entertainment Chief Sustainability Officer Gwen Migita emphasizes the correlation between sustainability, socioeconomics and gender.

KIM SHANAHAN, Executive Officer, Santa Fe Area Home Builders Association

They say that once a builder, always a builder. But this outspoken, pioneering, hero of sustainability has broken the mold. As Executive Officer of the Santa Fe Area Home Builders Association (SFAHBA), Kim Shanahan has had the unique opportunity to show by example how to build high performance, water-saving, durable homes. But he also has been able to influence the industry from the inside.

Shanahan's no-nonsense, collaborative style and his uncanny talent for always being informed and prepared, make him an excellent liaison between builders, policymakers, homebuyers and other stakeholders.

This is critical, since Shanahan faces the ultimate dichotomy on a daily basis—he represents a conservative industry in a progressive town. As such, Shanahan does his best to bring the sensibility of a small local business owner to controversial discussions about green building, climate change, affordable housing and growth management.

Leader by example. As a veteran green builder and small business owner, Santa Fe Area Home Builders Association Executive Officer Kim Shanahan gains an insight into sustainability that he is all too happy to share with others.

Leveraging his position in the building industry, Shanahan has nurtured change at all levels of local, state and national policy in favor of sustainability. He helped the City of Santa Fe draft and adopt one of the country's first comprehensive residential green construction codes, based on the National Green Building Standard (ICC-700).

Shanahan has also has played a pivotal role in shaping a national dialogue about water stewardship. He was a central figure in the adoption of strict standards in the water-starved Santa Fe area, including an innovative water bank program. As a board member of the Green Builder Coalition, he was instrumental in the development of the Water Efficiency Rating Score (WERS), a rating system that measures a home's water use.

"The zero to 100 scale of the WERS program plays right into the competitive nature of builders and the marketplace," says Shanahan. "Consumers can easily assess the most water-efficient home. A performance-based metric always produces better results than a purely prescriptive standard. It drives innovation and best practices that are quickly adopted by others."

When he's not shaking things up in the building industry, you can find Shanahan hiking, reading, writing, cooking and contemplating life at his cabin in Cow Creek, N.M. **GB**

GREEN BUILDER® MEDIA PRESENTS

THE ALIGNPROJECT BY Kasita

CREDIT: KASITA

Full house. Compact, airy and modern, *Kasita*'s small modular homes encourage a simple but satisfying lifestyle.

The Align Project: Align Your Space

What if we optimized our living spaces to create a home that's 100 percent useful?

BY JULIET GRABLE

EVERY YEAR IT'S THE SAME REPORT: New homes in the U.S. keep getting bigger, even as the size of the average household shrinks. Though the rate of bloating has slowed in recent years, new single-family homes still averaged 2,457 square feet in 2017. And we're filling those homes with stuff, much of it bought on credit.

If our homes were smaller, would we be forced to simplify? By giving up space and things, would we find ourselves with more time—and possibly more happiness? Kasita founder and CEO Jeff Wilson thinks so, and he has the experience to prove it. He spent 2014 living in a 33-square-foot dumpster on the Huston-Tillotson University campus, where he was a professor.

"I wanted to compress space to its ultimate limit and see if one could be happy owning things, rather than having them own you," says Wilson.

The value of space is one of the questions we decided to tackle with The Align Project, a joint partnership between Green Builder® Media and Kasita, an Austin-based modular home-builder that specializes in the optimization of space.

CREDIT: TREKANDSHOOT/ISTOCK

Maximum overload. Many families use their garages for overflow storage, while their cars are kicked to the curb.

GREEN BUILDER® MEDIA PRESENTS

THE ALIGNPROJECT

BY Kasita

CREDIT: KASITA

Biophilic experience. The *Cube* is an inviting nook that connects occupants with light, views and fresh air.

MISSION: OPTIMIZE

One of The Align Project's goals is to demonstrate that we can do more with less, without compromising. But first, let's consider the Great American Home of the 21st century. A University of California at Los Angeles (UCLA) study of 33 Los Angeles families confirms what we already know: The way we use our homes has changed. We've abandoned the formal dining room and we (mostly) use our bedrooms to sleep. The kitchen is the home's hub—it's where we eat, where we meet and where we exchange information. As for those extra rooms, many are stuffed with possessions we rarely use but can't bear to part with.

Most of us use only a fraction of the large homes we were told we needed. How can we instead optimize the living spaces we actually want and create a home that's 100 percent useful?

Wilson's epiphany came while living in the dumpster. "I realized that we need to design the space around the user, by asking how the user experiences space," he says.

Among other things, the 352-square-foot *Kasita* illustrates how to make a space feel larger than it is: Use high ceilings and clean, flat light-colored surfaces, and bring in as much natural light as you can.

Kasita's floorplan is a deceptively simple rectangle, consisting of a bathroom, kitchen, living space and airy niche, with plenty of designed-in storage. The living room ceilings are 10 feet high, and the stepped floorplan effectively creates separate "rooms" without full walls. This also enables the bed to be stowed under the kitchen when not in use, freeing up 50 square feet of underutilized space and pushing *Kasita* beyond the studio concept.

THE GREAT INDOORS

One of the sad findings of the UCLA study is that very few families were engaged in the famous "California Living." Even children spent very little time outside, despite ample backyards enhanced with swing sets and BBQ grills. With average adults spending more than 90 percent of their time indoors, it's crucial to foster a connection to the natural world. So-called biophilic design can have a positive impact on health and well-being, not to mention lower lighting costs.

One of *Kasita*'s most striking design features is the "Cube"—a 42-square-foot cantilevered space surrounded by glass on three sides. This flexible "end cap," inspired by San Francisco's iconic bay windows, can be outfitted with fixed windows or sliding glass doors and enhanced with a porch or balcony.

The glazing here and elsewhere is vital for connecting occupants with views, fresh air and sunlight, while contributing to the home's energy efficiency. Align Project sponsor Andersen Windows is bringing the clean, modern lines of the company's *E-Series* windows and doors to the home. These include fixed and casement windows that promote natural ventilation and hinge or gliding doors. The aluminum-clad windows are Energy Star certified, as are 99 percent

PHOTO COURTESY OF ANDERSEN WINDOWS

An open and shut case. *VeriLock* sensors can tell occupants whether a window or door is unlocked; a locked unit is more energy efficient.

of Andersen's products. The windows will also feature Andersen's *VeriLock* sensors— which tell the user whether a window is open, closed, locked or unlocked—and the *Yale Assure Lock*, a keyless smart lock that users can control remotely.

These doors and windows will connect to outdoor living spaces, which can expand the usable square footage of a smaller home. There's an inverse relationship between the amount of indoor "hang-out space" and time spent outdoors, says Wilson.

CREDIT: ALLEN MORRIS PHOTO/ISTOCK

Design Strategies for Outdoor Rooms

Do you (or your clients) want to boost outdoor time above 10 percent? Here are some tips for creating outdoor rooms that people will actually use:

DEFINITION. To help your outdoor room feel more like a place, delineate the borders with half-walls, railings, benches or raised planters.

DESTINATION. Entice indoor creatures outdoors with a pergola, water feature and/or sturdy but comfortable set of recycled furniture. Use transition spaces and pathways to usher people to the outdoor room.

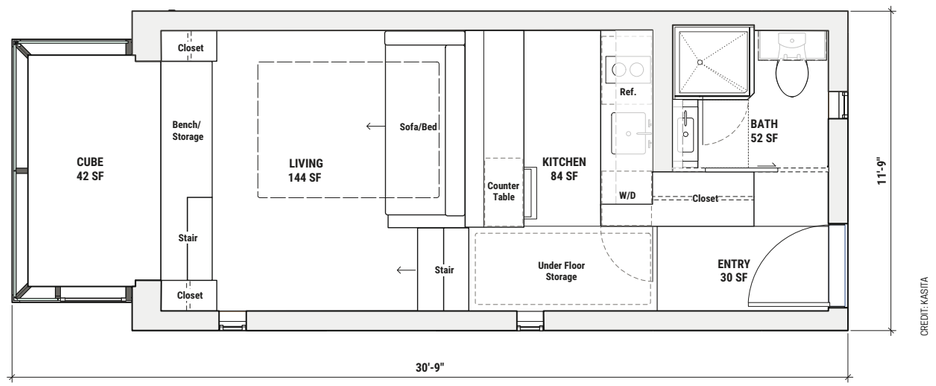
CONNECTION. It may sound basic, but providing a visual and physical connection to the outdoor room via windows and doors will help ensure the space gets used. After all, out of sight is out of mind.

SENSORY STIMULATION. Fresh breezes; views of plants growing up an arbor; the soothing trickle of a water feature—appealing to several senses will make for a multi-layered biophilic experience that can be enjoyed from inside as well as outside.

SHELTER AND SHADE. Even the most appealing outdoor room won't get used if it's blasted with afternoon sun or wind. Design shade that makes sense for the climate and orientation and ensures a comfortable experience for as much of the year as possible.

DON'T FORGET THE KIDS. No one will enjoy the outdoor room if the kids are bored. Stock it with games, or better yet, make the rest of the yard safe and appealing to children, so they can enjoy it while the adults socialize.

Less with more. The compact floor plan of the 352-square-foot *Kasita* includes functional kitchen and bath spaces and plenty of storage.



CREDIT: KASITA

GREEN BUILDER® MEDIA PRESENTS

THE ALIGN PROJECT BY Kasita

CREDIT: KASITA

Double duty. The stairs leading up to *Kasita*'s kitchen pull out to reveal a divided drawer.

SPACE SAVERS

According to Wilson, another trick to small spaces is keeping lines clean and possessions out of sight.

To solve the problem of storage, *Kasita* doubles down. The short stair leading up to the kitchen pulls out to reveal a deep drawer, which can also be accessed via a hatch next to the kitchen. A closet next to the kitchen houses a stacked washer and dryer pair and a couple of shelves. Two closets flank the *Cube*, for a total of 36 inches of hanging closet; the bench dividing this space from the living room also functions as storage.

The kitchen includes a full suite of appliances, including an induction cooktop, microwave and convection oven, range hood and refrigerator/freezer. And at 52 square feet, the bathroom isn't short-changed, either. Here you'll find one of the most eye-catching space savers in the demonstration home: the Viega carrier, which takes the place of a traditional two-piece toilet. The tank is elevated and housed in the wall cavity and can be accessed through the flush plate; the seat fixture attaches to the carrier through the wall. Not only does this save space and make cleaning a lot easier (no more working around those gasket covers!), the design takes advantage of gravity, making reliable performance possible with very small volumes of water and pressures down to 5 psi. The dual-flush *Eco Plus WC Carrier* featured in The Align Project uses 0.7 and 1.9 gallons per flush.

"These carriers are very prevalent in Europe," says Tim Schmidt, product manager of Flushing and Drainage Technology for Viega. He adds that although the technology is mostly confined to public facilities in the U.S., "it's coming."

THE STUFF OF EXPERIENCE

As the world gets more connected, you'll see more emphasis on the user experience and less on the actual stuff being sold. This is happening with brick-and-mortar retailers as they compete for real rather than virtual customers, and among manufacturers as they increasingly turn to the "product-as-a-service" model. So why should this not also happen in our homes?

Turns out, it is. Anticipating this trend, the creators of *Kasita* are focused as much on creating a rich and positive user experience as on flooring finishes and closet storage. They have partnered with Loxone to offer the company's integrated smart home technology with every *Kasita*. Users can control lighting, locks, entertainment, climate and more through the intuitive Loxone *Smart Home App*, or they can let the home cruise on autopilot. Meanwhile, the system will continuously learn occupants' patterns, refining schedules and settings in response.

Kasita's tech team is also working on a platform that allows users to take their settings with them—whether to a new *Kasita*, a hotel room or other space. After all, it's what we do within those walls that makes a building a home.

"I see *Kasita* as a vessel of permission to downsize," says Wilson. "Leave a light footprint and see how much richer your life can be."

Look for our next installment of The Align Project, where we'll look at how to align your finances by investing in resilience. **GB**

PHOTO COURTESY OF ANDERSEN WINDOWS

Made to Order

THE *E-SERIES* FROM ANDERSEN WINDOWS is a versatile, Energy Star-certified line of windows and doors that is appropriate for residential and commercial applications. The nearly limitless options for customization and suite of tools available to building professionals makes Andersen a good partner, especially for projects with special considerations.

The *E-Series* windows pictured here were carefully designed to replicate the original windows in the Watchcase Factory, an historic building built in 1881 in Sag Harbor, N.Y. Guided by archival photos, designers carefully selected the profiles and divided lights and exterior colors to match the original windows, which had been built on site. The factory has been fully renovated and now serves as luxury condominiums. The new *E-Series* windows preserve the historic character while enhancing energy efficiency.

Andersen WINDOWS • DOORS

Protecting Occupants, Helping Builders

THE ALIGN PROJECT demonstration house showcases products and materials that contribute to beauty, efficiency and functionality. Some also help protect occupants in the event of fire. These include a *PureFlow* residential fire sprinkler system from Viega and a fire-resistant building envelope insulated with *COMFORTBATT*, *COMFORTBOARD* and *AFB* mineral fiber products from Rockwool. These products are also easy for builders to work with and facilitate quick construction, saving time and money.

The 13D-rated fire sprinkler system from Viega uses polymer fittings and flexible PEX tubing.

"In contrast to the metal fittings that most of our competitors use, polymer fittings reduce cost, which is a big barrier to entry for residential customers," says Seth Larson, product manager for Viega LLC.

Because the system uses PEX rather than rigid pipe, installers can mount the sprinklers before running the PEX tubing, saving time and labor. The system also includes a special mounting bracket with "mounting reference designators," which accommodate different pendant styles and ensure they are installed at the right depth.

Exterior and cavity mineral wool insulation from Rockwool will contribute to energy efficiency, acoustics and fire resistance to The Align Project demonstration home.

Mineral wool insulation is naturally non-combustible. With a melting point of 2,150 °F, the material can help contain a fire and keep it from spreading to other rooms. It also has a smoke developed index of 0—the lowest possible, meaning it will not contribute significantly to toxic emissions.

Rockwool products also offer benefits to the builder or installer. The high-density material is dimensionally stable and friction fits into cavities without sagging. This is a plus for modular homes, which are often transported to the site mostly or fully constructed. Rockwool also works directly with modular home builders, streamlining the sales process and ensuring good detailing.

viega

Easy does it. The proprietary brackets used in Viega's fire sprinkler systems can be rotated to accommodate the most common types of pendants and sprinkler configurations.

PHOTO COURTESY OF VIEGA

ROCKWOOL

Forceful fiber. Rockwool works directly with modular builders and also offers a suite of a building science services, including thermal bridging modeling and R-value calculations.

PHOTO COURTESY OF ROCKWOOL

WHAT IS 13D?

NFPA 13D is an installation standard developed by the National Fire Protection Association (NFPA) for residential fire sprinkler systems for one- and two-family dwellings and manufactured homes. The intent of the standard is "to provide an affordable sprinkler system in homes while maintaining a high level of life safety."

Size Done Right

WHEN JEFF WILSON moved into a 33-square-foot dumpster on Huston-Tillotson University in Austin, Texas, he had to confront something big: his stuff.

Wilson decided to go cold turkey. He posted a notice on Facebook announcing he was selling almost everything he owned for $1 an item. It was all gone in one hour. He used the standard, "Does it spark joy?"—made famous by the wildly popular book, *The Life-Changing Magic of Tidying Up*—to vet his remaining few possessions. "What you own comes into sharp focus when you downsize this radically," he says.

He's not unhappy one bit. "My life and time became a lot richer," says Wilson, who became known as "Professor Dumpster" during his year-long stint. "The things I had, I absolutely loved, and I didn't miss the things I had lost."

After the Dumpster Experiment came the "craziest OkCupid date ever," when Wilson and his girlfriend of eight weeks embarked on a 21-day, eight-country tour with no plans and no baggage. Wilson continues to live a radically downsized life—proving his year in the dumpster wasn't just a gimmick—and he claims freedom as the payoff.

"These things we own have weight beyond their gravitational mass," he says. "They weigh on your pocketbook; they weigh on your soul."

COURTESY OF JEFF WILSON

Living 'large.' Despite the tight accomodations, Kasita CEO Jeff Wilson was all smiles during his year-long residence in a former trash dumpster. Wilson wanted to prove that it's possible to be happy without a lot of square footage and possessions at home.

GREEN BUILDER® MEDIA PRESENTS

THE ALIGN PROJECT

BY Kasita

Experience The Align Project

SOLAR POWER INTERNATIONAL:
September 24-27, 2018
Anaheim Convention Center,
Anaheim, CA

CONSUMER ELECTRONICS SHOW:
January 8-11, 2019
Las Vegas, NV

DESIGN & CONSTRUCTION WEEK:
February 19-21, 2019
Las Vegas, NV

CREDIT: KASITA

Can we chart a new course? The Align Project says YES.

Here's a peek at the facets of an aligned life we'll explore over the next year:

ALIGN Your Space: The 100 Percent House

Most of us use only 5 percent of the large homes we were told we needed. What if instead, we optimized our living spaces to create a home that's 100 percent useful? The *Kasita* house, with its precision-engineered design and modular construction, uses good design to optimize space and reflects how people actually use their homes.

ALIGN Your Finances: Investing in Resilience and Efficiency

Many of the choices we make about our homes sacrifice durability, resilience and efficiency for short-lived cost savings. When we put in a carpet that lasts five years instead of hardwood floor that lasts a century, we sabotage our future. To align our finances, we most focus on reducing predictable costs, not creating future sinkholes for our money.

ALIGN Your Technology: Mastering Our Machines

At what point do high-tech gadgets stop serving you and start sucking away your valuable time and life energy? How can we be seamlessly "connected" all the time without feeling watched and violated? We'll dig into research about where and how people are using technology, and explore which innovations are truly helping people improve the quality of their lives and which are merely trendy gizmos destined to be mothballed.

ALIGN Your Mobility: Destination Deconstruction

What if, when thinking about getting from point A to point B, we focused on the journey instead of the destination? This shift in focus could affect everything from the type of vehicle we drive to the type of neighborhood we choose to live in. Join us as we explore the topic of mobility from a human-centric perspective, considering the implications for everyone from city planners and car makers, to the users themselves.

ALIGN Your Future: Aging With Dignity

Devices and products are now available that monitor vital signs, improve access or mobility around the homes, and ensure safe and healthy spaces. Combine these with a compact, portable, flexible housing option like *Kasita* and you have the ultimate strategy for a home that changes with you.

Block party. Wendell Falls' highly energy-efficient design, and the option for rooftop solar and a home battery, are making near net-zero feasible for more North Carolinians.

COURTESY OF WENDELL FALLS

Net-Zero for the Masses

Wendell Falls offers homeowners a chance to soak up some sun.

BY BARBARA HORWITZ-BENNETT

DEMONSTRATING THAT NEAR-NET-ZERO HOMES CAN BE AFFORDABLE for more North Carolinians, a new development just east of Raleigh combines solar panels, a home battery and sustainably built homes that are 23 percent more energy efficient than the average local home.

At Wendell Falls (**www.wendellfalls.com**), a 3,348-home master-planned community, low-E windows, advanced framing, high-efficiency lighting and appliances, WaterSense-certified faucets and toilets, tankless water heaters and third-party blower door, duct and exhaust flow testing combine to deliver an average low Residential Energy Services Network Home Energy Rating System (HERS) score of 63. However, what really sets this 1,267-acre project apart is the opportunity to incorporate rooftop solar panels and a Tesla home battery, delivering greater grid independence at an affordable price point.

By allowing homeowners to package the added costs of a higher building efficiency design and solar power directly into the home's mortgage, total monthly operating costs—i.e., the mortgage and utility bills—are actually lower for a higher-priced home with these features than a similar code-built home, reports Graham Alexander, senior residential energy specialist at Southern Energy Management in Raleigh.

So if homeowners qualify for a 30 percent tax credit and utility rebate for the solar panels, they're looking at an eight- to 10-year payback for a 10 percent return on investment. But perhaps even more convincing is the fact the solar array will put owners into a cash-positive position from the get-go. By rolling the solar into the mortgage, monthly payments increase by $50 to $60. However, homeowners simultaneously save $70 to $80 on their monthly electric bill.

Furthermore, the cost of solar energy in North Carolina has gone down—now averaging $10,000 to $15,000 after incentives—so it's no longer considered a high-end amenity.

COURTESY OF GARMAN HOMES

Super sustainable. Homes in the Wendell Falls development are Energy Star and National Green Building Standard Bronze level certified, and meet ecoSelect standards.

"If you're in a financial position to buy or finance a car, now you're also in a financial position to be able to buy a solar array," says Jamie Hager, green building specialist at Southern Energy Management.

Generally speaking, builders are hesitant to put solar on a spec house, but with this new mortgage option, Alexander and Hager are optimistic this will enable more homeowners to opt for solar on new construction projects.

For the Wendell Falls project, the builder, Homes by Dickerson, selected black mono-crystalline modules with a 25-year warranty for the solar panels. While more expensive than poly-crystalline and thin-film PV panel technologies, mono-crystalline is a more efficient module, converting the highest amount of solar energy into electricity, and offering a proven track record of reliability and longevity.

But the big selling point for mono-crystalline was aesthetics. Black on black blends in much better to the dark shingled roofs typically found in North Carolina. In addition to avoiding the industrial look of solar farms, these solar modules are more power dense, so more energy harvesting can be packed into a smaller space, Alexander explains.

TIGHT AND EFFICIENT

Of course, a high-efficiency solar array and advanced home battery are only one half of the near-net-zero question. The homes themselves had to be efficiently designed, starting with the building enclosure and proceeding to the electrical, mechanical and plumbing systems.

For starters, Southern Energy Management directed the builder to take advantage of advanced framing techniques, including two-stud corners—which offer the same structural integrity as traditional solid corners—and ladder blocking where the exterior and interior walls meet up. Combined with 2-by-6 framing, insulated headers and reduced framing at windows and doors, these strategies allow for more insulation in these spaces, resulting in an above-code wall system.

Another key strategy was third-party insulation inspections and testing to verify that the home is performing as designed, according to Jonathan Bailey, project superintendent for Homes by Dickerson in Raleigh.

"These tests are performed on items hidden behind the walls and in crawlspaces and attics that are not easily accessible," Bailey says. "Not only do these tests ensure that the homes we are building meet Energy Star standards, they also act as a form of quality assurance for our customers."

Hager adds that the insulation inspection, blower door, duct and exhaust flow tests enable builders to pinpoint and address areas that impact energy use, comfort and indoor air quality encountered during construction that are not detailed in house plans. "Without these inspections and tests, homes can experience high energy bills, comfort issues and even mold problems and not have an idea where to start truly addressing their problems," Hager says.

By tightening the envelope and boosting insulation, the home is easier to heat and cool, with increased comfort and enhanced energy savings, she adds.

Ultimately, the tight, tested enclosures and insulation strategies result in homes that meet the High Efficiency Residential Option in the 2012 North Carolina Conservation Energy Code.

COURTESY OF SOUTHERN ENERGY MANAGEMENT

Dark synergy. Black on black mono-crystalline modules blend in well with the homes' dark shingled-roofs. They also work to convert a high level of solar energy into electricity.

Open air. The Wendell Falls homes incorporate a smart, whole-house fresh air ventilation system for enhanced indoor air quality and energy efficiency.

COURTESY OF GARMAN HOMES

PHOTOS COURTESY OF GARMAN HOMES

Easy viewing. Low-E, double-pane windows enhance daylighting and thermal performance in the Wendell Falls development.

CERTIFIED GREEN

As for the mechanical systems, the homes are outfitted with properly sized HVAC systems with high-performance filters and a whole-house fresh air ventilation system. Here, the homes have been designed to introduce fresh air through a dedicated "respiratory system," to allow the home to breathe without compromising its comfort and energy efficiency.

Furthermore, duct leakage has been tested to be less than 3 percent, compared to 30 percent or higher with some existing home duct systems. Naturally, this makes a large difference in air conditioning efficiencies.

Additional sustainable measures include low-VOC paints, Sustainable Forest Initiative-certified subfloor and sheathing, radiant barrier roof sheathing, high efficiency lighting and appliances, and regionally appropriate landscaping.

Wendell homes also meet Southern Energy Management's ecoSelect standards, which address energy, and indoor air and water quality through a straightforward checklist of strategies.

Furthermore, the houses are Energy Star certified and have achieved National Green Building Standard Bronze-level certification. This means that the residences offer high levels of energy efficiency and address water, indoor air quality, site design and materials for resource efficiency and sustainability.

"By making ecoSelect Certification a standard for all new homes, Wendell Falls is setting the bar high for building efficiency," Alexander says. "This allows for a solar array to have a much larger percentage of impact on a home's electric bill than a code-built home." **GB**

Room to spare. With a large 13.5 kWh storage capacity, the 44-by-29 inch Tesla *Powerwall 2* home battery system enables Wendell Falls homes to achieve near net-zero performance.

COURTESY OF SOUTHERN ENERGY MANAGEMENT

The Tesla *Powerwall*: What's it All About?

CAPITALIZING ON ADVANCED home battery technology with the Tesla *Powerwall 2*, Wendell Falls in Wendell, N.C., is giving homeowners the option to store their own solar power and not be so dependent on the grid.

"The Tesla *Powerwall*, combined with solar panels, provides that next step in green-home construction, offering our residents further grid autonomy and security against power outages," reports Hunter Matthews, Wendell Falls marketing manager.

"It is designed for the homeowner that wants these benefits but not the traditional ongoing maintenance of previous battery technologies," adds Graham Alexander, senior residential energy specialist for Southern Energy Management in Raleigh, N.C. "The 10-year warranty and the ease of use with this product via a phone app makes the solution feasible for every homeowner."

The Tesla *Powerwall 2* offers a large 13.5 kWh storage capacity, making it well suited for most large modern homes. The system delivers 7 kW of peak power and 5 kW of continuous energy, and runs 44 inches by 29 inches in length and width and 5.5 inches in depth.

"Building on experience from the durable Tesla electric vehicle batteries, it is a well-engineered system and has so far proven to be a very high-performing battery," writes renewable energy consultant Jason Svarc in a *Clean Energy News* review. "Also, it is the only battery to incorporate liquid cooling, which may mean it outlasts other batteries, especially in hotter climates."

This second generation of the *Powerwall* product also offers an integrated DC-AC inverter and a notable price drop. At the same time, supply is currently not keeping up with demand, leading to a six-month wait for the product. **GB**

Healthy Homes, Healthy Buildings

What we can't see and don't know can hurt us—and our clients.

This is the fifth in a series of articles about the increasing interest in—and necessity for—smart homes, villages, cities and communities globally, and how they relate to green building in the U.S.

BY TERRY BEAUBOIS

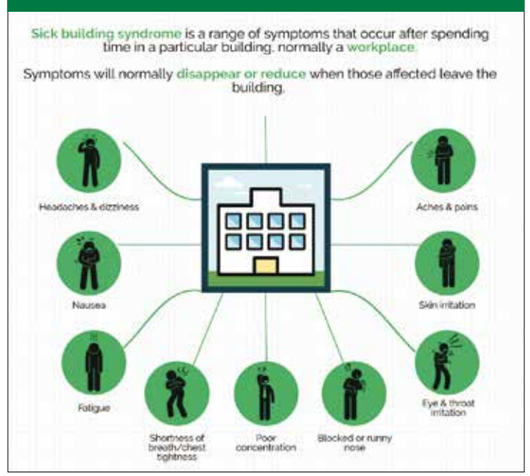
THE TOPIC OF HEALTHY HOMES AND BUILDINGS has been around for a while, but the awareness of the problem and what to do about it is being raised to a higher level with recent findings.

Having a healthy home environment is a core element for every member of the building industry—architects designing homes for people; builders building homes; and family members concerned about their family's health. This is an area that has been a career-long interest of mine. In the past, it was more of a background issue, but over time, research shows this to be increasingly important as we gain a better understanding and additional knowledge of the issues related to air quality.

CREDIT: TIVADSISTOCK

Home sick home. Indoor air quality may not seem to be a key point to consider when designing a house, but it can be a crucial aspect for builders and home occupants—especially if they consider working with you again years later.

WHAT IS SICK BUILDING SYNDROME?



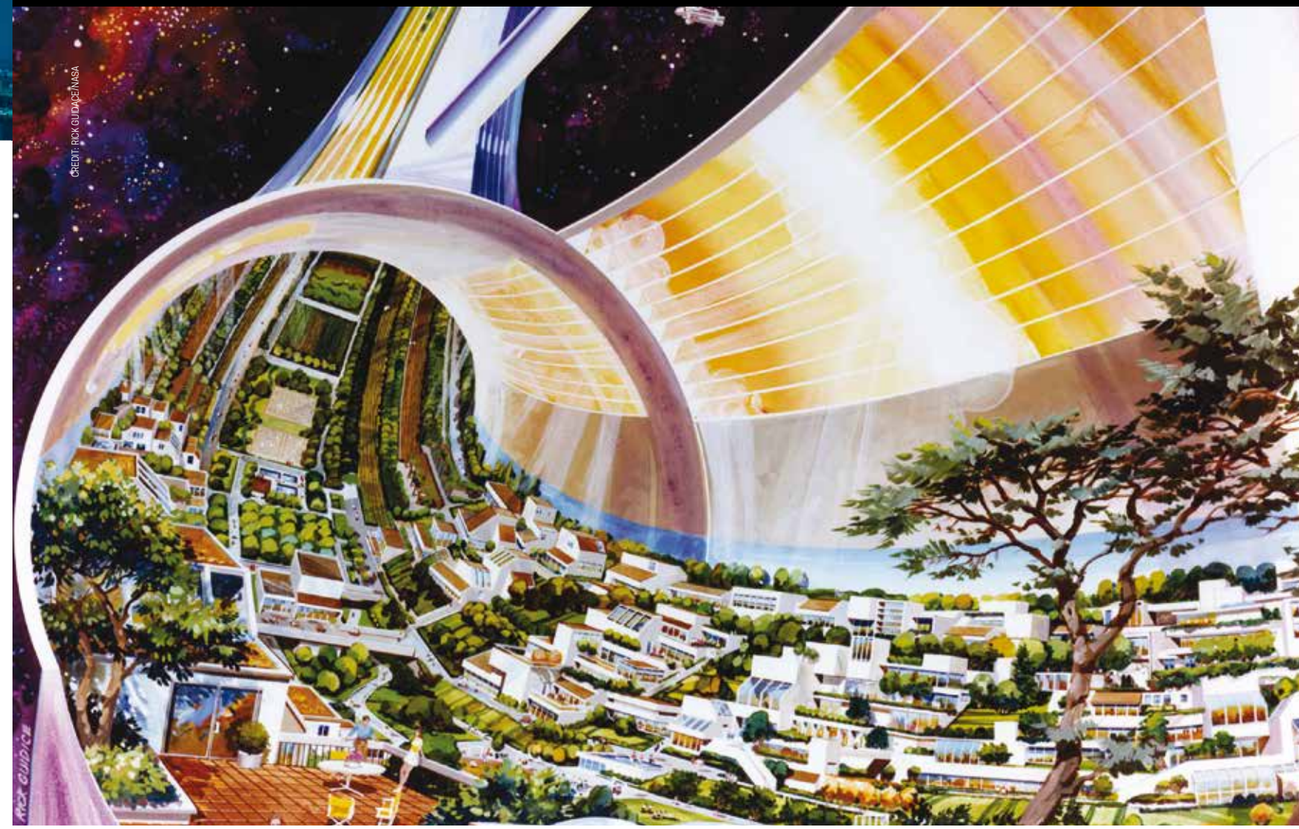
CREDIT: PAINT INSPECTION LTD.

Unhealthy households. After the World Health Organization acknowledged the existence of Sick Building Syndrome in the early 1980s, employers and employee associations got the word out about what to watch for at work and at home.

A healthy home is not an impossible goal to achieve, but it does not occur by accident. It requires knowledge of what to do and how to do it. While it may not seem to be the highest priority during the planning and design of a house, it can turn out to be one of the most important aspects of that house in the long run. "Healthy" is a term that should be included in any Green Building or SMART Home.

During the 1970s, the interest and importance of indoor air quality in buildings accelerated when the challenge of "leaky buildings" was addressed. We began to seal buildings better—around windows, doors and wall penetrations (electrical outlets, ducts, etc.)—to reduce the air leaking in and out of buildings, and reduce wasting of energy.

But when a new government building in Sacramento, Calif., was sealed tight, we learned that internal components such as carpet and plywood were "outgassing" formaldehyde, a gas that is detrimental to human health when allowed to remain in the building. If that building is "leaky," the gas could slowly escape. But because this structure was "sealed," there was an unintended consequence: Everyone was going home "sick." This later became



CREDIT: RICK GUIDICE/NASA

A real space case. NASA's interest in a massive, occupied space station—and the need for clean, breathable oxygen—helped generate interest in the type of air found in buildings and homes.

known as "Sick Building Syndrome." As a result, the study of building materials was increased to identify and help eliminate unhealthy components.

A LESSON FROM SPACE?

Around the same time, in late 1977, I became involved with NASA research. A space station was a hot topic, and the idea of people living in space became a new research area. I liked NASA's "mission critical" approach to planning and design of the station, including the quality of the air that people would breathe. I felt that the research around the space station would also create information of interest and value for buildings on Earth. The research, and design-implementation of that research, were elevated to the highest level possible by NASA. This is a level of concern that the building industry shares.

In 2007 to 2010 I led a team at Montana State University on an award-winning ecoSMART Home project. We were able to identify and address a number of issues relative to air quality (temperature, humidity and pollution) and would learn more as we implemented what we knew and understood at that time.

Because our design included mechanical heating, ventilating and air conditioning (HVAC), we were able to work directly with the equipment manufacturer. We custom designed a system to fully address issues that are not typically covered in an average home design and construction project. Special air filters, fresh air circulation, heat recovery ventilation (HRV), heat exchangers, air exchangers and air-to-air heat exchangers were all studied by the mechanical manufacturer and the mechanical engineering students. We were also able to use technology that had been developed by NASA in our windows.

This April, I was invited to join a team of researchers at Stanford Medical School who, along with Bangladesh research partner organization, the icddr,b, were already investigating the effects of ventilation on the health of residents of slum neighborhoods in Dhaka. The locations being studied have some of the highest incidences of childhood and adult pulmonary (lung) disease. The team's goal was to figure out how to increase the ventilation of residences in these areas and to see if doing so could reduce the level of disease.

The focus was on "natural ventilation"—window design, vent design, skylight design and non-mechanical solutions—because the people living in these areas do not have consistent access to

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SMART CITIES

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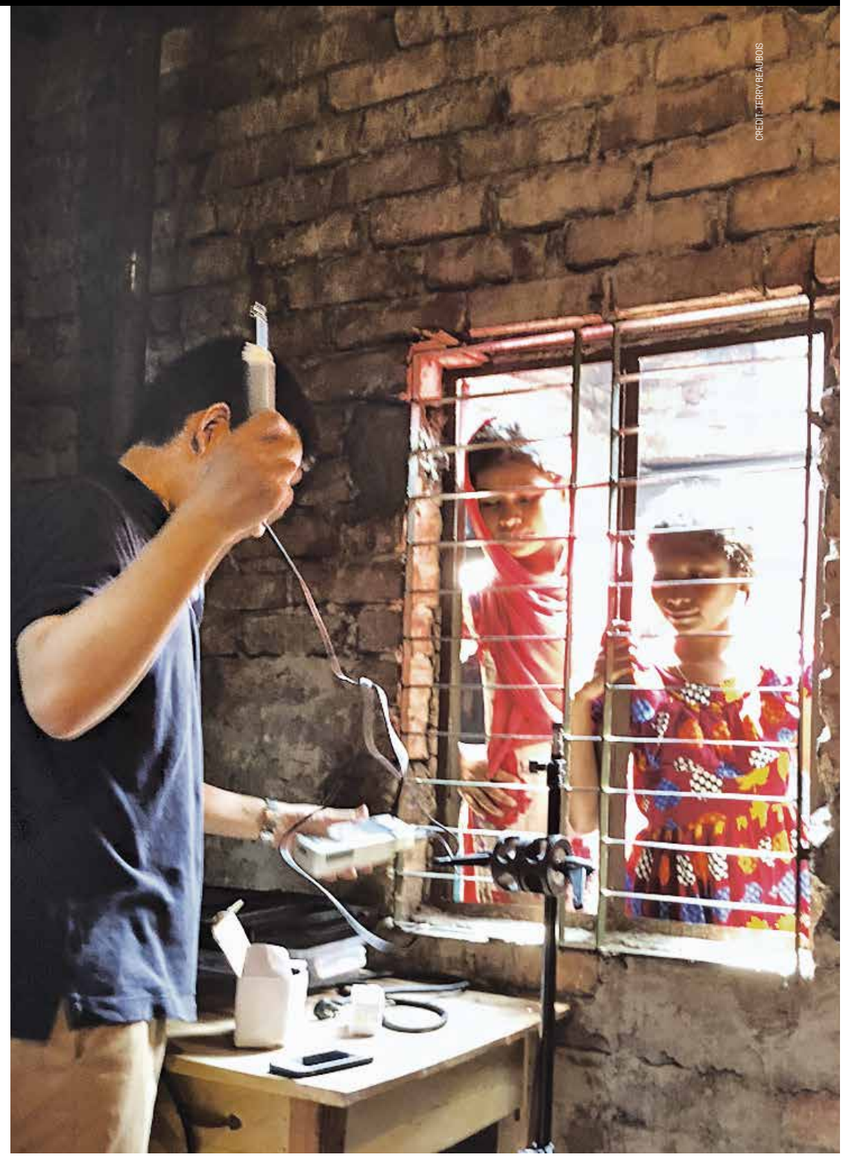
electricity and do not have mechanical air conditioning, heating or mechanical ventilating of these buildings or homes.

During my preliminary research, I was reminded about the issue of radon in homes in the U.S. and began to explore whether the chemical element could be a contributing factor in the Dhaka locations. What I found was remarkable: The World Health Organization (WHO) and the U.S. Environmental Protection Agency (EPA) state that the presence of radon gas in a home environment may increase the negative effect of other air pollutants, and increase the incidence of lung disease by a factor of 10 to 100 times. Both groups have recently ranked radon as the second-leading cause of lung cancer globally, after smoking cigarettes.

A HARD REALITY

Upon returning from Bangladesh, I did some research into the awareness level in the U.S. of radon and air quality, and found that there is still not a high level of knowledge and understanding about the issues of air quality in buildings throughout the residential building industry. But it appears these issues are as important throughout the U.S. as they are in Bangladesh.

Today, the building industry is faced with the reality that research proves that air quality is a dire problem. Whether it's within a Bangladesh slum or a U.S. suburb, people are dying due to building air quality issues. In 2017 in the U.S. alone, 21,000 deaths were attributed to radon exposure. Long-term exposure to this and other lethal elements in a building, that are invisible but can be detected with the right devices, may shorten a person's life span by 10 to 20 years if gone unaddressed.



Watchful eyes. Students in Dhaka, Bangladesh, look on as Stanford researcher Yunjae Hwang sets up air quality measuring equipment inside their home.

Recently, I met with a NASA astrophysicist who is working on this same issue, studying the effects of radiation on commercial airline pilots and crews who travel frequently and for long periods of time at high altitude, as well as astronauts on the existing International Space Station (ISS). We discussed coordinating our research in the future to fully address radiation exposure on humans, whether in the ISS or in their homes. So, again, NASA and the space station are in the scope of my building industry interests.

In addition, I have been in touch with a member of the building industry whose entire family had health issues that were traced to air quality and Sick Building Syndrome. His interests now include getting the word out about how to effectively address these issues during the design and construction period. I will report about this work in a future article. **GB**

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Time-Saving Tech

These new building trends may make future construction projects greener, cheaper and faster to complete.

BY TODD IMMING

CONSTRUCTION HAS THRIVED ON INNOVATION and technological breakthroughs for millennia. Now is no different. Firms that embrace today's cutting-edge technology and techniques can shorten project timelines, cut construction costs and promote a cleaner, more sustainable industry.

The search for efficiency in terms of labor, materials and timelines has come with the territory in the construction industry—from the moment someone first made a brick out of mud and then wondered if there was a better way.

We're way beyond that now, but the spirit remains the same. How can we speed up construction? What materials can we develop that make structures stronger? How can we incorporate increased sustainability into the work we do? How can we use the virtual world to our advantage?

Here are some of the trends we're seeing that are making a big impact on the industry.

Prefabrication

Building things elsewhere prior to their installation on a project site isn't necessarily new, but it's come a long way and is gaining in popularity as pressure ratchets up on project budgets and timelines.

You see this happening most on structures designed to contain repetitive elements. The technique has a few big advantages:

- Building features in a factory before on-site assembly keeps more of the job out of the elements that could delay construction.
- With external conditions well controlled, fewer workers are needed to build prefabricated parts compared to what would be needed on site.
- It's safer to build these components prior to assembly, as workers aren't needed in dangerous positions or conditions.
- Fewer workers are needed on site, because assembly is much easier than building piece by piece from the bottom up.

Expect to see more projects utilize prefabrication techniques—especially those on strict deadlines with tight budgets.

Entire homes built with durable PV panels

Pilot programs underway throughout the world show that roads made of extra-tough solar panels can work. The technology is expensive and has yet to be perfected, but the potential benefits of dual-use materials such as solar roads have proved too attractive to abandon. The maturation of technology that allows electric vehicles to charge up while in contact with solar roads sweetens the pot.

CREDIT: SOLAR ROADWAYS

Rising sun (power). Solar panels, a common sight on rooftops and an up-and-coming technology for roads, could one day turn an entire house into a renewable energy source for the local power grid.

But this technology isn't just about rights of way. Roof-mounted solar panels are great—but if an entire structure can also generate electricity, that much more clean, free energy is pumped into the grid. Solar-capable building materials may put the enterprising fly ash brick makers out of business, but they may also help end our reliance on fossil fuels for power generation.

Building information modeling (BIM)

BIM has also been around a few years, but the technology improved to the point where contractors and owners are finding it extremely useful.

In fact, BIM is required as a cost- and time-saving element of all government-funded structures in the United Kingdom. It's against the law there *not* to utilize BIM.

BIM software allows designers to produce 3-D mockups of a planned structure that also incorporate cost and time information. Variables—such as construction methods or different materials—can be manipulated in the software to, over time, compare the costs of differing techniques or materials used.

Permeable concrete

You've heard the term "concrete jungle" describing a more-than-just-unsightly scenario. Urban areas have long dealt with the negative effects of concrete structures that change the way the land handles rainwater.

Overuse or inappropriate design of roads or other concrete structures has taxed municipal sewer systems and forced local governments to spend precious public resources on runoff mitigation. It can be avoided.

Permeable or porous concrete uses larger stones and less sand. It's just as strong as traditional concrete but contains 15 to 20 percent empty space. The concrete allows rainwater to seep down into the ground as it normally would instead of pooling or running off. That's shown to take the burden off municipal sewer systems, extending their life, saving repair costs and eliminating the need for costly upgrades.

Fly ash bricks

If you've driven past a coal-fired power plant, you're likely to see two kinds of piles: heaping mounds of coal ready to burn, and heaping mounds of waste ash from fuel already used.

Waste ash is typically stored in "ash ponds" that do nothing but sit, posing serious risks to groundwater. That was the case in India, where the rapid expansion of coal-fired plants prompted concerned locals to wonder whether there was a way to use the mountains of coal ash quickly rising across the country.

CREDIT: SAAKAAR BRICKS

On the fly (ash). Fly ash bricks, made from expended coal, are lighter and stronger than traditional bricks or cinder blocks. They reduce the environmental impact of ash ponds.

CREDIT: VAN WIJNEN

Virtual reality's virtues. Building information modeling (BIM) software allows designers to produce 3-D mockups of a planned structure in order to compare costs by construction technique or materials used.

Fly ash bricks are lighter and stronger than traditional bricks or cinder blocks. They're also cheaper to make. It's helped mitigate the fly ash problems in India while making it cheaper to build dwellings for a rapidly increasing population.

The idea is catching on in the U.S., as firms are capitalizing on the chance to produce better-quality building materials while lessening the environmental impact of ash ponds.

Virtual reality/augmented reality

It's not just for video games.

Construction companies have begun using VR/AR tech to enhance worker safety training. It allows workers to visualize what they're learning instead of just reading it in a booklet. That reinforces how serious construction site hazards can be and has made work sites safer.

Firms also use apps that tie VR/AR tech to their BIM software. This allows contractors and owners to do virtual walkthroughs of a structure long before it's complete. Owners can then make more-informed design decisions earlier in the construction process, saving time and cutting costs.

The future favors the bold

Some of these technologies are widely in use. Some remain largely experimental. For example, your next building might not be made entirely of solar panels.

It's important to keep a keen eye looking forward. It will put you—and your customers—in prime position to take advantage of a future where anything is possible. **GB**

This article was originally published on The Korte Company learning center site [www.korteco.com].

About the author: Todd Imming is marketing director for The Korte Company, an Engineering News-Record (ENR) Top 100 Design-Build firm that has delivered more than 3,000 projects throughout the U.S.

Building Blocks

New framing, funding and energy efficiency laws pose challenges for cities and states nationwide.

BY MIKE COLLIGNON

Here is a roundup of recent construction-related legislative actions around the country:

GEORGIA

HB 876 has created quite a controversy—one that is not likely to go away anytime soon. In early May, Governor Deal signed the one-page bill into law, with an effective date of July 1. At the root of the argument is the provision, "No county or municipality shall prohibit the use of wood as a construction material so long as such use conforms to all applicable state minimum standard codes and the Georgia State Fire Code."[1]

The cities of Dunwoody and Sandy Springs had passed, in 2014 and 2016 respectively, ordinances that required buildings more than three stories tall or more than 100,000 square feet in total size to be framed with non-combustible materials, such as metal and/or concrete.

In the case of Sandy Springs, the ordinance applied to apartment buildings and even had the support of the mayor, whose family is in the tree-farming business.[2] Sandy Springs cited three main reasons for the ordinance: better-looking and longer-lasting buildings, fire safety and the discouragement of infill apartment buildings. The first reason is dubious at best, and the third is simply an anti-growth tactic. The second reason does have merit, but is limited in scope.

But in the span of three months, HB 876 went from introduced on the floor of the House to signed into law. The state law repealed all local ordinances once it went into effect.

The big issue here is local control. Georgia is a home rule state. And the irony is that seven Republicans, belonging to a political party that typically advocates for free trade and smaller government, favored the former, eschewed the latter and backed HB 876. The other major factor was the timber industry, which is very...persuasive in Georgia. In fact, State Rep. John Corbett, one of the bill's co-sponsors, admitted that "the timber industry was influential in its creation."[3]

The vote wasn't completely along party lines, however. State Sen. Jen Jordan, a Democrat who represents region of Georgia largely opposed to the legislation, said that with the imminent tariffs on steel, "a ban on wood raises the overall costs of construction for everyone—businesses, buyers, builders, etc."[4] She also hinted that a change to the state's fire code could bring the reversal that some still seek.

CREDIT: RYO CHIJIIWA/FLICKR

Lumber is in again. Georgia's new construction law prohibits the banning of wood as a construction material if it conforms to the state's fire code.

Savannah Fire Chief Charles Middleton indirectly agreed with her. "My belief is that everything works better with everyone operating under one standard, statewide building code," he says. "I also believe that as changes become necessary, these changes should be reflected in the updated code."[5]

CREDIT: AQUA MECHANICAL/FLICKR

Moving forward. By placing flow requirements on faucets, showerheads, urinals and sprinklers, Vermont's new water efficiency standards go where outdated federal standards won't.

CREDIT: NATIONAL RURAL KNOWLEDGE EXCHANGE/FLICKR

No quick refusal. The compost market in Illinois could become a big deal as a result of legislation requiring consideration of locally produced, amended soil in place of dirt imported from elsewhere.

ILLINOIS

A number of bills were sent to Gov. Bruce Rauner in late June for signing just before the state's legislative session ended. Some of the notables include:

SB 2773: This Program of All-inclusive Care for the Elderly (PACE)-related bill empowers a local government to sell any and all assessment contracts. This opens up PACE financing to more funders. It also allows more than one program administrator, in addition to the local government. This equates to increased options and competition, which will hopefully keep costs down.

While it is not unique to see "water-use improvement" as part of a PACE program, the fact that it's retained in the bill is a forward-thinking measure for a Midwestern state. Whether anyone uses PACE financing for water efficiency remains to be seen.

HB 4790: This bill is more symbolic in nature than anything, but it's still a step in the right direction. It enables "any State agency that undertakes a landscaping project that requires the use of offsite soil and that is located within 10 miles of any Illinois Environmental Protection Agency-permitted compost facility shall request a separate bid for compost-amended soil as part of that project. The State agency shall consider whether compost-amended soil shall be used based upon the costs, and shall incorporate compost-amended soil into a landscaping project if the cost of using compost-amended soil is equal to or less than the cost of using other new offsite soil."[6]

By the end of 2019, the Department of Transportation is asked to conduct two pilot demonstration projects using compost-amended soil. Within one year of substantial completion of both projects, the Department shall report to the General Assembly stating the costs, and advantages and disadvantages of using compost-amended soil.

The hope is that this will kickstart a market for compost and composting. One positive sign is that HB 4790 had 58 co-sponsors, with both sides of the aisle represented. It also passed both chambers without a single "No" vote.

VERMONT

House Bill 410, approved by Gov. Phil Scott in late May, calls for energy or water efficiency standards on a wide array of products. The state was unhappy with the lack of progress on updating federal efficiency standards, so it has decided to take matters into its own hands. While the legislation applies to a number of commercial products (like fryers and steam cookers), it also requires efficiency from residential products like faucets, ventilating fans and showerheads. Here is the breakdown of various products cited in the bill:

- Commercial dishwashers, fryers and steam cookers; water coolers: Energy Star v2.0
- Lavatory faucets and replacement aerators: 1.5 gpm at 60 psi
- Kitchen faucets and replacement aerators: 1.8 gpm at 60 psi (temporary 2.2 gpm allowed)
- Public lavatory faucets and replacement aerators: 0.5 gpm at 60 psi

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CODE ARENA

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- Showerheads: 2.0 gpm at 80 psi
- Urinals (most: 0.5 gpf)
- Residential ventilating fans: Energy Star v3.2
- Spray sprinkler bodies: internal pressure regulator and WaterSense v1.0

The effective date for the standards applicable to commercial dishwashers, fryers, steam cookers, residential ventilating fans, spray sprinkler bodies and water coolers (among others) is July 1, 2020. The effective date for efficiency standards for faucets, urinals and showerheads is July 1, 2021.

The efficiency standards do not apply to "products installed in mobile manufactured homes at the time of construction, or products designed expressly for installation and use in recreational vehicles."[7]

The bill also calls for the Department of Public Service to prepare a State Comprehensive Energy Plan covering at least a 20-year period. The plan will include a comprehensive analysis and projections regarding the use, cost, supply and environmental effects of all forms of energy resources used in the state. It will also include recommendations for both state implementation actions, as well as regional and municipal energy planning and standards. An annual progress report will be filed by the Commissioner of Public Service on or before Jan. 15, starting in 2019. GB

Links:

1. https://legiscan.com/GA/text/HB876/2017
2. https://bit.ly/2LhFffv
3. https://bit.ly/2upSeWb
4. https://bit.ly/2LfsQft
5. https://bit.ly/2I7ScH4
6. https://legiscan.com/IL/text/HB4790/2017
7. https://legiscan.com/VT/text/H0410/2017

Mike Collignon is the executive director and co-founder of the Green Builder® Coalition.

COURTESY OF

The Green Builder® Coalition

The Green Builder® Coalition is a not-for-profit association dedicated to amplifying the voice of green builders and professionals, driving advocacy and education for more sustainable homebuilding practices. For more information, visit **GreenBuilderCoalition.org**

GREEN BUILDER® MEDIA PRESENTS

THE ALIGN PROJECT

BY Kasita

RENDEZVOUS WITH REALITY

THE ALIGN PROJECT is a one-year demonstration project designed to challenge entrenched ideas about how we live in the U.S. and offer suggestions for how we can align our lifestyles with our changing socio-economic and environmental realities.

Whether we like it or not, the changing climate is demanding a sweeping overhaul of the way we live. Fortunately, advances in high-performance products and enabling technologies are providing viable solutions for enhanced efficiency, resiliency, sustainability, and connectivity.

The centerpiece of The Align Project is Kasita's small-footprint, net-zero, connected independent dwelling unit. The precision-engineered home takes advantage of every square foot of space and comes with Kasita's smart home technology platform, which seamlessly integrates devices, appliances, lighting, and mechanical systems.

Recognizing that sustainable living extends beyond the home, The Align Project will also focus on revamping our cities, energy infrastructure, mobility solutions, and finances, highlighting sustainable choices that align with our moral compass to ensure a flourishing future.

Visit The Align Project

Solar Power International
September 24-27 2018, Anaheim, CA

CES
January 8-11 2019, Las Vegas, NV

Design & Construction Week
February 19-21 2019, Las Vegas, NV

Project Sponsors	Rheem, JinKO Solar, TOYOTA, DUPONT, TABUCHI ELECTRIC, Andersen, viega, ROCKWOOL, LOXONE, AWAIR
For More Information	Visit www.greenbuildermedia.com/vision-house-the-align-project or email Cati O'Keefe at cati.okeefe@greenbuildermedia.com

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COMING NEXT ISSUE

GREEN BUILDER®

Digital Ambitions

The U.S. Department of Energy shares its latest building science research and field tests.

CREDIT: U.S. DEPARTMENT OF ENERGY

FROM THE TAILGATE

New Offerings for the Sustainable Minded

By Ron Jones

An Even Higher Standard

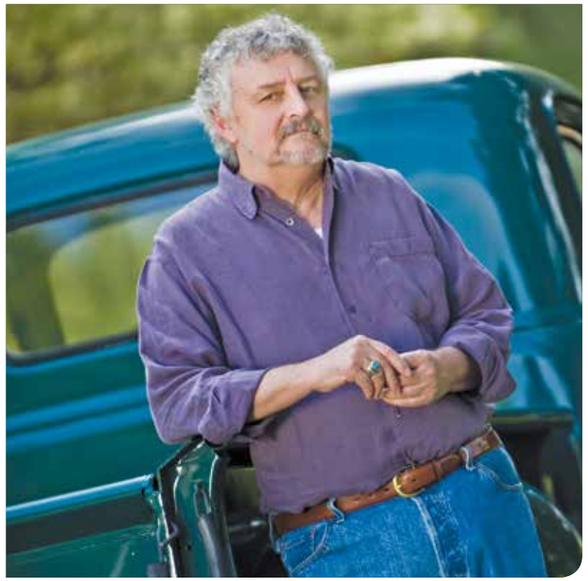
FOR A DECADE, Green Builder® Media has conducted our Green Home of the Year Awards, most recently presented in the 2018 March/April issue of this publication. Since their inception, our awards have been the industry standard for recognizing excellence in high-performance, sustainably built residential projects in all 50 states, across the continent and beyond. Builders from coast to coast and elsewhere (this year we even enjoyed an entry from New Zealand!) have been celebrated through the program for their commitment to green building, environmental stewardship and exceptional quality.

More recently, in 2017 to be precise, we produced our inaugural Green Builder Sustainability Symposium™, held in January of that year in Orlando. We returned to Orlando for a reprise event 12 months later in January 2018. Both gatherings garnered high praise from the national press, attendees and presenters alike, and we proudly consider them to be among our most successful and meaningful endeavors ever.

By now you have probably heard or read that for 2019, we have decided to marry the electricity and prestige of these two benchmark events by consolidating the 2019 Symposium. This will be held for the first time in Las Vegas on Monday, Feb. 18 [a day before the Design and Construction Week® (DCW) opens at the Las Vegas Convention Center]. The announcement of the next collection of award-winning entries in our annual competition will be celebrated the night before on Sunday, Feb. 17, in conjunction with our pre-symposium VIP dinner, where we provide a unique networking opportunity for our presenters, sponsors, industry leaders and dedicated community of sustainability advocates.

We are excited to announce that we are expanding our awards program as well, to become known as the Green Builder Sustainability Awards™. For the first time, we will include a development/community award in the Projects category. Additionally, we will be honoring the most exemplary municipal sustainability program, the building products manufacturer who is doing the most for sustainable building, and the individual we are affectionately calling our "Sustainability Superhero"—the person who has made the most significant contribution in the built environment.

This means a couple of things. First, the call for entries is going out earlier in the calendar year in order to facilitate all that goes into the selection, recognition and promotion of the next group of honorees. Please be sure to watch for our announcements of entry deadlines and details so that your projects, or nominees in our new categories, have every opportunity to be considered.



[Of course, you could just shoot for the minor leagues and enter the BOGUS Awards...]

Second, whether you anticipate attending the Design & Construction Week (DCW) Expo, make plans to register for the 2019 Sustainability Symposium. This will be held at the performing arts center, the spectacular Artemus W. Ham Concert Hall, on the campus of the University of Nevada Las Vegas on Feb. 18, 2019. We have the most compelling and exciting lineup of presenters you will find at any event of this kind, anywhere, in 2019!

That date happens to be Presidents Day, and many people in a variety of sectors will have the day off from work. Plus, there are no classes on the UNLV campus on that date, so access and parking should not be a challenge. Registration is available online at **www.greenbuildermedia.com/desert-shall-bloom-2019**.

Last but not least, consider joining us for the VIP dinner on Sunday evening. Seating is strictly limited and by reservation only. To learn details and secure seats or a group table, visit **www.greenbuildermedia.com/11th-home-of-the-year-call-for-entries**.

We can't wait to see you in Las Vegas! GB

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Trust doesn't come easily. It's the result of time, experience and hard work. We're honored that the majority of U.S. homes depend on our products. And we're committed to maintaining the same level of trust with you by providing **quality appliances, purposeful innovations** and **reliable service** that will help you sell more homes.

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* Based on a Whirlpool Corporation consumer survey.

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